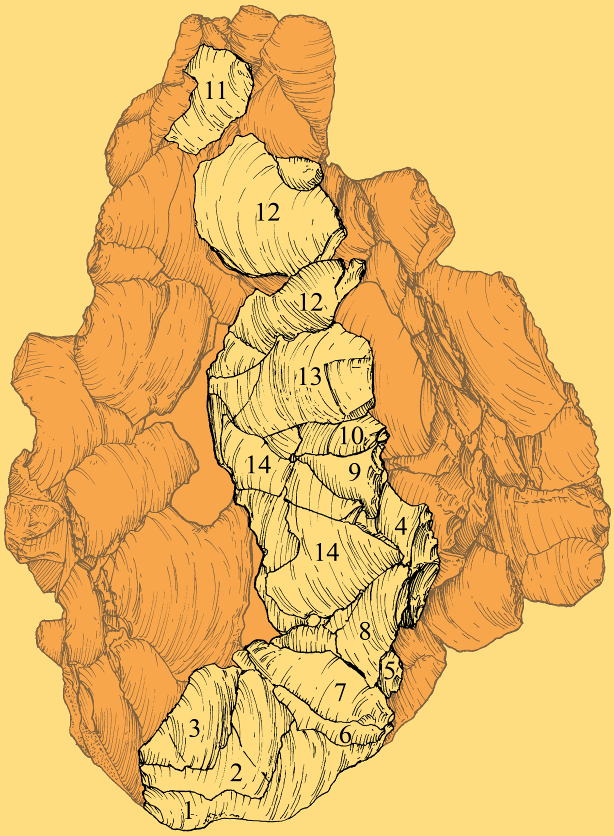
Palaeolithic Sites of Crimea · Vol. 3 · Part 2

KABAZI V:
INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS - MOUSTERIAN CAMP SITES



Edited by

Victor Chabai, Jürgen Richter and Thorsten Uthmeier

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НАЦИОНАЛЬНАЯ АКАДЕМИЯ НАУК УКРАИНЫ
ИНСТИТУТ АРХЕОЛОГИИ
КРЫМСКИЙ ФИЛИАЛ

КЁЛЬНСКИЙ УНИВЕРСИТЕТ
ИНСТИТУТ ДО- И ПРОТОИСТОРИИ

Палеолитические стоянки Крыма,
Том 3 · Часть 2

КАБАЗИ V:
ИНТЕРСТРАТИФИКАЦИЯ МИКОКСКИХ И ЛЕВАЛЛУА-МУСТЬЕРСКИХ КОМПЛЕКСОВ

Редакторы:
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Симферополь – Кёльн
2008

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INSTITUTE OF ARCHAEOLOGY
CRIMEAN BRANCH

UNIVERSITY OF COLOGNE
INSTITUTE OF PREHISTORIC ARCHAEOLOGY

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УТВЕРЖДЕНО К ПЕЧАТИ УЧЕНЫМ СОВЕТОМ КРЫМСКОГО
ФИЛИАЛА ИНСТИТУТА АРХЕОЛОГИИ НАН УКРАИНЫ.

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Table of Contents

СОДЕРЖАНИЕ

NATIONAL ACADEMY OF SCIENCES OF UKRAINE INSTITUTE
OF ARCHAEOLOGY CRIMEAN BRANCH

UNIVERSITY OF COLOGNE INSTITUTE OF PREHISTORIC
ARCHAEOLOGY

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Chapter 7

Kabazi V, Sub-Unit III/1: The Starosele Facie of Micoquian

Andrey P. Veselsky

This chapter presents the analysis of materials recovered from four levels (III/1B, III/1, III/1C, III/1A) of sub-unit III/1 at Kabazi V. Whereas the archaeological levels III/1 and III/1A, excavated between 1993 and 1995, are already published (Yevtushenko 1998b), levels III/1B and III/1C were only defined during the last field campaigns in 2002 and 2003 (Chapter 1, this volume). Thus, together with the presentation of the assemblages from these latter investigated levels, this chapter also considers, for the first time, the occupational characteristics of levels III/1B, III/1, III/1C and III/1A of sub-unit III/1 as palimpsests (Chapter 2, this volume). The description of artefacts follows the variant of Gladilin's classification (Gladilin 1976), as adopted for Crimean Middle Palaeolithic studies (Chabai, Demidenko 1998).

Structure of the Artefact Assemblage

Sub-unit III/1 has yielded a total of 90,231 artefacts (Table 7-1). The artefacts are subdivided into three main groups: artefacts on flint, artefacts on bone, and artefacts on pebble.

The first group is represented by 89,865 items which are assigned to one of seven artefact categories: chips, flakes, tools, blades, chunks, cores, and preforms (Table 7-1). The most part of flint artefacts (94.98 %) are presented by chips (flakes less than 3 cm in length or width). The totality of flakes and blades comprise 3.23 % of the total number of flint artefacts. Most numerous are flakes, which in the essential count constitute 60.79 % (Table 7-1).

Tools in the essential count from all levels make up practically a quarter (25.93 %) of all artefacts (Table 7-1). Unifacial tools are the most frequent. Indexes of bifacial tools in relation to all tools, including retouched and unidentifiable pieces, are for each of the levels as follows: level III/1B – 28.8 %, level III/1 – 32.4 %, level III/1C – 36.4 % and level III/1A – 28.6 %. However, disregarding the retouched and unidentifiable pieces, indexes differ from the above quite considerably: level III/1B – 7.4 %, level III/1 – 21.53 %, level III/1A – 17.72 %. No complete bifacial tool was found in level III/1C. Also, the overall number of unifacial tools from this level is small, at just 5 items.

	III/1B	III/1	III/1C	III/1A	Total:	%	ess %
Flint artefacts							
Chunks	19	173	·	150	342	0.38	·
Cores	4	8	·	14	26	0.03	0.62
Bifacial preforms	8	7	3	13	31	0.03	0.74
Preforms of bifacial tools or cores	3	62	·	68	133	0.15	3.19
Chips	10,130	47,033	4,177	24,013	85,353	94.98	·
Flakes	259	1,322	87	867	2,535	2.82	60.79
Blades	29	195	10	130	364	0.41	8.73
Tools	73	541	22	445	1,081	1.20	25.93
Total:	**10,525**	**49,341**	**4,299**	**25,700**	**89,865**	**100.00**	**100.00**
Pebble & bone artefacts							
Pebble fragments	7	81	4	131	223		
Retouchers on pebbles	·	4	2	17	23		
Hammer-stones	·	·	1	10	11		
Choppers on pebbles	·	·	·	1	1		
Pièce esquille on pebble	·	1	·	·	1		
Retouchers on bones	21	60	3	23	107		
Total:	**28**	**146**	**10**	**182**	**366**		

Table 7-1 Kabazi V, sub-unit III/1: artefact totals.

Two other groups of archaeological material comprise bone tools and pebbles. Bone artefacts consist of retouchers on bones: 2.36 % in the essential count. Pebbles are numerous (Table 7-1), although the most part (223 pieces) display no visible traces of use. Hammer-stones and retouchers on pebbles were found in three archaeological levels: III/1 (4 pieces), III/1C (3 pieces) and III/1A (27 pieces). Two further tools on pebble (a chopper and *pièce esquille*) were found in archaeological levels III/1 and III/1A.

The characteristic features of sub-unit III/1 artefact structures are as follows: the percentages of tools, cores and preforms are common for Micoquian on-site workshops; the presence of bifacial tool preforms and bifacial tools themselves are also a Micoquian feature.

Chunks

In sub-unit III/1 chunks compose 0.38 % (Table 7-1) of all artefacts. Most chunks were found in flint assemblages from levels III/1 (173 pieces) and III/1A (150 pieces). No chunks were found in level III/1C. All chunks are fragments of bad quality raw material, and all stem from flint plaquettes. Usually chunks do not exceed maximum dimensions of 5 cm. Chunks larger than 5 cm compose from 6.94 % of the entire assemblage of level III/1C, and up to 12.67 % in level III/1. The biggest chunk is from level III/1A (117.03 mm long, 58.54 mm wide, and 22.9 mm thick). Only one chunk from level III/1A was tested by few removals. Among chunks, six burnt examples were also discovered, two such artefacts in each of the levels in which they were identified. As a rule, all chunks are the discarded fragments of raw material blocks which broke during their first stage of flaking.

Preforms

Preforms comprise 0.18 % (Table 7-1) of all artefacts in sub-unit III/1. This artefact category is characterised by the absence of pronounced retouched edges; indeed, it is this factor which prevents their affiliation to the bifacial tools (Fig. 7-1, *1, 2*). The edges of preforms are wavy in profile, and display denticulated outlines in plan. The greatest amount of

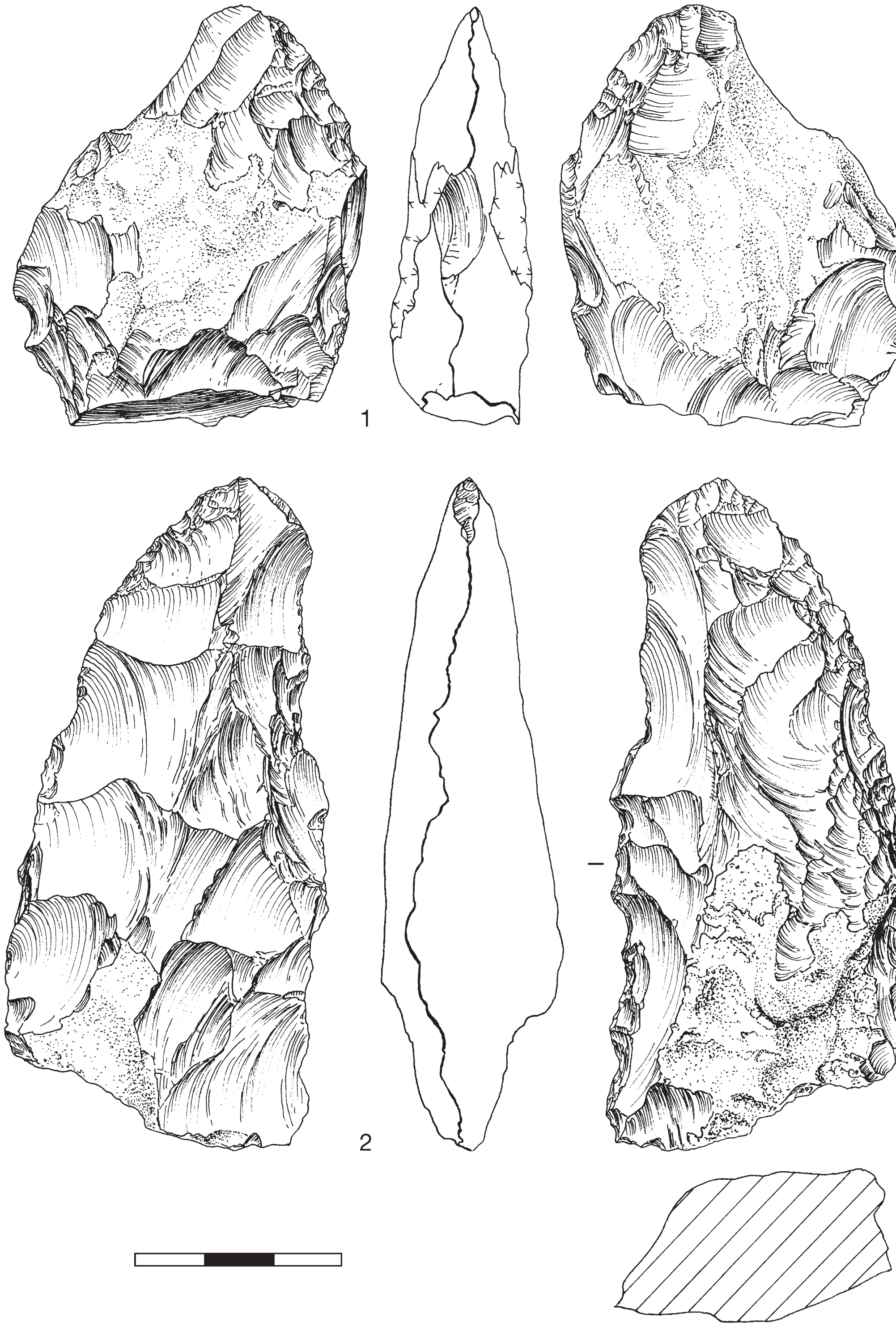

Fig. 7-1 Kabazi V, level III/1A. Bifacial preforms.

preforms was observed in level III/1A (Table 7-1). From a typological perspective, preforms can be subdivided into two groups: preforms of bifacial tools, and preforms of bifacial tools or cores. The majority of pieces assigned to the first group were made on flint plaquettes and natural flakes. Flakes as blanks for bifacial tool preforms were used in five cases, and were found in level III/1 (1 item), level III/1C (1 item), and level III/1A (3 items). Among preforms produced on flint plaquettes or natural flakes, the largest recorded piece stems from level III/1; it has a length of 124.01 mm, a width of 41.2 mm, and is between 11.57 and 34.49 mm thick. Preforms made on flakes are smaller than those made on plaquettes. Among the preforms made on flakes, the largest piece is from level III/1A; it is 58.33 mm long, 50.22 mm wide, and between 12.7 and 16.7 mm thick. Such preforms are a common feature in Crimean Micoquian assemblages, especially at on-site workshops, such as at Zaskalnaya V, Zaskalnaya VI, and Kabazi V, level III/2.

The second group is represented by small fragmented pieces which can only tentatively be classified as bifacial tool preforms or preforms of cores (Table 7-1). Among these pieces, items with maximum dimensions exceeding 5 cm compose 11.27 % of all preforms. For example, when compared with bifacial tool preforms, the examples with maximum dimensions larger than 5 cm make up 68.97 % of all of the latter preforms. Most of bifacial tool or core preforms were made on flint plaquettes. Items on flakes are not numerous. Four pieces were made on already patinated flakes.

Cores

Cores were found in all levels with the exception of level III/1C. The total number of cores from sub-unit III/1 lies at 26 items. Fourteen pieces were found in level III/1A, eight in level III/1, and four cores were recovered from level III/1B (Table 7-1). The cores are represented by the following typological classes: radial (N=9) (Fig. 7-2, *1*); discoid (N=1); unidirectional (N=3); bidirectional (N=3); transverse (N=1); subcrossed (N=5) (Fig. 7-2, *2*); Levallois (N=1); and unidentifiable (N=3). All unidirectional, sub-cylindrical, Levallois and transverse types display rectangular flaking surfaces. The most part of bidirectional and sub-crossed cores are also rectangular in shape. The only item with a rounded flaking surface is a subcrossed core (Fig. 7-2, *2*). All cores from sub-unit III/1 are heavily exhausted; only 4 specimens are larger than 6 cm. The largest core is 77.74 mm long and 47.51 mm wide, it was found in level III/1A. Ten cores are thinner than 20 mm, while only one core is thicker than 30 mm. Such parameters are indicative of a high degree of reduction. Nine cores display signs of a radial reduction. The majority of cores from subunit III/1 feature lateral supplementary platforms. Also, in most cases, both the main and supplementary platforms are faceted. Those cores belonging mainly to bi-, unidirectional and radial types show consistency with typological transformation processes observed during studies on cores from WCM assemblages from Kabazi II, Unit II (Chabai 1998b, Usik 2003). At the same time, radial cores are common in Micoquian assemblages, too (Kolosov 1983, 1986). WCM features are most obvious in the core assemblage from archaeological level III/1A, which also yielded the largest of the core assemblages (54 %) from sub-unit III/1. Core types from level III/1A that are, however, not characteristic for homogeneous Crimean Micoquian assemblages are sub-cylindrical and Levallois types; on the other hand, both these types are only represented by a single item each.

Blank variability

Blanks from sub-unit III/1 were assigned to the following categories: chips, flakes, and blades. Further, pieces affiliated to these categories are differentiated according to whether they are “regular”, display “bifacial thinning”, or are “unidentifiable”. Alternatively, blanks may have crushed or missing striking platforms. The majority of blanks are chips, 91.16 % of which comprise regular chips with a broken butt (Table 7-2). Pieces which may have resulted from bifacial tool production constitute 4.84 % of all blanks. Blanks from bifacial thinning are represented by 22.29 % of all blanks (Fig. 7-3). Both values are lower than those observed in the Crimean Micoquian assemblages at Buran-Kaya III, level B; Chokurcha I, Unit IV; and Kabazi V, level III/2 (Chabai 2004b, this volume, Demidenko 2004). Nevertheless, such blanks still constitute much higher ratios than in any WCM assemblage. The distribution of “bifacial thinning” blanks in the assemblages from sub-unit III/1 is of a marked heterogeneous character (Fig. 7-4). Lowest percentages of “bifacial thinning” blanks (17.55 %) are recorded for level III/1, while in other levels “bifacial thinning” blanks always exceed 24 % of the respective assemblages. The low percentage of “bifacial thinning” blanks in all levels of subunit III/1 demonstrates that flakes and blades also resulted from core reduction. This is confirmed by the relatively high number of cores, especially in archaeological level III/1A. Nevertheless, most blanks

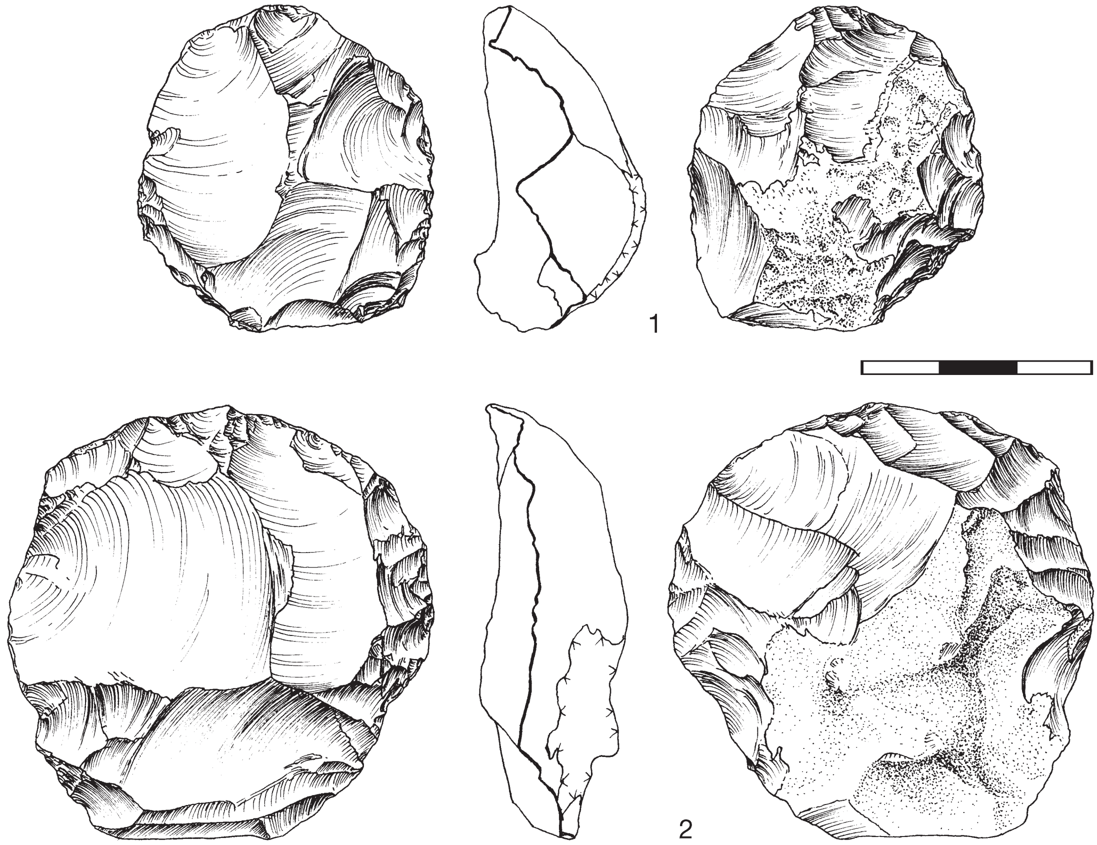

Fig. 7-2 Kabazi V, level III/1. Cores: 1 – radial, 2 – sub-crossed.

	III/1B	III/1	III/1C	III/1A	Total:	%
Chips, regular and unidentifiable	9,809	45,744	4,077	21,663	81,293	91.16
Bifacial thinning & rejuvenating chips	321	1,297	100	2,354	4,072	4.57
Flakes, regular and unidentifiable	294	1,649	99	1,133	3,175	3.56
Bifacial thinning & rejuvenating flakes	24	99	9	82	214	0.24
Blades, regular and unidentifiable	29	210	10	146	395	0.44
Bifacial thinning blades	3	11	1	11	26	0.03
Total:	**10,480**	**49,010**	**4,296**	**25,389**	**89,175**	**100.00**

Table 7-2 Kabazi V, sub-unit III/1: blank variability, as numbers and percentages of each type.

stem from bifacial tool production. The percentages of blades in all assemblages from sub-unit III/1 are about the same. The smallest blade index is noted for levels III/1B (9.14 %) and III/1C (9.24 %). Levels III/1 and III/1A have slightly higher indexes, 11.22 and 11.44, respectively. Such low blade indexes are common among Micoquian complexes (Kolosov 1986, Chabai 2004c, this volume). In spite of a few core types characteristic of the Levallois-Mousterian, blank assemblages from sub-unit III/1 show pronounced Micoquian attributes: the presence of bifacial thinning and rejuvenation blanks, low percentages of blades, as well as the absence of Levallois and *débordantes* flakes and blades.

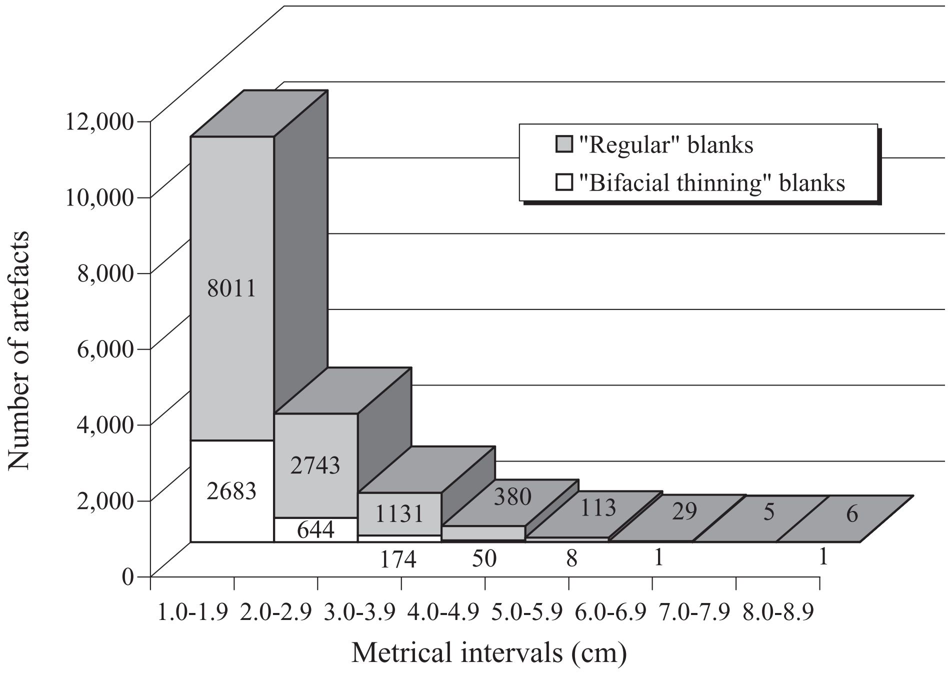

Fig. 7-3 Kabazi V, sub-unit III/1: "regular" and "bifacial thinning" blanks, by metrical intervals.

Chips

Chips have been subdivided into five groups: "regular", bifacial thinning chips, rejuvenating chips, broken chips, and chips between 0.1 and 0.9 mm in length (Table 7-3). Due to the small size of the pieces from the latter group, it proved difficult to differentiate between those resulting from regular and those from bifacial thinning processes. All above listed groups of chips are present in all levels of sub-unit III/1. Characteristic for all levels are relatively low ratios of bifacial thinning chips. In level III/1A, the level with the most bifacial chips, these pieces make up no more than 29.13 % of all identifiable chips. The lowest percentage of bifacial thinning chips is noted for level III/1 – 18.29 %.

As a whole, the percentages of bifacial thinning chips in all levels of sub-unit III/1 are considerably lower than noted for Kabazi V, sub-units III/2 and III/4. However, the percentage of bifacial chips from sub-unit III/1 is at least 2.4 times greater than observed in the WCM assemblage from Kabazi V, IV/1. The rejuvenating chips from all metrical intervals comprise only 0.29 % of all identifiable chips. It should be noted that rejuvenating chips in this sub-unit comprise solely reshaping chips from bifacial tool tips. The rejuvenating chips comprise 7.97 % of the sum of bifacial thinning and rejuvenating chips. This last value considerably exceeds those for Kabazi V, sub-units III/2 (4.06 %) and III/4 (3.72 %).

Flakes and blades

On average, blades comprise 8.73 % of all artefacts (Table 7-1). The blade index varies from 9.14 in level III/1B to 11.44 in level III/1A. On average, 6.7 % of flakes and blades originated from bifacial tool reduction. This percentage of bifacial blanks among blanks longer than 3 cm is even lower than observed in levels of sub-unit III/4 (8.1 %). For each level this index has the following values: III/1B – 7.72 %, III/1 – 5.59 %, III/1C – 8.4 %, and III/1A – 6.78 %. The available cores signify some blade production, especially in level III/1A, and the presence of bifacial tools and of bifacial tool preforms in assemblages of sub-unit III/1 are indicative of bifacial flaking.

Blank dimensions

As a whole, regular blanks are bigger than bifacial thinning and unidentifiable blanks in practically all archaeological levels of sub-unit III/1 (Table 7-4). The only exception are flakes from level III/1C; regular and bifacial flakes from this level have a tendency toward transverse proportions. Moreover, in this level the average length and width of regular and bifacial thinning flakes are almost equal. A similar situation is observed for flakes in archaeological level III/1 (Table 7-4). The thickness of regular flakes and blades in all levels considerably exceed those parameters for bifacial thinning flakes and blades. The largest blades are found among "regular" blades.

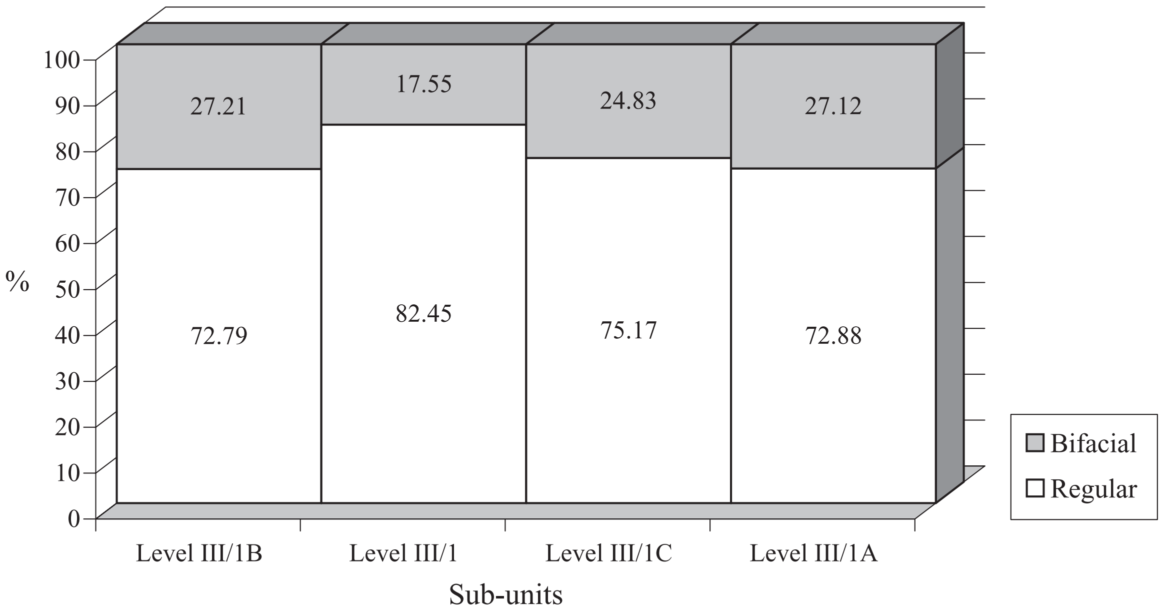

Fig. 7-4 Kabazi V, sub-unit III/1: percentage of "regular" and "bifacial thinning" blanks among chips (1.0 – 2.9 cm).

Bifacial thinning blades are shorter and thinner than the latter. Moreover, blades in archaeological level III/1B are longer, wider and thicker than the blades from other levels of sub-unit III/1.

Tools in all archaeological levels were made on the largest blanks. The longest tools are found in level III/1B. Combined with the prevalence of faceted platforms on the largest blanks, this may indicate that tools from sub-unit III/1 can be assigned to a Levallois-Mousterian tool-kit, especially those from level III/1A (Fig. 7-5, *A*).

Platform dimensions

In all levels of sub-unit III/1 the width and thickness of platforms on "regular" blanks are greater than platforms on "bifacial thinning" blanks. Among regular blanks, platforms on blades are considerably narrower and thinner than platforms on flakes (Table 7-4). However, in levels III/1B and III/1A the platforms of bifacial thinning blades are wider and thicker than those on regular blades. As a rule, the sizes of tool platforms correspond to the average sizes of striking platforms on regular flakes. An exception are the tool butts from level III/1C, these have practically the same values as the bifacial thinning flakes, while the thickness of tool butts occupies intermediate position between regular and bifacial thinning flakes (Table 7-4).

Whereas in levels III/1B and III/1C largest striking platforms are found on cortex-covered, polyhedral and plain butts (Fig. 7-5, *B*), in levels III/1, and especially III/1A, these are found on cortex-covered, polyhedral, plain and faceted butts. Among all types of striking platforms in all levels those platforms covered by cortex are the thickest. The relatively large sizes of faceted platforms in levels III/1 and III/1A are uncommon for the Micoquian, and are more characteristic of Levallois-Mousterian techno-complexes.

Surface cortex

61.67 % of all blanks retain amounts of cortex (Table 7-5). Blanks with dorsal cortex comprise 83.54 % of blanks on flakes, 10.82 % of blanks on blades, 5.05 % of bifacial thinning flakes, and 0.59 % of bifacial thinning blades. In all blank groups, most pieces display the minimal percentage of cortex, i.e. no more than one quarter of the dorsal surface is covered. Thus, partly corticated blanks are characteristic for all blank groups. The ratio of corticated to non-corticated flakes lies at 1.62. The same ratio for bifacial thinning flakes is 1.25. For blades and bifacial thinning blades these ratios are 1.82 and 1.17, respectively. Blanks whose dorsal surfaces are covered in excess of 50 % by cortex are not numerous: 18.42 % of the total amount of blanks. Most of these latter pieces comprise primary blanks: 12.95 % of the total amount of blanks. A high percentage of blanks with cortex is a characteristic feature of all Crimean Middle Palaeolithic industries based on flint plaquette raw material exploitation.

	cm	III/1B	III/1	III/1C	III/1A	Total:	esse %
Regular	1.0 - 1.9	613	4,294	216	2,888	8,011	9.38
	2.0 - 2.9	174	1,462	61	1,049	2,746	3.22
Bifacial	1.0 - 1.9	253	975	83	1,209	2,520	2.95
	2.0 - 2.9	48	205	12	326	591	0.69
Rejuvenating	0.1 - 0.9	·	9	·	23	32	0.04
	1.0 - 1.9	12	86	5	60	163	0.19
	2.0 - 2.9	8	21	·	24	53	0.06
Unidentifiable chips	0.1 - 0.9	5,955	22,599	2,748	9,916	41,218	48.28
	1.0 - 1.9	2,685	14,945	938	7,009	25,577	29.96
	2.0 - 2.9	382	2,445	114	1,513	4,454	5.22
Total:		**10,130**	**47,041**	**4,177**	**24,017**	**85,365**	**100.00**

Table 7-3 Kabazi V, sub-unit III/1: chips, grouped maximum dimensions.

Dorsal scar patterns

There are many varieties of dorsal scar patterns in sub-unit III/1 assemblage. The five most common dorsal scar pattern types that are found on all kinds of flakes and regular blades are: cortex-covered, converging, unidirectional, and bidirectional (Table 7-6). Blanks with converging scar pattern tend to dominate (24.96 % of all blanks), while cortex-covered blanks are most common among regular flakes. Although not numerous, blanks with unidirectional-crossed (9.89 %) and bidirectional-crossed (5.86 %) scar patterns are present in all groups of blanks. The lateral, bilateral, radial, four-directional and Janus types are represented by a few items each. Crested blanks are represented by 2.88 %. This type of scar pattern is most often (3.4 %) encountered among regular flakes from level III/1B (Table 7-6). Crested items among regular flakes from levels III/1C and III/1A compose 2.02 % and 2.52 %, respectively. Crested scar pattern among regular blades is characteristic for archaeological levels III/1C (20.0 %) and III/1A (12.33 %), while in level III/1 they constitute just 4.76 %, and are completely absent in level III/1B. Among bifacial thinning flakes are found the most widespread scar patterns, the converging and bidirectional types. Among bifacial thinning blades the converging scar pattern type is the most commonly observed. Levallois blanks are absent.

Axis

Generally speaking, on-axis blanks are dominant: 67.07 % (Table 7-7), although off-axis blanks dominate among bifacial thinning flakes from levels III/1B and III/1A.

Shapes

Trapezoidal shaped blanks are the most common in the blank assemblage from sub-unit III/1, with 33.77 % of all blanks being of this particular shape (Table 7-8). However, trapezoidal shapes are more characteristic for flakes than blades, while the latter are usually rectangular or crescent shaped. Among flakes from bifacial thinning and regular flakes, these latter mentioned shapes are insignificant, constituting just 7.4 % and 5.45 % of these items, respectively. Other shapes clearly play a subordinate role.

Lateral profiles

The "generalised" structure of types of lateral profiles is the same as for "regular" flakes, although for other kinds of blanks a number of differences can be observed (Table 7-9). Among "regular" flakes, the greater part of blanks displays an incurvate medial lateral profile (39.01 %). These are followed by blanks with twisted (15.52 %), incurvate distal (8.57 %), flat (5.21 %), and convex (1.33 %) lateral profiles. Among bifacial thinning flakes, as well as "regular" flakes, the largest percentage of blanks display an incurvate medial lateral profile (64.49 %). Bifacial thinning flakes with incurvate distal and twisted lateral profiles are also numerous and make up 17.29 % and 13.55 %, respectively. Flat and convex lateral profiles are less representative, with 3.27 % and 1.4 %, respectively (Table 7-9). Among "regular" blades a twisted lateral profile is the most frequent. Blades with this type of lateral profile constitute 51.65 % of all regular blades, and are followed by "regular" blades with an incurvate medial profile (39.49 %).

	Blank types	III/1B	III/1	III/1C	III/1A
Length	regular flakes including tools	33.19	32.13	33.20	33.13
	bifacial flakes including tools	31.04	32.48	33.31	30.34
	regular blades including tools	46.14	42.09	43.52	42.06
	bifacial blades including tools	35.14	37.66	60.76*	38.86
	blanks (flakes & blades)	34.01	33.53	35.51	33.02
	tools	47.67	41.45	43.74	42.91
Width	regular flakes including tools	31.65	32.24	31.47	31.62
	bifacial flakes including tools	30.46	29.91	31.32	31.96
	regular blades including tools	20.29	18.05	18.55	17.43
	bifacial blades including tools	16.98	16.97	26.76*	15.74
	blanks (flakes & blades)	31.43	28.83	29.60	29.13
	tools	34.44	33.76	29.72	31.76
Thickness	regular flakes including tools	5.96	6.14	7.31	6.07
	bifacial flakes including tools	4.36	4.45	4.34	4.56
	regular blades including tools	7.32	5.25	7.00	5.63
	bifacial blades including tools	4.10	3.26	7.56*	3.32
	blanks (flakes & blades)	5.75	5.68	7.01	5.82
	tools	8.47	7.14	7.08	6.75
Platform width	regular flakes including tools	16.66	15.87	16.87	14.77
	bifacial flakes including tools	11.10	10.48	10.13	11.21
	regular blades including tools	9.92	8.53	7.63	9.02
	bifacial blades including tools	10.82	6.16	3.99*	8.12
	blanks (flakes & blades)	15.65	13.22	15.51	13.5
	tools	14.61	15.87	10.57	14.55
Platform thickness	regular flakes including tools	4.36	4.04	5.03	4.10
	bifacial flakes including tools	2.54	2.83	1.97	2.96
	regular blades including tools	2.92	2.78	2.73	2.71
	bifacial blades including tools	3.26	1.54	1.3*	2.94
	blanks (flakes & blades)	3.97	3.68	4.51	3.75
	tools	4.31	4.05	3.15	4.07

* single piece

Table 7-4 Kabazi V, sub-unit III/1: average dimensions.

Poorly represented among regular blades are blanks with flat (6.08 %), incurvate distal (2.03 %), or convex (0.25 %) lateral profiles. Bifacial thinning blades are presented only by three types of lateral profiles: flat, incurvate medial, and twisted. Among the latter, most pieces are either incurvate medial or twisted; both types are represented in more or less equal proportions. However, among bifacial thinning blades the percentage of incurvate in medial part is slightly higher (50 %) than the twisted variant (46.15 %) (Table 7-9). Unidentifiable blanks make up 14.18 % of all removals.

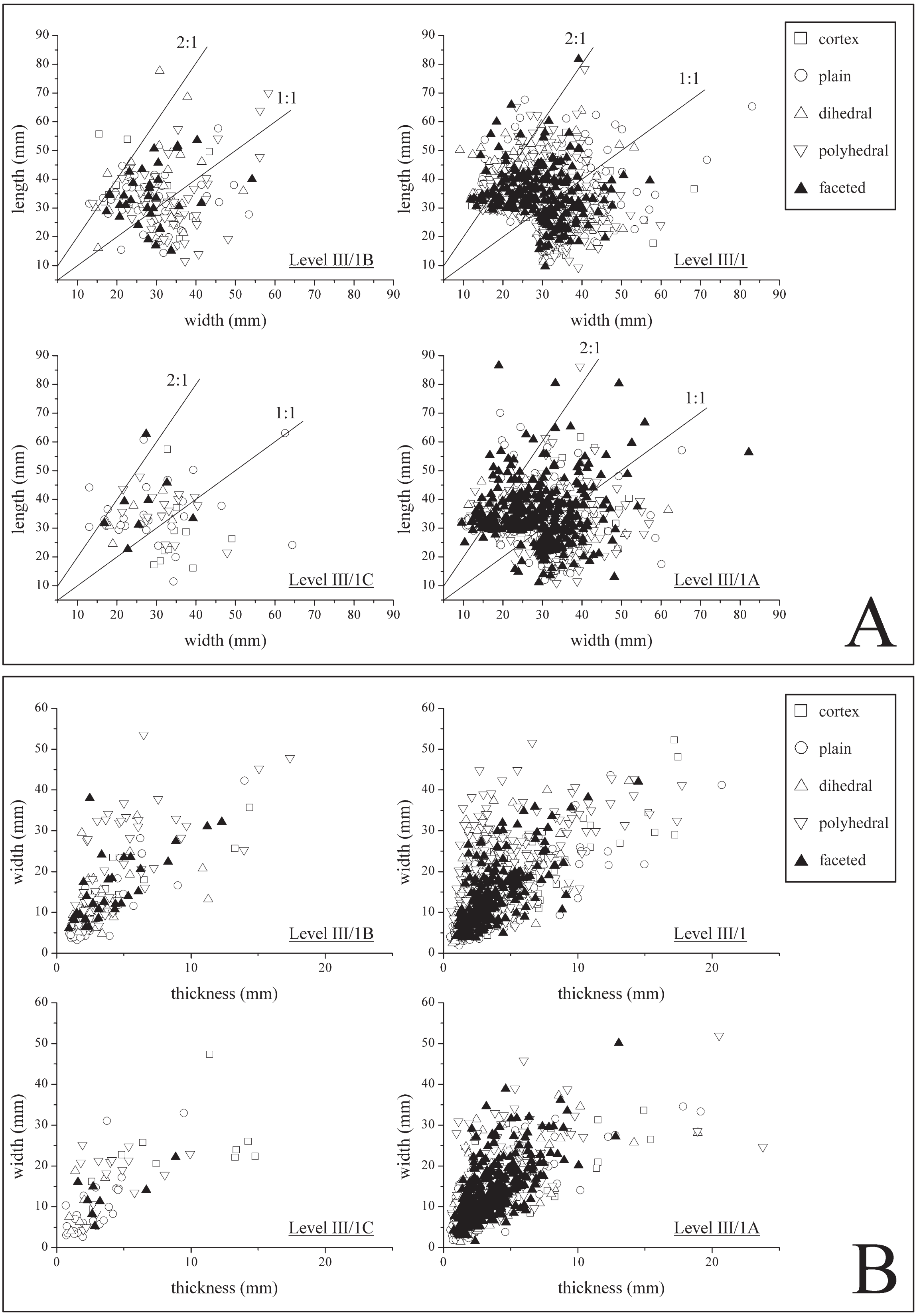

Fig. 7-5 Kabazi V, Sub-unit III/1: A – length/width scatterplot for blanks, by platforms types; B – width/thickness scatterplot for platforms of blanks, by platforms types.

	III/1B	III/1	III/1C	III/1A	Total	%
Flakes & tools on flake						
0%	119	617	41	441	1,218	31.87
1-25 %	98	554	21	350	1,023	26.77
26-50 %	32	167	15	115	329	8.61
51-75 %	10	69	2	93	174	4.55
76-100 %	35	254	20	134	443	11.59
Total	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
0%	11	42	4	38	95	2.49
1-25 %	10	42	3	25	80	2.09
26-50 %	2	9	1	9	21	0.55
51-75 %	·	3	·	5	8	0.21
76-100 %	1	3	1	5	10	0.26
Total	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
0%	5	81	3	51	140	3.66
1-25 %	10	65	5	48	128	3.35
26-50 %	10	24	1	25	60	1.57
51-75 %	2	14	·	10	26	0.68
76-100 %	2	26	1	12	41	1.07
Total	**29**	**210**	**10**	**146**	**395**	**10.33**
Bifacial thinning blades & tools on bifacial thinning blade						
0%	1	6	·	5	12	0.31
1-25 %	2	4	·	4	10	0.26
26-50 %	·	1	·	1	2	0.05
51-75 %	·	·	·	1	1	0.03
76-100 %	·	·	1	·	1	0.03
Total:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-5 Kabazi V, sub-unit III/1: flakes & blades – percentage of dorsal cortex.

Distal profiles

The feathering distal profile is the most widespread type of end termination among all blanks from sub-unit III/1 (Table 7-10). Compared with regular blanks, bifacial thinning blanks display the highest percentage of pieces with this type of the distal profile, and is observed on 48.6 % of thinning flakes, and 61.54 % of thinning blades. Blanks with hinged terminations are also numerous. "Hinged blanks" are the most numerous among regular blanks, comprising 29.14 % of flakes, and 24.05 % of blades. Among bifacial thinning blanks, the number of "hinged blanks" decreases in favour of the aforementioned feathering distal profile. Both flakes and blades show a very low maintenance of blanks with blunt and overpassed end terminations. Altogether, overpassed and blunt types do not exceed 3.75 % (Table 7-10).

	III/1B	III/1	III/1C	III/1A	Total:	%
Flakes & tools on flake						
Cortex	31	254	18	140	443	11.59
Lateral	3	20	1	41	65	1.70
Bilateral	5	14	1	24	44	1.15
Radial	2	10	·	5	17	0.44
Converging	81	433	18	235	767	20.07
Unidirectional	47	228	16	175	466	12.19
Unidirectional-crossed	22	146	10	131	309	8.08
Bidirectional	30	190	6	124	350	9.16
Bidirectional-crossed	11	75	3	88	177	4.64
Fourdirectional	2	3	·	6	11	0.29
Crested	10	42	2	24	78	2.04
Janus	·	1	·	2	3	0.08
Unidentifiable	50	245	24	138	457	11.96
Total:	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
Cortex	1	3	1	5	10	0.26
Lateral	·	·	·	1	1	0.03
Bilateral	1	1	·	3	5	0.14
Converging	9	40	4	20	73	1.91
Unidirectional	4	7	2	20	33	0.86
Unidirectional-crossed	·	7	1	9	17	0.44
Bidirectional	7	30	1	14	52	1.36
Bidirectional-crossed	2	9	·	9	20	0.52
Fourdirectional	·	·	·	1	1	0.03
Crested	·	2	·	·	2	0.05
Total:	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
Cortex	2	26	1	11	40	1.05
Lateral	1	5	1	2	9	0.24
Bilateral	·	5	·	2	7	0.18
Radial	·	·	·	1	1	0.03
Converging	6	64	3	31	104	2.72
Unidirectional	7	41	3	32	83	2.17
Unidirectional-crossed	5	29	·	14	48	1.26
Bidirectional	5	18	·	16	39	1.02
Bidirectional-crossed	3	8	·	13	24	0.63
Fourdirectional	·	2	·	4	6	0.16
Crested	·	10	2	18	30	0.78
Unidentifiable	·	2	·	2	4	0.10
Total:	**29**	**210**	**10**	**146**	**395**	**10.33**

	III/1B	III/1	III/1C	III/1A	Total:	%
Bifacial thinning blades & tools on bifacial thinning blade						
Cortex	·	·	1	·	1	0.03
Converging	2	3	·	5	10	0.26
Unidirectional	·	1	·	3	4	0.10
Unidirectional-crossed	·	3	·	1	4	0.10
Bidirectional	·	3	·	1	4	0.10
Bidirectional-crossed	1	1	·	1	3	0.08
Total:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-6 Continued.

	III 1B	III 1	III 1C	III 1A	Total:	%
Flakes & tools on flake						
On-axis	121	703	52	478	1,354	35.43
Off-axis	71	428	21	310	830	21.72
Unidentifiable	102	530	26	345	1,003	26.24
Total:	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
On-axis	11	60	3	33	107	2.80
Off-axis	13	35	3	43	94	2.46
Unidentifiable	·	4	3	6	13	0.34
Total:	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
On-axis	29	210	10	146	395	10.33
Total:	**29**	**210**	**10**	**146**	**395**	**10.33**
Bifacial thinning blades & tools on bifacial thinning blade						
On-axis	3	11	1	11	26	0.68
Total:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-7 Kabazi V, sub-unit III/1: flakes & blades – axes.

◄ **Table 7-6** Kabazi V, sub-unit III/1: flakes & blades – dorsal scar patterns.

	III/1B	III/1	III/1C	III/1A	Total:	%
Flakes & tools on flake						
Rectangular	21	135	8	106	270	7.06
Triangular	15	59	3	44	121	3.17
Trapezoidal	114	654	37	352	1,157	30.27
Trapezoidal elongated	13	53	3	54	123	3.22
Ovoid	·	5	·	3	8	0.21
Leaf shaped	5	12	1	5	23	0.60
Crescent	13	68	7	98	186	4.87
Irregular	1	26	1	30	58	1.52
Unidentifiable	112	649	39	441	1,241	32.47
Tolal:	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
Rectangular	1	10	·	2	13	0.34
Triangular	2	5	·	5	12	0.32
Trapezoidal	13	58	6	47	124	3.24
Trapezoidal elongated	3	6	·	5	14	0.37
Ovoid	1	·	·	1	2	0.05
Leaf shaped	1	2	·	1	4	0.10
Crescent	2	11	1	8	22	0.58
Irregular	·	1	·	3	4	0.10
Unidentifiable	1	6	2	10	19	0.50
Tolal:	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
Rectangular	16	83	4	52	155	4.06
Triangular	·	3	·	8	11	0.29
Trapezoidal	·	4	1	1	6	0.16
Trapezoidal elongated	3	19	1	10	33	0.86
Leaf shaped	·	15	2	7	24	0.63
Crescent	6	44	2	41	93	2.43
Irregular	1	2	·	1	4	0.10
Unidentifiable	3	40	·	26	69	1.81
Tolal:	**29**	**210**	**10**	**146**	**395**	**10.33**
Bifacial thinning blades & tools on bifacial thinning blade						
Rectangular	2	5	·	6	13	0.34
Trapezoidal elongated	·	1	1	2	4	0.10
Leaf shaped	1	1	·	·	2	0.05
Crescent	·	4	·	1	5	0.13
Unidentifiable	·	·	·	2	2	0.05
Tolal:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-8 Kabazi V, sub-unit III/1: flakes & blades – shapes.

	III/1B	III/1	III/1C	III/1A	Total:	%
Flakes & tools on flake						
Flat	14	98	8	79	199	5.21
Incurvate medial	161	752	40	538	1,491	39.01
Incurvate distal	28	183	13	104	328	8.57
Twisted	41	312	14	226	593	15.52
Convex	5	31	2	13	51	1.33
Unidentifiable	45	285	22	173	525	13.74
Total:	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
Flat	1	·	·	6	7	0.18
Incurvate medial	15	60	5	58	138	3.61
Incurvate distal	6	19	4	8	37	0.97
Twisted	2	18	·	9	29	0.76
Convex	·	2	·	1	3	0.08
Total:	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
Flat	·	12	1	11	24	0.63
Incurvate medial	11	87	1	57	156	4.08
Incurvate distal	2	3	·	3	8	0.21
Twisted	14	107	8	75	204	5.34
Convex	1	·	·	·	1	0.03
Unidentifiable	1	1	·	·	2	0.05
Total:	**29**	**210**	**10**	**146**	**395**	**10.33**
Bifacial thinning blades & tools on bifacial thinning blade						
Flat	·	1	·	·	1	0.03
Incurvate medial	1	7	·	5	13	0.34
Twisted	2	3	1	6	12	0.31
Total:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-9 Kabazi V, sub-unit III/1: flakes & blades – lateral profiles.

Cross-sections at midpoint

Among flakes and blades the two most representative types of cross-sections at midpoint are the triangular and trapezoidal types (Table 7-11), with other types being very much insignificant. The flat and lateral step types are the most numerous categories among regular flakes. Among regular blades the lateral step type constitutes from between 7.14 % (III/1) and 10.34 % (III/1B), but is completely absent in level III/1C. The lateral step profile is not characteristic for bifacial thinning blades (Table 7-11).

Platform preparation

Practically in all archaeological levels of sub-unit III/1 cortex platforms are represented by insufficient percentages, especially among bifacial thinning blanks (Table 7-12). Plain platforms make up 24.22 % of all identifiable platforms. They dominate exclusively among "bifacial thinning" flakes. On the whole, in all archaeological levels of sub-unit III/1 the sum of prepared platforms (dihedral, polyhedral and faceted) is dominant: 67.65 % of all identifiable platforms.

	III/1B	III/1	III/1C	III/1A	Total:	%
Flakes & tools on flake						
Feathering	85	478	15	358	936	24.49
Hinged	104	493	42	290	929	24.31
Overpassed	3	15	·	23	41	1.07
Blunt	8	39	3	36	86	2.25
Retouched	13	139	6	109	267	6.98
Missing	81	497	33	317	928	24.28
Total:	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
Feathering	15	47	4	38	104	2.72
Hinged	8	36	2	28	74	1.93
Overpassed	·	3	·	·	3	0.08
Blunt	·	·	·	1	1	0.03
Retouched	·	1	1	3	5	0.13
Missing	1	12	2	12	27	0.71
Total:	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
Feathering	13	115	6	51	185	4.84
Hinged	7	43	2	43	95	2.48
Overpassed	·	1	·	1	2	0.05
Blunt	1	5	1	2	9	0.24
Retouched	·	7	1	10	18	0.47
Missing	8	39	·	39	86	2.25
Total:	**29**	**210**	**10**	**146**	**395**	**10.33**
Bifacial thinning blades & tools on bifacial thinning blade						
Feathering	1	7	1	7	16	0.42
Hinged	·	1	·	2	3	0.08
Overpassed	·	1	·	·	1	0.03
Missing	2	2	·	2	6	0.16
Total:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-10 Kabazi V, sub-unit III/1: flakes & blades – distal profiles.

	III/1B	III/1	III/1C	III/1A	Total:	%
Flakes & tools on flake						
Flat	·	12	·	·	12	0.31
Triangular	62	425	21	340	848	22.19
Lateral steep	17	66	6	51	140	3.66
Trapezoidal	133	659	36	419	1,247	32.63
Polyhedral	4	29	·	43	76	1.98
Convex	29	160	17	95	301	7.87
Unidentifiable	49	310	19	185	563	14.73
Total:	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
Triangular	8	29	2	18	57	1.49
Lateral steep	·	6	·	·	6	0.16
Trapezoidal	11	54	6	48	119	3.11
Polyhedral	4	9	·	9	22	0.58
Convex	1	1	1	4	7	0.18
Unidentifiable	·	·	·	3	3	0.08
Total:	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
Flat	1	·	·	·	1	0.03
Triangular	12	91	4	68	175	4.58
Lateral steep	3	15	·	12	30	0.78
Trapezoidal	12	83	4	58	157	4.11
Polyhedral	·	3	1	1	5	0.13
Convex	1	17	1	5	24	0.63
Unidentifiable	·	1	·	2	3	0.08
Total:	**29**	**210**	**10**	**146**	**395**	**10.33**
Bifacial thinning blades & tools on bifacial thinning blade						
Triangular	2	5	·	7	14	0.37
Trapezoidal	1	5	·	4	10	0.26
Polyhedral	·	1	·	·	1	0.03
Convex	·	·	1	·	1	0.03
Total:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-11 Kabazi V, sub-unit III/1: flakes & blades – cross-sections.

	III/1B	III/1	III/1C	III/1A	Total:	%
Flakes & tools on flake						
Cortex	11	74	10	46	141	3.69
Plain	38	169	17	95	319	8.35
Dihedral	17	85	5	65	172	4.50
Polyhedral	41	219	12	222	494	12.93
Facetted	26	167	7	137	337	8.82
Crushed	56	284	13	122	475	12.43
Missing by retouch	3	31	2	54	90	2.35
Missing	102	632	33	392	1,159	30.32
Total:	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
Cortex	·	1	·	·	1	0.03
Plain	10	32	5	34	81	2.12
Dihedral	1	10	1	8	20	0.52
Polyhedral	8	29	3	25	65	1.70
Facetted	5	25	·	14	44	1.15
Crushed	·	2	·	1	3	0.08
Total:	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
Cortex	2	7	·	3	12	0.31
Plain	3	27	3	18	51	1.33
Dihedral	3	23	·	8	34	0.89
Polyhedral	1	26	1	10	38	0.99
Facetted	1	23	1	36	61	1.61
Crushed	6	40	2	19	67	1.75
Missing by retouch	·	1	·	7	8	0.21
Missing	13	63	3	45	124	3.24
Total:	**29**	**210**	**10**	**146**	**395**	**10.33**
Bifacial thinning blades & tools on bifacial thinning blade						
Plain	1	3	1	3	8	0.21
Dihedral	1	3	·	1	5	0.13
Polyhedral	1	1	·	1	3	0.08
Facetted	·	3	·	6	9	0.24
Missing	·	1	·	·	1	0.03
Total:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-12 Kabazi V, sub-unit III/1: flakes & blades – platform types.

Blanks with prepared platforms fall into two different groups. The first group includes all types of blanks from archaeological levels III/1B, III/1 and III/1C, as well as all types of flakes from level III/1A. These assemblages are characterised by a prevalence of blanks with dihedral and polyhedral butts over blanks with facetted platforms. The second group comprises blades from level III/1A, where faceted platforms dominate over all other types of prepared striking platforms. The faceting indices of the different archaeological levels from sub-unit III/1 are as follows:

III/1B – Ifs = 18.82, Ifl = 61.76;
III/1 – Ifs = 23.52, Ifl = 66.24;
III/1A – Ifs = 26.37, Ifl = 72.81;
and III/1C – Ifs = 12.12, Ifl = 45.45.

The highest value of both indices is found in level III/1A. Moreover, in levels III/1B, III/1, and III/1C the percentages of unifacial tools with faceted platforms do not exceed 30% of the total number of tools with identifiable striking platforms. The highest percentage of tools with faceted platforms among all identifiable pieces is observed in level III/1A – 38.89 %. The high index of faceting among blanks and unifacial tools in level III/1A testifies to the fact that the archaeological material might include a WCM component. This is not, however, in contradiction to the maintenance of cores with Levallois-Mousterian typology in level III/1A. The low index of blades for this level (11.44), practically identical to the index for level III/1 (11.22), assumes that the Levallois-Mousterian contribution to the level III/1A assemblage has not significantly changed the Micoquian structure of its III/1A inventory.

Platform lipping

A total of 82.19 % of all identifiable blanks feature unlipped platforms (Table 7-13). However, unlipped platforms prevail among "regular" blanks only, with semi-lipped and lipped platforms being less frequently encountered, 7.1 % and 10.7 %, respectively; there is one single lipped platform among the "regular" blades (III/1A). On the other hand, the overwhelming majority of "bifacial thinning" flakes and blades are characterised by lipped platforms, which are a common feature of these pieces by definition.

Platform angles

In sum, 78.64 % of identifiable blanks are characterised by obtuse platforms (Table 7-14). Flakes with a right angled platform make up 21.36 % of identifiable flakes and 24.55 % of all blades have right angled, or near right angled, platforms. A common feature of both "bifacial thinning" flakes and blades is the dominant role played by obtuse platforms, one of the main attributes of these kinds of blanks.

Tools

Tools were found in all archaeological levels of sub-unit III/1 (Table 7-1). In 75.81 % of all cases, tools were made on flakes (Table 7-15). Blades served as blanks for 5.26 % of tools. In comparison, the percentage of tools on blades from sub-unit III/4 lies at 11.49 %. Only 0.09 % of tools were made on chips. Tools on "bifacial thinning" blanks make up 1.66 % of all pieces; 2.86 % of tools were made on natural flakes.

In all archaeological levels of sub-unit III/1 the average length of unifacial tools does not exceed 5 cm. The largest unifacial tools were discovered in level III/1B (Table 7-16). Moreover, in level III/1B the highest percentage of unifacial tools longer or wider than 5 cm were observed, while in other levels such large pieces are considerably less frequent.

The average size of bifacial tools from levels III/1 and III/1A is considerably greater than for unifacial tools. The percentage of bifacial tools larger than 5 cm lies at in excess of 57 % (Table 7-16).

There are twelve classes of tools: points, scrapers, denticulates, notches, scaled pieces, bifacial points, bifacial scrapers, bifacial heavily exhausted tools, retouched pieces, thinned pies, burins and unidentifiable tool fragments. The most numerous are scrapers: 64.26 % in the essential count (Table 7-17). Points comprise 11.73 % of tools in the essential count. Other classes of unifacial tools are not numerous (Table 7-17). Bifacial tools are represented by points, scrapers, and heavily exhausted tools. Bifacial tools were found in levels III/1B (7.4 %), III/1 (21.53 %), and III/1A (17.2 %).

Points

Points were found in all levels of sub-unit III/1 (Table 7-17). Most points (92.86 %) stem from just two levels (III/1 and III/1A). Points were made on flakes (36 items), blades (5) and chips (1 item). The blanks used for the production of points are usually quite small. Only 35.71 % of all points are longer than 5 cm. The lengths of points vary from between 20.87 and 90.74 mm. Only four points are larger than 7 cm. Most points were removed on-axis. Off-axis blanks were used for 7 points, and the axis attributes of 5 points could not be distinguished.

Points are represented by five main morphological groups. The most representative are leaf (13 pieces) and triangular (10 pieces) points (Table 7-17). Leaf points are subdivided into semi-leaf dorsal (Fig. 7-6, *3, 5, 6, 7*); semi-leaf dorsal, thinned base; semi-leaf alternative (Fig. 7-6, *4*); sub-leaf dorsal, bi-terminally thinned; sub-leaf dorsal, thinned base (Fig. 7-6, *8*); and sub-willow-leaf dorsal, terminally thinned (Fig. 7-6, *2*) points. Among the triangular points

	III/1B	III/1	III/1C	III/1A	Total:	%
Flakes & tools on flake						
Unlipped	124	670	51	512	1,357	35.51
Semi-lipped	9	38	·	45	92	2.41
Lipped	·	2	·	6	8	0.21
Unknown	161	951	48	570	1,730	45.26
Total:	**294**	**1,661**	**99**	**1,133**	**3,187**	**83.39**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
Unlipped	2	14	·	1	17	0.44
Semi-lipped	3	10	2	7	22	0.58
Lipped	19	73	7	73	172	4.50
Unknown	·	2	·	1	3	0.08
Total:	**24**	**99**	**9**	**82**	**214**	**5.60**
Blades & tools on blade						
Unlipped	9	98	5	62	174	4.55
Semi-lipped	1	7	·	11	19	0.50
Lipped	·	·	·	1	1	0.03
Unknown	19	105	5	72	201	5.25
Total:	**29**	**210**	**10**	**146**	**395**	**10.33**
Bifacial thinning blades & tools on bifacial thinning blade						
Unlipped	·	3	·	·	3	0.08
Semi-lipped	·	·	1	·	1	0.03
Lipped	3	7	·	11	21	0.54
Unknown	·	1	·	·	1	0.03
Total:	**3**	**11**	**1**	**11**	**26**	**0.68**

Table 7-13 Kabazi V, sub-unit III/1: flakes & blades – platform lipping.

there were distinguished sub-triangular dorsal; sub-triangular dorsal, thinned base; sub-triangular dorsal, bi-terminally thinned; sub-triangular dorsal, terminally thinned; and triangular dorsal, terminally thinned points. Sub-triangular dorsal types (Fig. 7-7, *3*) are the most numerous (Table 7-17). Although not particularly numerous, the remaining two groups – trapezoidal and crescent – are still an important feature in the assemblage of sub-unit III/1 (Table 7-17). These groups are represented by semi-trapezoidal, sub-trapezoidal, semi-crescent, and sub-crescent types. The most characteristic shapes among the trapezoidal shaped pieces are semi-trapezoidal dorsal points (Fig. 7-7, *1, 2*). Two examples of semi-trapezoidal points have terminal and base thinning. The crescent shapes of points are represented by three types: semi-crescent dorsal; semi-crescent dorsal, thinned base; and sub-crescent dorsal. Two distal points – alternate and dorsal (fig. 7-6, *1*) – were found in levels III/1B and III/1A, respectively. These two points, although uncommon in Micoquian assemblages, are one of the most characteristic types from the WCM.

The points were produced using different combinations of scalar, flat and/or semi-step retouch, sometimes invasive.

	III/1B	III/1	III/1C	III/1A	Total:	%
Flakes & tools on flake						
Right, 90°	32	200	18	106	356	11.17
Obtuse, > 110°	101	510	33	455	1,099	34.48
Unknown	161	951	48	572	1,732	54.35
Total:	**294**	**1,661**	**99**	**1,133**	**3,187**	**100.00**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake						
Obtuse, > 90°	24	97	9	81	211	98.60
Unknown	·	2	·	1	3	1.40
Total:	**24**	**99**	**9**	**82**	**214**	**100.00**
Blades & tools on blade						
Right, 90°	2	37	3	11	53	13.42
Obtuse, > 110°	8	69	2	63	142	35.95
Unknown	19	104	5	72	200	50.63
Total:	**29**	**210**	**10**	**146**	**395**	**100.00**
Bifacial thinning blades & tools on bifacial thinning blade						
Right, 90°	·	1	·	·	1	3.85
Obtuse, > 110°	3	9	1	11	24	92.30
Unknown	·	1	·	·	1	3.85
Total:	**3**	**11**	**1**	**11**	**26**	**100.00**

Table 7-14 Kabazi V, sub-unit III/1: flakes & blades – platform angles.

	III/1B	III/1	III/1C	III/1A	Total:	%	% esse
Tool on natural flake	·	12	1	18	31	2.86	3.30
Tool on chip	1	7		4	12	1.11	1.28
Tool on flake	58	417	19	327	821	75.81	87.34
Tool on blade	3	26	1	27	57	5.26	6.06
Tool on bifacial thinning chip	·	1	·	·	1	0.09	0.11
Tool on bifacial thinning flake	1	9	1	7	18	1.66	1.91
Unidentifiable	10	77	·	56	143	13.21	·
Total:	**73**	**549**	**22**	**439**	**1,083**	**100**	**100**

Table 7-15 Kabazi V, sub-unit III/1: blank types used for tool production.

Levels	Unifacial tools				Bifacial tools			
	length	width	thickness	% > 5 cm	length	width	thickness	% > 5 cm
III/1B	46.80	31.10	7.19	36.40	74.70*	36.30*	10.10*	·
III/1	40.18	32.81	6.86	20.00	55.30	38.64	12.50	57.14
III/1C	43.48	29.36	6.73	25.00	·	·	·	·
III/1A	42.04	31.46	6.58	25.19	57.93	35.93	11.35	75.00

* single piece

Table 7-16 Kabazi V, sub-unit III/1: average dimensions of unifacial and bifacial tools.

	III/1B	III/1	III/1C	III/1A	Total:	%	ess %
Points							
Distal, dorsal	·	·	·	1	1	0.09	0.28
Distal, alternate	1	·	·	·	1	0.09	0.28
Semi-leaf, dorsal	·	4	·	1	5	0.46	1.39
Semi-leaf, dorsal, thinned base	·	3	·	·	3	0.28	0.84
Semi-leaf, alternative	·	·	·	1	1	0.09	0.28
Sub-leaf, dorsal, bi-terminally thinned	·	·	·	1	1	0.09	0.28
Sub-leaf, dorsal, thinned base	·	1	·	1	2	0.19	0.56
Sub-willow-leaf, dorsal, terminally thinned	·	·	·	1	1	0.09	0.28
Sub-triangular, dorsal	·	4	·	1	5	0.46	1.39
Sub-triangular, dorsal, thinned base	·	·	·	2	2	0.19	0.56
Sub-triangular, dorsal, bi-terminally thinned	·	·	·	1	1	0.09	0.28
Sub-triangular, dorsal, terminally thinned	·	·	·	1	1	0.09	0.28
Triangular, dorsal, terminally thinned	·	·	·	1	1	0.09	0.28
Semi-trapezoidal, dorsal	·	3	·	2	5	0.46	1.39
Semi-trapezoidal, dorsal, terminally thinned	1	·	·	·	1	0.09	0.28
Semi-trapezoidal, dorsal, thinned base	·	·	·	1	1	0.09	0.28
Sub-trapezoidal, dorsal	·	1	·	·	1	0.09	0.28
Semi-crescent, dorsal	·	1	·	1	2	0.19	0.56
Semi-crescent, dorsal, thinned base	·	·	·	2	2	0.19	0.56
Sub-crescent, dorsal	·	1	1	·	2	0.19	0.56
Unidentifiable	·	·	·	3	3	0.28	0.84
Scrapers							
Transverse-straight, dorsal	·	1	·	1	2	0.19	0.56
Transverse-convex, dorsal	1	·	·	3	4	0.37	1.11
Transverse-convex, alternative	·	·	·	1	1	0.09	0.28
Diagonal straight, dorsal	·	·	·	2	2	0.19	0.56
Diagonal convex, dorsal	·	4	·	3	7	0.65	1.96
Diagonal-convex, dorsal, terminally thinned	1	1	·	·	2	0.19	0.56
Diagonal convex, dorsal, thinned back	·	·	·	1	1	0.09	0.28
Diagonal convex, alternative	·	1	·	·	1	0.09	0.28
Diagonal wavy, dorsal	·	·	·	1	1	0.09	0.28
Straight, dorsal	1	8	·	8	17	1.57	4.74
Straight, dorsal, terminally thinned	·	1	·	·	1	0.09	0.28
Straight, dorsal, thinned base	·	·	·	1	1	0.09	0.28
Straight, dorsal, naturally backed, thinned base	·	·	·	1	1	0.09	0.28
Convex, dorsal	3	14	·	8	25	2.31	6.98
Convex, dorsal, terminally thinned	·	·	·	3	3	0.28	0.84
Convex, dorsal, backed	·	1	·	·	1	0.09	0.28
Convex, dorsal, naturally backed	·	·	·	1	1	0.09	0.28
Convex, alternative, naturally backed	·	1	·	·	1	0.09	0.28
Convex, ventral	1	·	·	·	1	0.09	0.28
Concave, dorsal	1	·	·	2	3	0.28	0.84
Concave, dorsal, thinned base	·	·	·	1	1	0.09	0.28
Concave, dorsal, thinned base	·	2	·	·	2	0.19	0.56
Concave, dorsal, naturally backed	·	·	1	·	1	0.09	0.28
Wavy, dorsal	·	·	·	1	1	0.09	0.28
Wavy, dorsal, naturally backed, terminally thinned	·	·	·	1	1	0.09	0.28
Wavy, alternative	·	·	·	1	1	0.09	0.28
Wavy, alternative, thinned base	·	·	·	1	1	0.09	0.28
Double straight, dorsal	·	4	·	·	4	0.37	1.11
Double straight-convex, dorsal	3	5	·	2	10	0.92	2.79
Double straight-concave, dorsal	·	1	·	·	1	0.09	0.28
Double convex, dorsal	2	2	·	2	6	0.56	1.68
Double convex, dorsal, thinned base	·	·	·	1	1	0.09	0.28
Double convex, alternative	·	·	·	2	2	0.19	0.56
Double convex-wavy, dorsal	·	·	·	3	3	0.28	0.84
Double convex-concave, dorsal	·	1	·	1	2	0.19	0.56
Double convex-concave, dorsal, terminally thinned	·	1	·	·	1	0.09	0.28
Double concave-wavy, dorsal	·	·	·	1	1	0.09	0.28

Table 7-17 Kabazi V, sub-unit III/1: tool classification.

Table 7-17 Continued ▶

	III/1B	III/1	III/1C	III/1A	Total:	%	ess %
Scrapers continued							
Semi-leaf, dorsal	·	4	·	·	4	0.37	1.11
Semi-leaf, alternative	·	·	·	1	1	0.09	0.28
Semi-leaf, dorsal, terminally thinned	·	·	·	1	1	0.09	0.28
Semi-leaf, dorsal, bi-terminally thinned	·	·	·	2	2	0.19	0.56
Semi-leaf, dorsal, thinned back	·	1	·	·	1	0.09	0.28
Sub-leaf, dorsal	·	2	·	·	2	0.19	0.56
Sub-leaf, dorsal, terminally thinned	·	·	1	·	1	0.09	0.28
Sub-leaf, dorsal, thinned base	·	·	·	1	1	0.09	0.28
Leaf-shaped, bi-terminally thinned	·	·	·	1	1	0.09	0.28
Sub-triangular, dorsal	·	·	·	2	2	0.19	0.56
Sub-triangular, unidentifiable	·	·	·	2	2	0.19	0.56
Sub-triangular, dorsal, thinned base	·	·	·	1	1	0.09	0.28
Sub-triangular, dorsal, terminally thinned	·	·	·	1	1	0.09	0.28
Triangular, dorsal, bi-terminally thinned	·	·	·	1	1	0.09	0.28
Triangular, alternative	·	2	·	·	2	0.19	0.56
Semi-trapezoidal, dorsal	1	10	1	2	14	1.29	3.91
Semi-trapezoidal, dorsal, thinned base	·	·	·	1	1	0.09	0.28
Semi-trapezoidal, dorsal, elongated, thinned base	·	1	·	·	1	0.09	0.28
Semi-trapezoidal, alternative	1	·	·	2	3	0.28	0.84
Sub-trapezoidal, dorsal	·	5	·	3	8	0.74	2.23
Sub-trapezoidal, dorsal, elongated	·	2	·	·	2	0.19	0.56
Sub-trapezoidal, alternative, elongated	·	1	·	·	1	0.09	0.28
Sub-trapezoidal, dorsal, terminally thinned	1	·	·	·	1	0.09	0.28
Sub-trapezoidal, dorsal, thinned back	·	1	·	·	1	0.09	0.28
Sub-trapezoidal, dorsal, thinned base	·	·	·	1	1	0.09	0.28
Trapezoidal, dorsal, thinned base	·	1	·	·	1	0.09	0.28
Semi-rectangular, dorsal	1	1	·	2	4	0.37	1.11
Semi-rectangular, alternative	·	·	·	1	1	0.09	0.28
Semi-rectangular, dorsal, naturally backed, thinned base	·	·	·	1	1	0.09	0.28
Sub-rectangular, dorsal	1	·	·	3	4	0.37	1.11
Sub-rectangular, dorsal, terminally thinned	·	·	·	1	1	0.09	0.28
Sub-rectangular, unidentifiable, thinned back	·	·	·	1	1	0.09	0.28
Rectangular, dorsal	·	·	·	1	1	0.09	0.28
Semi-crescent, dorsal	2	6	·	8	16	1.48	4.47
Semi-crescent, ventral	·	1	·	·	1	0.09	0.28
Semi-crescent, dorsal, thinned base	1	·	·	1	2	0.19	0.56
Semi-crescent, dorsal, thinned back	·	·	·	1	1	0.09	0.28
Semi-crescent, dorsal, terminally thinned	·	1	·	3	4	0.37	1.11
Semi-crescent, alternative, thinned base	·	·	·	1	1	0.09	0.28
Semi-crescent, alternative, terminally thinned	·	·	·	1	1	0.09	0.28
Semi-crescent, alternative, bi-terminally thinned	·	·	·	1	1	0.09	0.28
Sub-crescent, dorsal	·	1	1	1	3	0.28	0.84
Sub-crescent, dorsal, thinned base	·	1	·	2	3	0.28	0.84
Sub-crescent, unidentifiable, thinned back	·	·	·	1	1	0.09	0.28
Sub-crescent, alternative	·	·	·	1	1	0.09	0.28
Crescent, dorsal, bi-terminally thinned	·	·	·	1	1	0.09	0.28
Crescent, alternative, thinned base	·	·	·	1	1	0.09	0.28
Hook-like, dorsal, thinned base	·	1	·	·	1	0.09	0.28
Convergent, dorsal, unidentifiable	2	5	·	·	7	0.65	1.96
Upper Palaeolithic types							
Burin	·	·	·	1	1	0.09	0.28
Denticulates							
Straight, dorsal	·	·	·	1	1	0.09	0.28
Convex, dorsal	·	2	·	·	2	0.19	0.56
Double convex, alternative	·	1	·	1	2	0.19	0.56
Transverse-convex, dorsal	·	·	·	1	1	0.09	0.28
Unidentifiable	·	·	·	2	2	0.19	0.56
Notches							
Lateral, dorsal	·	1	·	·	1	0.09	0.28
Lateral, dorsal, bi-terminally thinned	·	·	·	1	1	0.09	0.28
Lateral, ventral	·	·	·	2	2	0.19	0.56
Transverse, dorsal	·	2	·	·	2	0.19	0.56
Unidentifiable	·	·	·	1	1	0.09	0.28

	III/1B	III/1	III/1C	III/1A	Total:	%	ess %
Scaled pieces							
Radial	·	1	·	7	8	0.74	2.22
Bi-terminal	·	·	·	1	1	0.09	0.28
Bifacial points							
Sub-leaf	·	3	·	·	3	0.28	0.84
Sub-leaf, thinned base	·	·	·	3	3	0.28	0.84
Leaf, thinned base	·	1	·	·	1	0.09	0.28
Sub-triangular	1	·	·	·	1	0.09	0.28
Sub-triangular, thinned base	·	1	·	·	1	0.09	0.28
Trapezoidal	·	·	·	1	1	0.09	0.28
Semi-crescent	·	4	·	·	4	0.37	1.11
Sub-crescent, thinned base	·	1	·	·	1	0.09	0.28
Unidentifiable	1	·	·	·	1	0.09	0.28
Bifacial scrapers							
Convex	·	·	·	1	1	0.09	0.28
Straight, naturally backed	·	1	·	·	1	0.09	0.28
Convex, naturally backed	·	1	·	3	4	0.37	1.11
Convex, naturally backed, terminally thinned	·	·	·	1	1	0.09	0.28
Convex, backed	·	·	·	1	1	0.09	0.28
Sub-leaf	·	6	·	3	9	0.83	2.51
Sub-leaf, "wide"	·	·	·	1	1	0.09	0.28
Sub-leaf, thinned base	·	1	·	·	1	0.09	0.28
Sub-triangular	·	1	·	·	1	0.09	0.28
Sub-trapezoidal	·	1	·	·	1	0.09	0.28
Semi-crescent	·	·	·	2	2	0.19	0.56
Semi-crescent, terminally thinned	·	·	·	1	1	0.09	0.28
Sub-crescent	·	7	·	5	12	1.11	3.35
Sub-crescent, thinned base	·	1	·	2	3	0.28	0.84
Sub-crescent, thinned base & back	·	1	·	·	1	0.09	0.28
Crescent	·	·	·	4	4	0.37	1.11
Bifacial heavily exhausted tools	·	·	·	1	1	0.09	0.28
Retouched pieces							
On chip, lateral, dorsal	1	2	·	·	3	0.28	·
On chip, bilateral, dorsal	·	·	·	1	1	0.09	·
On chip, bilateral-transverse, dorsal	·	1	·	·	1	0.09	·
On chip, bilateral-transverse, alternative	·	·	·	1	1	0.09	·
On chip, lateral-transverse, dorsal	·	2	·	·	2	0.19	·
On chip, transverse, dorsal	·	1	·	·	1	0.09	·
On flake, lateral, dorsal	7	81	4	47	139	12.83	·
On flake, lateral, ventral	1	7	·	7	15	1.39	·
On flake, lateral, ventral, thinned base	·	·	·	1	1	0.09	·
On flake, lateral, alternative	3	2	·	5	10	0.92	·
On flake, lateral-transverse, dorsal	·	7	1	9	17	1.57	·
On flake, lateral-transverse, alternative	·	3	·	4	7	0.65	·
On flake, lateral-transverse, ventral	·	·	·	1	1	0.09	·
On flake, bilateral, dorsal	3	21	·	16	40	3.69	·
On flake, bilateral, ventral	·	1	·	1	2	0.19	·
On flake, bilateral, alternative	·	6	1	6	13	1.20	·
On flake, bilateral, dorsal, thinned base	·	·	·	1	1	0.09	·
On flake, bilateral-transverse, dorsal	·	2	·	2	4	0.37	·
On flake, bilateral-transverse, alternative	·	2	·	2	4	0.37	·
On flake, transverse, dorsal	·	25	2	17	44	4.06	·
On flake, transverse, ventral	1	1	·	2	4	0.37	·
On flake, transverse, alternative	·	2	·	1	3	0.28	·
On blade, lateral, dorsal	1	8	·	·	9	0.83	·
On blade, lateral, alternative	1	3	·	·	4	0.37	·
On blade, bilateral, dorsal	·	2	·	2	4	0.37	·
On blade, bilateral, alternative	·	3	·	2	5	0.46	·
On blade, transverse, dorsal	·	2	·	·	2	0.19	·
On chunk	·	3	·	2	5	0.46	·
Truncated-faceted							
Distal	·	5	·	1	6	0.56	·
Unidentifiable							
Unifacial tools fragments	19	144	8	97	268	24.79	·
Bifacial tools fragments	9	55	1	41	106	9.81	·
Total:	**73**	**541**	**22**	**445**	**1,081**	**100.00**	**100.00**

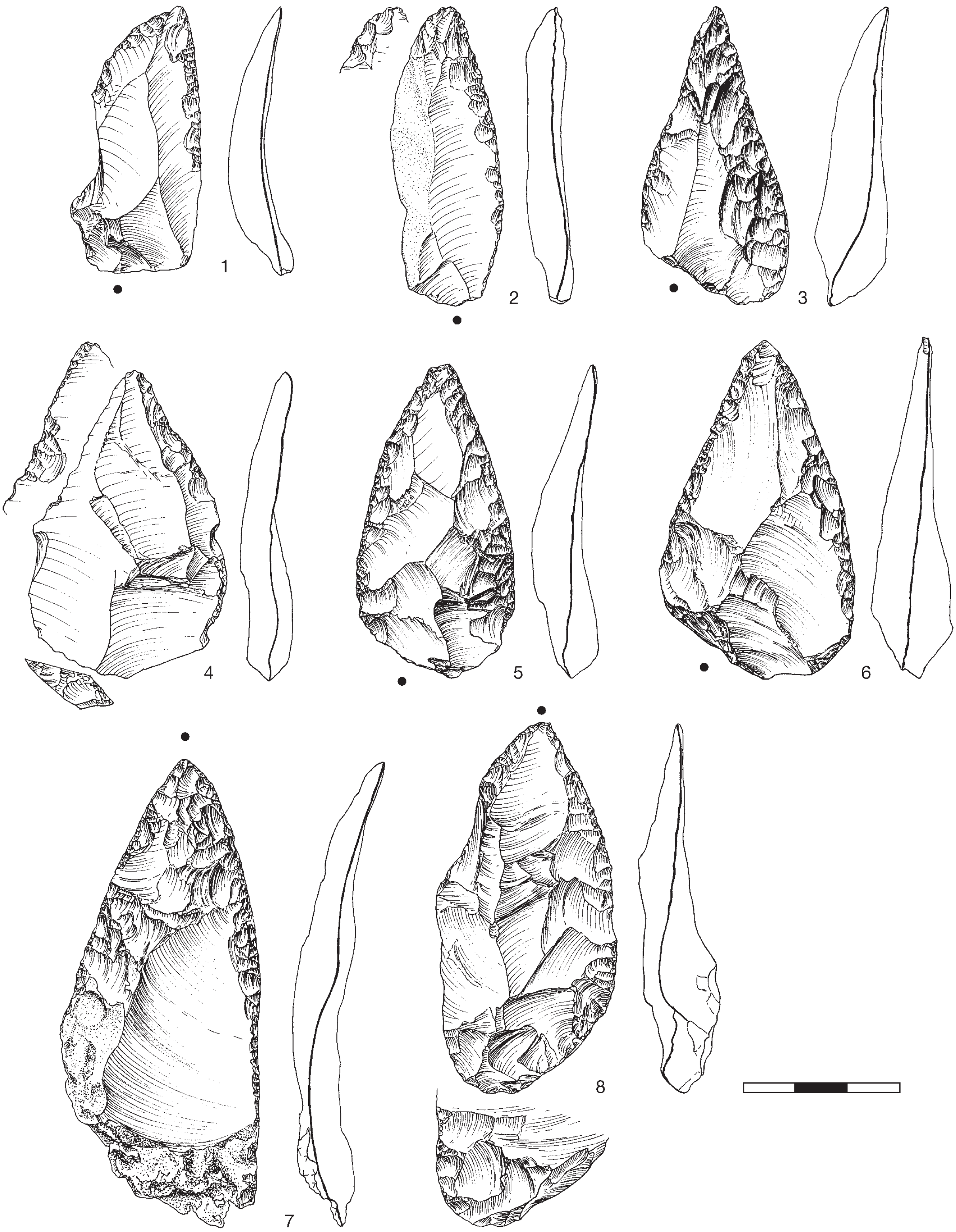

Fig. 7-6 Kabazi V, levels III/1 (3, 5, 6, 7), III/1A (1, 2, 4, 8). Points: 1 – distal; 2 – sub-willow-leaf, terminally thinned; 3, 5, 6, 7 – semi-leaf; 4 – semi-leaf alternative; 8 – sub-leaf thinned base.

◄ **Table 7-17** Continued.

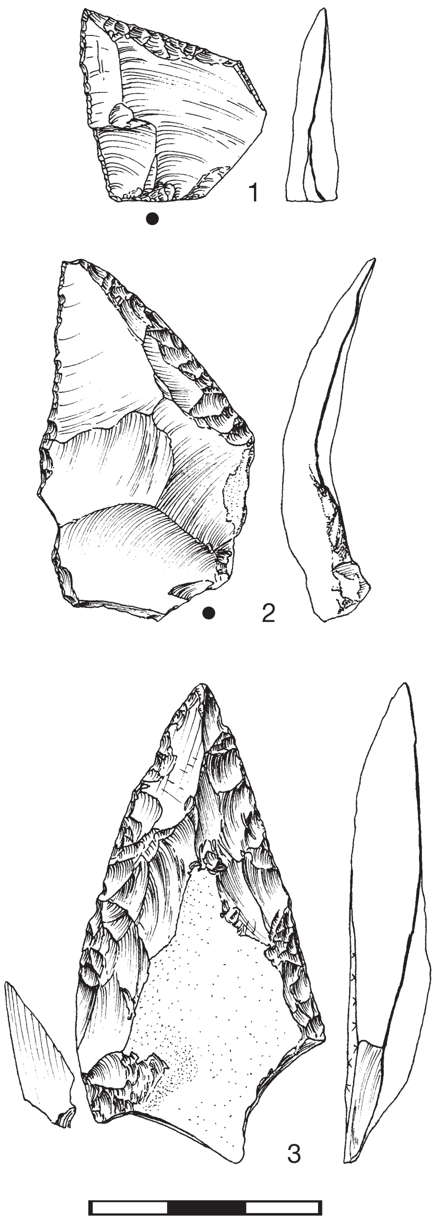

Fig. 7-7 Kabazi V, levels III/1 (1, 2), III/1A (3). Points: 1, 2 – semi-trapezoidal; 3 – sub-triangular.

Scrapers

Scrapers are the most representative tools class, they occur in all levels of sub-unit III/1 (Table 7-17). The largest scraper assemblages stem from levels III/1 and III/1A, and the smallest is that from level III/1C. The scrapers are subdivided into 87 types, which make up four basic morphological groups: transverse and diagonal (N=20), simple (N=63), double (N=31), and convergent (N=117) groups. In general, scrapers with one retouched edge (transverse, diagonal and simple) comprise 35.93 % of all scrapers, bilateral (double) 13.42 %, and converging scrapers 50.65 %. Most scrapers are made on flakes (84.42 %). Scrapers made on blades make up just 8.65 % of all scrapers, and only 1.3 % of scrapers were made on chips. In 5.63 % cases natural flakes were used in scraper production. On-axis blanks prevail among scrapers (72.54 % of all identifiable blanks). There are 113 unbroken scrapers. 41 scrapers are longer than 5 cm. Scrapers were produced using different combinations of scalar, flat and/or semi-step retouch, sometimes invasive. 15.58 % of scrapers were elaborated by different kinds of ventral thinning.

Transverse and diagonal scrapers

Transverse and diagonal scrapers were found in three levels of sub-unit III/1 (Table 7-17). Tools with convex working edges are the most numerous among diagonal and transverse scrapers. The diagonal scrapers are represented by three main types: diagonal-straight (Fig. 7-8, *1*), diagonal-convex (Fig. 7-8, *3, 4, 5*), and diagonal-wavy types. Diagonal-convex scrapers comprise diagonal convex dorsal, diagonal convex dorsal with thinned back (Fig. 7-8, *2*), diagonal-convex dorsal, terminally thinned (Fig. 7-9, *1, 4*) and diagonal convex alternative (Table 7-17) pieces.

Transverse scrapers are subdivided into the following types: transverse-straight dorsal (Fig. 7-9, *2, 3*), transverse-convex dorsal, and transverse-convex alternative (Table 7-17) types. All transverse and diagonal scrapers were produced on flakes. 68 % of diagonal and transverse scrapers were made on off-axis flakes.

Simple scrapers

Simple scrapers are found in all levels of sub-unit III/1 (Table 7-17). These scrapers are more numerous in levels III/1 and III/1A. According to the shape of retouched edges, simple scrapers are either straight (N=20) (Fig. 7-10, *1, 2, 3, 4, 5*), convex (N=32) (Fig. 7-11, *1, 2, 3, 4, 6, 7, 9*), wavy (N=4) (Fig. 7-11, *8*), or concave (N=7) (Fig. 7-12, *1*). Most scrapers display a dorsal retouch. The only convex scraper from level III/1B has a ventral retouch, and three further scrapers (2 wavy, 1 convex) are alternatively retouched (Table 7-17). Ventral thinning among simple scrapers is not significant. Only 19.05 % of scrapers have ventral thinning (Fig. 7-10, *5*; 7-11, *5*). The following types of ventral thinning were defined: terminally thinned (N=6) and thinned base (N=6). Further, one backed (Fig. 7-10, *5*) and three naturally backed simple scrapers were defined in levels III/1, III/1C and III/1A (Table 7-17). One of the naturally backed tools displays a terminal thinning. 80.95 % of simple

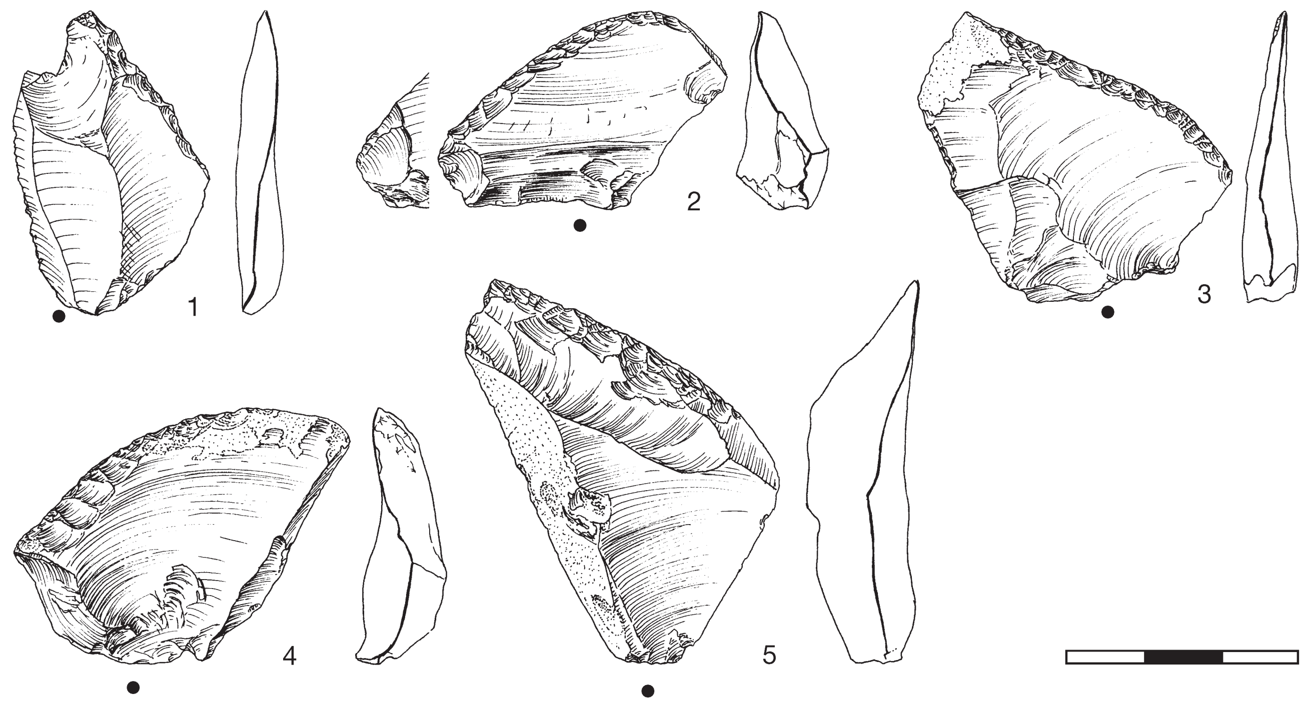

Fig. 7-8 Kabazi V, levels III/1 (2, 3, 4), III/1A (1, 5). Scrapers: 1, 3, 5, 4 – diagonal; 2 – diagonal, thinned back.

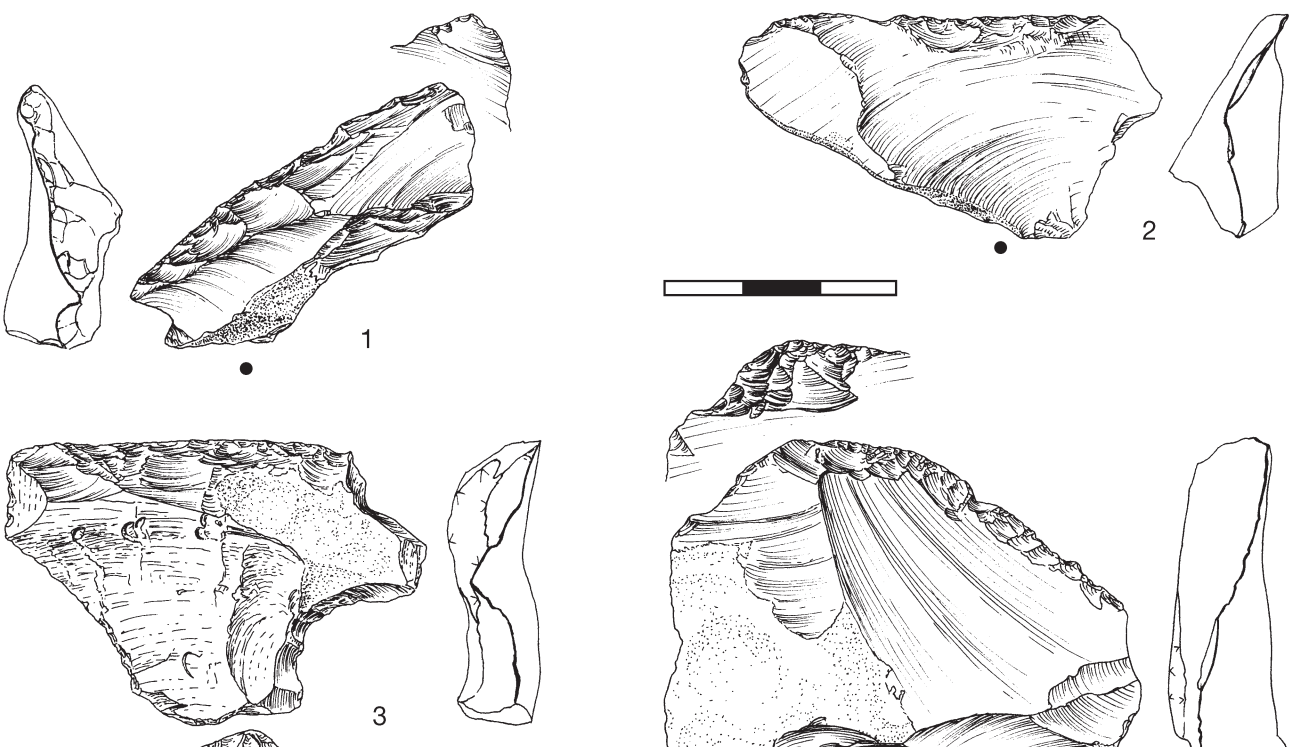

Fig. 7-9 Kabazi V, levels III/1 (1, 2), III/1A (3), III/1B (4). Scrapers: 1, 4 – diagonal convex, terminally thinned; 2, 3 – transverse straight.

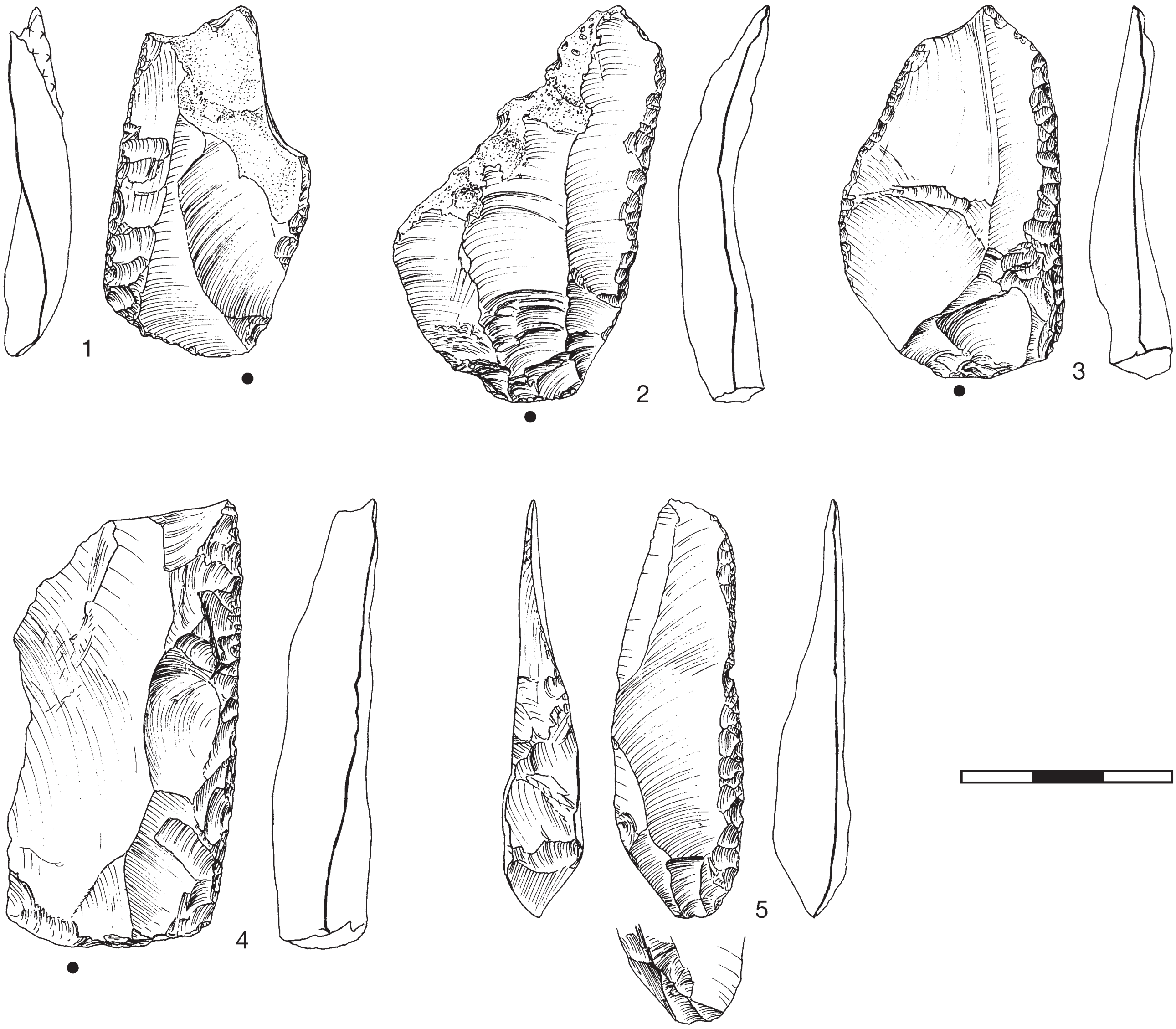

Fig. 7-10 Kabazi V, levels III/1 (2, 3), III/1A (1, 4, 5). Scrapers: 1, 2, 3, 4 – simple straight; 5 – simple straight, backed, thinned base.

scrapers were made on flakes, 11.11 % on blades, and 7.94 % on natural flakes. Eight scrapers were made on off-axis blanks, the remaining identifiable scrapers (N=44) were produced on on-axis blanks.

Double scrapers

Double scrapers occur in three levels of sub-unit III/1 (Table 7-17). The most representative belong to one of two groups: the double straight-convex type (Fig. 7-12, *4, 5, 6*) and the double convex type (Fig. 7-12, *2, 7*). All remaining double scrapers are represented by double straight, double convex-wavy, and double convex-concave (Fig. 7-12, *3*) types. There is one example respectively of a double straight-concave type, a double convex, thinned base type, a double convex-concave, terminally thinned type, and a double concave-wavy type. With the exception of two double convex tools, which are alternatively retouched, all double-edge scrapers are characterised by dorsal retouch. Two double scrapers have ventral thinning. Both terminal and base thinning are documented. Twenty nine double scrapers were produced on flakes, and two double scrapers were made on blades. The majority of blanks (N=23) used for double scraper production were removed on-axis.

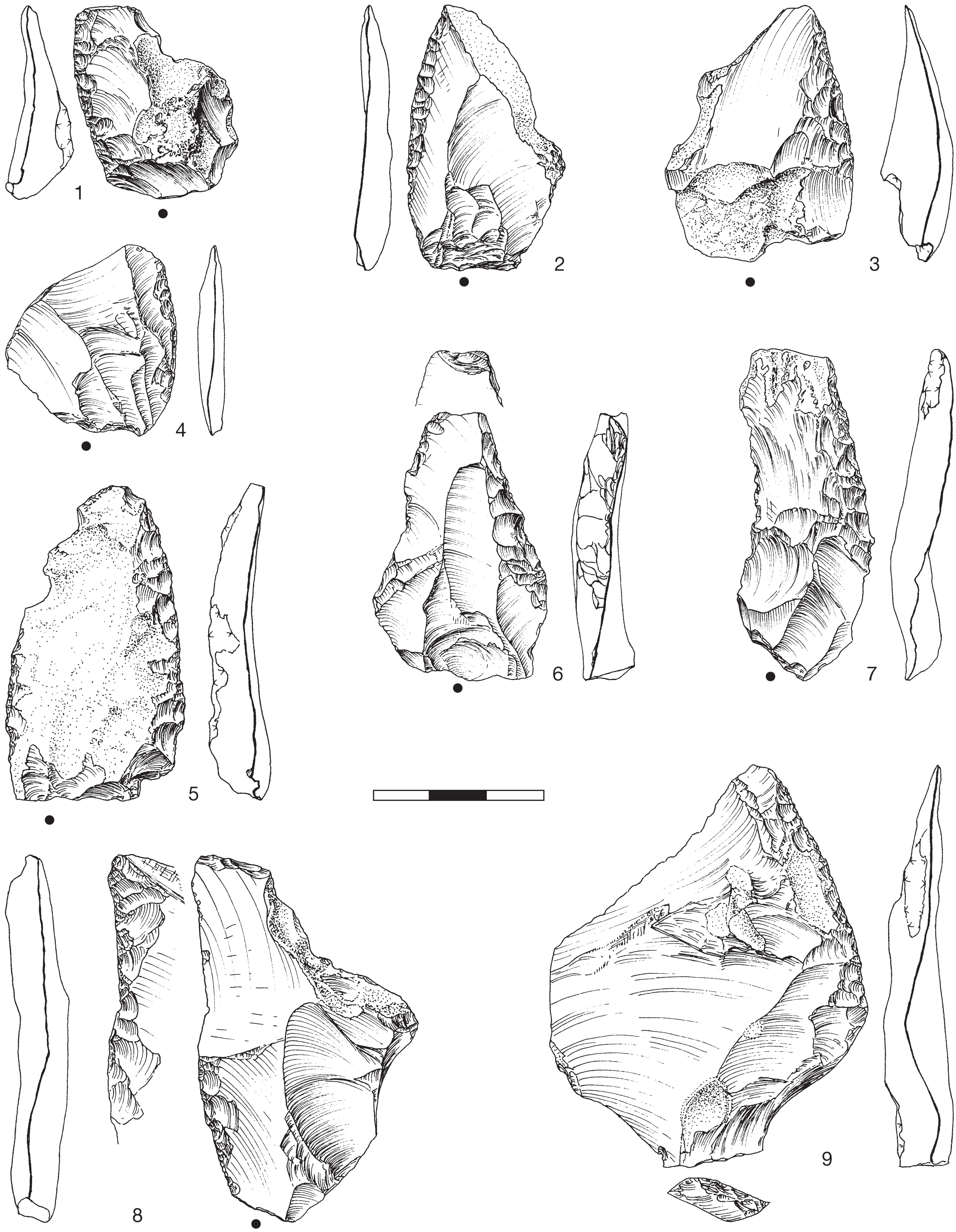

Fig. 7-11 Kabazi V, levels III/1 (1, 4, 5, 6), III/1A (3, 7, 8, 9), III/1B (2). Scrapers: 1, 2, 3, 4, 6, 7, 9 – simple convex; 5 – simple convex, terminally thinned; 8 – simple wavy, alternative.

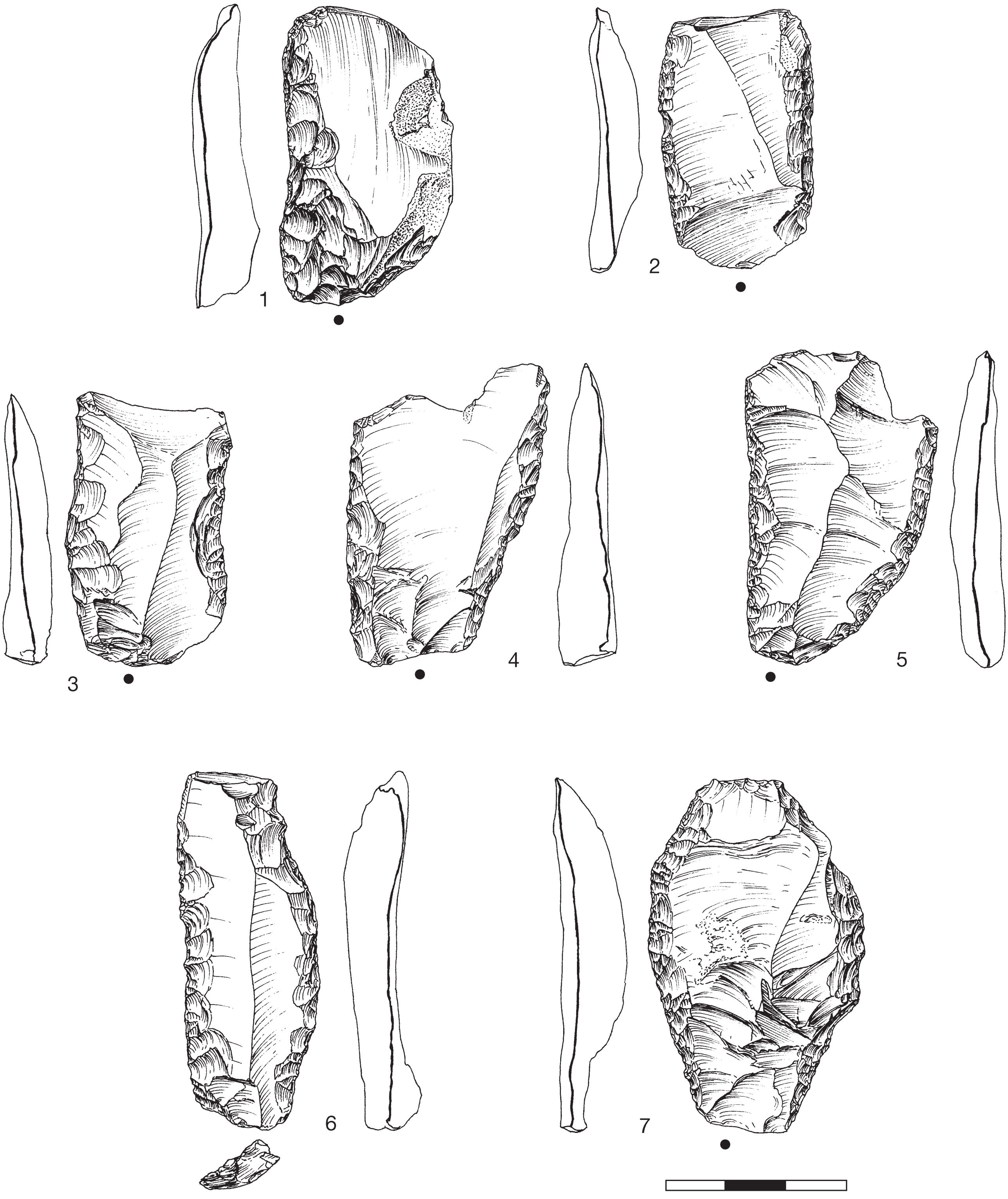

Fig. 7-12 Kabazi V, levels III/1 (1, 2, 4), III/1A (3, 6), III/1B (5, 7). Scrapers: 1 – simple concave; 2, 7 – double convex; 3 – double convex-concave; 4, 5, 6 – straight-convex.

Convergent Scrapers

Convergent scrapers are the most numerous morphological group of scrapers, and were found in all levels of sub-unit III/1 (Table 7-17). Based on the morphology of the retouched edges, six main shapes are distinguished: leaf-shaped (N=14), triangular (N=9), trapezoidal (N=35), rectangular (N=13), crescent-shaped (N=38), and hook-like (N=1). Due to fragmentation seven tools could not be identified on a morphological level. Leaf scrapers comprise semi-leaf (Fig. 7-13, *1, 2, 3*), sub-leaf, and leaf-shaped pieces. One item has an alternative retouch. Ventral thinning is dominant, with bi-terminal (Fig. 7-13, *5, 6, 7*), terminal (Fig. 7-13, *4*), base and back types of thinning (Table 7-17) completing the repertoire.

Real triangular scrapers are represented by only three items (Table 7-17), and comprise triangular dorsal bi-terminally thinned (Fig. 7-14, *3*) and triangular bi-terminally/ back thinned (Fig. 7-14, *1*) pieces. All remaining triangular shaped scrapers are sub-triangular, dorsal items (Fig. 7-14, *2*). Three of the sub-triangular dorsal scrapers have distal (1) or base (2) thinning.

Trapezoidal scrapers are subdivided into three main groups: semi-trapezoidal (Fig. 7-15, *1, 2, 3, 7, 10*), sub-trapezoidal (Fig. 7-15, *6, 8*) and trapezoidal (Table 7-17) pieces. The most numerous are semi-trapezoidal scrapers (N=20). With the exception of three alternative semi-trapezoidal scrapers, all others are dorsal types. Moreover, one of these tools has elongated proportions (Fig. 7-15, *5*), and two have a thinned base (Fig. 7-14, *4*; 7-15, *4*). There are 14 examples of sub-trapezoidal scrapers. Alternative retouch is observed on only one sub-trapezoidal scraper. Three blanks of sub-trapezoidal scrapers have elongated proportions (Fig. 7-15, 9). The ventral thinning of sub-trapezoidal scrapers is equally represented by terminal, base and back types of thinning. The trapezoidal scraper (four retouched edges) is represented by only obversely retouched examples with a thinned base.

Rectangular shaped pieces comprise semi-rectangular; semi-rectangular naturally backed, thinned base; sub-rectangular (Fig. 7-16, *1, 4*); sub-rectangular (Fig. 7-16, *2*), terminally thinned; sub-rectangular, thinned back; and rectangular (Table 7-17) items. All of these, except one, are obversely retouched. Crescent scrapers are represented by three main types: semi-crescent (Fig. 7-17, *1, 2, 3, 4*), sub-crescent (Fig. 7-17, *7*) and crescent. Most pieces belonging to this morphological group were found in level III/1A (24 items). Semi-crescent scrapers have dorsal (N=24), alternative (N=3) and ventral (N=1) retouch. Ten semi-crescent scrapers have either bi-terminal (Fig. 7-17, *5*), terminal, base (Fig. 7-17, *6, 8*) or back thinning (Table 7-17).

Most sub-crescent scrapers are obversely retouched items. Alternative retouch is observed on only two tools. Further, four sub-crescent scrapers display a thinned base, and one piece has a thinned back.

There are two crescent scrapers, the first a crescent dorsal, bi-terminally thinned piece, and the second a crescent alternative piece with a thinned base. There is just one hook-like scraper (Fig. 7-18, *3*). The shapes of seven convergent tools could not be identified due to them being represented by their tips only. The overwhelming majority of blanks on-axis flakes. Blades, chips and natural flakes account for 19.59 % of the total number of convergent tools.

Burins

The Upper Palaeolithic tool type is represented by a single atypical, fragmented burin on a natural flake from level III/1A (Table 7-17).

Denticulates

Denticulated tools were found in levels III/1 and III/1A (Table 7-17). All were made on flakes, including two natural flakes. Two denticulates have bi-lateral retouch, four pieces have a lateral retouch, one piece has a transverse retouch, and two further pieces proved too fragmented for any further classification.

Notches

Notched tools were found in the same levels as denticulates (Table 7-17). Six notches were made on flakes and one on a chunk. Two types of notches were distinguished: lateral (N=3) and transverse (N=3). One lateral notched tool is bi-terminally thinned.

Retouched pieces and thinned pieces

Retouched pieces were found in all levels of sub-unit III/1 (Table 7-17). They make up 32 % of the total number of tools. The majority of retouched pieces were made on flakes (88.63 %). Blades served as blanks for just 7.29 % of retouched pieces, and chips and chunks were used in only 4.08 % of cases. The three most characteristic types are either flakes or blades with obversely retouched lateral/bi-lateral/transverse edges. The remaining 34.99 % of retouched pieces can be assigned to a further twenty five different types (Table 7-17). Two retouched pieces display a basal thinning.

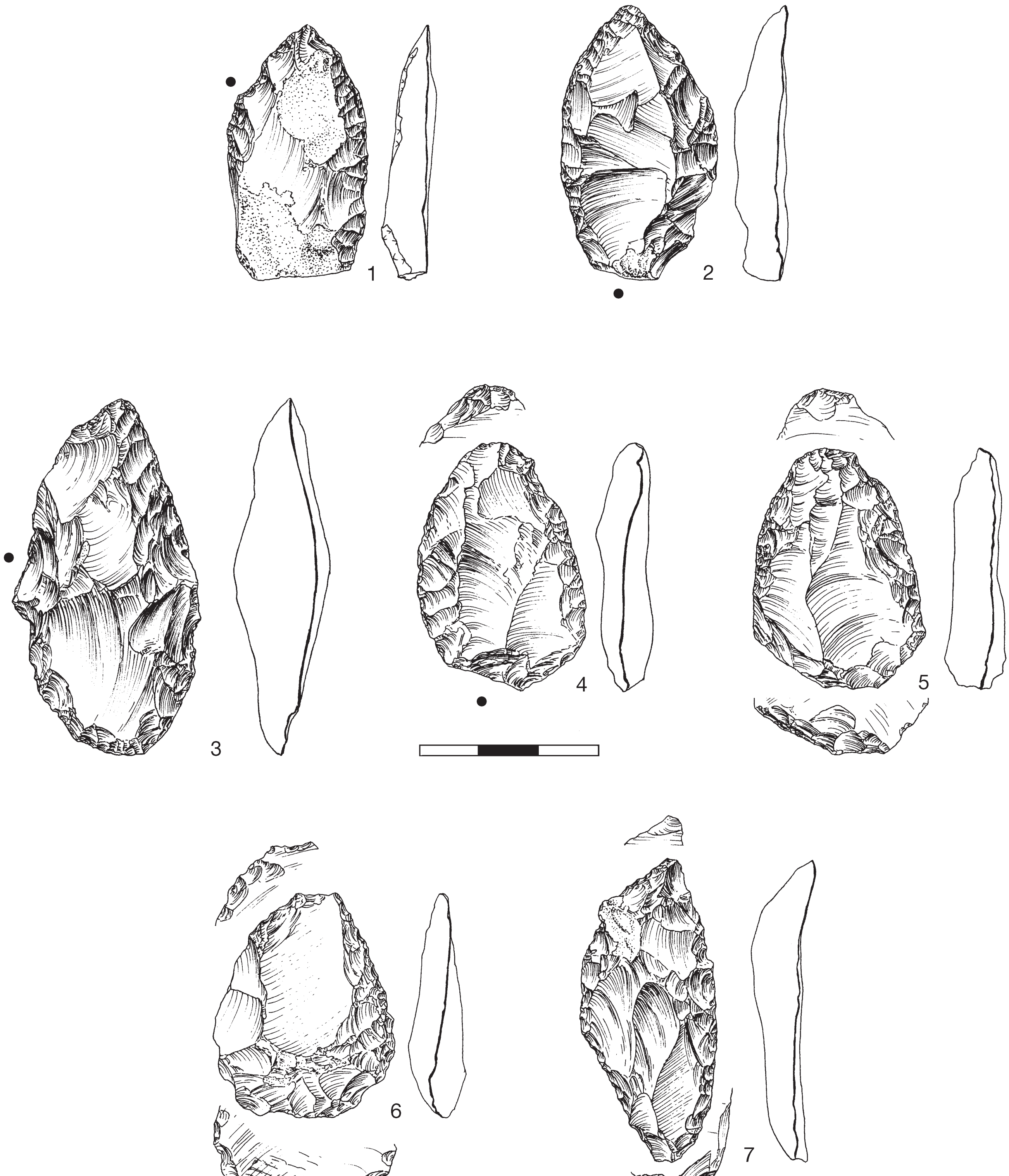

Fig. 7-13 Kabazi V, levels III/1 (2, 3), III/1A (1, 4, 5, 6, 7). Scrapers: 1, 2, 3 – semi-leaf; 4 – semi-leaf, terminally thinned; 5, 6 – semi-leaf, bi-terminally thinned; 7 – leaf-shaped, bi-terminally thinned.

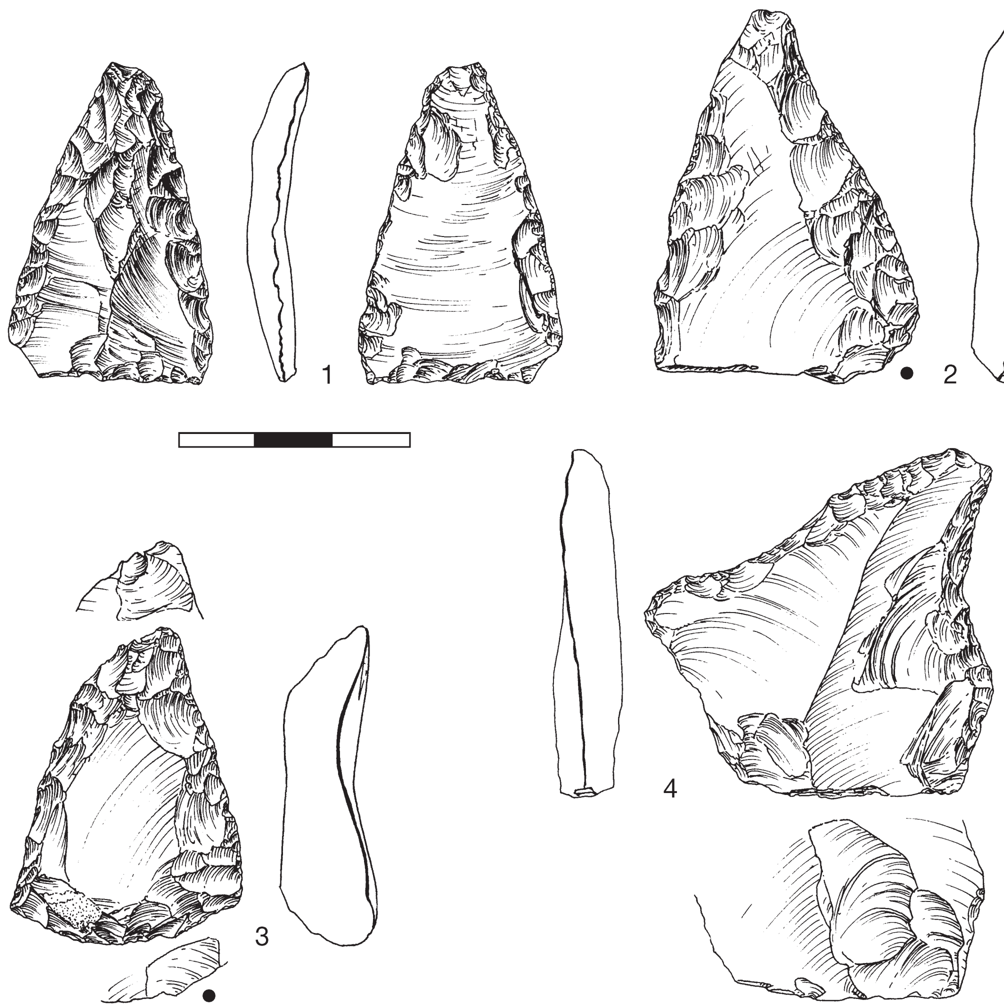

Fig. 7-14 Kabazi V, levels III/1 (1), III/1A (2, 3, 4). Scrapers: 1 – triangular, bi-terminally / back thinned; 2 – sub-triangular; 3 – triangular, bi-terminally thinned; 4 – semi-trapezoidal, thinned base.

Truncated-faceted

Four truncated-faceted pieces were discovered in two levels (Table 7-17). All are distally truncated-faceted flakes (Fig. 7-18, *1, 2*).

Scaled pieces

These types of tools were found in the two archaeological levels III/1 (N=1) and III/1A (N=9) (Table 7-17). Typologically these pieces are either inverse bi-terminal (Fig. 7-19, *2*) or inverse radial (Fig. 7-19, *1, 3, 4*). The latter is the most numerous with a total of eight examples. Generally speaking, the ventral surface of these tools is either completely or partly covered by differently directed negatives. Further, these items are characterised by their generally small size, with the exception of one tool (length: 40.81 cm, width: 43.84 cm, thickness: 12.07 cm) (Fig. 7-19, *4*). The parameters of the other specimens lie within the following ranges: length: 24.54–37.93 cm, width: 23.23–37.45 cm, and thickness: 9.78–5.28 cm. On the whole, the parameters of length and width for scaled pieces do not exceed 4 cm. Similar types of tools have been found in other Micoquian complexes on the Crimea, such as at Starosele (Marks, Monigal 1998, fig. 7-16, e, p. 150) and at Kabazi II (Chabai 2005b, fig. 6-13, 3, p. 121). Moreover, analogous types of scaled pieces are also known in the Central European Micoquian complexes, e.g. J. Richter found similar tool types in level G of the Sesselfelsgrotte III, which he identified as micro-cores and termed *"diskomorphe Restkerne"* (Richter 1997, Fig. 150: 4, 5, 6, p. 160).

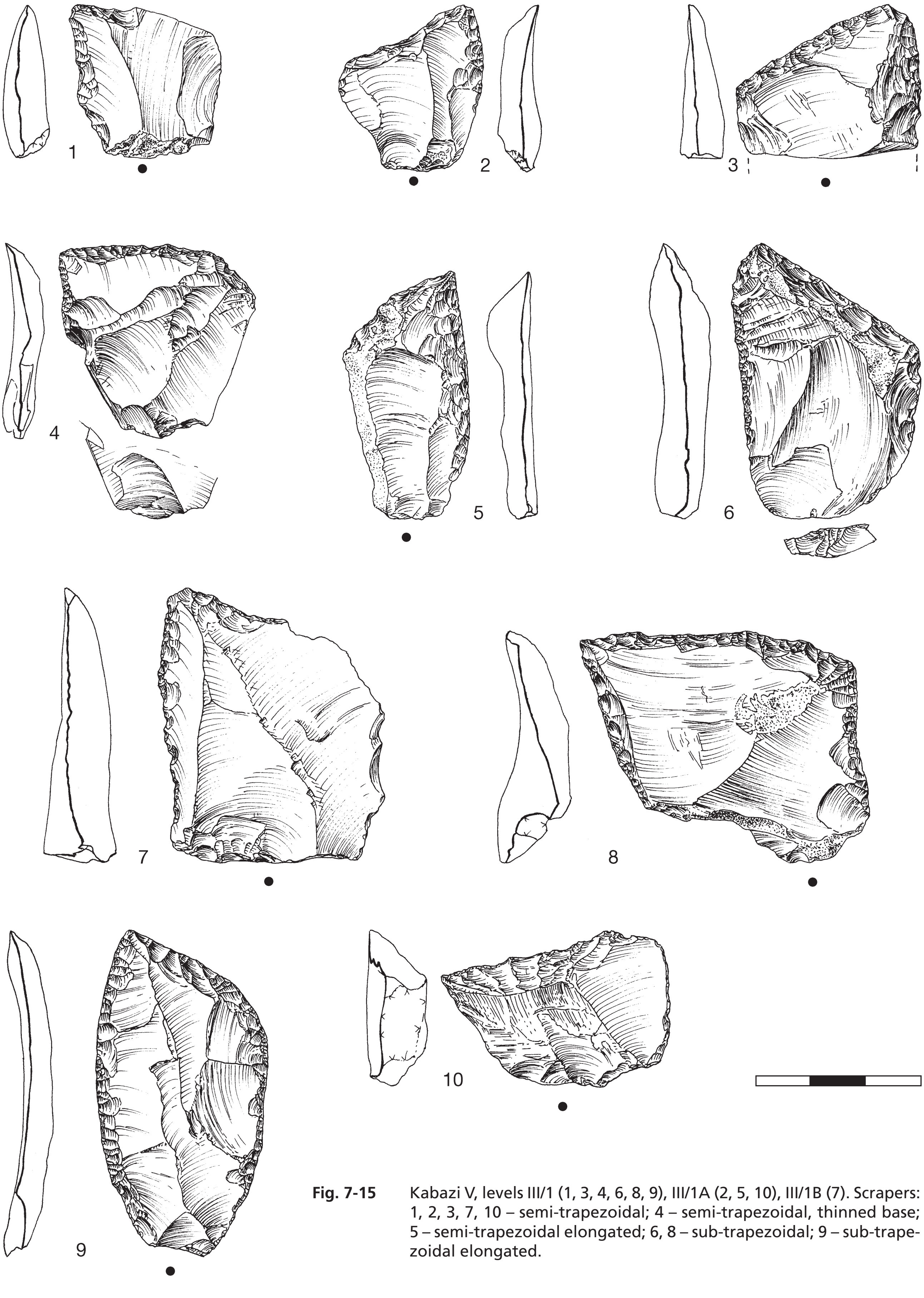

Fig. 7-15 Kabazi V, levels III/1 (1, 3, 4, 6, 8, 9), III/1A (2, 5, 10), III/1B (7). Scrapers: 1, 2, 3, 7, 10 – semi-trapezoidal; 4 – semi-trapezoidal, thinned base; 5 – semi-trapezoidal elongated; 6, 8 – sub-trapezoidal; 9 – sub-trapezoidal elongated.

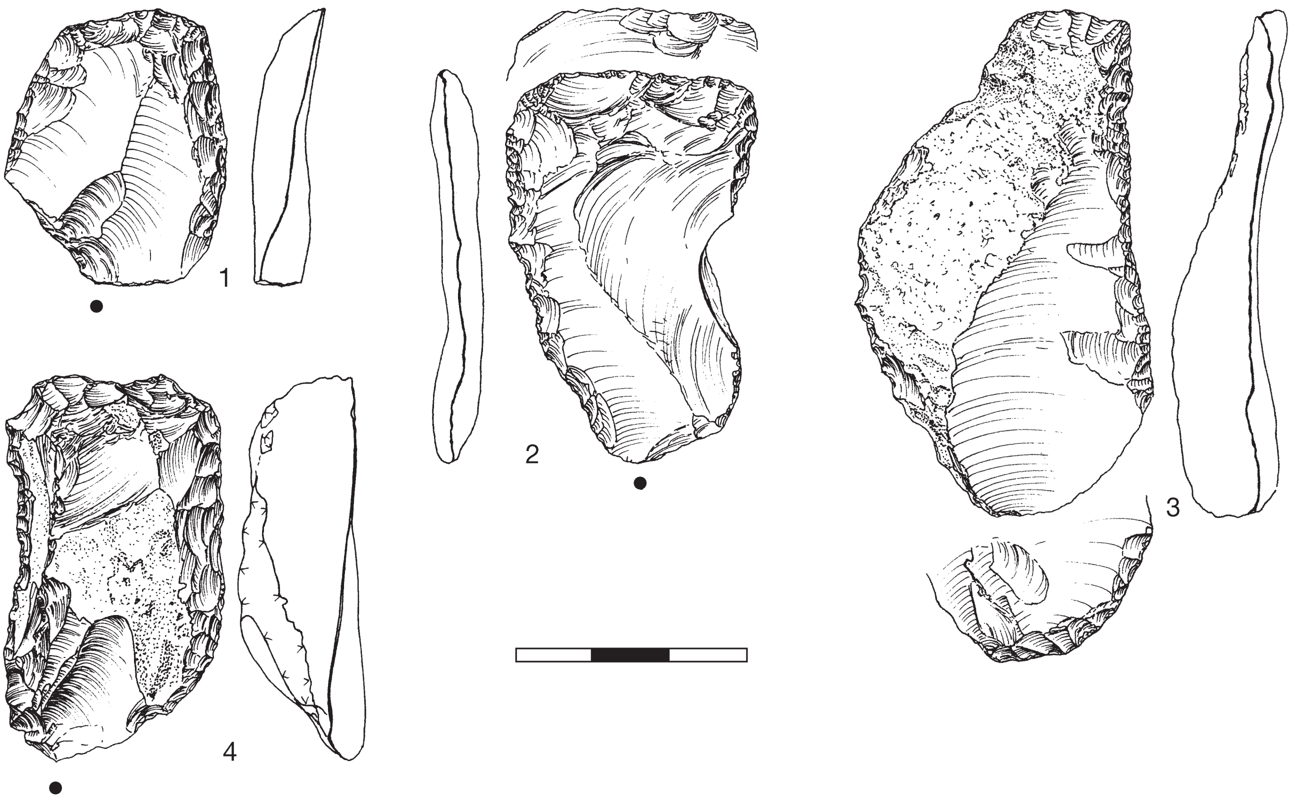

Fig. 7-16 Kabazi V, levels III/1A (1, 2, 3), III/1B (4). Scrapers: 1, 4 – sub-rectangular; 2 – sub-rectangular, terminally thinned; 3 – semi-rectangular alternative.

Further, in analogy to the Crimean Micoquian scaled pieces, one might also consider the core from the same complex of the Sesselfelsgrotte III, which was identified as a *"Restkern mit Kostenki-Ende"* (Richter 1997, abb. 154: 2, s. 164). The *"Kostionki treatment"* was recognised in the preparation of two opposite striking platforms. A third group with similar forms from level G at the Sesselfelsgrotte III are the *"Kerne von zentripetalem oder orthogonalem Levallois-Abbau, zum Teil secundär als Schaber genutzt"* (Richter 1997, Fig. 147: 1-5, p. 157).

The scaled pieces or micro-cores are characteristic for Micoquian complexes. In the Crimean Micoquian assemblages they are often observed, but not numerous (Chabai 2005b, p. 121).

Bifacial points

Bifacial points were found in three levels of sub-unit III/1 (Table 7-17). More than half of these are from archaeological level III/1 (N=7). Morphologically, points are represented by four basic shapes: leaf-shaped (N=4), triangular (N=2), trapezoidal (N=1), and crescent-shaped (N=5) pieces. One further piece is too fragmented to be identifiable.

Leaf points can be described as either sub-leaf, leaf-shaped with thinned base (Fig. 7-20, *1*) or sub-leaf with thinned base (Fig. 7-20, *2, 3*). The sub-leaf, thinned base points are more common for the assemblage from archaeological level III/1A. Moreover, these points are a specific type of leaf-shaped bifacials common to the Crimean Micoquian. The maximal width of these tools is in relation to the bottom part of the tool, and is equal to about half its length. Such sub-leaf points are usually referred to as "wide" or "leaf of a poplar" (Fig. 7-20, *2, 3*).

Crescent bifacial points are either semi- or sub-crescent (Fig. 7-21, *1*). These types of bifacial points are observed exclusively in archaeological level III/1. The least common morphological groups are the triangular and trapezoidal forms. Six of sixteen bifacial points display a thinned base. All bifacial points are plano-convex. A combination of scalar and parallel retouch was employed in bifacial point production. The angles of retouched edges vary from flat to semi-step. Bifacial points are characterised by the following dimensions: length – max. 80.09 mm, min.

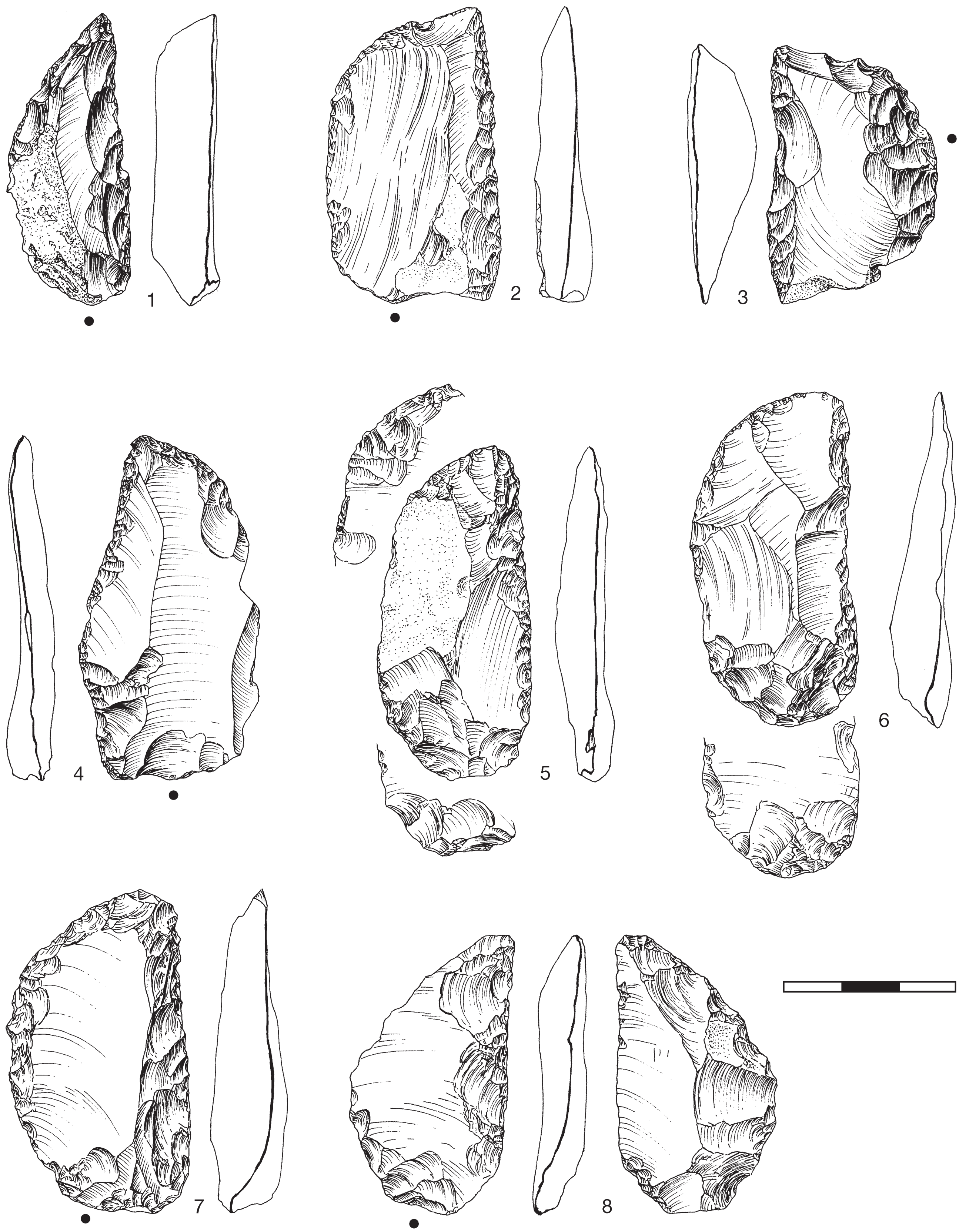

Fig. 7-17 Kabazi V, levels III/1 (1, 3, 4), III/1A (2, 5, 6, 7, 8). Scrapers: 1, 2, 3, 4 – semi-crescent; 5 – semi-crescent, bi-terminally thinned; 6 – sub-crescent, thinned base; 7 – sub-crescent 8 – sub-crescent alternative, thinned base.

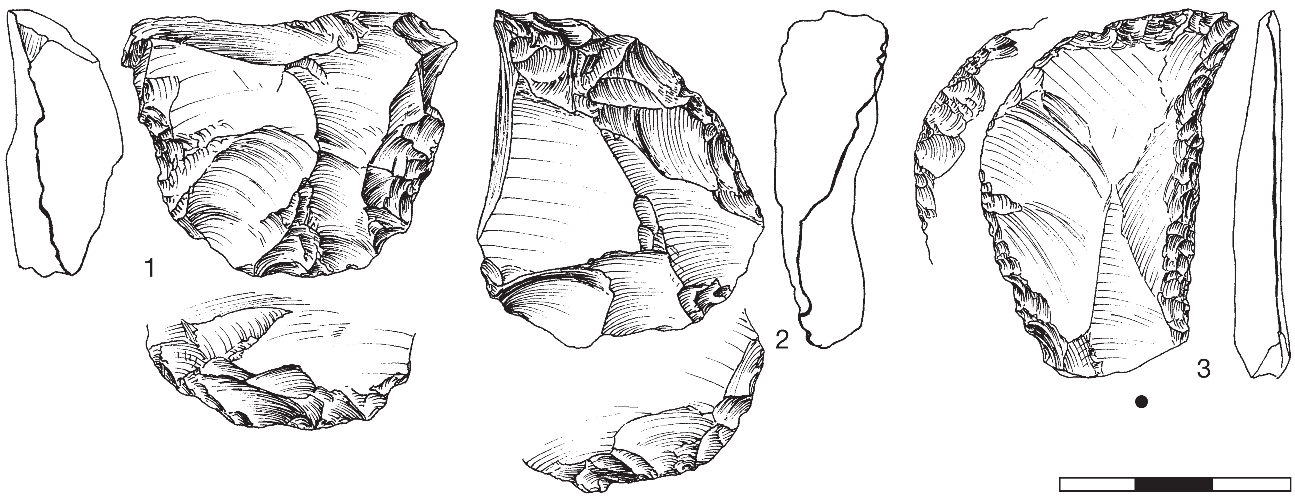

Fig. 7-18 Kabazi V, level III/1 (1, 2, 3). Truncated-faceted: 1, 2 – base truncated-faceted flakes; scrapers: 3 – hook-like, thinned back.

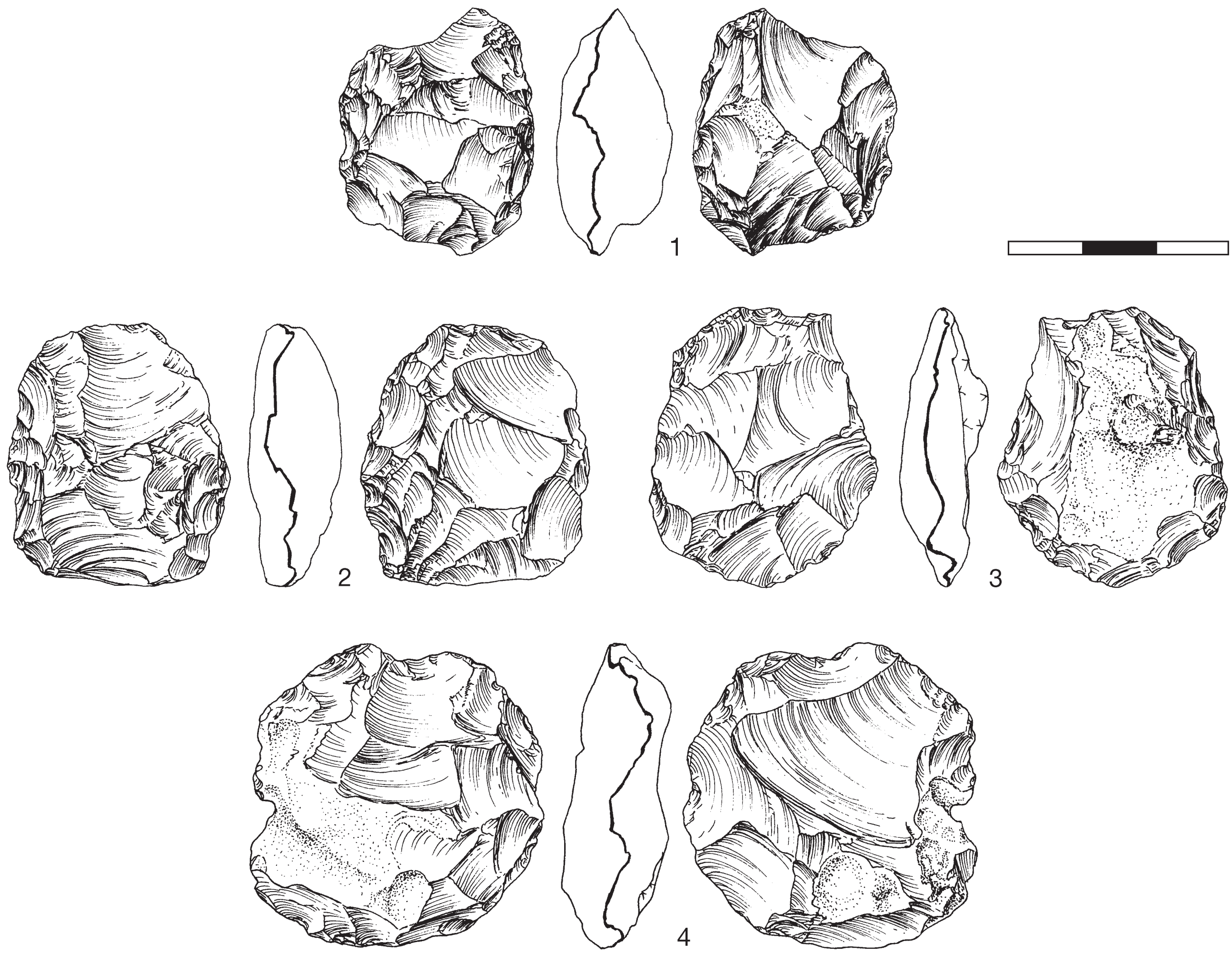

Fig. 7-19 Kabazi V, levels III/1 (1), III/1A (2, 3, 4). Scaled tools: 1, 3, 4 – radial, 2 – bidirectional.

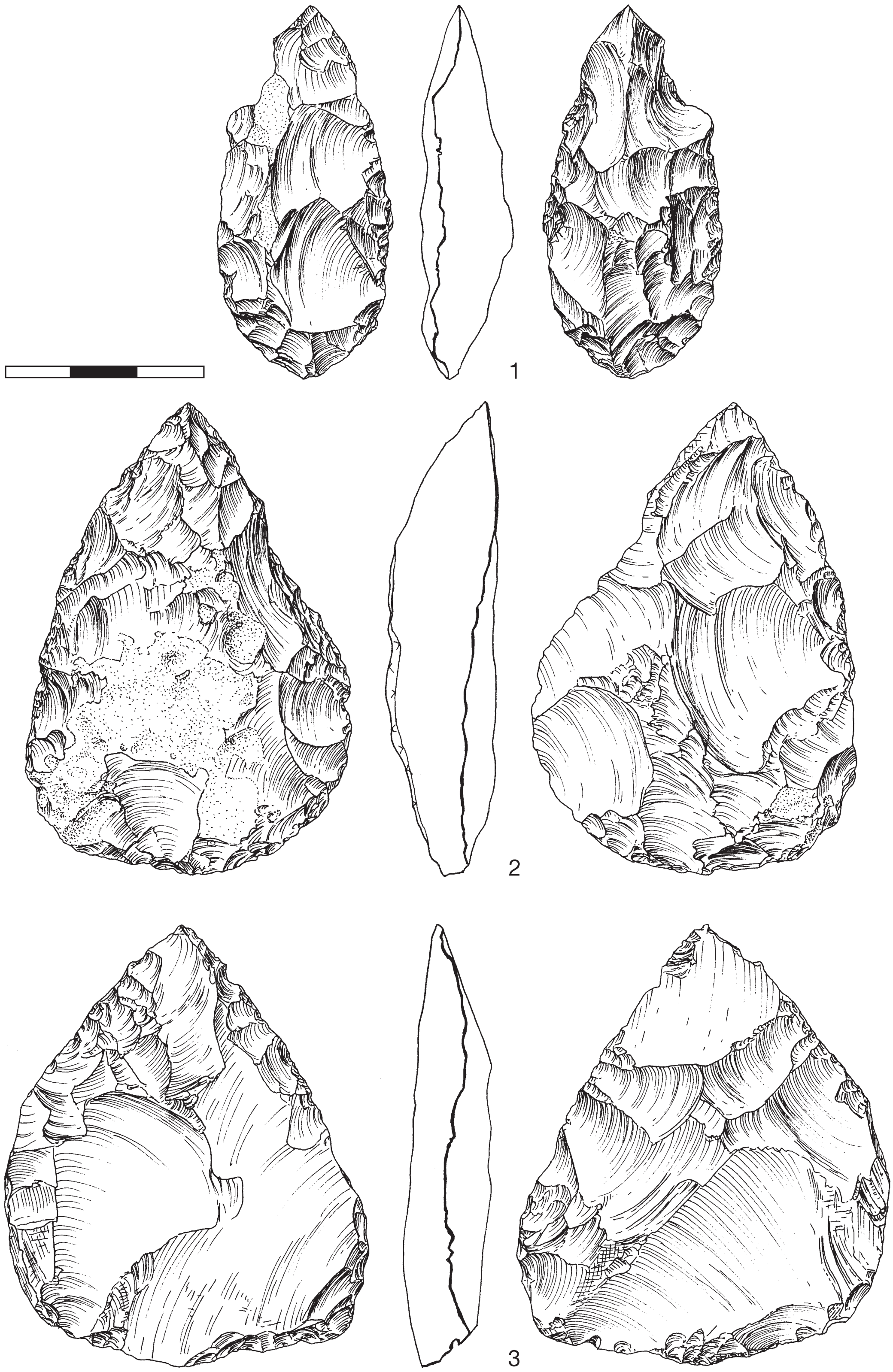

Fig. 7-20 Kabazi V, levels III/1 (1), III/1A (2, 3). Bifacial points: 1 – leaf, thinned base; 2, 3 – sub-leaf, thinned base.

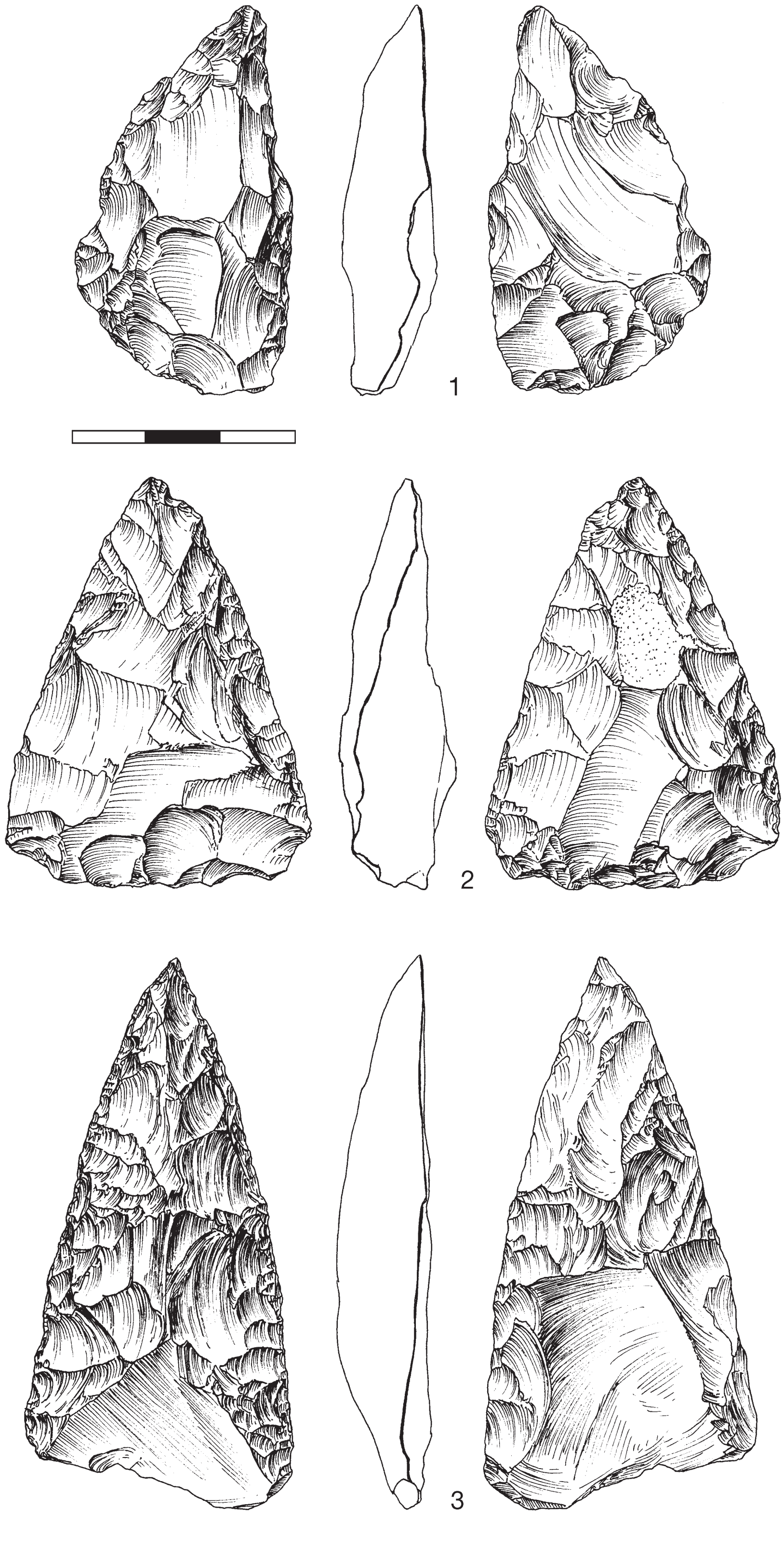

Fig. 7-21 Kabazi V, levels III/1 (1, 2), III/1B (3). Bifacial points: 1 – sub-crescent, thinned base; 2 – sub-triangular, thinned base, 3 – sub-triangular.

52.12 mm; width – max. 56.46 mm, min. 28.66 mm; thickness – max. 9.95 mm, min. 15.18 mm. Average dimensions of points are: length – 58.49 mm, width – 36.41 mm, thickness – 10.42 mm. As a rule, fragments of flint plaquettes were used for bifacial point production, but in a single case a bifacial point was also made on a flake (Fig. 7-20, *3*).

Bifacial scrapers

Bifacial scrapers were discovered in two archaeological levels – III/1 and III/1A (Table 7-17). Bifacial scrapers belong to one of five basic morphological groups: simple – one-edge (N=7), leaf (N=11), crescent (N=24), triangular (N=2), and trapezoidal (N=1).

Simple – one-edge bifacial scrapers

There are eight tools in this morphological group (Table 7-17). The majority of one-edge bifacial scrapers stems from level III/1A. According to the shape of the working edges simple bifacial scrapers can be described as either straight (Fig. 7-22, *1*) or convex (Fig. 7-22, *2, 3*; 7-23, *1*). Six tools have a natural back (Fig. 7-22, *1, 3*; 7-27, *1*), and in one case the back is retouched (Fig. 7-22, *2*). Moreover, one tool is terminally thinned (Fig. 7-22, *3*). All bifacial simple scrapers are plano-convex, and were made using a combination of scalar and semi-step retouch. Only one simple bifacial scraper is shorter than 5 cm. On the whole, bifacial simple scrapers are characterised by the following dimensions: length – max. 70.03 mm, min. 31.28 mm; width – max. 42.85 mm, min. 10.95 mm; thickness – max. 36.68 mm, min. 6.87 mm. The average sizes of bifacial scrapers are as follows: length – 58.28 mm, width – 32.73 mm, thickness – 16.71 mm. All but one simple bifacial scraper were made on flint plaquettes. A single item was made on a transverse flake.

Crescent bifacial scrapers

Bifacial scrapers belonging to the crescent shapes were found in archaeological levels III/1 and III/1A. Crescent shaped bifacial scrapers are dominant among bifacial scrapers in both the aforementioned levels (Table 7-17), and either semi-crescent (N=3), sub-crescent (N=16) or crescent (N=4).

Semi-crescent scrapers (Fig. 7-24, *2*) were discovered in level III/1A. One semi-crescent tool has a terminal thinning. The sub-crescent types are the most numerous among crescent shaped bifacial scrapers in both levels III/1 and III/1A (Fig. 7-24, *1, 3*; 7-25, *1, 2*); moreover, in archaeological level III/1 it is the only identifiable type (Table 7-17). Three bifacial sub-crescent scrapers have a thinned base (Fig. 7-24, *1*; 7-25, *1, 2*) and one piece displays both a thinned base and a thinned back. Bifacial scrapers of the crescent type were only found in archaeological level III/1A (Table 7-17). All bifacial scarpers of this shape are plano-convex, and were made using a combination of scalar and semi-step retouch. Among the crescent shaped bifacial scrapers in sub-unit III/1 a total of 44.44 % of items are smaller than 5 cm. In archaeological level III/1 28.57 % of crescent shaped bifacial scrapers are smaller than 5 cm, while in level III/1A this applies to 46.15 % of this tool type. Crescent shaped bifacial scrapers fall within the following size parameters: length – max 95.51 mm, min 36.09 mm; width – max 53.47 mm, min 21.7 mm; thickness – max. 17.36 mm, min. 6.95 mm. Average dimensions are: length – 55.57 mm, width – 33.54 mm, thickness – 11.49 mm. In 69.57 % of cases crescent shaped bifacial scrapers were made from flint plaquettes, and 30.43 % items were made on flakes.

Leaf bifacial scrapers

Leaf-shaped bifacial scrapers are most numerous in archaeological level III/1 (7 of 11 tools; Table 7-17). These comprise sub-leaf types which can be assigned to either sub-leaf (Fig. 7-26, *1, 2, 3*) or sub-leaf with thinned base (Fig. 7-27, *2*) types. All sub-leaf bifacial points are plano-convex. Their production involved a combination of scalar and semi-step retouch. With the exception of one piece, bifacial sub-leaf scrapers are larger than 5 cm in length. Four leaf-shaped scrapers fall within the following size parameters: length – max. 66.16 mm, min. 40.2 mm; width – max. 45.54 mm, min. 28.66 mm; thickness – max. 12.2 mm, min. 8.47 mm. The average dimensions of leaf-shaped scrapers are: length – 56.16 mm, width – 35.67 mm, thickness – 10.9 mm. Sub-leaf bifacial scrapers were made mainly on flint plaquettes (10 items), but also on a flake (1 Item).

Triangular bifacial scrapers

This kind of bifacial scraper is represented by just one sub-triangular piece (Fig. 7-27, *1*) from level III/1 (Table 7-17). This tool was made in a plano-convex manner, and using scalar retouch. It has the following proportions: length – 36.77 mm, width – 38.55 mm, and thickness – 9.11 mm. It was produced on a flint plaquette.

Trapezoidal bifacial scrapers

One sub-trapezoidal bifacial scraper was discovered in archaeological level III/1 (Table 7-17). It was executed in a plano-convex fashion and using scalar retouch. It has the following dimensions: length – 49.19 mm, width – 36.99 mm, and thickness – 9.96 mm. This tool was made on a flint plaquette.

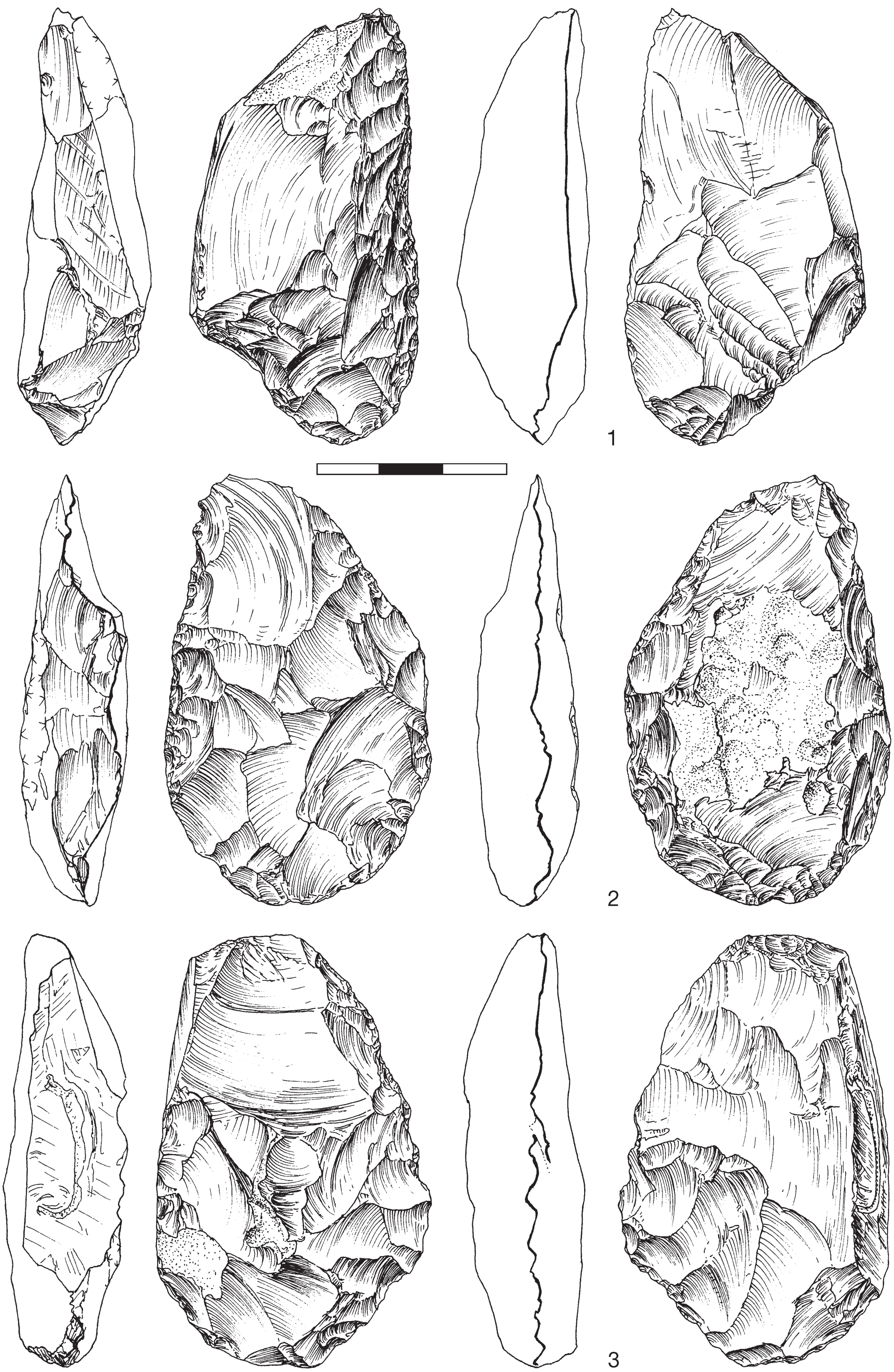

Fig. 7-22 Kabazi V, levels III/1 (1), III/1A (2, 3). Bifacial one-edge scrapers: 1 – straight, naturally backed; 2 – convex backed; 3 – convex naturally backed.

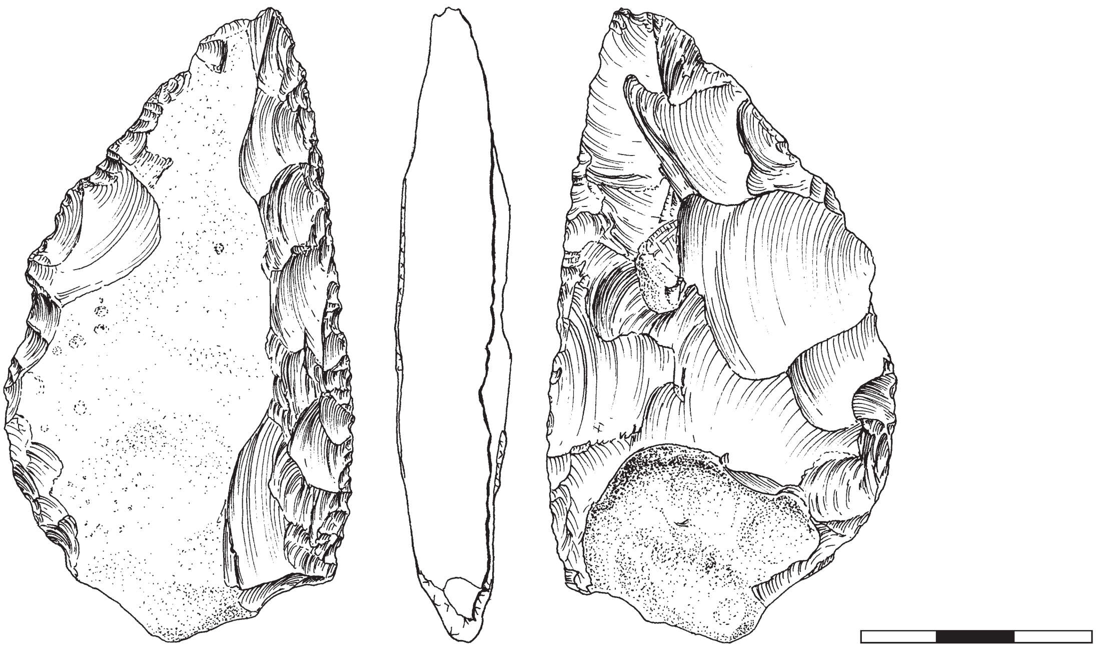

Fig. 7-23 Kabazi V, level III/1A (1). Bifacial convex scraper.

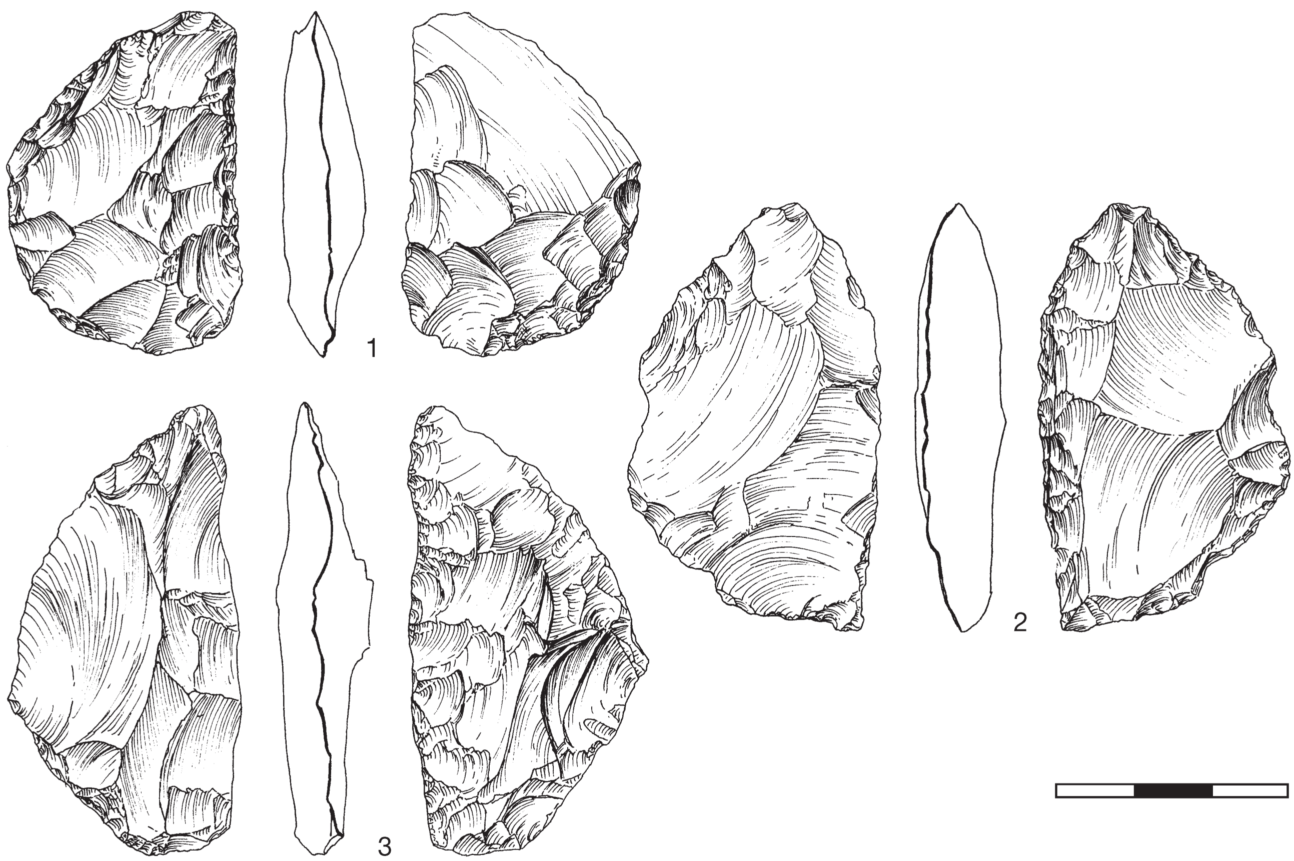

Fig. 7-24 Kabazi V, level III/1A (1, 2, 3). Bifacial scrapers: 1 – sub-crescent, thinned base; 2 – semi-crescent; 3 – sub-crescent.

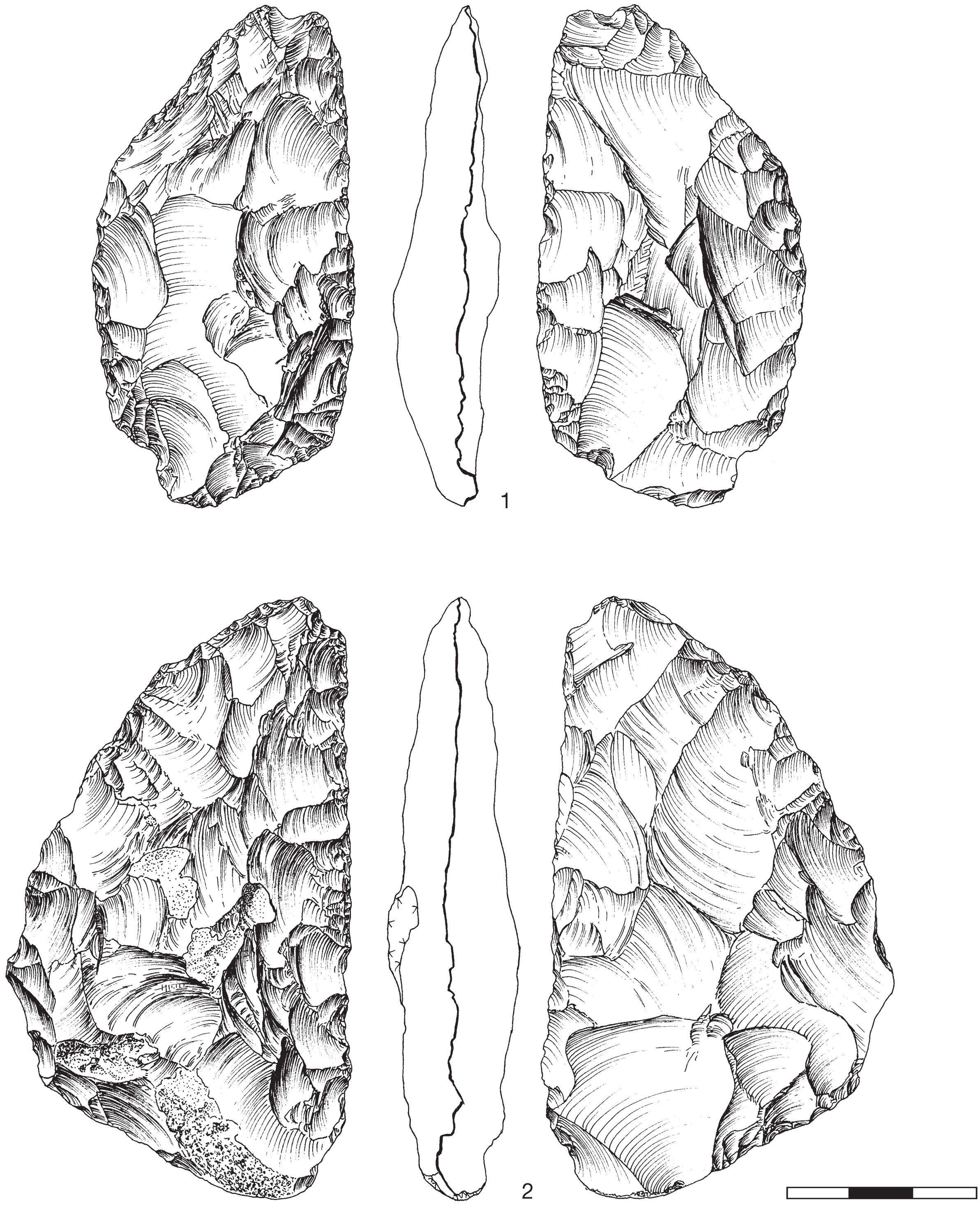

Fig. 7-25 Kabazi V, Level III/1 (1, 2). Bifacial scrapers: 1, 2 – sub-crescent, thinned base.

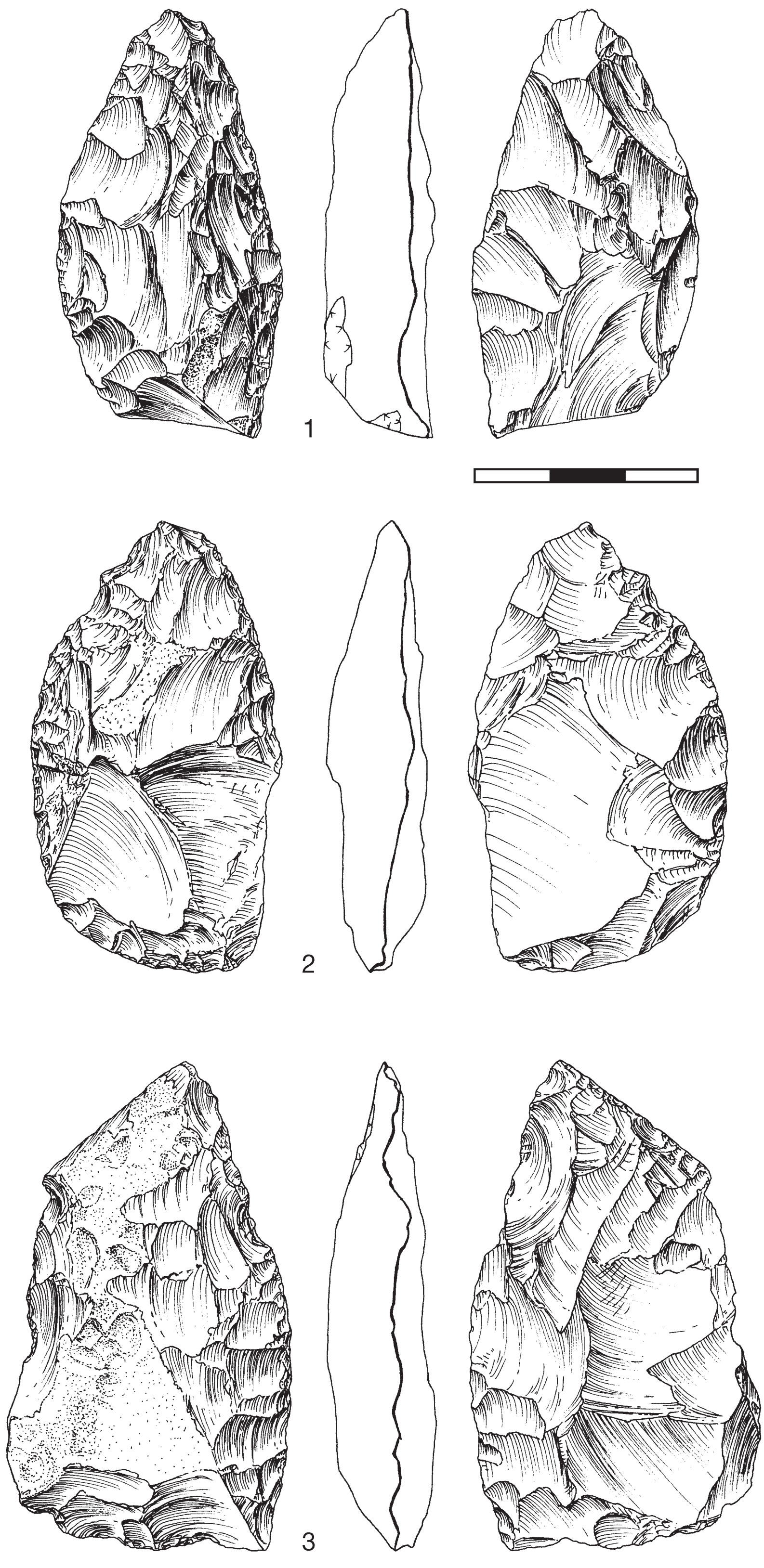

Fig. 7-26 Kabazi V, levels III/1 (1), III/1A (2, 3). Bifacial scrapers: 1, 2, 3 – sub-leaf.

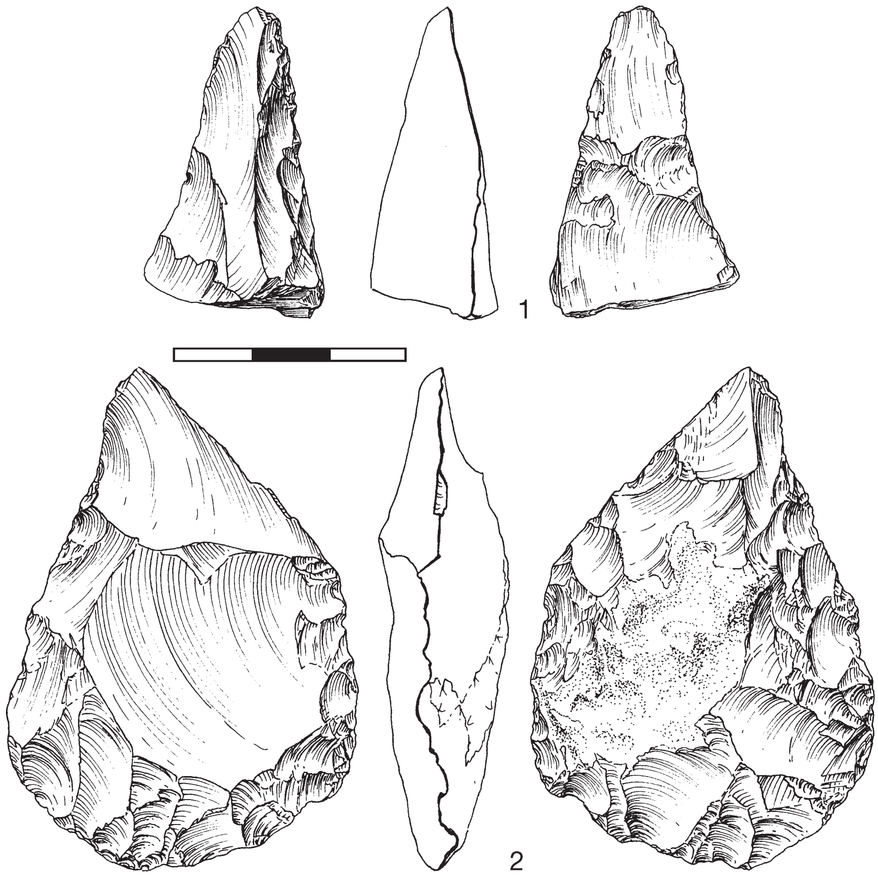

Fig. 7-27 Kabazi V, level III/1 (1), level III/1A (2). Bifacial scraper: 1 – sub-triangular, unidentifiable; 2 – sub-leaf, thinned base.

Bifacial heavily exhausted tools

One tool of this type was found in level III/1A (Table 7-17). It displays a stage of rejuvenation / reshaping: there is no visible retouch along it edges. This tool was made on a flake. It parameters are: length – 53.37 mm, width – 27.96 mm, and thickness – 14.00 mm.

Unidentifiable tools

All tiny tool fragments were defined as unidentifiable tools. These tool fragments occur in all levels of sub-unit III/1 (Table 7-17). Unifacial unidentifiable tools comprise 25 % of the entire tool assemblage. Fragments of bifacial tools comprise 9.79 % of all tools.

Bone retouchers

Bone retouchers were found in all levels of sub-unit III/1 (Table 7-1) and have been assigned to two types: simple (N=79) and double (N=26). For a more detailed description of retouchers see Chapter 15, this volume.

Pebbles

Pebbles and their fragments were found in three levels (Table 7-1). A total of 259 pebbles were found in all levels of sub-unit III/1. The largest number of pebbles was observed in level III/1A (Table 7-1). Among the pebbles 223 have no traces of use; 25 examples of these are complete. The most part of unused pebbles (N=187) are of sandstone material (187). Another pebble group is made up of limestone pebbles: 30 items. Such pebbles occur only on the bank of the Alma River. Rare examples are those made from flint (1), quartz (2), quartzite (1), tuff (2), and sedimentary (1) pebbles.

Fig. 7-28 Kabazi V, Level III/1A (1). Tool on pebble: chopper.

Tools on pebbles

In archaeological levels III/1 and III/1A two pebbles were found which have negatives of removals from one of their narrow extremities (Table 7-1). These tools were identified as a chopper (Fig. 7-28) and a *pièce esquille* (Fig. 7-29). The chopper stems from level III/1A and has the following dimensions: length – 228.8 mm, width – 111.85 mm, thickness – 47.74 mm, and weight – 2337 gr. Such tools are also known at Chokurcha I, Level IV-I (Chabai 2004b, pp. 407 - 408). The *pièce esquille* from level III/1 has the following size parameters: length – 62.84 mm, width – 18.85 mm, and thickness – 14.01 mm. Both pebble tools (chopper and *pièce esquille*) have elongated rectangular proportion. Tools of these types are otherwise unknown at Kabazi V.

Stone retouchers and hammer-stones

As a rule, river pebbles were used as stone retouchers and hammer-stones in Middle Palaeolithic assemblages in the Crimean, although cases are also known in which flint flakes and unifacial tools were used for this task (Stepanchuk 1993, Chabai 2004c). In the case of the latter these pieces usually display traces of use on a ventral part in the area of the bulb of percussion.

At Kabazi V river pebbles were used exclusively as hammer-stones and retouchers. These kinds of tools are found in archaeological levels III/1A (N=27), III/1 (N=4) and III/1C (N=3) (Table 7-1). For a more detailed description of retouchers see Chapter 15, this volume.

Fig. 7-29 Kabazi V, Level III/1 (1). Tool on pebble: *pièce esquille.*

Discussion: The Characteristic Features of Sub-Unit III/1 Artefact Assemblages

Prior to summarising the general characteristics of archaeological materials from sub-unit III/1, it is perhaps necessary to recall once again that this sub-unit is in fact made up of two main archaeological levels (III/1 and III/1A). The subsequent planigraphical and stratigraphical analysis has shown that levels III/1B and III/1C are not independent archaeological levels, and are connected with the deposition of level III/1. Consequently, levels III/1B, III/1 and III/1C should be considered as one single archaeological complex (III/1). Both levels III/1 and III/1A are palimpsests of repeated visits. For this points the thickness of cultural levels, which is ca. 10 cm for level III/1, and ca. 6 cm for level III/1A, comprises disturbed hearths and stratigraphical sequences of pits (see Chapters 1 and 2, this volume).

The technical and typological structure of artefacts recovered from archaeological levels belonging to sub-unit III/1 show a full cycle of flint reduction, as attested by the presence of primary and tested raw material, preforms, cores, preforms of bifacial tools, a large ratio (61.67 %) of debitage covered by cortex, and also by the presence of stone and bone retouchers (Table 7-1). Such a structure proves without a doubt that archaeological levels of sub-unit III/1 can be interpreted as on-site workshops. Taking into account the technical and typological indices one might also note that all archaeological levels of sub-unit III/1 are stratified Micoquian assemblages with a low contamination by a Levallois-Mousterian – Western Crimean Mousterian (WCM) – component.

The WCM component is expressed mainly in the identified core treatment processes. The highest maintenance of cores was observed in archaeological level III/1A, with these pieces constituting more than 60 % of the general collection of cores from sub-unit III/1. In the level III/1A assemblage Levallois, unidirectional and bidirectional cores make up 30.43 % of cores. The distinctive feature for the majority of these cores is the presence of lateral supplementary platforms (Fig. 7-2, *1, 2*; 7-5, *1, 2, 3*). Also, both main and supplementary platforms are often faceted. The presence of core reduction in levels III/1 and III/1A also influenced the ratio of tools to cores. For unmixed Crimean Micoquian assemblages the blade index would be slightly too high. This also applies to the increased indexes of blank striking platform preparations, as well as to the percentage of tools with faceted platforms (Table 7-18). Among the prepared platforms the sum of dihedral and polyhedral prevails over faceted types. In level III/1 the presence of a Levallois-Mousterian component is best noted in the upper stratigraphical hart (level III/1B) whereas the lower part (level III/1C) has either no WCM contribution, or it is minimal (Table 7-18). Besides the presence of core reduction in all archaeological levels, the low percentages of bifacial blanks have also been noted. Particularly their low maintenance is marked among blanks which are longer or wider than 3 cm (Table 7-18). In any case, even such indexes for bifacial blanks considerably surpass similar values for Levallois-Mousterian industries, for example Kabazi V, Level IV/1 (Chapter 14, this volume).

		III/1B	III/1	III/1C	III/1A	III/2
"bifacial thinning" chips, 1,0-1,9 cm *		22.83	13.86	22.02	21.78	27.00
"bifacial thinning" chips, 2,0-2,9 cm *		4.33	2.91	3.18	5.85	7.11
"bifacial rejuvenating" chips, 1,0-1,9 cm *		1.08	1.22	1.33	1.08	1.28
"bifacial rejuvenating" chips, 2,0-2,9 cm *		0.72	0.30	·	0.43	0.49
"bifacial thinning" flakes (%)		7.55	5.66	8.33	6.75	18.41
"bifacial thinning" blades (%)		9.38	4.98	9.09	7.01	15.38
indices of blades		9.14	11.22	9.24	11.44	9.91
indices of faceted platforms	Ifs	18.82	23.52	12.12	26.37	14.65
	Ifl	61.76	66.24	45.45	72.81	52.27
percentage of bifacial tools		7.40	21.53	·	17.20	27.90
ratio cores : tools		1 : 18	1 : 67	·	1 : 31	1 : 70
tools > 5 cm	unifacial	42.86	22.78	33.33	29.70	42.00
	bifacial	100.00	42.86	·	75.00	100.00

* - percentage of all identifiable chips

Table 7-18 Kabazi V, levels III/1B, III/1, III/1C, III/1A and III/2: lithic variability.

On the whole, tool assemblages recovered from sub-unit III/1 comprise unifacial forms. Among the points the most important are leaf-shaped and triangular pieces. Together these make up 54.76 % of all points; trapezoidal and crescent shaped points are less significant, comprising together about one third of points. Also, further types of points were also observed which are not characteristic for Micoquian complexes. These include distal points (Fig. 7-6, *1*) which are represented by only a few pieces (Table 7-17).

Among the scrapers from archaeological levels of sub-unit III/1 convergent shaped pieces are the most numerous (50 %), the least frequent being double scrapers (13.49 %). Among the simple scrapers the most widespread are those with a convex working edge (about 40 % of all simple scrapers) (Table 7-17). Among convergent scrapers the trapezoidal and crescent shaped pieces are the most common (altogether 61.74 %), and hence dominate among convergent scrapers. The least numerous among the convergent forms are triangular and rectangular shaped pieces (Table 7-17).

Bifacial reduction is attested by the presence of both bifacial tool preforms and finished bifacial tools. Preforms are common for Crimean Micoquian assemblages, especially at on-site workshops, such as at Zaskalnaya V, Zaskalnaya VI, and Kabazi V, III/2.

Leaf and crescent shaped pieces are the most characteristic among bifacial points (Table 7-17).

Among bifacial scrapers convergent shapes (Table 7-17) are dominant. In all levels the basic type of convergent scrapers are crescent shaped pieces. Also, in archaeological level III/1 leaf-shaped bifacial scrapers are important. Tools with one working edge are not so numerous. These comprise exclusively backed forms, mainly with convex working edges.

The sizes of the majority of unifacial tools from sub-unit III/1 assemblages do not exceed 5 cm (Table 7-18). The majority of bifacial tools are usually longer than 5 cm. The only exception is the bifacial tool assemblage from level III/1 which is dominated by "small bifacials" (Table 7-18).

The high percentage of convergent tools (Table 7-19) and the small number of "big" unifacial tools (>5 cm) at Kabazi V, levels III/1 and III/1A is indicative of intensive on-site processes of tool use and rejuvenation (Table 7-18). The intensive raw material reduction is attested by unusually dense concentrations of artefacts in all occupations of sub-unit III/1 (Chapter 1. this volume).

In archaeological levels III/1 and III/1A the ratios of simple, convergent and bifacial tools are very similar: level III/1 – simple 35.4 %, convergent 46.3 %, bifacial 18.3%; level III/1A – simple 35.5 %, convergent 48.1 %, bifacial 18.4 (Fig. 7-30).

The above analysis of the artefact assemblages from sub-unit III/1 permits a typological correlation of Kabazi V, levels III/1 and III/1A with the Starosele facie of the Crimean Micoquian (Table 7-19, Fig. 7-30). The closest analogies to material from these levels are to be found at Zaskalnaya V, layer I, and at Zaskalnaya VI, layer V. These complexes are characterised by large ratios of bifacial and convergent tools, and with low values of simple tools.

		Simple	*Convergent*	*Bifacial*
Ak-Kaya facie	Kabazi II, V & VI	26.2	24.6	49.2
	Sary Kaya, 1985-86	35.2	20.2	44.6
	Chokurcha I, IV-I	48.1	15.4	36.5
	Zaskalnaya VI, II	37.8	32.1	30.1
	Kabazi V, III/2	**37.7**	**34.4**	**27.9**
	Chokurcha I, IV-M	30.0	40.0	30.0
	Zaskalnaya V, V	28.2	42.3	29.5
	Kabazi II, III	51.3	20.5	28.2
	Chokurcha I, IV	45.1	26.8	28.1
	Sary Kaya, 1977	58.1	15.3	26.6
	Zaskalnaya V, II	49.9	26.2	23.9
	Zaskalnaya V, III	46.1	30.4	23.5
	Zaskalnaya V, VI	41.7	35.4	22.9
	Zaskalnaya VI, III	53.9	26.1	20.0
Starosele facie	Prolom II, III	48.3	34.8	16.9
	Kabazi V, III/1	**35.4**	**46.3**	**18.3**
	Kabazi V, III/1A	**33.5**	**48.1**	**18.4**
	Zaskalnaya VI, V	37.9	45.4	16.7
	Zaskalnaya V, I	33.3	50.8	15.9
	Prolom II, II	43.6	42.6	13.8
	Chokurcha I, IV-O	53.1	34.4	12.5
	Zaskalnaya V, IV	39.9	47.7	12.4
	Starosele, 1	44.3	43.4	12.3
	Zaskalnaya VI, IV	46.9	42.5	10.6
	Kabazi V, III/5	**51.5**	**38.4**	**10.1**
	Prolom II, IV	48.6	44.3	7.1
Kiik-Koba facie	Buran Kaya III, B	36.5	49.1	14.4
	Kiik-Koba, upper	26.9	59.3	13.8
	Prolom I, lower	30.2	59.1	10.7
	Prolom I, upper	30.9	54.4	14.7
	Buran Kaya III, 7-8	37.0	51.9	11.1

Table 7-19 Relationship of tool morphological groups in Crimean Micoquian assemblages.

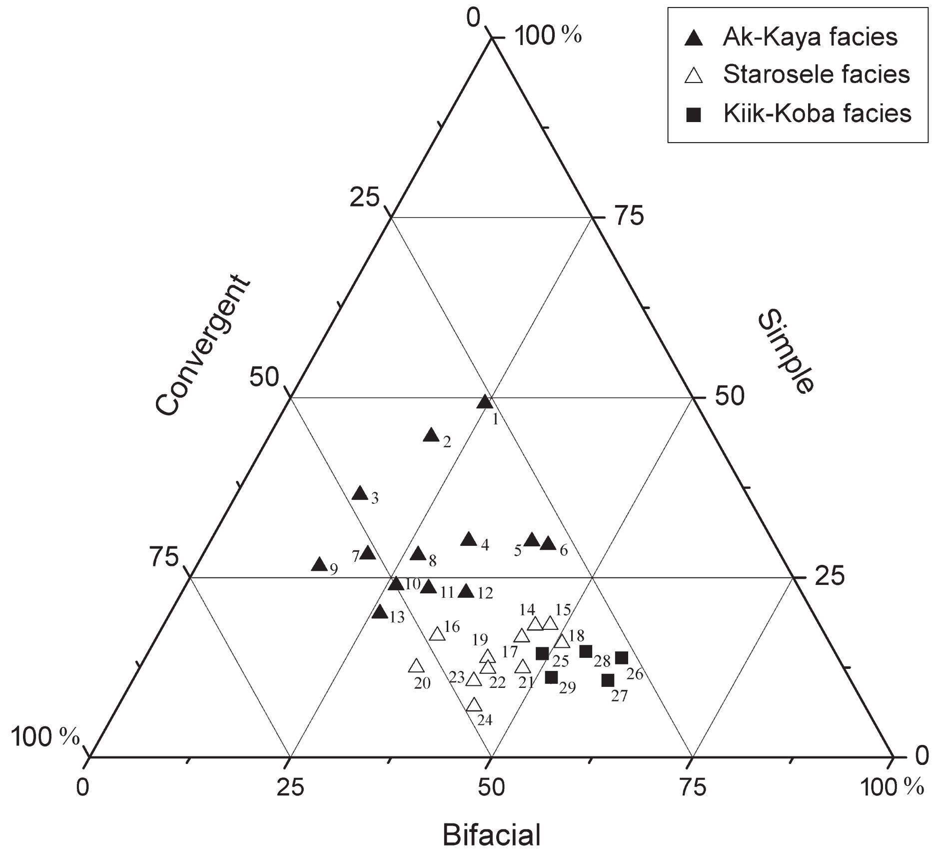

Fig. 7-30 Relationship of tool morphological groups in Crimean Micoquian assemblages according to facies.

Ak-Kaya facie: Kabazi II, Units V-VI (1); Sary-Kaya, 1985-86 (2); Chokurcha I, IV-I (3); Zaskalnaya VI, II (4); Chokurcha I, IV-M (5); Zaskalnaya V, V (6); Kabazi II, Unit III (7); Chokurcha I, IV (8); Sary-Kaya, 1977 (9); Zaskalnaya V, II (10); Zaskalnaya V, III (11); Zaskalnaya V, VI (12); Zaskalnaya VI, III (13);

Starosele facie: Kabazi V, level III/1 (14); Kabazi V, level III/1A (15); Prolom II, III (16); Zaskalnaya VI, V (17); Zaskalnaya V, I (18); Prolom II, II (19); Chokurcha I, IV-O (20); Zaskalnaya V, IV (21); Starosele, 1 (22); Zaskalnaya VI, IV (23); Prolom II, IV (24);

Kiik-Koba facie: Buran Kaya III, B (25); Kiik-Koba, upper level (26); Prolom I, lower level (27); Prolom I, upper level (28); Buran Kaya III, 7-8 (29).

Abstract

КАБАЗИ V, ПАЧКА ГОРИЗОНТОВ III/1: СТАРОСЕЛЬСКАЯ ФАЦИЯ МИКОКА

ВЕСЕЛЬСКИЙ А.П.

В ходе полевых исследований в пачке археологических горизонтов III/1 было выделено 4 археологических горизонта – III/1, III/1B, III/1A, III/1C – разделенных между собой линзами стерильных отложений. Мощность горизонтов III/1B и III/1C не превышает толщины одной археологической находки. Толщина горизонтов III/1 и III/1A варьирует от 6 до 10 см.

Общее количество артефактов для всей пачки археологических горизонтов III/1 составляет 90231 предметов, представленных тремя основными группами. К первой группе относятся 89865 кремневых артефактов, которые подразделяются на следующие семь категорий: обломки (342 экз.), преформы (164 экз.), нуклеусы (26 экз.), чешуйки (85353 экз.), отщепы (2535 экз.), пластины (364 экз.) и орудия (1081 экз.). Две другие группы представлены 107 костяными ретушерами и 259 гальками. Среди последних только 36 экземпляров имеют следы использования и функционально подразделяются на отбойники (11 экз.), ретушеры (23 экз.), чоппер (1 экз.) и pièce esquille (1 экз.).

Орудия пачки горизонтов III/1 представлены 12 классами: остроконечники, скребла, зубчатые, выемчатые, pièce esquille, двусторонние острия, двусторонние скребла, двусторонние изношенные формы, сколы с ретушью, сколы с утончениями, резцы и неопределимые фрагменты. Для всех горизонтов пачки III/1 характерно преобладание односторонних орудий. Среди односторонних орудий наиболее многочисленный класс составляют скребла – 64,26 %. Половина всех односторонних скребел представлена конвергентными типами. Для конвергентных скребел наиболее характерными формами являются трапециевидные и сегментовидные. Остроконечники составляют 11,73 %. Общая морфологическая структура остроконечников выглядит следующими образом: дистальные, листовидные, треугольные, трапециевидные и сегментовидные. Другие типы односторонних орудий в среднем составляют 4,54 %. Характерной особенностью всех классов односторонних орудий является широкое использование различных типов вентральных утончений. Четверть всех односторонних скребел и остроконечников характеризуется наличием терминального, базального или тыльного утончений. Кроме того, более 7 % однолезвийных скребел являются обушковыми формами.

Процент двусторонних орудий в горизонтах пачки III/1 представлен следующими показателями: III/1B – 7,4 % , III/1 – 21,53 %, и III/1A – 17,2 %. Двусторонние скребла наиболее многочисленная группа – более 72 % двусторонних орудий. Большая часть двусторонних скребел представлена конвергентными типами, среди которых лидируют сегментовидные и листовидные формы. Эти же формы являются преобладающими для двусторонних острий. Более 21% двусторонних орудий характеризуются наличием различных типов утончений. Кроме того, практически все однолезвийные двусторонние скребла оснащены различными обушками.

Для наиболее многочисленных коллекций из горизонтов III/1 и III/1A соотношение простых, конвергентных и двусторонних орудий имеют очень близкие показатели и составляют: горизонт III/1, простые – 35,4 %, конвергентные – 46,3 %, двусторонние – 18,3 %; горизонт III/1A, простые – 33,5 %, конвергентные – 48,1 %, двусторонние – 18,4 %.

Кремневая индустрия пачки горизонтов III/1 относится к старосельской фации микокского технокомплекса с незначительной примесью леваллуа-мустьерского

компонента. Наиболее близкими аналогиями для археологических горизонтов III/1 и III/1A являются материалы Заскальной V, культурный слой I и Заскальной VI, культурный слой V. Наличие высокого процента конвергентных типов и небольшое количество односторонних орудий длиной более 5 см в горизонтах III/1 и III/1A Кабази V указывает на интенсивность процессов использования и переоформления орудий на стоянке. Высокую степень переработки сырья отражает плотность артефактов на один кубический метр культурных отложений. Для горизонта III/1 этот показатель составляет 2046,15, а для горизонта III/1A – 2318,36 артефактов.

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter 8

Kabazi V, Sub-Unit III/2: The Ak-Kaya Facie of the Crimean Micoquian

Victor P. Chabai

In Kabazi V, sub-unit III/2 (levels III/2 and III/2A) artefact assemblages are not as numerous as in the uppermost occupations. Whereas in level III/2 a total of 10,671 pieces were discovered, in level III/2A the assemblage comprises 2,806 items. Artefact densities are, however, high – 1,285.7 items per m^3 in level III/2, and 666.6 items per m^3 of cultural bearing deposits in level III/2A. As such, these layers are among the most dense of the Crimean Middle Palaeolithic so far, and are comparable with the situation, for example, at Zaskalnaya V, layers I-VI; Zaskalnaya VI, layers II-V; Buran Kaya III, layer B; Kiik Koba, upper level; and Chokurcha I, Unit IV (Chabai 2004c, pp. 226, 230-232; Chabai, Uthmeier 2006, pp. 323, 327, 332). On the basis of depositional characteristics and archaeozoological studies, it can be stated that both sub-unit III/2 levels are palimpsests (Chabai, Patou-Mathis 2006; Chapter 6, this volume), however not as intensive as observed in the uppermost occupations.

Artefact Assemblage Composition

Artefacts are made of both flint and bone (Table 8-1). Bone artefacts were found in level III/2 and comprise three retouchers on bone tube fragments. As usual, the majority of artefacts are flint chips, although flakes dominate the artefact assemblage in the essential count (Table 8-1). The percentage of tools corresponds to the lowest range for Crimean Middle Palaeolithic assemblages, and is comparable with the assemblages recovered from Kabazi II, Unit II as well as Zaskalnaya V and Zaskalnaya VI. Altogether the core-like pieces (cores and preforms of cores and/or bifacial tools) compose just over 1% of the artefact assemblage. In level III/2 the ratio of blanks to core-like pieces lies at 35.7:1, and in level III/2A at 73:1. The former ratio is close to the same calculated for Zaskalnaya V, layers I and II, and Zaskalnaya VI, layers II and III, while the latter resembles those calculated for Zaskalnaya V, layers IV and V (Chabai 2004c, pp. 226; Chabai, Uthmeier 2006, pp. 323). However, if only the real cores are considered in these calculations, the ratio observed for level III/2 increases to 339:1. Such a ratio might imply a complete, or nearly complete, absence of on-site core reduction processes. On the other hand, the high percentage of debitage does suggest some kind of knapping activity.

Chunks

Chunks are unmodified pieces of flint plaquettes. In the sub-unit III/2 flint assemblage, eleven (10 from level III/2 and 1 from level III/2A) of 58 chunks are large enough (max. dimension > 5 cm) to be interpreted as representative of a raw material reserve. Chunks vary in length from about 10 to 1.5 cm, they are between 6.5 and 1 cm wide, and are 4 to 0.5 cm thick. Most chunks are breakage from flint plaquettes. The majority of chunks (35 of 58 items) is 1-2 cm thick, a thickness which is also "standard" among bifacial tools in Crimean Micoquian assemblages.

Probably, most chunks were transported to the site for further modification into bifacial tools. During the knapping process chunks were broken and / or modified into either bifacial tools preforms or pre-cores.

Bifacial Preform or Pre-Core / Core Fragments

Artefacts which might be interpreted as either bifacial preforms or core preforms were found in level III/2 (Table 8-1). These fragments are – on average – 43.94 mm long, 34.69 wide, and 18.87 mm thick. On the basis of such features as scars and the presence/absence of striking platforms it proves extremely difficult to establish whether these fragments stem from preforms of bifacial tools, pre-cores or cores fragments. Also, some fragments may have resulted from bifacial tool reshaping. Nevertheless, the average thickness of this category of artefacts falls within the range of bifacial tools thicknesses common as is for Crimean Micoquian. Seven of eleven fragments are between 1 and 2 cm thick.

Cores

There are two cores in the level III/2 assemblage, a complete Levallois Tortoise core (Fig. 8-1) and a broken radial core. Both cores, even in their fragmented state, are relatively large, they measuring in excess of 70 mm in length, >50 mm wide, and >20 mm thick. The biggest negatives observed on their flaking surfaces are >55 mm long and >37 mm wide. Cores are relatively rare in Crimean Micoquian assemblages, and especially rare are Levallois Tortoise cores. The Levallois Tortoise cores discovered at Zaskalnaya V, in layers II and III, and at Zaskalnaya VI, in layers II, III and IV, were all identified as WCM contributions to the Micoquian palimpsests of these layers (Chabai 2004c, p. 76-79). On the other hand, all the above mentioned Micoquian assemblages contain some Levallois blanks, *débordantes*, crested blades and other attributes of WCM. However, this is not the case of Kabazi V, level III/2, where the Levallois Tortoise core is the only representative of the Levallois-Mousterian techno-complex.

Preforms of Bifacial Tools

A total of six bifacial tool preforms were found in level III/2, with one preform discovered in level III/2A. All but one piece was broken. Broken preforms do not exceed 65 mm in maximum length or width; they are between 12 and 23 mm thick. The only complete preform stems from level III/2 and is 158.65 mm long, 86.31 mm wide, and 38.82 mm thick (Fig. 8-2). Both the complete preform and one of the broken preforms were elaborated in a bi-convex manner. All remaining preforms were worked in plano-convex manner. The biggest negatives observed on preform flaking surfaces range in length from 34 to 60 mm, and are between 29 and 71 mm wide. Bifacial tool preforms have been found at most Crimean Micoquian sites; by no means are they rare finds.

Debitage Structure

Debitage comprises the following categories in descending numerical order: chips, flakes, blades, and unidentifiable debitage (Table 8-2). Each of these categories is further subdivided into "regular", bifacial thinning, natural and unidentifiable items. Regular blanks among flakes and blades are the most numerous. Unidentifiable items are most numerous among chips. In level III/2, chips and bifacial thinning

	Level III/2			Level III/2A		
Flint Artefacts	#	%	**esse %**	#	%	**esse %**
Chips, <2.99 cm	9,885	92.67	·	2,719	97.00	·
Chunks	50	0.46	·	8	0.29	·
Preform & Core Fragments	11	0.10	1.50	·	·	·
Cores	2	0.02	0.27	·	·	·
Preforms of Bifacial Tool	6	0.06	0.82	1	0.04	1.32
Flakes	518	4.86	70.77	54	1.93	71.05
Blades	55	0.52	7.51	6	0.21	7.89
Tools	140	1.31	19.13	15	0.53	19.74
Total:	**10,667**	**100.00**	**100.00**	**2,803**	**100.00**	**100.00**
Pebble Artefacts						
Retouchers	1			·		
Bone Artefacts						
Retouchers	3			3		

Table 8-1 Kabazi V, sub-unit III/2: Artefact totals.

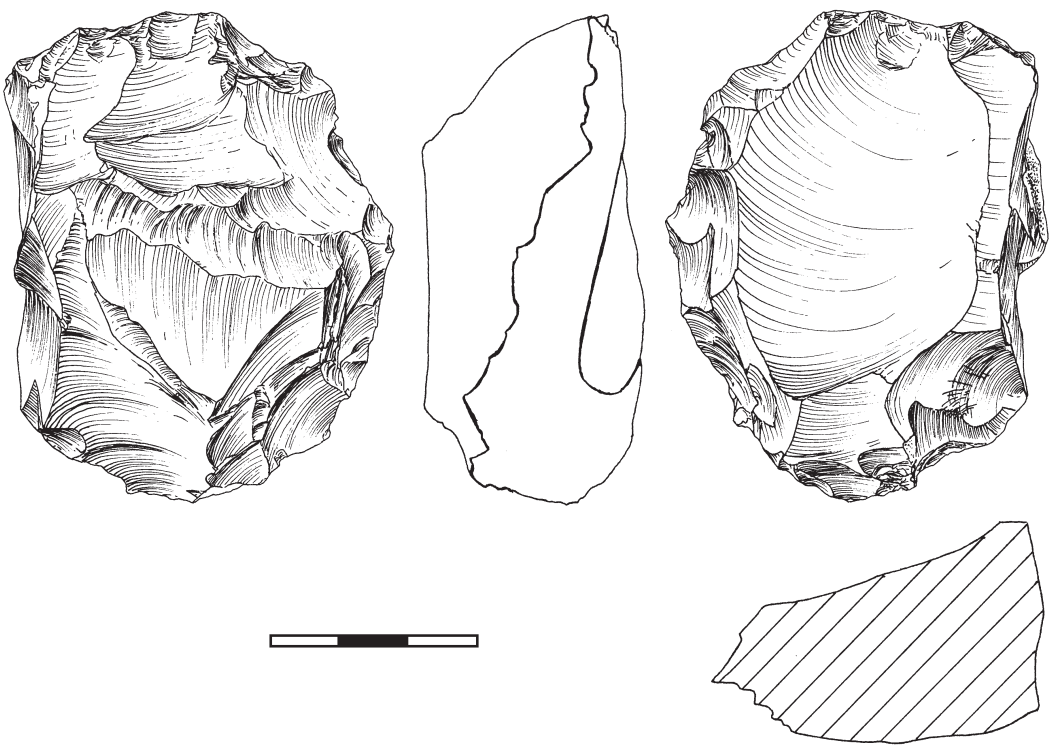

Fig. 8-1 Kabazi V, level III/2. Levallois Tortoise core.

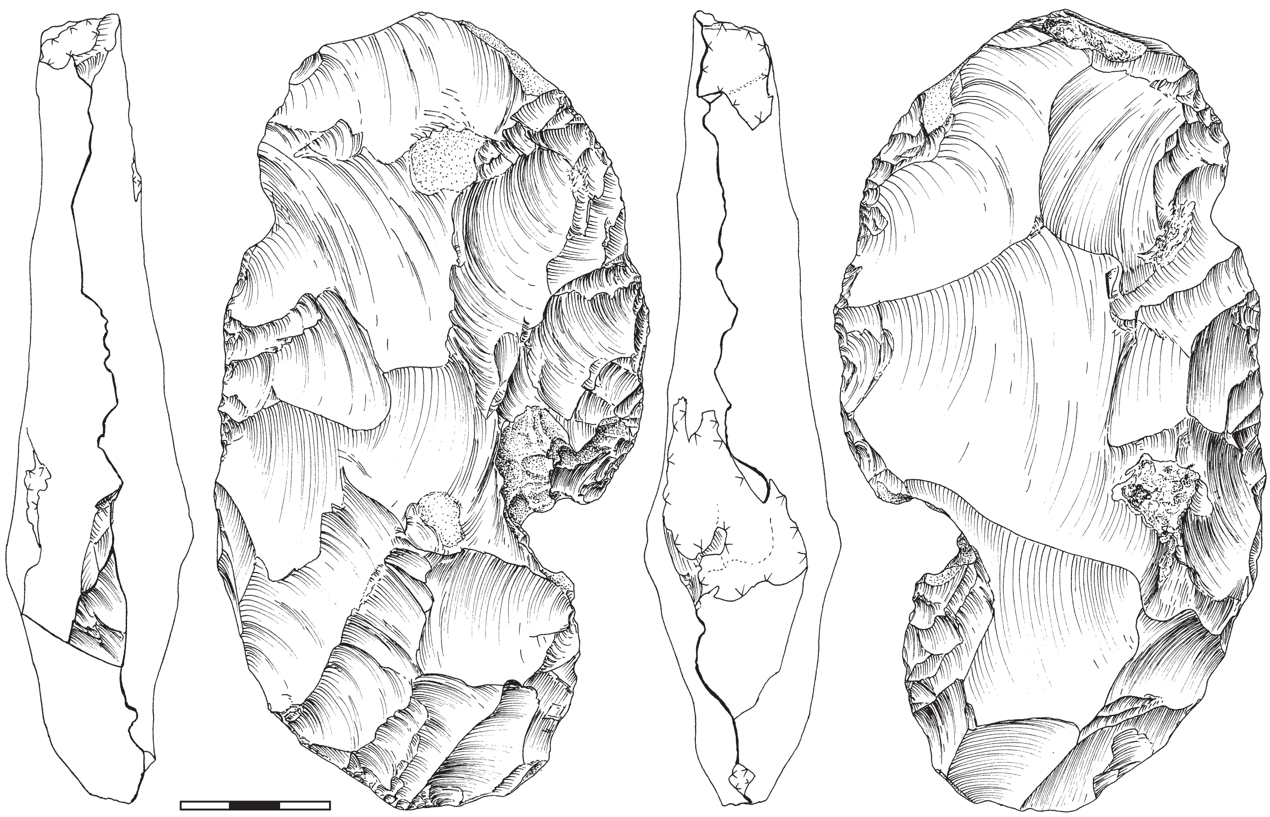

Fig. 8-2 Kabazi V, level III/2. Bifacial tool preform.

debitage comprise 41.39 % (without chips 18.21 %) of all identifiable debitage. The blade index lies at 9.91; however, if chips (>2,0 cm in length) are considered for this same calculation, this value drops to 5.58.

In level III/2A, chips and bifacial thinning debitage comprise 25.38 % (without chips 10.0 %) of all identifiable debitage. The blade index lies at 10.96; however, once again, if chips (>2,0 cm in length) are considered for this same calculation, this value drops to 4.40.

All in all, the debitage from Kabazi V, sub-unit III/2 is characterised by relatively high percentages of bifacial thinning items. In this respect, sub-unit III/2 is comparable with such assemblages as Starosele, Buran Kaya III, B; Kabazi II, Units III, V, VI; and Chokurcha I, IV (Marks, Monigal 1998, Demidenko 2004, Chabai 1998c, 2004b, 2005b).

Chips

Three main groups of chips are distinguished: regular, bifacial thinning chips, bifacial rejuvenating chips, and unidentifiable chips (Table 8-2). Pieces assigned to the latter category lack striking platforms. The chip assemblages from levels III/2 and III/2A are characterised by a high percentage of bifacial thinning and rejuvenating items (44.24 % and 27.19 %, respectively). Even upon exclusion of the smallest metrical category of chips (0.1 – 1.9 cm), a total of 38.76 % (level III/2) and 19.27 % (level III/2A) of chips are still associated with bifacial tool production. At the same time, real rejuvenating chips are not numerous. This might point to the absence of intensive on-site bifacial tool reshaping processes (Demidenko 2003).

Flakes and Blades

The quantitative and qualitative characteristics of blades give no reason to assume a significant role for blades in the sub-unit III/2 assemblage. Not only the aforementioned blade indexes, but also the absence of blade cores, as well as further blade attributes to be mentioned below, clearly imply a mere incidental role of blades in the Kabazi V, sub-unit III/2 assemblage. Six of 42 blades with unbroken butts resulted

		Level III/2			Level III/2A		
		#	%	esse %	#	%	esse %
Chips	"regular", 2.0-2.9 cm	326	3.09	8.87	88	3.15	22.33
	"regular", 0.1-1.9 cm	1,498	14.18	40.77	170	6.09	43.15
	"bifacial thinning", 2.0-2.9 cm	188	1.78	5.12	21	0.75	5.33
	"bifacial thinning", 0.1-1.9 cm	1,240	11.74	33.75	74	2.65	18.78
	"bifacial rejuvenating", 2.0-2.9 cm	2	0.02	0.06	·	·	·
	"bifacial rejuvenating", 0.1-1.9 cm	17	0.16	0.46	1	0.04	0.25
	unidentifiable	6,614	62.59	·	2,365	84.71	·
	unidentifiable, modified in tools, 2.0-2.9 cm	1	0.01	·	·	·	·
Flakes	"regular"	254	2.40	6.91	28	1.00	7.12
	"regular", modified in tools	43	0.41	1.17	5	0.18	1.26
	"bifacial thinning"	63	0.59	1.72	4	0.14	1.02
	"bifacial thinning", modified in tools	4	0.04	0.11	·	·	·
	unidentifiable	198	1.86	·	22	0.79	·
	unidentifiable, modified in tools	34	0.32	·	6	0.21	·
	natural	3	0.03	·	·	·	·
	natural, modified in tools	1	0.01	·	·	·	·
Blades	"regular"	29	0.28	0.79	3	0.11	0.76
	"regular", modified in tools	4	0.04	0.11	·	·	·
	"bifacial thinning"	6	0.06	0.16	·	·	·
	unidentifiable	20	0.19	·	3	0.11	·
	unidentifiable, modified in tools	7	0.07	·	2	0.07	·
	unidentifiable blanks, modified in tools	14	0.13	·	·	·	·
	Total:	**10,566**	**100.00**	**100.00**	**2,792**	**100.00**	**100.00**

Table 8-2 Kabazi V, sub-unit III/2: Composition of blank assemblage

from bifacial tool reshaping, and seven blades from the total number of 74 display bladelet proportions, i.e. are between 7 and 12 mm thick.

Cortex

The majority of blanks is covered by cortex (Table 8-3). Whereas 10-13 % of blanks are completely covered by cortex on their dorsal surfaces, about 30% display less than one quarter coverage. This might be suggestive of intensive reduction of cortex-covered raw material. At the same time, there are, however, relatively few "real primary blanks "(relatively large blanks covered by cortex). In level III/2 non-corticated blanks display max. dimensions of 37.63 mm, while blanks whose dorsal surface display cortex coverage in excess of 76 % reach max. dimensions of 38.89 mm. This observation might be suggestive of either an off-site raw material decortication, or of a special method of on-site raw material flaking. Such a method might include bifacial preform and tool reduction, which would have resulted in a number of non-corticated and corticated small flakes.

On the other hand, there is an observable difference between cortication on "regular" and on

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, "regular"	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
0 %	87	29	76	1	7	5	11	216	32.43	LEVEL III/2
1-25 %	81	23	61	·	15	·	8	188	28.23	
26-50 %	61	6	37	1	5	1	6	117	17.57	
51-75 %	37	8	26	·	3	·	1	75	11.26	
>76 %	31	1	32	2	3	·	1	70	10.51	
Total:	**297**	**67**	**232**	**4**	**33**	**6**	**27**	**666**	**100.00**	
0 %	8	4	9	·	1	·	4	26	35.62	LEVEL III/2A
1-25 %	14	·	4	·	2	·	1	21	28.77	
26-50 %	2	·	7	·	·	·	·	9	12.33	
51-75 %	5	·	3	·	·	·	·	8	10.95	
>76 %	4	·	5	·	·	·	·	9	12.33	
Total:	**33**	**4**	**28**	**·**	**3**	**·**	**5**	**73**	**100.00**	

Table 8-3 Kabazi V, sub-unit III/2: Cortex, by blank types

"bifacial thinning" blanks. Whereas "regular" blanks display a pattern which is close to the average values (Table 8-3), "bifacial thinning" debitage is characterised by larger ratios of non-corticated blanks (up to 45%) and a smaller percentage of fully corticated blanks (about 1.5%). This observation might be interpreted logically as the difference between blanks from bifacial tools shaping/reshaping, i.e. "bifacial thinning blanks", and blanks from preform/core reduction processes, i.e. "regular blanks". In the level III/2 assemblage, average maximum sizes of blanks are 32.9 mm for bifacial thinning blanks with 51-75% corticated surfaces, and 42.1 mm for "regular" blanks. Thus, "regular" heavily corticated blanks are larger than "bifacial thinning" heavily corticated blanks. Average maximum sizes of non-corticated bifacial thinning and "regular" blanks are roughly equal (36.6 and 34.9 mm, respectively). All this may suggest that, generally speaking, "regular blanks" are not connected with core reduction, but appear to have resulted from bifacial treatment, too.

Patterns of cortex placement on the dorsal surfaces of both "regular" and "bifacial thinning" blanks are very similar, with the exception of non-corticated and completely corticated blanks (Table 8-4). The sum of distal and lateral-distal placements of cortex makes up about a quarter of all "regular", and about one-third on all "bifacial thinning" blanks. Such a high ratio of distally corticated blanks might be explained by the location of cortex on bifacial preform/tool surfaces. Often, whereas the corticated part of a bifacial tool is its central part, edge shaping resulted in numerous distally corticated blanks.

Thus, the pattern of cortex distribution on blank dorsal surfaces, as well as its correlation with blank sizes, suggests a preferential on-site reduction of bifacial preforms/tools, rather than cores.

Dorsal Scar Pattern

As is usual for Crimean Micoquian complexes, the Kabazi V, sub-unit III/2 assemblage is dominated by unidirectional and unidirectional-crossed scar patterns on dorsal negatives (Table 8-5). Between 40 and 58% of each blank group, including both "regular" and "bifacial thinning" blanks, have been identified as belonging to these types. The sum of bidirectional and bidirectional-crossed patterns comprises 12 - 20% in each of the blank groups. The same or about the

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, "regular"	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
None	87	29	76	1	7	5	11	216	32.43	LEVEL III/2
Proximal	16	3	4	·	1	·	·	24	3.6	
Lateral-Proximal	13	1	3	·	3	·	1	21	3.15	
Central	14	3	17	·	2	·	1	37	5.56	
Lateral	45	5	44	·	10	1	8	113	16.97	
Bilateral	10	2	4	·	·	·	·	16	2.41	
Lateral-distal	34	9	22	1	4	·	2	72	10.81	
Distal	37	13	29	·	3	·	3	85	12.76	
Distal-Proximal	10	1	1	·	·	·	·	12	1.80	
>76 %	31	1	32	2	3	·	1	70	10.51	
Total:	**297**	**67**	**232**	**4**	**33**	**6**	**27**	**666**	**100.00**	
None	8	4	9	·	1	·	4	26	35.61	LEVEL III/2A
Proximal	3	·	·	·	1	·	·	4	5.48	
Lateral-Proximal	1	·	·	·	·	·	·	1	1.37	
Central	·	·	2	·	·	·	·	2	2.74	
Lateral	10	·	3	·	1	·	1	15	20.55	
Bilateral	2	·	3	·	·	·	·	5	6.85	
Lateral-distal	2	·	·	·	·	·	·	2	2.74	
Distal	3	·	6	·	·	·	·	9	12.33	
>76 %	4	·	5	·	·	·	·	9	12.33	
Total:	**33**	**4**	**28**	**·**	**3**	**·**	**5**	**73**	**100.00**	

Table 8-4 Kabazi V, sub-unit III/2: Cortex placement, by blank types.

same distribution of dorsal scar types is common for the Crimean Micoquian, and has been noted at a number of sites (Kolosov 1983, 1986, Chabai 1998c, 1999, 2004b, Marks, Monigal 1998, Yevtushenko 1998b, 2004, Demidenko 2004).

Shapes & Axes

The sum of trapezoidal, trapezoidal elongated and rectangular shapes clearly dominates, comprising from 60 % to 80 % of identified shapes in each blank group. The exceptions are "bifacial thinning" and "unidentifiable" blades, where these shapes make up just 40 % of identified shapes (Table 8-6). At the same time, blades are only available in statistically insufficient numbers. Another characteristic feature with regard to shape is observed among the flakes: "regular", bifacial thinning and unidentifiable flakes tend to display transversal proportions, which were observed in 41.67 % of "regular" and 36.36 % of "bifacial thinning" flakes. In level III/2 average values for blank length and width dimensions are very similar; "regular" flakes are 34.4 mm long and 32.94 mm wide, and "bifacial thinning" flakes are 31.89 mm long and 29.9 mm wide. In level III/2A average values for blank length and width are as follows: "regular" flakes are 35.8 mm long and 29.3 wide, and "bifacial thinning" flakes are 29.9 mm long and 30.0 mm wide. Hence, "regular" flakes from levels III/2A are slightly more

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, "regular"	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
Cortex	30	1	32	1	3	·	1	68	10.43	LEVEL III/2
Lateral	13	·	16	·	1	·	·	30	4.60	
Bilateral	5	·	9	·	1	·	·	15	2.30	
Radial	19	11	15	·	1	1	·	47	7.21	
Converging	13	5	5	·	2	1	2	28	4.29	
Unidirectional	91	20	51	3	9	1	6	181	27.76	
Unidirectional-crossed	70	16	45	·	9	3	10	153	23.47	
Bidirectional	26	9	22	·	5	·	3	65	9.97	
Bidirectional-crossed	16	5	23	·	·	·	1	45	6.90	
Crested	8	·	3	·	2	·	4	17	2.61	
Plain (Yanus flake)	3	·	·	·	·	·	·	3	0.46	
Total:	294	67	221	4	33	6	27	652	100.00	
Unidentifiable	3	·	11	·	·	·	·	14	·	
Cortex	4	·	5	·	·	·	·	9	12.5	LEVEL III/2A
Lateral	2	·	·	·	·	·	·	2	2.78	
Bilateral	·	·	2	·	·	·	·	2	2.78	
Radial	1	·	1	·	·	·	1	3	4.17	
Converging	1	·	3	·	·	·	·	4	5.56	
Unidirectional	14	2	5	·	·	·	3	24	33.33	
Unidirectional-crossed	9	·	8	·	1	·	·	18	25.00	
Bidirectional	1	1	3	·	1	·	1	7	9.72	
Bidirectional-crossed	1	1	·	·	·	·	·	2	2.78	
Crested	·	·	·	·	1	·	·	1	1.38	
Total:	33	4	27	·	3		5	72	100.00	
Unidentifiable	·	·	1	·	·	·	·	1		

Table 8-5 Kabazi V, sub-unit III/2: Dorsal scar pattern, by blank types.

elongated than "regular" flakes from level III/2, while the average sizes and proportions of bifacial thinning flakes from both levels are almost identical.

There are slightly more off-axis than on-axes blanks in all groups of debitage (Table 8-7). Thus, both "regular" and "bifacial thinning" flakes are short, wide, either trapezoidal or rectangular, sometimes on-axes, and sometimes off-axes. Such characteristics of debitage are considered rather more common for bifacial flaking than for core reduction.

Blank Profiles and Cross-Sections

Incurvate profiles are clearly dominant (Table 8-8), with twisted, incurvate medial, and distal types making up 80 – 85 % of profiles in all blade groups. Among the flake groups, these aforementioned profiles are, however, more characteristic for "bifacial thinning" flakes (about 75 %) than for "regular" flakes (54.55 – 60.78 %).

The feathering type of distal extremity dominates (Table 8-9). Also, the percentages of all

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, "regular"	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
Rectangular	76	20	34	2	16	2	5	155	29.52	LEVEL III/2
Triangular	15	3	7	·	2	·	1	28	5.33	
Trapezoidal	74	24	44	·	·	·	·	142	27.05	
Trapezoidal elongated	30	10	8	·	6	1	4	59	11.24	
Ovoid	13	2	5	1	1	·	·	22	4.19	
Leaf-shaped	8	·	4	·	1	3	5	21	4.00	
Crescent	4	1	10	·	4	·	4	23	4.38	
Irregular	40	3	25	·	3	·	4	75	14.29	
Total:	**260**	**63**	**137**	**3**	**33**	**6**	**23**	**525**	**100.00**	
Unidentifiable	37	4	95	1	·	·	4	141		
Rectangular	7	1	3	·	·	·	3	14	24.14	LEVEL III/2A
Triangular	2	·	·	·	·	·	·	2	3.45	
Trapezoidal	7	2	4	·	·	·	·	13	22.41	
Trapezoidal elongated	8	·	5	·	2	·	·	15	25.86	
Ovoid	2	·	2	·	·	·	·	4	6.90	
Leaf-shaped	·	·	1	·	·	·	·	1	1.72	
Crescent	1	1	1	·	1	·	1	5	8.62	
Irregular	2	·	1	·	·	·	1	4	6.90	
Total:	**29**	**4**	**17**	**·**	**3**	**·**	**5**	**58**	**100.00**	
Unidentifiable	4	·	11	·	·	·	·	15		

Table 8-6 Kabazi V, sub-unit III/2: Shapes, by blank types.

"worthless" distal ends, e.g. hinged, overpassed and blunt types, reach very high values in each of the blank groups; among "regular" flakes these values reach 42.86 – 57.94 %, among "bifacial thinning" flakes about 40 %, among "unidentifiable" flakes 33.33 – 40.09 %, and among blades 35 %. Thus, all the above types must be considered "problematic" regarding the production of tools; it should be noted that these comprise between 40 and 57 % of all blanks.

Regarding mid-point cross-sections, trapezoidal and triangular types are the most common in practically all debitage groups (Table 8-10).

Thus, blanks profiles are not of immense quality, most being incurvate in one way or another, and often with blunt and hinged distal ends. Obviously, these are not "desired" characteristics for a blank assemblage. In other words, the quality of these blanks is very low.

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, regular	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
On-axis	133	28	74	·	19	6	14	274	49.10	LEVEL III/2
Off-axis	144	36	77	·	14	·	13	284	50.90	
Total:	**277**	**64**	**151**	·	**33**	**6**	**27**	**558**	**100.00**	
Unidentifiable	20	3	81	4	·	·	·	108		
On-axis	12	2	8	·	3	·	2	27	46.55	LEVEL III/2A
Off-axis	17	2	9	·	·	·	3	31	53.45	
Total:	**29**	**4**	**17**		**3**		**5**	**58**	**100.00**	
Unidentifiable	4	·	11	·	·	·	·	15		

Table 8-7 Kabazi V, sub-unit III/2: Axes, by blank types.

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, regular	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
Flat	77	14	51	·	6	2	4	154	24.37	LEVEL III/2
Incurvate medial	93	21	43	·	10	4	8	179	28.32	
Incurvate distal	33	14	29	·	6	·	1	83	13.13	
Twisted	49	14	55	·	11	·	14	143	22.63	
Convex	36	3	30	4	·	·	·	73	11.55	
Total:	**288**	**66**	**208**	**4**	**33**	**6**	**27**	**632**	**100.00**	
Unidentifiable	9	1	24	·	·	·	·	34	·	
Flat	11	·	5	·	1	·	2	19	26.40	LEVEL III/2A
Incurvate medial	11	·	10	·	·	·	2	23	31.94	
Incurvate distal	4	·	2	·	·	·	·	6	8.33	
Twisted	3	3	8	·	2	·	1	17	23.61	
Convex	4	1	2	·	·	·	·	7	9.72	
Total:	**33**	**4**	**27**	·	**3**	·	**5**	**72**	**100.00**	
Unidentifiable	·	·	1	·	·	·	·	1		

Table 8-8 Kabazi V, sub-unit III/2: Lateral profiles, by blank types.

Level		Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, "regular"	Blades, "bifacial thinning"	Blades, unidentifiable	#	%
LEVEL III/2	Feathering	98	32	80	1	14	5	10	240	46.07
	Hinged	76	17	49	1	5	·	3	151	28.98
	Overpassed	·	2	5	·	2	·	·	9	1.73
	Blunt	59	6	39	·	11	1	5	121	23.22
	Total:	**233**	**57**	**173**	**2**	**32**	**6**	**18**	**521**	**100.00**
	Retouched	18	1	9	·	·	·	3	31	·
	Missing	46	9	50	2	1	·	6	114	·
LEVEL III/2A	Feathering	12	4	12	·	1	·	3	32	65.31
	Hinged	3	·	1	·	·	·	·	4	8.16
	Blunt	6	·	5	·	1	·	1	13	26.53
	Total:	**21**	**4**	**18**	·	**2**	·	**4**	**49**	**100.00**
	Retouched	3	·	4	·	·	·	1	8	·
	Missing	9	·	6	·	1	·	·	16	·

Table 8-9 Kabazi V, sub-unit III/2: Distal end profiles, by blank types.

Platform Preparation

Plain platforms are the most frequent among all groups of blanks, followed by dihedral and polyhedral types (Table 8-11). Faceted platforms are not numerous. For the sum of all blanks, faceting indexes are: Ifl=52.51 and Ifs=14.57 for level III/2; and Ifl=37.50 and Ifs=20.00 for level III/2A. As usual, these same indexes are somewhat higher for "bifacial thinning" blanks (Ifl=62.33; Ifs=16.88), and slightly smaller for "regular blanks" (Ifl=39.4 – 49.32; Ifs=14.73 – 21.21).

Average platform sizes on "regular" flakes from level III/2 are: width – 13.98 mm, and thickness – 4.64 mm. Average sizes of platforms on "bifacial thinning" flakes are somewhat smaller: width – 11.49 mm, and thickness – 3.27 mm. All types of platforms on "bifacial thinning" flakes are smaller than those on "regular" flakes, with one exception: the average width of faceted platforms on "regular" flakes is 15.62 mm, but on "bifacial thinning" flakes 15.84 mm. Nevertheless, the faceted platforms on the "regular" flakes are still much larger (7.80 mm) than those on "bifacial thinning" flakes (5.23 mm). In any case, faceted platforms are the largest platform type found on "bifacial thinning" flakes. The largest platforms among "regular" flakes are the polyhedral type, with an average width of 20.28 mm, and an average thickness of 7.79 mm. The smallest platform type on "bifacial thinning" flakes is the plain platform, with an average width of 7.26 mm and an average thickness of 1.86 mm. These same platforms on "regular" flakes are much bigger, they having an average width of 11.46 mm and an average thickness of 7.26 mm.

All the aforementioned variations of platform types and sizes among both "regular" and "bifacial thinning" blanks differ from observations made for blanks from core reduction (Chapter 14, this volume).

Whereas semi-lipped platforms prevail among the "regular" blanks, lipped platforms dominate bifacial thinning blank assemblages (Table 8-12). Also, about a quarter of "regular" blanks display pronounced lipped platforms.

Obtuse platforms make up more than half of all identifiable platforms (Table 8-13). On the other hand, "regular" blanks demonstrate some dominance of right angle platforms.

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, "regular"	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
Flat	11	1	2	·	·	·	·	14	2.25	LEVEL III/2
Triangular	92	20	77	1	12	3	12	217	34.89	
Lateral steep	23	·	20	2	9	·	4	58	9.33	
Trapezoidal	96	30	48	·	7	3	7	191	30.71	
Polyhedral	18	13	10	·	2	·	3	46	7.39	
Convex	23	3	26	·	2	·	·	54	8.68	
Irregular	20	·	19	1	1	·	1	42	6.75	
Total:	**283**	**67**	**202**	**4**	**33**	**6**	**27**	**622**	**100.00**	
Unidentifiable	14	·	30	·	·	·	·	44	·	
Flat	1	·	·	·	·	·	·	1	1.49	LEVEL III/2A
Triangular	10	2	4	·	1	·	4	21	31.35	
Lateral steep	2	·	1	·	1	·	·	4	5.97	
Trapezoidal	12	1	12	·	1	·	1	27	40.30	
Polyhedral	·	1	·	·	·	·	·	1	1.49	
Convex	5	·	4	·	·	·	·	9	13.43	
Irregular	3	·	1	·	·	·	·	4	5.97	
Total:	**33**	**4**	**22**		**3**		**5**	**67**	**100.00**	
Unidentifiable	·	·	6	·	·	·	·	6	·	

Table 8-10 Kabazi V, sub-unit III/2: Cross-sections, by blank types.

All in all, common characteristics of blank platforms might be summarised in following terms: in general, blank platforms from sub-unit III/2 are narrow, thin, lipped or semi-lipped, and display mainly an obtuse angle. Such characteristics are consistent with the assumption that we are dealing with an on-site bifacial tool production rather than core reduction.

Blank Dimensions

Being more statistically complete, blank dimensions were studied for the sub-unit III/2 assemblage as a whole. On average "regular" flakes are 34.38 mm long and 33.03 mm wide. "Bifacial thinning" flakes appear slightly smaller, being 31.89 mm long and 30.68 mm wide. Also, average thickness is higher among "regular" flakes (5.54 mm) than for "bifacial thinning" flakes (4.15 mm). By definition, both "regular" and "bifacial thinning" blades are longer (48.96 mm versus 40.56 mm), but narrower (20.12 mm versus 16.83 mm), than flakes. The average thickness of "regular" blades (5.63 mm) is about the same as that observed among "regular" flakes. However, the average thickness of bifacial thinning blades (2.97 mm) is much smaller than of any flake or blade. Thus, bifacial debitage is smaller than "regular" debitage; indeed, the same was suggested above on the basis of the average sizes of "bifacial" and "regular" blank platforms.

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, "regular"	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
Cortex	22	·	·	·	1	·	·	23	5.78	LEVEL III/2
Plain	126	22	·	·	14	4	·	166	41.71	
Dihedral	50	16	·	·	10	·	·	76	19.10	
Polyhedral	51	17	·	·	6	1	·	75	18.84	
Faceted straight	20	3	·	·	1	1	·	25	6.28	
Faceted convex	23	6	·	·	1	·	·	30	7.54	
Faceted lateral	·	3	·	·	·	·	·	3	0.75	
Total:	**292**	**67**	·	·	**33**	**6**	·	**398**	**100.00**	
Crushed	5	·	59	·	·	·	10	74	·	
Retouched	·	·	5	·	·	·	2	7	·	
Missing	·	·	168	4	·	·	15	187	·	
Cortex	3	·	·	·	1	·	·	4	10.00	LEVEL III/2A
Plain	17	3	·	·	1	·	·	21	52.50	
Dihedral	2	1	·	·	·	·	·	3	7.50	
Polyhedral	4	·	·	·	·	·	·	4	10.00	
Faceted straight	2	·	·	·	1	·	·	3	7.50	
Faceted convex	4	·	·	·	·	·	·	4	10.00	
Faceted concave	1	·	·	·	·	·	·	1	2.50	
Total:	**33**	**4**	·	·	**3**	·	·	**40**	**100.00**	
Crushed	·	·	5	·	·	·	2	7	·	
Missing	·	·	23	·	·	·	3	26	·	

Table 8-11 Kabazi V, sub-unit III/2: Platform types, by blank types.

Another important feature are the differing ratios of "regular" and "bifacial thinning blanks" in different metrical groups (Fig. 8-3). Whereas the smallest metrical group (0.1 – 1.9 cm) comprises 45.63 % "bifacial thinning" debitage, the subsequent group (2.0 – 2.9 cm) contains 36.82 %. In the following metrical group (3.0 – 3.9 cm) this same type of debitage constitutes 21.03 % of pieces, and in the next metrical group (4.0 – 4.9 cm) its contingent drops to 17.81 %. Finally, in the last group (5.0 – 5.9 cm) it makes up just 6.67 % of the assemblage. Not a single bifacial thinning blade or flake was found in the 6.0 – 6.9 cm metrical group. Indeed, the next largest groups comprise very few artefacts whatsoever. Thus, the smaller the metrical group, the larger the ratio (quantity and percentage) of "bifacial thinning" debitage.

One more specific feature of level III/2 debitage metrics is the near absence of primary debitage, i.e. a lack of relatively big flakes and blades that are completely or mainly covered by cortex. The largest dimensions for corticated (>76 % of cortex) blanks were measured for two flakes. These are 56.55 and 62.93 mm long, respectively. Dimensions of all remaining corticated blanks range from to 31 to 45 mm. Among the partly corticated flakes (51-75 % of cortex) two items belong to the metrical group 6.0-6.9 cm, five stem from the 5.0-5.9 metrical group, and all remaining 23 pieces are smaller than 4.9 cm.

	Flakes, "regular"	Flakes, "bifacial thinning"	Flakes, unidentifiable	Flakes, natural	Blades, "regular"	Blades, "bifacial thinning"	Blades, unidentifiable	#	%	
Lipped	66	43	·	·	12	2	·	123	30.52	LEVEL III/2
Semi-lipped	139	24	·	·	18	4	·	185	45.91	
Unlipped	92	·	·	·	3	·	·	95	23.57	
Total:	**297**	**67**	·	·	**33**	**6**	·	**403**	**100.00**	
Unknown	·	·	232	4	·	·	27	263	·	
Lipped	8	2	·	·	1	·	·	11	27.50	LEVEL III/2A
Semi-lipped	15	2	·	·	1	·	·	18	45.00	
Unlipped	10	·	·	·	1	·	·	11	27.50	
Total:	**33**	**4**	·	·	**3**	·	·	**40**	**100.00**	
Unknown	·	·	28	·	·	·	5	33	·	

Table 8-12 Kabazi V, sub-unit III/2: Lipping, by blank types.

	Flakes, "regular"	Flakes, "bifacial thinning"	Blades, "regular"	Blades, "bifacial thinning"	#	%	
Acute	1	·	·	·	1	0.25	LEVEL III/2
Obtuse	137	66	21	6	230	57.07	
Right	159	1	12	·	172	42.68	
Total:	**297**	**67**	**33**	**6**	**403**	**100.00**	
Acute	·	·	·	·	·	·	LEVEL III/2A
Obtuse	22	4	2	·	28	70.00	
Right	11	·	1	·	12	30.00	
Total:	**33**	**4**	**3**	·	**40**	**100.00**	

Table 8-13 Kabazi V, sub-unit III/2: Platform angles, by blank types.

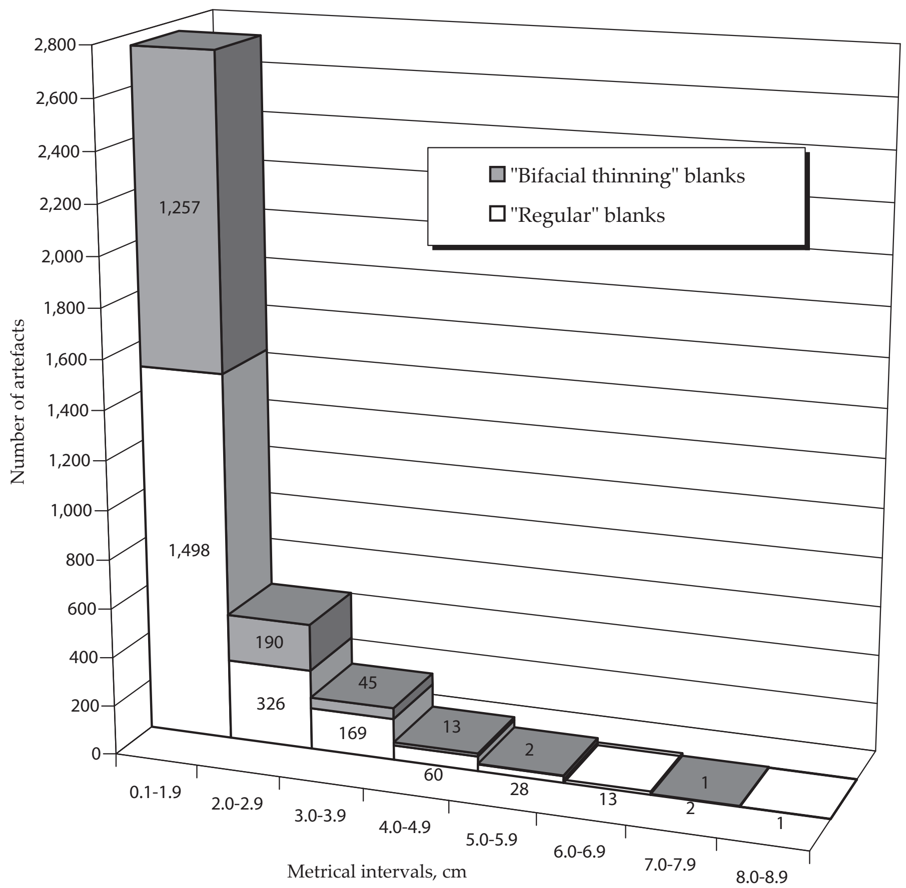

Fig. 8-3 Kabazi V, level III/2. "Regular" and "bifacial thinning" blanks, by metrical intervals.

The blank assemblage from level III/2A comprises five flakes from the 5.0 – 5.9 cm metrical group. One of these flakes is completely covered by cortex, and another has 51-75 % cortex coverage on its dorsal surface. All remaining pieces exhibit less than 50 % dorsal cortex.

Thus, the blank dimensions presented above are suggestive of intensive bifacial preform and tool retouching and reshaping, but without the preceding decortication stage.

Summary of Attribute Analysis

In summary, the analysis of technologically representative attributes has demonstrated that the main modes of flint exploitation comprised an intensive on-site bifacial tool production from preforms which had already been decorticated off-site. This conclusion is based on the following observations:

1. The rarity of cores and relatively good representation of bifacial preforms
2. The absence of primary flakes
3. The over-representation of "bifacial thinning" blanks of small sizes
4. The typology and metrics of blank platforms, shapes and profiles

Consequently, the sub-unit III/2 blank assemblage is made up predominantly of the waste from bifacial tool production. In other terms, the average blank is not very impressive, it being short, with often transverse proportions, and with hinged or blunt distal extremities and incurvate lateral profiles. At the same time, only a limited amount of flakes (no more than 10 % of all blanks bigger than 3 cm) could be used as blanks for tool production. These are mainly blanks bigger than 4 cm in maximum dimension with more or less straight lateral profiles and feathering distal ends.

Flint Tools

A total of 140 tools were recovered from sub-unit III/2. These comprise 108 unifacial and 32 bifacial tools. The bifacial tool index lies at 22.86. There are 30 retouched pieces, and 43 heavily fragmented typologically unidentifiable items, of which 28 are unifacial and 15 bifacial. Upon exclusion of both the retouched pieces and the unidentified tools, the bifacial tool index adjusts slightly to 25.37. Hence, there is no great difference between these two index values; both are relatively high, over 20, and correspond with bifacial indexes from "classical" Ak-Kaya facie assemblages from such sites as Zaskalnaya V, layers II, III, and V, and Zaskalnaya VI, layers II and III (Kolosov 1983, 1986). The bifacial tool index for the level III/2A tool kit was not calculated owing to this assemblage being too small, it consisting of just 15 items (13 unifacial and 2 bifacial tools), with 2 unidentifiable and 3 retouched pieces among the unifacial tools.

The sub-unit III/2 assemblage is dominated by scrapers, followed in descending order by bifacial scrapers, unifacial points, and bifacial points. All remaining tools are represented by four more classes, each of them containing just a few artefacts (Table 8-14). In the essential count (without retouched pieces and unidentifiable tools) the tool assemblage comprises the following tool types: points (N=6; 8.95 %), scrapers (N=38 ; 56.74 %), denticulates (N=1; 1.49 %), notches (N=3; 4.48 %), a truncated-faceted piece (N=1; 1.49 %), an end-scraper (N=1; 1.49 %), bifacial points (N=4; 5.97 %), bifacial scrapers (N=11; 16.41 %), and bifacial reutilised fragments (N=2; 2.98 %). Level III/2A tools comprise points (N=3), scrapers (N=5), and bifacial scrapers (N=2) (Table 8-14).

Points

There are six types of obversely retouched points. Each type is represented by one point, except the semi-crescent and semi-leaf, which account for three and two items, respectively (Table 8-14). Five points were elaborated using scalar flat, non-invasive retouch (Fig. 8-4, *1*). Two points were produced by scalar semi-abrupt, non-invasive retouch (lateral and semi-crescent), and two further pieces were produced using a combination of scalar flat and scalar semi-abrupt retouch (semi-leaf and semi-crescent points). The tip of a semi-leaf point was made on the proximal part of the blank. This same point was made on a blade, as were a distal point and one semi-crescent point. All remaining points were made on flakes, including the sub-triangular point which was made on a transversal (canted) flake (Fig. 8-4, *1*). The lengths of points range from 39.33 mm to 56.62 mm.

Scrapers

Scrapers are subdivided into two morphological groups: simple and convergent scrapers. The group of simple scrapers comprises transverse-diagonal, one-edge longitudinal, and double types.

Transverse and diagonal scrapers account for 10 items, or 23.25 % of all scrapers. Transverse scrapers are further subdivided into convex (Fig. 8-4, *7*) and straight types, which also applies to diagonal scrapers (Table 8-14). Three transverse-convex scrapers were elaborated by obverse scalar semi-abrupt and one by scalar flat retouch. Both transverse-straight scrapers were made using obverse scalar flat retouch, as were two of the diagonal-convex scrapers. The third diagonal-convex scraper was worked using an obverse scalar semi-abrupt retouch. The only diagonal convex scraper was made with an obverse scalar flat retouch. All transverse and diagonal scrapers were made on flakes with transversal proportions, with the exception of one diagonal scraper which was produced on a longitudinal flake. The lengths of transverse and diagonal scrapers range from 23.09 mm to 50.11 mm, widths lie between 31.44 mm to 66.83 mm.

One-edge longitudinal scrapers can be attributed to six different types (Table 8-14), which together account for 10 items, or 23.25 % of all scrapers. All one-edge longitudinal scrapers were elaborated using an obverse retouch (Fig. 8-4, *2*, *3*, *4*, *6*). On the other hand, ventral thinning was observed in two cases: one straight scraper was distally thinned (Fig. 8-4, *4*) and one convex scraper displays a thinned back. One further convex scraper was made on a naturally backed blank. There is some diversity in the retouch types used in the production of one-edge longitudinal scrapers. All four straight scrapers were made using scalar flat and non-invasive retouch (Fig. 8-4, *2*, *3*), as was also noted for wavy scraper production. All convex scrapers were made using a scalar semi-abrupt retouch (Fig. 8-4, *6*). Finally, the straight, distally thinned scraper was elaborated using a stepped semi-abrupt retouch (Fig. 8-4, *4*). One-edge longitudinal scrapers are between 38.11 and 64.94 mm long, and between 20.82 and 51.11 mm wide. Both convex scrapers were made on blades. All remaining one-edge scrapers were made on flakes.

	Level III/2	Level III/2A	Total:	%
Points				
Distal, dorsal	1	·	1	*1.30*
Lateral, dorsal	1	·	1	*1.30*
Sub-triangular, dorsal	1	·	1	*1.30*
Semi-trapezoidal, dorsal	·	1	1	*1.30*
Semi-crescent, dorsal	2	1	3	*3.88*
Semi-leaf, dorsal	1	1	2	*2.60*
Scrapers				
Transverse-straight, dorsal	1	1	2	*2.60*
Transverse-convex, dorsal	3	1	4	*5.19*
Diagonal-straight, dorsal	·	1	1	*1.30*
Diagonal-convex, dorsal	3	·	3	*3.88*
Straight, dorsal	3	1	4	*5.19*
Straight, dorsal, distally thinned	1	·	1	*1.30*
Convex, dorsal	2	·	2	*2.60*
Convex, dorsal, naturally backed	1	·	1	*1.30*
Convex, dorsal, thinned back	1	·	1	*1.30*
Wavy, dorsal	1	·	1	*1.30*
Double straight, dorsal	2	·	2	*2.60*
Straight-convex, dorsal	2	·	2	*2.60*
Double-convex, dorsal, thinned base	1	·	1	*1.30*
Double-convex, alternating	1	·	1	*1.30*
Double-wavy, alternate	1	·	1	*1.30*
Semi-trapezoidal, dorsal, naturally backed	2	·	2	*2.60*
Semi-rectangular, dorsal	2	·	2	*2.60*
Semi-rectangular, dorsal, thinned back	1	·	1	*1.30*
Semi-crescent, dorsal	1	·	1	*1.30*
Semi-crescent, dorsal, thinned base	1	·	1	*1.30*
Crescent, dorsal, thinned back	1	·	1	*1.30*
Semi-leaf, dorsal (one reverse)	4	·	4	*5.19*
Semi-leaf, dorsal, distally thinned	1	·	1	*1.30*
Semi-leaf, dorsal, thinned base/back	1	·	1	*1.30*
Sub-leaf, dorsal, distally thinned	1	·	1	*1.30*
Semi-ovoid, dorsal, distally thinned	·	1	1	*1.30*
Denticulates				
Straight, dorsal	1	·	1	*1.30*
Notches				
Lateral, dorsal	1	·	1	*1.30*
Distal, dorsal	2	·	2	*2.60*
Truncated-faceted				
Proximal	1	·	1	*1.30*
End-scrapers				
Transverse-convex, dorsal, thinned base/back	1	·	1	*1.30*
Bifacial Points				
Semi-leaf	2	·	2	*2.60*
Semi-crescent	1	·	1	*1.30*
Semi-crescent, backed, thinned base	1	·	1	*1.30*

Table 8-14 Kabazi V, sub-unit III/2: Tools.

	Level III/2	Level III/2A	Total:	%
Bifacial Scrapers				
Straight	1	·	1	*1.30*
Straight, naturally backed	1	·	1	*1.30*
Semi-leaf	4	·	4	*5.19*
Leaf, thinned base	2	·	2	*2.60*
Semi-crescent	1	1	2	*2.60*
Sub-crescent	1	1	2	*2.60*
Sub-crescent, thinned base	1	·	1	*1.30*
Bifacial tool reutilized fragments				
Straight, naturally backed, on edge fragment	1	·	1	*1.29*
Sub-triangular, on edge fragment	1	·	1	*1.29*
Retouched pieces				
Transversal, dorsal	6	1	7	
Lateral, dorsal	22	2	24	
Lateral, ventral	1	·	1	
Lateral, alternating	1	·	1	
Unidentifiable				
Unifacial tool edge fragments	26	2	28	
Unifacial tool tip fragments	2	·	2	
Bifacial tool base fragments	4	·	4	
Bifacial tool edge fragments	6	·	6	
Bifacial tool mid part fragments	2	·	2	
Bifacial tool tip fragments	3	·	3	
Total:	**140**	**15**	**155**	***100.00***

Table 8-14 Continued.

There are 7 double scrapers (16.28 % of all scrapers) which could be attributed to five different types (Table 8-14). There are three variants of retouch placement; 5 pieces are obverse, one piece is alternating (a double-convex scraper) and one is alternate (double-wavy). Mostly, the retouch on double scrapers is non-invasive. One example of ventral thinning was found on a double-convex scraper. All double scrapers were elaborated using scalar retouch. At the same time, there is some variety among the angles of retouch. One double-straight scraper was produced with a flat, another with an abrupt retouch. The flat retouch was used for the production of straight-convex and double-convex, alternating scrapers. The semi-abrupt retouch was used to produce a straight convex scraper, with this same type of retouch used for double-convex, thinned base (Fig. 8-4, *5*) and double wavy, alternate scrapers. Double scrapers are between 66.51 and 43.41 mm long, and between 40.71 and 20.19 mm wide. Only one double scraper was made on a blade (the double-straight scraper), while all remaining double scrapers were madeon flakes.

Convergent scrapers account for 16 pieces, or 37.21 % of all scrapers. Convergent scrapers were assigned to 6 different forms: semi-trapezoidal (N=2), semi-rectangular (N=3), semi-crescent (N=2), crescent (N=1), semi-leaf (N=6), sub-leaf (N=1), and semi-ovoid (N=1). All convergent scrapers were made using an obverse retouch. Invasive retouch was generally used for convergent scraper production.

Both semi-trapezoidal naturally backed scrapers were made using an obverse scalar retouch. The only difference between the two is that one scraper has a flat retouch angle (Fig. 8-5, *2*), while that of the other is abrupt. One of the three semi-rectangular scrapers has a thinned back. Both this semi-rectangular, thinned back scraper, as well as another of the semi-rectangular scrapers, was produced using a scalar flat retouch. The third semi-rectangular scraper was produced by means of a scalar semi-abrupt

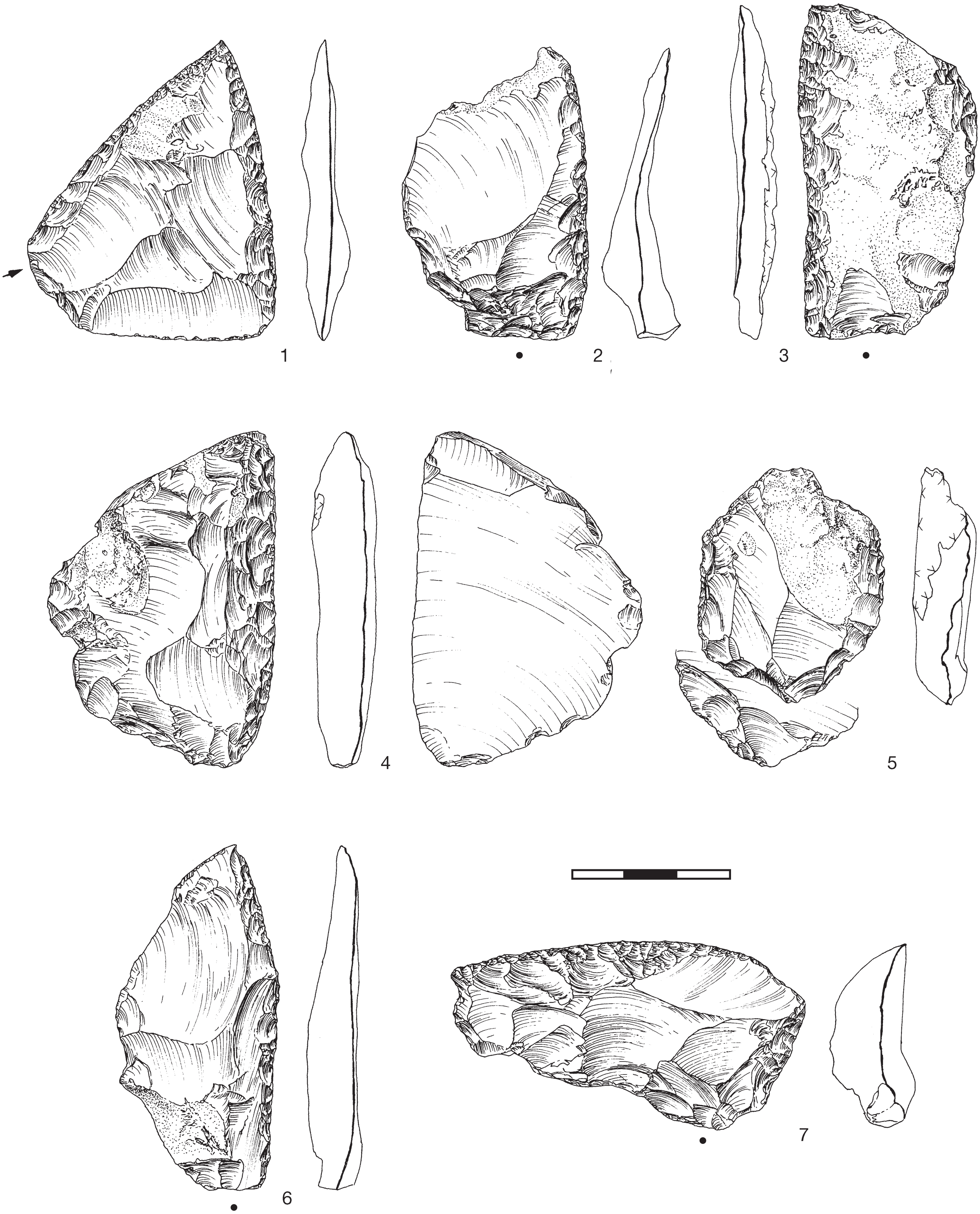

Fig. 8-4 Kabazi V, level III/2. Tools: 1 – point, sub-triangular; 2 and 3 – scrapers, straight; 4 – scraper, straight, distally thinned; 5 – scraper, double convex, thinned base; 6 – scraper, convex; 7 – scraper, transverse convex.

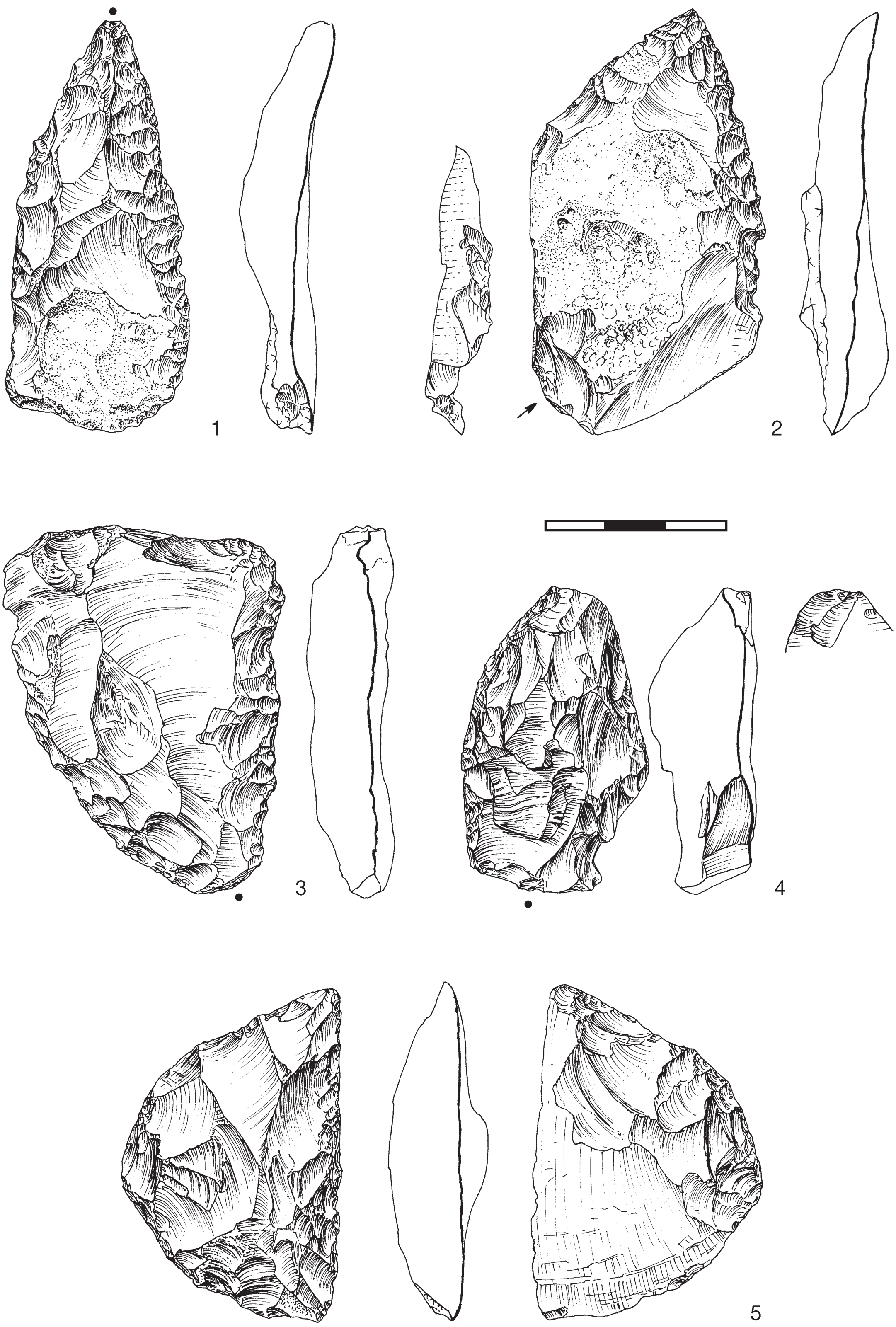

Fig. 8-5 Kabazi V, level III/2. Scrapers: 1 – semi-leaf; 2 – semi-trapezoidal, naturally backed; 3 – semi-rectangular; 4 – sub-leaf, distally thinned; 5 – crescent, thinned back.

retouch (Fig. 8-5, *3*). The semi-crescent and semi-crescent, thinned back scrapers were made using scalar semi-abrupt and scalar flat retouch, respectively. Scalar semi-abrupt retouch were also used in the production of the crescent-shaped scraper with a thinned back (Fig. 8-5, *5*).

Leaf-shaped scrapers are the most numerous among convergent scrapers (Table 8-14). Semi-leaf scrapers account for four regular examples, and there is one distally thinned piece and one piece with a thinned base and back. Two regular semi-leaf scrapers were elaborated using a scalar flat retouch, and two further items were made using a scalar semi-abrupt retouch (Fig. 8-5, *1*). For semi-leaf, distally thinned scraper production a combination of stepped and semi-abrupt retouch was used, while the semi-leaf thinned base / back scraper was made using a scalar flat retouch. Finally, the sub-leaf, distally thinned scraper was manufactured using a stepped abrupt retouch (Fig. 8-5, *4*). The only semi-ovoid scraper is morphologically similar to the semi-leaf items. The former exhibits a ventral distal thinning and was made using a scalar flat retouch.

Convergent scrapers are between 24.03 and 76.33 mm long, and between 25.31 and 56.28 mm wide.

The only tool, with exception of the three retouched pieces, to have been made on a bifacial thinning blank is a semi-rectangular, thinned back scraper. The semi-leaf scraper was made on a blade. All remaining convergent scrapers were produced on flakes.

Denticulates

The only denticulate tool encountered in sub-unit III/2 stems from level III/2. It has a single straight edge, and was made on a flake using an obverse scalar semi-abrupt retouch. It is 59.86 mm long, and 34.95 mm wide.

Notches

There were discovered one lateral and two distal notched tools. All were made using an obverse scalar abrupt retouch. The lateral notch was produced on a broken blade. Both distal notches are on flakes. These pieces are between 53,13 and 56.18 mm long, and between 28.86 and 40.67 mm wide.

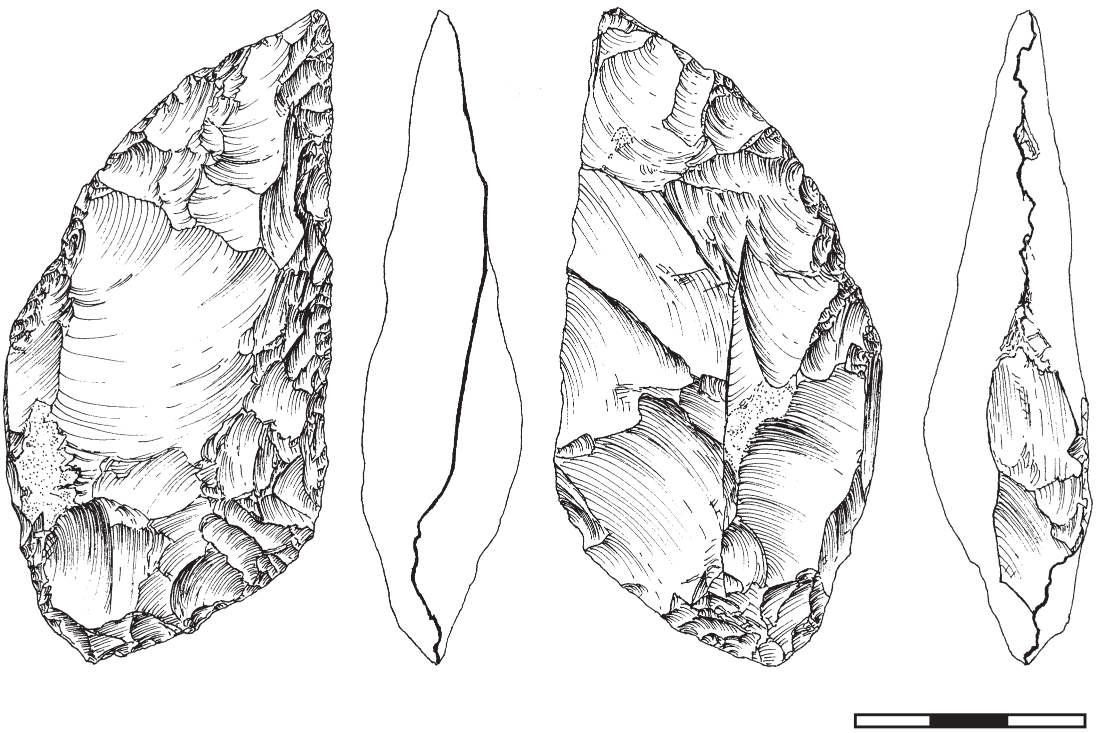

Fig. 8-6 Kabazi V, level III/2. Bifacial point, semi-crescent, backed and thinned base.

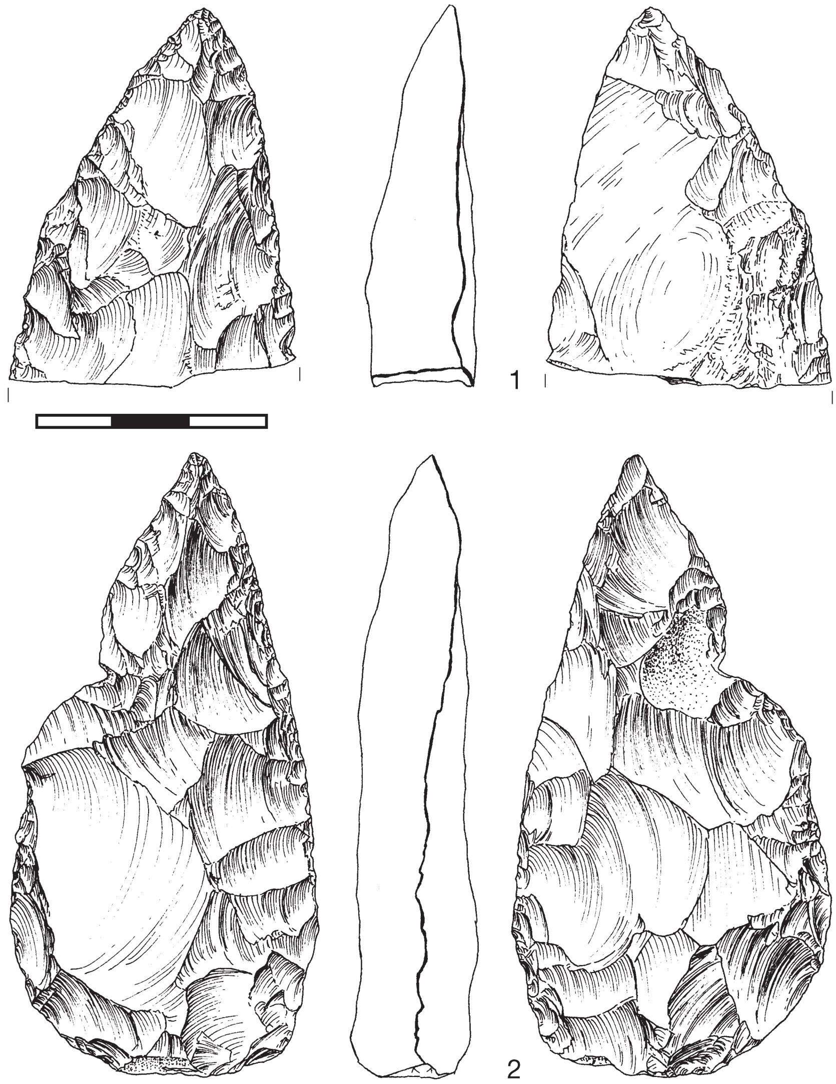

Fig. 8-7 Kabazi V, level III/2. Bifacial points: 1 – semi-crescent; 2 – sub-leaf.

Truncated-Faceted

A truncated-faceted piece was made on the proximal part of a flake using an obverse parallel abrupt retouch. The piece is 47.22 mm long, and 30.42 mm wide.

End-Scrapers

One end-scraper with a thinned base and back was made on a chip (length: 24.56, width: 23.15). Its distal extremity displays a convex edge which was shaped using an obverse sub-parallel abrupt retouch.

Bifacial Points

Four bifacial points were discovered in level III/2; two are semi-crescents (Fig. 8-6; 8-7, *1*) and two semi-leaf (Fig. 8-7, *2*). One of semi-crescent bifacial pieces is backed (Fig. 8-6). Yu. Kolosov evaluated such types as morphologically close to the *Klausennische Keilmesser* (Kolosov 1978). All bifacial points were made in a plano-convex manner, using scalar retouch. The retouch angles of the semi-crescent naturally backed point range from scalar flat to stepped semi-abrupt variations. The retouch angles observed on the three remaining points are flat. Bifacial points are between 81.14 and 88.44 mm long, between 36.93 and 40.98 mm wide, and between 12.59 and 15.88 mm thick.

Bifacial Scrapers

Thirteen bifacial scrapers are subdivided into three main morphological groups: items with one-edge (N=2), leaf-shaped (N=6), and crescent-shaped items (N=5) (Fig. 8-8; 8-9). Each of these morphological group is again further subdivided, whereby seven different types of bifacial scrapers are differentiated (Table 8-14). Semi-leaf scrapers are the most numerous, accounting for a total of 4 items. Three pieces were made in a plano-convex manner and one piece in plano-convex alternating manner. Scalar flat retouch was used for the elaboration of three semi-leaf scrapers, and in one case, scalar abrupt retouch was also applied. One of the leaf-shaped scrapers was made using a plano-convex stepped semi-abrupt retouch (Fig. 8-9, *1*); another was produced using a plano-convex alternate scalar flat retouch. Sub-crescent scrapers were produced in a plano-convex manner, using scalar semi-abrupt retouch, while semi-crescent scrapers were manufactured using a scalar flat retouch, but in the same plano-convex manner. One bifacial leaf scraper and one of the sub-crescents exhibit a thinned base (Fig. 8-9, *1, 2*). Finally, there are two more bifacial scrapers which are plano-convex one-edge tools, one has a natural back, the other is made on a natural flake (Fig. 8-8). The former was elaborated using scalar semi-abrupt retouch, while for the latter a scalar flat retouch was used.

Unbroken bifacial scrapers range from 58.82 to 96.45 mm in length, 33.03 to 57.39 mm in width, and are between 12.45 and 18.46 mm thick.

Reutilised Bifacial Tool Fragments

There are two bifacial tools which broke but were subsequently reused (Table 8-14). In both cases there are the fragments of bifacial tool edges. The reshaping of breakage zones resulted in two re-modified scrapers, a sub-triangular piece, and a straight piece with a "natural" back. In the case of the latter, the "natural" back is represented by the breakage zone. Although these tools were made on fragments of former bifacial tools, the two pieces are still relatively large; they are 58.05 and 66.74 mm long, 39.41 and 34.89 wide, and 7.30 and 9.25 mm thick, respectively.

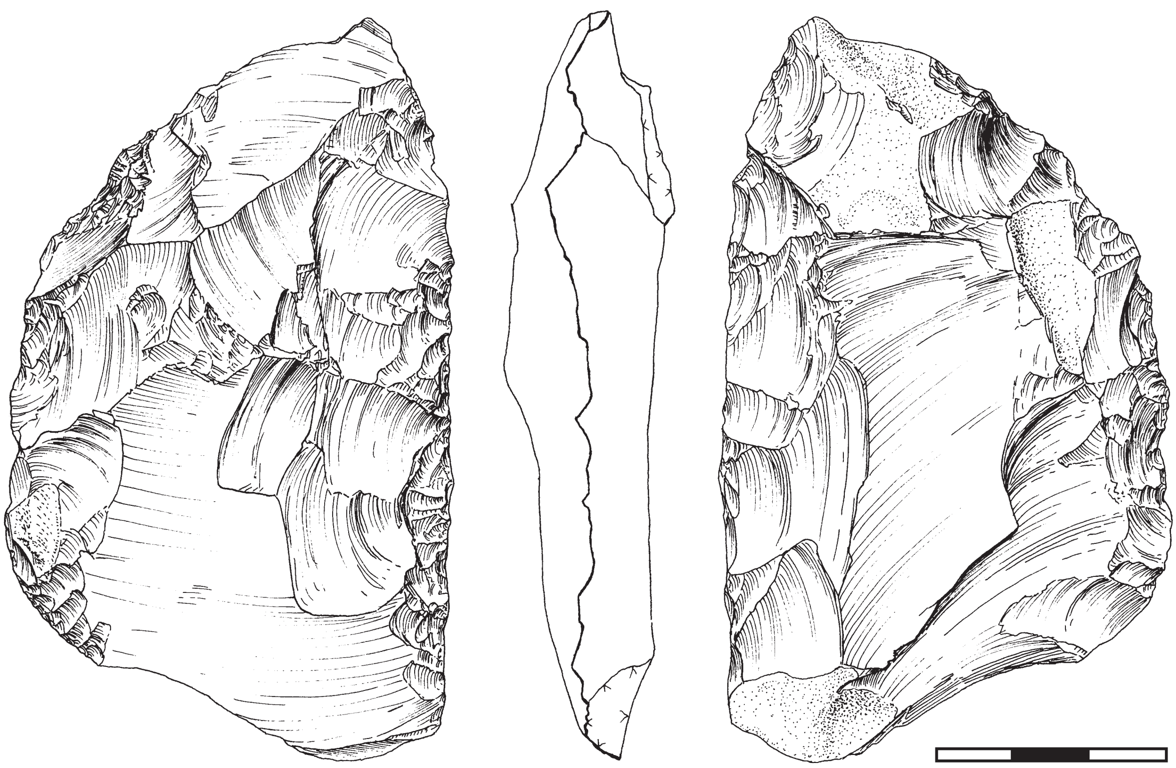

Fig. 8-8 Kabazi V, level III/2. Bifacial scraper, straight, made on natural flake.

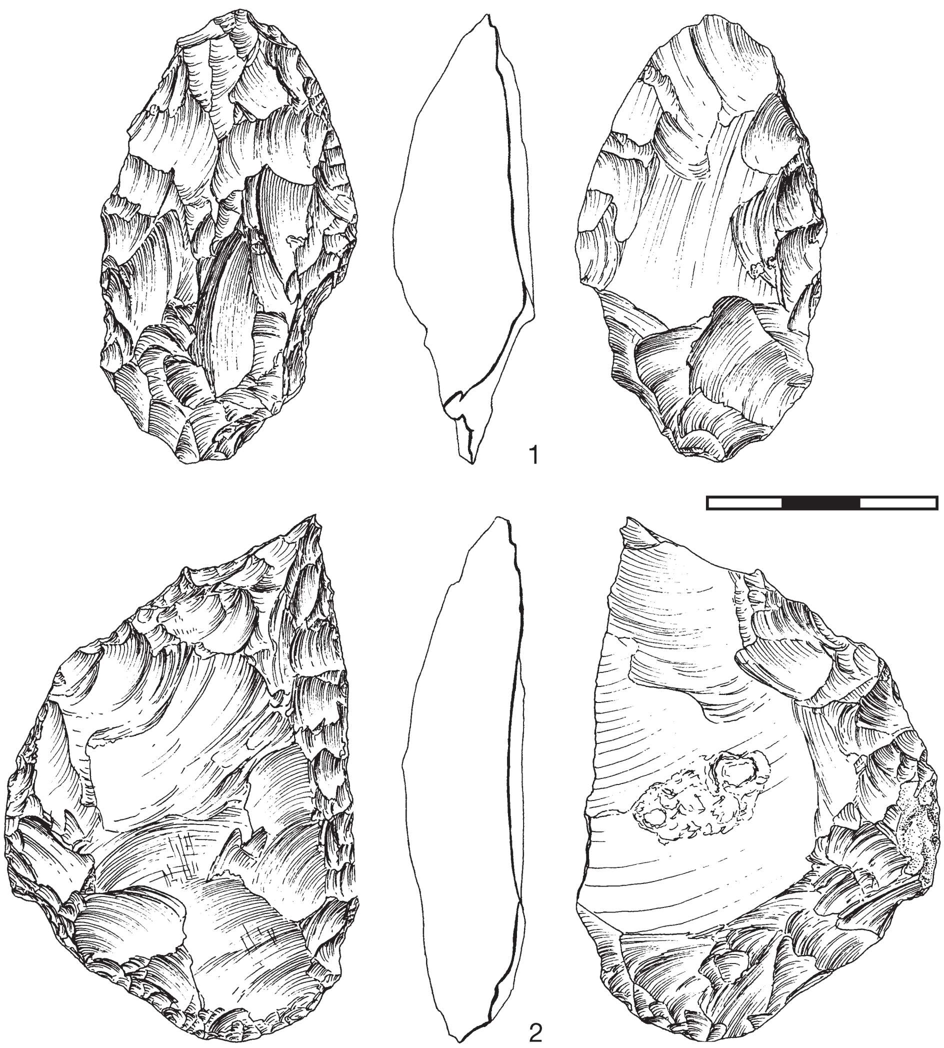

Fig. 8-9 Kabazi V, level III/2. Bifacial scrapers: 1 – leaf-shaped, thinned base; 2 – sub-crescent, thinned base.

Retouched Pieces

There are four types of retouched pieces (Table 8-14). The most numerous are those pieces with an obverse retouch on one of their lateral edges. Four of the lateral, obverse retouched pieces were made on blades; two were made on bifacial thinning flakes, and all remaining pieces on flakes; a piece with a distal, obverse retouch was made on a bifacial thinning flake. By definition, retouched pieces were made by marginal, scalar partial, scalar discontinuous and irregular retouch. Retouched pieces range in length from 23.00 mm to 65.03 mm, and are between 17.40 and 47.25 mm wide.

Unidentifiable Tools

These artefacts comprise tiny fragments of unifacial (30 items) and bifacial (15 items) tools (Table 8-14), which could not be assigned to any given class of tool.

Bone Retouchers

Sub-unit III/2 yielded a total of seven retouchers; six were made on fragments of bone tubes, and one made on a pebble. Retouchers are presented in Chapter 15, this volume.

Discussion: Tool Production & Tool Reshaping

Length and width dimensions of unifacial tools, "regular" and "bifacial thinning" blanks compose together a joint cluster of values (Fig. 8-10). Whereas unifacial tools tend to be the longest and widest artefacts, they still lie within the ranges characteristic of clusters of "regular" and "bifacial thinning" blanks. Indeed, such values have been identified as a criterion for blank selection (Stepanchuk, Chabai 1986). Accordingly, the biggest blanks are usually preferred for tool production (Fig. 8-11). In the case of Kabazi V, level III/2 this means that among the blanks selected for tool production 0.19 % measured between 2.0 and 2.9 cm; 1.46 % between 3.0 and 3.9 cm; 13.25 % between 4.0 and 4.9 cm; 41.9 % between 5.0 and 5.9 cm; and 53.3 % between 6.0 and 6.9 cm.

Interestingly, seeing as tool dimensions do not form a separate cluster, the blanks used in their production must have been made on-site. Indeed, this would appear to have been the case, i.e. the main source of these relatively big blanks were preforms and rare cores. The maximum dimensions of negatives from cores and preforms (Table 8-15) suggest that nearly all, if not all, blanks that were used for unifacial tool production were made on-site. Moreover, taking into account the maximum sizes of the negatives on bifacial tools (Table 8-15), it would appear that bifacials were also the source of blanks for unifacial tools production. At least, four clear bifacial thinning flakes were selected for the production of one scraper and three retouched pieces.

On the other hand, the metrical distribution of the main groups of tools (Fig. 8-12), as well as the average sizes of tools belonging to typologically different tool units (Table 8-15) raises the question whether tool reshaping was also conducted on-site. The biggest tools in the level III/2 assemblage are bifacials. Not one of the complete bifacials is smaller than 5 cm. Even the reutilized bifacials are still of

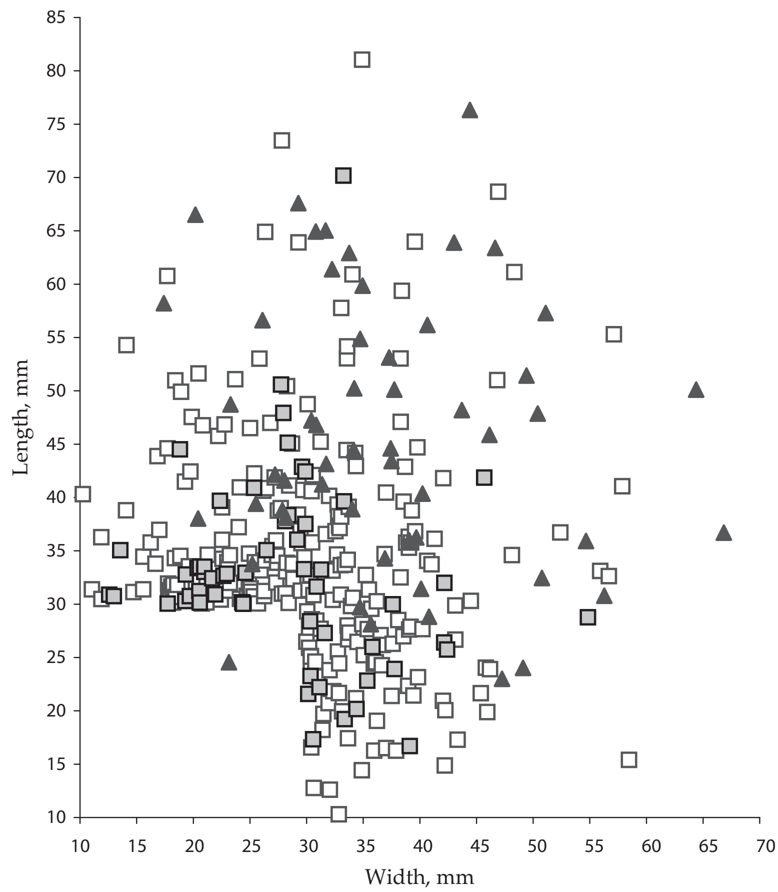

Fig. 8-10 Kabazi V, level III/2. Length / width scatterplot for blanks and tools on blanks: rectangles – "regular" blanks; grey rectangles – "bifacial thinning" blanks; black triangles – tools.

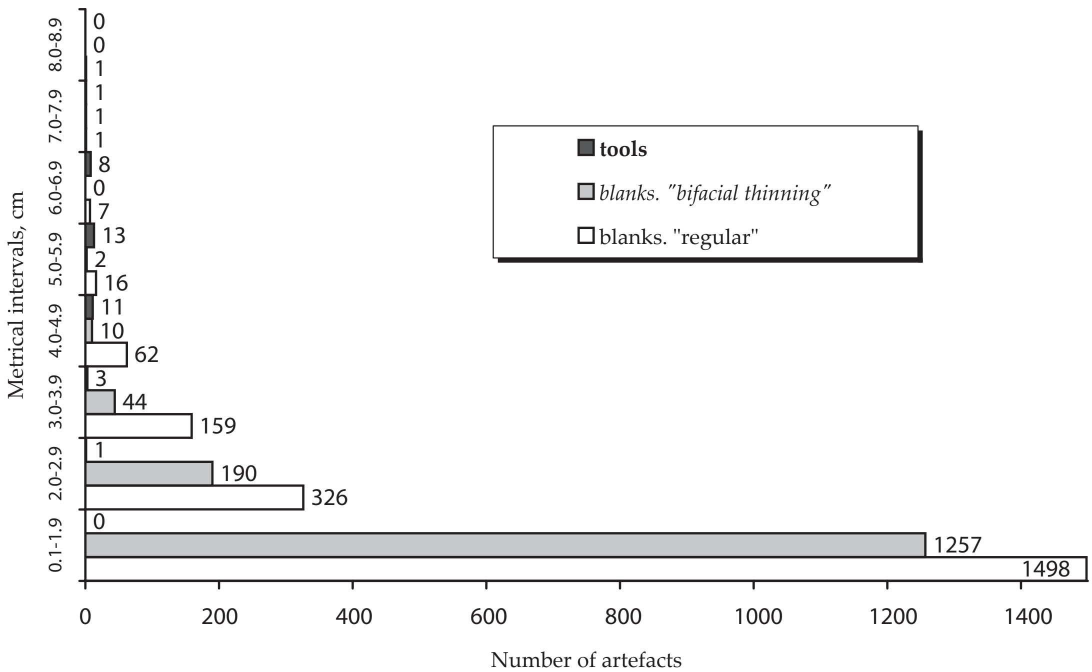

Fig. 8-11 Kabazi V, level III/2. Tools on blanks, "regular" and "bifacial thinning" blanks, by metrical intervals.

	Platform width	Platform thickness	Length	Width	Thickness	Negative length	Negative width
Cores, *max.*	·	·	71.22	53.66	35.51	55.55	37.24
Preforms, *max.*	·	·	158.65	86.31	38.82	60.22	70.85
Bifacial tools, *av.*	·	·	76.30	40.86	10.29	33.46	25.85
Simple tools, *av.*	22.08	7.36	48.12	38.28	7.81	·	·
Convergent tools, *av.*	15.18	5.78	48.12	37.67	7.39	·	·
Other tools, *av.*	14.19	4.84	48.19	32.56	8.16	·	·
Retouched Pieces, *av.*	13.77	5.48	41.08	32.92	6.19	·	·
Flakes, "regular", *av.*	13.62	4.48	32.74	32.23	5.36	·	·
Flakes, "bifacial thinning", *av.*	10.74	2.85	31.89	30.11	3.94	·	·
Flakes, "unidentifiable", *av.*	·	·	30.52	31.59	4.92	·	·
Blades, "regular", *av.*	9.42	3.51	47.49	19.35	5.52	·	·
Blades, "bifacial thinning", *av.*	5.88	1.44	40.56	16.83	2.97	·	·
Blades, "unidentifiable", *av.*	·	·	41.29	15.02	4.43	·	·

Table 8-15 Kabazi V, sub-unit III/2: Artefacts maximum (max.) & average (av.) dimensions.

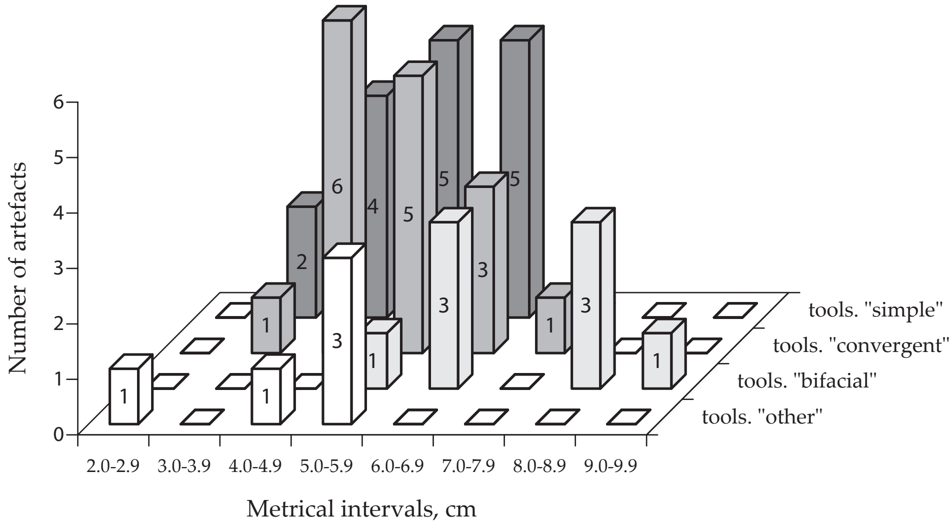

Fig. 8-12 Kabazi V, level III/2. Main typological groups of tools, by metrical intervals.

considerable sizes. Whereas the majority of unifacial tools is bigger than 5 cm and only about 10% are smaller than 4 cm (Fig. 8-12), unifacial tools are on average slightly smaller than 5 cm (Table 8-15). The predominant combination of retouch shape and retouch angle is the scalar flat variation (Table 8-16). Invasive retouch is rare and mainly characteristic of tools with convergent retouched edges.

Thus, considering not only the qualitative and quantitative characteristics of the bifacial plano-convex method of flaking, but also bifacial and unifacial tool dimensions as well as the dominant retouch types and angles, very little points to pronounced on-site reduction and to a tool-kit produced on-site. As usual, there are still some exceptions to this apparent trend, e.g. the reutilized bifacials, and a few – more or less – reduced unifacial scrapers and points. Also, worthy of mention is the possibility of a pocket tool-kit, which after having been reshaped several times, was eventually discarded during the Kabazi V, sub-unit III/2 occupation. Undoubtedly, all of these, and even more unexpected possibilities, exist. However, and this is certain, the main kind of activity which produced this assemblage was on-site bifacial and unifacial tool production accompanied by a small amount of tool reshaping. The main flaking technology evident in the Kabazi V, sub-unit III/2 assemblage is plano-convex method of bifacial flaking.

The thickness of the cultural bearing deposits, as well as the pronounced lenses of sterile sediments below and above the level III/2 occupation, are all suggestive of infrequent visits to the site, and are not consistent with a repeated exploitation of the same surface. According to M. Patou-Mathis, level III/2 is the result of two short economic episodes separated in time (Chabai, Patou-Mathis 2006). In cases where sedimentation rates were high, flint discarded at the site would not have been visible to groups who later visited the same surface, and therefore these same artefacts would not have been available for repeated reduction.

All in all, a number of economic and natural factors led to the formation of the Kabazi V, sub-unit III/2 assemblage. The characteristic features of this assemblage could be summarised as follows:

1. Pronounced evidence of bifacial plano-convex technology and, but with very weak, evidence of core reduction
2. A relatively high ratio of bifacial tools
3. A dominance of simple (transverse, diagonal, simple and double scrapers) over convergent (points and convergent shapes of scrapers) tools
4. The presence of bifacial backed and leaf-shaped tools
5. The presence of scrapers with canted shapes
6. The majority of both bifacial and unifacial tools are bigger than 5 cm.

In the context of Crimean MP, these features are characteristic of the Ak-Kaya facie of the Micoquian. Among those assemblages previously assigned to the Ak-Kaya facie of the Micoquian, those most resembling of Kabazi V, level III/2, as well as the

	Scalar, flat	Scalar, semi-abrupt	Scalar, abrupt	Sub-parallel, abrupt	Parallel, flat	Parallel, abrupt	Stepped, semi-abrupt	
Bifacial	19	11	1	·	·	·	1	LEVEL III/2
Simple	10	11	1	·	·	·	1	
Convergent	11	8	1	·	·	·	1	
Other tools	·	1	3	1	·	1	·	
Bifacial	1	1	·	·	·	·	·	LEVEL III/2A
Simple	3	1	·	·	·	·	·	
Convergent	2	2	·	·	·	·	·	
Other tools	1	2	1	·	1		·	
Total, #:	**47**	**37**	**7**	**1**	**1**	**1**	**3**	
Total, %:	**48.45**	**38.14**	**7.22**	**1.03**	**1.03**	**1.03**	**3.10**	

Table 8-16 Kabazi V, sub-unit III/2: Retouch combinations, by tool morphological groups.

	Simple	Convergent	Bifacial
Zaskalnaya VI, Layer III	53.9	26.1	20
Zaskalnaya V, Layer VI	41.7	35.4	22.9
Zaskalnaya V, Layer III	46.1	30.4	23.5
Zaskalnaya V, Layer II	49.9	26.2	23.9
Kabazi V, Level III/2	**37.7**	**34.4**	**27.9**
Kabazi V, Sub-Unit III/2	**38.0**	**35.2**	**26.8**
Zaskalnaya V, Layer V	28.2	42.3	29.5
Zaskalnaya VI, Layer II	37.8	32.1	30.1

Table 8-17 Percentages of morphological groups among tools from Crimean Micoquian sites-workshops.

entire sub-unit III/2, is those from Zaskalnaya V, layers II, III and VI. Both sites have in common that they are situated very close to flint outcrops. Zaskalnaya V, II, III and VI have produced the closest analogies to the simple, convergent and bifacial tools from Kabazi V, III/2 (Table 8-17). Cores are also relatively rare at Zaskalnaya V, III, with a minimum blank to core ratio of 110:1 (Chabai 2004c). Further, not only is the majority of bifacial and unifacial tools bigger than 5 cm (Stepanchuk, Chabai 1986), but bifacial backed "knifes" and canted scrapers are common (Kolosov 1983). All of these aforementioned occupations comprise palimpsests. The difference between the Kabazi V and Zaskalnaya palimpsests lies purely in the intensity and frequency of the evidenced exploitations. In contrast to the clear underlying and overlying sterile sediments with carpet-like scatters of bones and artefacts at Kabazi V, level III/2, the average thickness of Zaskalnaya V, II, III and VI is 15-20 cm, but "*on some squares up to 30 cm*" (Kolosov 1983, p. 45, 70, 103). The excavation and interpretation of palimpsests pose a number of questions. One such question is whether the reconstructed models of fauna and raw material exploitation result from a number of repeated similar repertoires or from an aggregation of different kinds of activity.

Abstract

КАБАЗИ V, ПАЧКА ГОРИЗОНТОВ III/2: АККАЙСКАЯ ФАЦИЯ КРЫМСКОГО МИКОКА

ЧАБАЙ В.П.

Пачку горизонтов III/2 составляют два горизонта III/2 и III/2А. Оба горизонта являются палимпсестами, сохранившимися в первичном положении (см. Главу 1, в этом томе.). В горизонте III/2 обнаружено 10667, а в горизонте III/2А – 2806 кремневых артефактов.

Структура категорий артефактов (Table 8-1) характеризуется преобладанием сколов, низким содержанием или полным отсутствием нуклеусов и незначительным, как для среднего палеолита Крыма, процентным выражением орудий. Такой тип соотношений основных категорий артефактов характерен для микокских лагерей, тип А, на которых происходило интенсивное изготовление и переоформление двусторонних орудий.

Незначительная роль нуклеусного расщепления подтверждается высоким соотношением сколов к нуклеусам (339 к 1), значительным содержанием сколов двусторонней обработки (41,39 %), низким индексом пластин (около 10), низким уровнем фасетажа ударных площадок (Ifl=52,51 и Ifs=14,57 для горизонта III/2; Ifl=37,50 и Ifs=20,00 для горизонта III/2А). Основную роль двусторонней обработки в образовании артефактов пачки горизонтов III/2 подтверждает анализ технико-типологических особенностей коллекции сколов. «Типичным сколом» для данной пачки горизонтов является отщеп длиной 31-32 мм, шириной 30-32 мм, толщиной 3-5 мм, зачастую поперечных пропорций, с коркой на дорсальной поверхности, с петлевидным или тупым дистальным и искривленным латеральным профилями, скошенной гладкой или двугранной ударной площадкой.

Орудийный набор горизонта III/2 отличается высоким содержанием двусторонних орудий – 22,86 % с учетом всех изделий с вторичной обработкой или 25,37 % без учета неопределимых орудий и сколов с ретушью. В пачке горизонтов III/2 были обнаружены следующие классы орудий: остроконечники (9 экз.); скребла (43 экз.); зубчатые (1 экз.); выемчатые (3 экз.); тронкировано-фасетированные (1 экз.); скребки (1 экз.); двусторонние острия (4 экз.); двусторонние скребла (13 экз.); реутилизированные фрагменты двусторонних орудий (2 экз.); отщепы с ретушью (33 экз.); неопределимые на уровне класса фрагменты односторонних (30 экз.) и двусторонних (15 экз.) орудий. Среди остроконечников наиболее часто встречаются полусегментовидные (3 экз.), обнаружены также дистальные (1 экз.), латеральные (1 экз.), подтреугольные (1 экз.), полутрапециевидные (1 экз.) и полулистовидные (2 экз.) типы.

Класс скребел представлен следующими морфологическими группами: поперечные (6); диагональные (4); продольные (10); двойные (7); трапециевидные (2); прямоугольные (3); сегментовидные (3); листовидные (7); овальные (1). Зубчатые, выемчатые, тронкировано-фасетированные и скребки – единичны. Двусторонние острия представлены полусегментовидными (2 экз.) и полулистовидными типами (2 экз.). Двусторонние скребла подразделяются на простые – однолезвийные (2 экз.), сегментовидные (5 экз.) и листовидные (6 экз.) формы. Среди реутилизированных двусторонних орудий определено одно подтреугольное и одно прямое, обушковое

изделия. Основной чертой двусторонних острий, скребел и реутилизированных орудий является наличие обушковых элементов. Наиболее распространенными комбинациями ретуши, использовавшимися для обработки односторонних и двусторонних орудий, являются чешуйчатая плоская и чешуйчатая полукрутая.

В целом, наиболее близкими технико-типологическими аналогиями кремневому инвентарю Кабази V, пачка горизонтов III/2 являются коллекции Заскальной V, культурные слои II, III, VI, которые относятся к памятникам аккайской фации крымского микока.

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter

9

Kabazi V, Sub-Unit III/3: Western Crimean Mousterian Assemblages

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Some Remarks on the Flint Artefact Assemblages: Composition, Classification and Description

Kabazi V, sub-unit III/3 (6 levels from up to bottom – III/3-1, III/3-1A, III/3-2, III/3-2A, III/3-3, and III/3-3A), that is generally characterised by Western Crimean Mousterian (hereafter WCM) flint artefacts, is sandwiched between archaeological sub-units with, on the other hand, basically Micoquian flint artefacts – sub-units III/1 - III/2 above and sub-units III/4 - III/5 below. Due to this situation, it is highly likely that some admixture of Micoquian flints within the sub-unit III/3 levels with its mainly WCM artefacts resulted from either depositional and post-depositional processes, or through disturbance connected with activities at the site by Neanderthals. The Micoquian admixture can be defined through the presence of a few bifacial tools, some clearly morphologically determined bifacial shaping and thinning flakes, as well as some specific unifacial convergent tools. Thus, we can roughly estimate the scale of Micoquian admixture through the identification of peculiar flint items in the assemblages of any given level from sub-unit III/3. At the same time, the WCM basic industrial component is characterised by the presence of artefact types certainly uncommon for the Crimean Micoquian: Levallois and parallel cores with additional supplementary striking platforms, Levallois flakes with prepared butts and centripetal and/or 3-directional scar patterns, some Levallois points with prepared butts and convergent scar pattern, various *débordante*/crested pieces and even some core tablets, and finally, quite a pronounced number of blades that were received not from different bifacial tool reductions, as it is known for Micoquian, but from regular core reduction processes.

Thus, keeping in mind these points, the assemblages from Kabazi V, sub-unit III/3 are described and analysed with regard to the respective technological and typological accents. However, before proceeding, it is necessary to note some classification remarks on the Micoquian and WCM artefact types. Principally, all the required definitions have already been published in the basic classification system that has been developed for Crimean Middle Palaeolithic artefacts analyses (Chabai, Demidenko 1998), while many additional morphological specifications on Micoquian bifacial debitage can be found elsewhere (e.g. Demidenko 2004a; Chabai 2004b). The only artefacts types that require more detailed consideration are core maintenance products (CMP). First, these artefacts must be classified to enable a better understanding of different core reduction processes which occurred at the site. Second, they are not typical for all Crimean Micoquian assemblages and, therefore, their quite specific characteristics will add much to our understanding of the technology behind WCM core reductions. Thus, CMP classifications, particular on the basis of the Kabazi V, sub-unit III/3 assemblages, are elaborated below.

Core Maintenance Products

Débordantes & crested pieces – morphological and technological subdivision

As noted in the classification system adopted for Crimean Middle Palaeolithic flint artefacts (Chabai, Demidenko 1998, p. 48), *"there is considerable variety in the detailed morphology"* of *débordantes* and crested pieces, *"but this has not been studied"* for WCM artefacts from Unit II at Kabazi II. Here, on the basis of the flint artefacts from sub-unit III/3 of Kabazi V, these particular CMP are firstly differentiated into proper pièces *débordantes* and crested pieces and, secondly, are subdivided into several types and sub-types.

Débordantes pieces

1. *Simple natural lateral débordantes.* Such pieces display one pronouncedly steep/abrupt lateral edge that is covered by primary cortex, with scarring on the dorsal surface; cresting treatment is completely lacking. Thus, these pieces are the most simple *débordantes.* From a technological perspective, these pieces served both as longitudinal renovation of a core's flaking surface edges and, at the same time, lifted a core's flaking surface for further primary reduction. These *débordantes* type pieces, as well as all their sub-types, are characterised by a lateral steep profile at midpoint that has resulted from the lateral steep/abrupt edge of the core.

2. *Lateral débordantes.* These pieces are also characterised by one pronouncedly steep/abrupt lateral edge that is covered by primary cortex. Also, cresting treatment is completely lacking. However, additionally, these pieces display a series or several scars oriented perpendicularly to the piece's axis proceeding from its lateral edge, being therefore a supplementary platform, onto the dorsal surface. The occurrence of lateral *débordantes* is indicative of the intentional removal of a core's wasted lateral supplementary platform for the radical re-shaping of its flaking surface. This step facilitates a continuation of regular primary reduction. Let us also recall here that the main technological purpose of supplementary lateral platforms on cores is the *"preparation of flaking surface convexity"* (Chabai, Demidenko 1998, p. 47).

2A. *Lateral débordantes.* These pieces differ from the aforementioned type 2 *débordantes* solely in that their lateral steep/abrupt edge (a supplementary platform) is not covered by primary cortex and, instead, is characterised by a naturally flat core edge / a plain supplementary platform.

Crested pieces

These CMP artefacts can be differentiated from proper *débordantes* owing to cresting treatment on their dorsal surfaces. Depending on the exact treatment, crested pieces can be subdivided into two basic types: lateral crested pieces and central crested pieces (Demidenko, Usik 1993a). Whereas the former are, technologically speaking, more *débordantes*, the latter are mainly products resulting from the application of true *"lame à crête technique"*. A more careful consideration of these CMP characteristics results in the differentiation of the following four variations of crested pieces.

1. *Lateral crested pieces.* Regarding their general form, these are similar to lateral *débordantes* due to their lateral steep profile at midpoint resulting from one steep / abrupt lateral edge. Such pieces resemble real crested blades or flakes. These lateral crested pieces are not especially produced crested ridges. The resulting lateral crested piece is well known for lateral *débordantes* described above. Thus, here we are dealing with lateral crested blades and/or flakes that are not really crested pieces.

2. *Central crested pieces.* These artefacts are products of a *"lame à crête technique"* on cores. They are characterised by a more or less triangular profile at midpoint and by a varying crested treatment that is either unilateral or bilateral. Accordingly, central crested pieces are differentiated into two sub-types, either with unilateral (2A) or bilateral (2B) crested ridges.

3. *Secondary crested pieces*. These are CMP resulting from a very first systematic, mainly parallel, reduction of cores. Morphologically, they are defined by an absence of preserved tops of crested ridges on their dorsal surfaces. The dorsal surfaces of truly secondary crested pieces can already be characteristic of a series of removals from the systematic reduction of cores. One more important thing about the secondary crested pieces is that it is possible to differentiate secondary central crested pieces, showing frontal reduction on a core, and secondary lateral crested pieces, which display evidence of "a semi-volumetric" core reduction.

4. *Re-crested pieces* are products resulting from the preparation (re-cresting) of flaking surfaces on cores. This follows systematic, mostly parallel, reduction which has served to "repair" flaking surfaces, for example, as often occurred after hinge fractures. During such re-preparation processes a new crested ridge is formed partially on a cores' flaking surfaces and, respectively, the related re-crested items display just partial crested treatment on their dorsal sides, while the remaining surface of the dorsal side is marked by regular parallel scars.

Core trimming elements

It is a usual practice when *"all artefacts which exhibit evidence of previous core preparation, except for core tablets"*, are defined as crested pieces (Marks 1976, p. 375). Basically, it is true, but there are always a series of items among CMP in Palaeolithic assemblages which, let us say, do occupy an intermediate morphological position between core tablets and crested pieces. Such artefacts from Kabazi V, sub-unit III/3 are characterised by a transversal location of crested ridges on their dorsal surfaces. These "transversal crested pieces" also display a unilateral partially crested treatment. These pieces seem to reflect the initial formation of pre-cores and a rather radical re-preparation of cores during their reduction processes. This is marked by a change of the core's striking platform and flaking surfaces; at this point, some crested ridges on a core had to be removed. Here it is proposed that we should refer to such "transversal crested pieces" as *core trimming elements*.

Core tablets. This is the well-known sub-category of CMP. They are received through cores' striking platforms radical rejuvenation, when these platforms are usually exhausted. There is a lack of secondary core tablets in Kabazi V assemblages. This indicates that this Upper Palaeolithic core platform rejuvenation technique was not practiced in this Middle Palaeolithic industry.

Following the proposed CMP classification, we have to underline that basically only some lateral crested pieces sporadically occur within Crimean Micoquian assemblages. Their presence is explained by a radical re-preparation of radial cores and "primitive" parallel cores during their multiple reductions. All the other CMP types and sub-types are typical for WCM assemblages and their occurrence in levels of Kabazi V, sub-unit III/3 is strong indicator for WCM artefacts there.

General Flint Artefact Structure

In the course of excavations at Kabazi V in 2002, a total of 10,755 flint artefacts were recovered from six clearly distinguishable archaeological levels in sub-unit III/3. Additionally, there were also identified several special instruments (so-called non-flint archaeological artefacts) – retouchers on pebbles (2 items) and retouchers on animal bones (5 items) (Table 9-1). All flint artefacts have been assigned to seven artefact categories which are, in decreasing order of their frequency in all six levels, as follows: chips, flakes, tools, blades, chunks, core-like pieces, and preforms. Chips are the most dominant category – comprising on average 85.5% of the total assemblage, but ranging from 81.0% to 89.4% in the individual levels. In all six levels, flakes make up the second most common artefact type, on average 7.5%, but fluctuating between 5.9% and 9.5%. Tools comprise an average of 2.5% of the entire sub-unit assemblage; however, whereas they are the third most common type of artefact in 3 levels – III/3-1 (3.1%), III/3-2A (2.8%), and III/3-3A (3.2%), in the remaining levels blades are more common: 2.3% blades *versus* 1.7% tools in level III/3-1A; 1.6% blades *versus* 1.5% tools in level III/3-2; and 2.5% blades *versus* 2.1% tools in level III/3-3. Further, in level III/3-1A chunks are also more frequent than tools (2.1% chunks *versus* 1.7% blades). Again, in level III/3-2A, chunks are more frequent than both tools and blades – (5.8% *versus* 2.8% and 1.5%, respectively). Accordingly, the average ratio for blades (4th position) in the six assemblages is 2.4%, and that of chunks is, on average, 1.6% (5th position). Finally, objects resulting from primary flaking processes (core-like pieces and performs)

	III/3-1	%	ess %	III/3-1A	%	ess %	III/3-2	%	ess %	III/3-2A	%	ess %
Preforms	–	–	–	–	–	–	2	0.1	1.3	–	–	–
Core-like Pieces	11	0.7	4.7	12	0.8	5.7	4	0.2	2.6	2	0.3	2.5
Flakes	136	8.8	58.9	139	9.5	66.5	97	5.9	62.6	52	8.6	65
Blades	35	2.2	15.2	33	2.3	15.8	27	1.6	17.4	9	1.5	11.3
Tools	49	3.1	21.2	25	1.7	12.0	25	1.5	16.1	17	2.8	21.2
Chunks	28	1.8	–	31	2.1	–	21	1.3	–	35	5.8	–
Chips	1,297	83.4	–	1,222	83.6	–	1,480	89.4	–	490	81.0	–
Total:	**1,556**	**100.0**	**100.0**	**1,462**	**100.0**	**100.0**	**1,656**	**100.0**	**100.0**	**605**	**100.0**	**100.0**
Pebble Retouchers	–	–	–	1	–	–	–	–	–	–	–	–
Bone Retouchers	1	–	–	–	–	–	–	–	–	1	–	–

	III/3-3	%	ess %	III/3-3A	%	ess %	Total:	%	ess %
Preforms	–	–	–	1	0.1	0.2	3	0.1	0.2
Core-like Pieces	4	0.2	1.4	11	0.3	2.6	44	0.4	3.2
Flakes	168	7.6	61.1	218	6.7	50.8	810	7.5	58.8
Blades	55	2.5	20	95	2.9	22.2	254	2.4	18.4
Tools	48	2.1	17.5	103	3.2	24.2	267	2.5	19.4
Chunks	18	0.8	–	44	1.3	–	177	1.6	–
Chips	1,925	86.8	–	2,786	85.5	–	9,200	85.5	–
Total:	**2,218**	**100.0**	**100.0**	**3,258**	**100.0**	**100.0**	**10,755**	**100.0**	**100.0**
Pebble Retouchers	–	–	–	1	–	–	2	–	–
Bone Retouchers	2	–	–	1	–	–	5	–	–

Table 9-1 Kabazi V, sub-unit III/3: general structure of artefacts.

are the least common artefacts in all six levels.

Based on the essential calculations of the above date, i.e. without chunks and chips, the assemblages comprise primarily reduction waste. In these calculations (Table 9-1), debitage pieces (flakes and blades) are the most dominant artefact categories. For average accounts of all sub-unit III/3 assemblages, they do compose 77.2% (flakes – 58.8% and blades – 18.4%). Regardless of a very minor prevalence of tools over blades in three levels, we should note that, when taken together, debi-tage pieces dominate over tools in each of the six levels, from 3.0 – 6.9 : 1. On average, in the whole sub-unit III/3, this ratio is 4 : 1. At the same time, the dominance of debitage pieces over core-like pieces is even more pronounced, corresponding to three main ranges – 15.5 – 14.3 : 1 for levels III/3-1 and III/3-1A; 31.0 – 30.5 – 28.5 : 1 for levels III/3-2, III/3-2A and III/3-3A; and finally, 55.7 : 1 for level III/3-3. All these correlative data relating to debitage, tools and core-like pieces definitely imply intensive on-site core reduction processes, but with a given variability within the six levels.

Preforms

Usually, preforms are not distinguished in WCM assemblages (e.g. Chabai 1998b: Table 9-1 on p. 201). This is due to the fact that true WCM assemblages are not characterised by bifacial tool production traditions and, for this reason, bifacial performs are absent in these assemblages. On the other hand, there are so-called simple preforms that are little more than very initially tested flint objects (plaquettes/nodules or big flakes). Therefore, it is difficult to state for certain whether a piece is a pre-core or a bifacial preform (Chabai, Demidenko 1998, p. 39). Again, for the WCM assemblages such pieces are defined as pre-cores, but for the particular materials from sub-unit III/3 of Kabazi V, where some admixture of Micoquian artefacts is supposed, it is better to be on the safe typological side and to define these initially tested flint objects as preforms, as we cannot exclude that they are of "Micoquian origin", although no bifacial preform was recognised here.

Only three preforms were discovered in the analysed assemblages – two from level III/3-2 and one from level III/3-3A.

Preforms from level III/3-2 very closely resemble one another. These comprise heavily fragmented flint plaquettes, lacking both striking platform preparation and retouch, and with just a couple of rough removal negatives on their surfaces. These pieces are 6.4 and 3.6 cm long, 2.5 and 5.1 cm wide, and 1.4 and 1.1 cm thick, respectively. Thus, the items are interpreted as fragmented preforms.

The single preform from level III/3-3A is of a different nature. This comprises a large flint plaquette (11.4 cm long, 8.4 cm wide, 3.3 cm thick) with 4 tested and hinged removals. This might be the preparation of either a bifacial preform or a pre-core.

Core-like pieces

The sub-unit III/3 assemblages have yielded a total of 44 core-like pieces. These are differentiated into precores (N=2 / 4.3%) and proper cores (N=42 / 95.7%).

Pre-cores

Like the preforms, pre-cores are also tested flint objects, but display definite core-like striking platform(s) and a removal of negatives running from the platforms. Therefore, it is logical, from a typological point of view, that these are referred to as pre-cores. Pre-cores were found in only two of the seven levels (Table 9-1): one piece in level III/3-1, and one piece in level III/3-3A. The piece from level III/3-1 is a fragmented item of either a flake or a blade. It is 5.4 cm long, 6.0 cm wide and 2.2 cm thick. The latter piece from level III/3-3A (on a nodule) displays two prepared striking platforms with associated removal negatives. During removals from one of the platforms, the precore broke and was not further reduced. Accordingly, the pre-core is not big – 6.1 cm long, 3.5 cm wide, and 2.2 cm thick.

It is worth noting that the existing pre-core sample is represented by only a small number of pieces, and this in spite of the easy access to flint outcrops at nearby Mylnaya Mountain. This rather strange situation can be understood in two ways. On the one hand, flint plaquettes and nodules could be mostly tested at the outcrops and only then, in some prepared state, brought to the site. On the other hand, on several occasions, the numerical prevalence of chunks over core-like pieces (Table 9-2) might also point to the import of some complete flint plaquettes and nodules in an unprepared shape, but which during initial reduction were so dry and of such a bad flaking quality that they simply broke into several chunks each, leaving no cores and/or pre-cores.

Cores

Cores are observed in each level of sub-unit III/3 (Table 9-2). In the following, not only are their typological categories described, but special reference is also made to their occurrence in each of the Kabazi V, sub-unit III/3 levels.

Generally speaking, cores can be affiliated to one of three different categories (parallel, convergent and unsystematic). In total, 84.6% of all typologically definable cores were worked using parallel methods of reduction, while convergent and unsystematic primary reduction methods are represented by only a couple of cores from the entire sub-unit, i.e. – a mere 7.7%, respectively. It is also worth no-ting the presence of a substantial number of core fragments (38.1% out of all cores from the sub-unit), and in each of its levels that is an indisputable indication on the intensity of primary flaking procedures at the site.

Parallel cores

Parallel cores of sub-unit III/3 (N=22) are composed of three unidirectional, ten bi-directional, one orthogonal, one sub-crossed, and seven unidentifiable examples (Table 9-2). If we exclude parallel unidentifiable cores, parallel cores comprise 20.0% unidirectional items, 66.6% bi-directional examples, and 6.7% orthogonal and sub-crossed cores, respectively. Thus, bi-directional cores are the main objects of parallel primary flaking methods. Now let us consider the morphological and metrical data of these parallel cores.

Bi-directional cores (Table 9-2) are observed in each level of Sub-Unit III/3. This once again underlines that they are the most characteristic among the cores in this sub-unit. No further core category has been recorded in all levels of Sub-Unit III/3. Bi-directional cores can be subdivided into three defined typological groups, all of which are characterised by non-volumetric flaking surfaces.

Bi-directional rectangular cores (N=3) are characterised by elongated metrical proportions, whereby length is greater than width. Such pieces have been observed as single items in levels III/3-1, III/3-1A, and III/3-3A. Thus, these pieces occur in the two uppermost and in the one lowermost levels of the Kabazi V, Sub-Unit III/3 sequence.

The item from level III/3-1 displays a naturally flat undersurface (covered by primary cortex), is 5.2 cm long, 3.7 cm wide, and 1.3 cm thick. The core has two opposed striking platforms and one lateral supplementary platform. The first striking platform is finely faceted (3.5 cm wide and 0.7 cm thick) and negatives from removals are quite regular and long (up to 3.8 cm). The second striking platform

	III/3-1	III/3-1A	III/3-2	III/3-2A	III/3-3	III/3-3A	Total:
Parallel							**22**
Unidirectional, sub-cylindrical	·	·	·	·	·	1	1
Unidirectional, rectangular	·	·	·	·	·	1	1
Unidirectional-transverse, rectangular	1	·	·	·	·	·	1
Bi-directional, rectangular	1	1	·	·	·	1	3
Bi-directional-transverse, rectangular	1	2	1	·	1	·	5
Bi-directional, alternate, rectangular	·	·	·	1	·	·	1
Bi-directional-transverse, alternate, ovoid	·	1	·	·	·	·	1
Orthogonal, rectangular	·	·	·	·	·	1	1
Sub-crossed, rectangular	·	·	·	·	1	·	1
Parallel, unidentifiable	1	2	·	·	1	3	7
Convergent							**2**
Convergent-transverse, fan-shaped	1	·	·	·	·	·	1
Convergent-transverse, ovoid	·	1	·	·	·	·	1
Unsystematic	1	·	·	·	·	1	**2**
Core fragments	4	5	3	1	1	2	**16**
Total:	**10**	**12**	**4**	**2**	**4**	**10**	**42**

Table 9-2 Kabazi V, sub-unit III/3: cores by levels, categories and groups.

is crudely faceted (2.6 cm wide and 1.1 cm thick); the only recognisable removal is hinged and short (1.6 cm). The supplementary platform is finely faceted (2.4 cm wide and 1.1 cm thick); negatives (1.1 cm) leading from it are of a quite regular shape. It is high likely that this core was abandoned due to both its limited thickness (just 1.3 cm) and the last hinged removal from the second striking platform.

The item from level III/3-1A (Fig. 9-1, *3*) also displays a naturally flat undersurface covered by primary cortex. Its overall size is, however, larger – 6.8 cm long, 6.2 cm wide, and 1.8 cm thick. This core has two opposed striking platforms and two lateral supplementary platforms. The first striking platform (3.6 cm wide and 1.8 cm thick) is crudely faceted, and a series of associated negatives, although of a regular shape, are short (2.6 cm). The second striking platform (5.9 cm wide and 1.6 cm thick) is also crudely faceted, and the negatives of five removals are heavily hinged (5.4 cm maximum length). Both lateral supplementary platforms are only very weakly pronounced. Accordingly, their features are as follows: the first supplementary platform is crudely faceted (4.3 cm wide and 0.5 cm thick); it is associated with only one short negative (1.2 cm long). The second supplementary platform is plain (1.6 cm wide and 0.9 cm thick); negatives from two removals are, again, only very short (1.2 cm). The core was probably abandoned owing to its reduced thickness (1.0 cm), possibly resulting from the wide and concave removals from the second striking platform.

The last bi-directional rectangular core from level III/3-3A (Fig. 9-1, *1*) is also characterised by a naturally flat undersurface which is covered by primary cortex. This is a classical WCM bi-directional core, with two striking platforms and two clear supplementary platforms. It is 5.9 cm long, 5.0 cm wide and 1.6 cm thick. The first striking platform is finely faceted (3.2 cm wide, 0.6 cm thick) with negatives from hinged removals (1.9 cm long) running from it. The second striking platform is crudely faceted (4.1 cm wide, 0.9 cm thick); removals running from this platform are also hinged (2.0 cm long). Owing to its overall parameters (metrics, thickness of both striking platforms and flaking surface) this core can be described as being in a very exhausted state.

Bi-directional transverse cores (N=5) are certainly more numerous than the above-described bi-directional cores with elongated proportions. They are well represented in the uppermost part of the sub-unit III/3 archaeological sequence:

level III/3-1 – 1 piece, level III/3-1A – 2 pieces, and level III/3-2 – 1 piece.

All five bi-directional transverse cores are characterised by their rectangular shape. More detailed descriptions of these pieces are as follows: The core

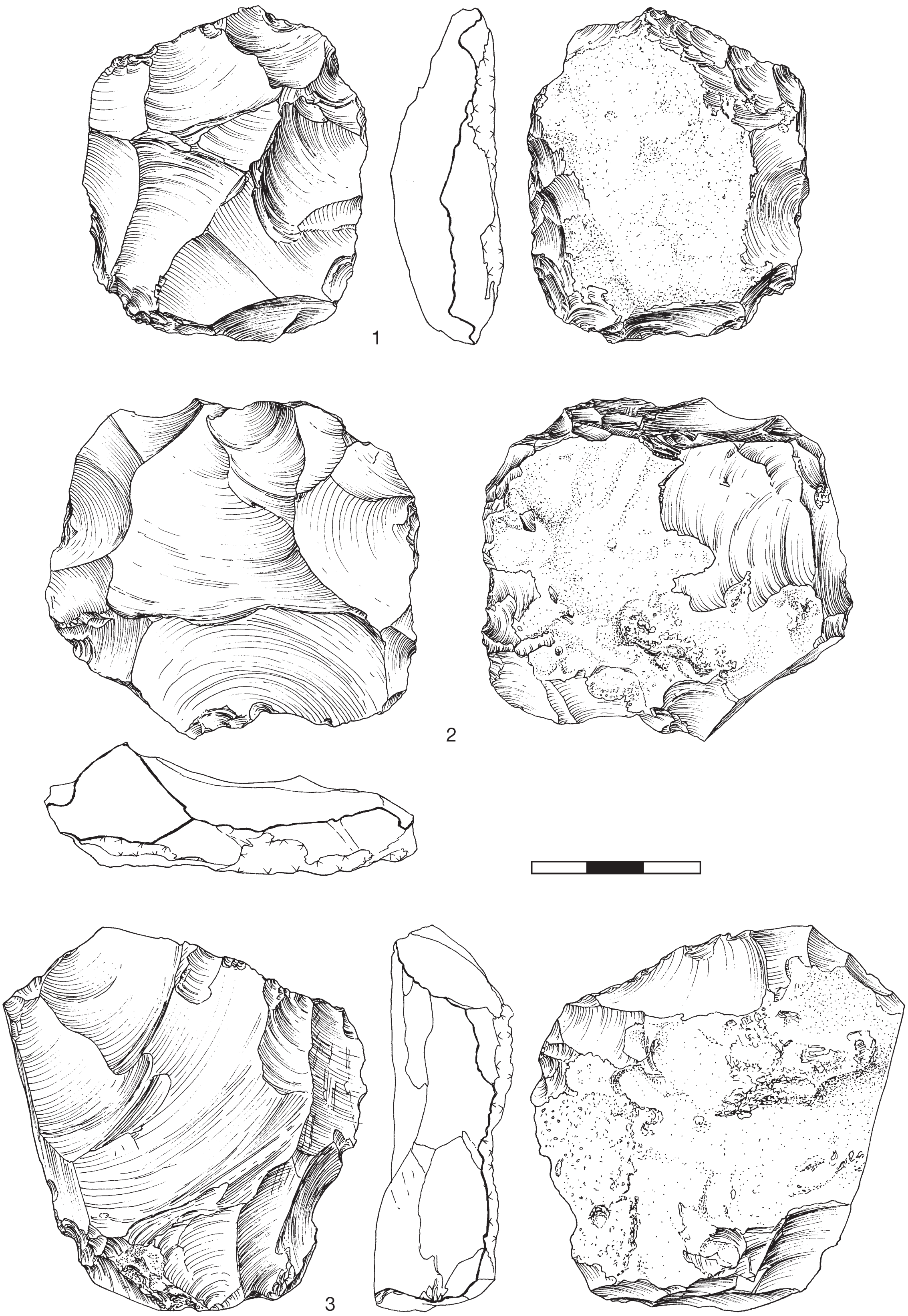

Fig. 9-1 Kabazi V, sub-unit III/3: levels III/3-3A (1); III/3-1A (2, 3). Cores: bi-directional rectangular (1, 3); bi-directional transverse rectangular (2).

from level III/3-1 has a naturally flat undersurface covered by primary cortex. It is 4.1 cm long, 5.5 cm wide, and 2.0 cm thick. The first striking platform is plain (5.3 cm wide and 1.1 cm thick) with negatives from regular removals running from it (3.7 cm long). The second striking platform is crudely faceted (3.1 cm wide, 1.4 cm thick) and is associated with the negatives of mostly hinged removals (1.5 cm long). The peculiar thing about the core is that it displays no negatives resulting from removals from its two lateral supplementary platforms. These are only seen through the presence of their plain and very narrow surfaces. Such are the characteristics of these latter supplementary platforms that it must be concluded that there occurred a radical re-preparation of the core's flaking surface during which the lateral crested pieces were removed, and the supplementary platforms almost completely destroyed. Subsequently, some core reduction on its flaking surface from the second striking platform has led, however, to a serious hinging of the surface that probably led to the abandonment of the core.

The first core from level III/3-1A (5.5 cm long; 5.7 cm wide; 2.8 cm thick; naturally flat undersurface covered by primary cortex) is quite similar to the one from level III/3-1 because of very little data on the left lateral supplementary platform. It is covered by cortex (1.5 cm wide and 0.5 cm thick) with two removals struck (1.0 cm long). Thus, supplementary platforms were removed in the course of the core reduction. The first striking platform is plain (5.6 cm wide and 3.1 cm thick) and associated solely with negatives from hinged removals (2.5 cm long). The second striking platform is also plain (2.4 cm wide, 1.8 cm thick), with just one negative, and otherwise only those from hinged removals running from it (2.0 cm long). These features testify to a series of heavy and unsuccessful reductions which led to the removal of all faceted edges. Accordingly, the core was reduced no further.

The second core from level III/3-1A (Fig. 9-1, *2*) is a very good example for an exhausted WCM bi-directional core. It displays two striking platforms and two lateral supplementary platforms. It is 6.0 cm long, 6.6 cm wide, and 1.4 cm thick and with flat (partially thinned) undersurface. The first striking platform is crudely faceted (6.0 cm wide, 0.8 cm thick); negatives bear witness to regular shaped removals from this platform (2.1 cm). The second striking platform is finely faceted (4.7 cm wide and 1.5 cm thick) and is dominated by the wide negative of a heavily hinged final removal (3.8 cm long), which would have led to this core becoming abandoned. The first supplementary platform is finely faceted (4.3 cm wide, 0.8 cm thick) and from it was struck off a series of regular removals (2.2 cm long). The second supplementary platform is crudely faceted (4.0 cm wide, 1.4 cm thick) and again removals from it are quite regular (1.6 cm long). Such are the characteristics of all four platforms that they allow us some "dynamic technological interpretations". First, it is possible to assume that platforms were used in pairs, i.e. first for striking and then as supplementary. Moreover, such are the technological changes of platforms during core reductions that it is likely that this also leads to some cores becoming exhausted. For example, a core from the WCM assemblage at Kabazi II, Unit II, level II/7F8 (Chabai 1998b: Fig. 9-9 : 1 on p. 224).

The bi-directional transverse core from level III/3-2 is characterised by an absence of supplementary platforms. On the other hand, it is still a real bi-directional core with the same metrical parameters with respect to its length and width (6.8 cm). It is 3.2 cm thick and displays a naturally flat undersurface that is covered by primary cortex. The first striking platform is plain (5.3 cm wide, 2.0 cm thick) with a heavily hinged series of negatives running from it (a single regular removal is 5.2 cm in length, while all remaining removals are really short). The second striking platform is finely faceted (4.4 cm wide, 1.0 cm thick); negatives bear witness to the striking of more regular than hinged removals' from it. The core was abandoned due to a rather concave flaking surface that had resulted from a large number of hinged removals.

The last of the bi-directional transverse rectangular cores from level III/3-3 is partially broken (Fig. 9-2, *2*). This piece is 5.8 cm long, 7.2 cm wide, and 1.7 cm thick. It also displays a naturally flat undersurface that is covered by primary cortex. Part of one striking platform is missing, as it was broken during the original reduction of the core. The preserved striking platform is crudely faceted (7.1 cm long, 1.2 cm thick) with negatives, mostly from regular removals, running from it (4.0 cm long). There is one supplementary platform, too. It is crudely faceted (3.9 cm wide, 0.9 cm thick): negatives of removal struck from this platform (0.9 cm) were intended to raise the flaking surface of the core.

Bi-directional alternate cores are represented by one item in level III/3-1A and one item from level III/3-2A. Main morphological features of bi-directional alternate cores are *"two opposed striking platforms, but on two opposite flaking surfaces"* (Chabai, Demidenko 1998, p. 39). Usually, these cores have a long history of primary flaking.

The ovoid shaped core with transverse proportions from level III/3-1A is a good example. First, it is quite obvious that this core was a mere bi-directional

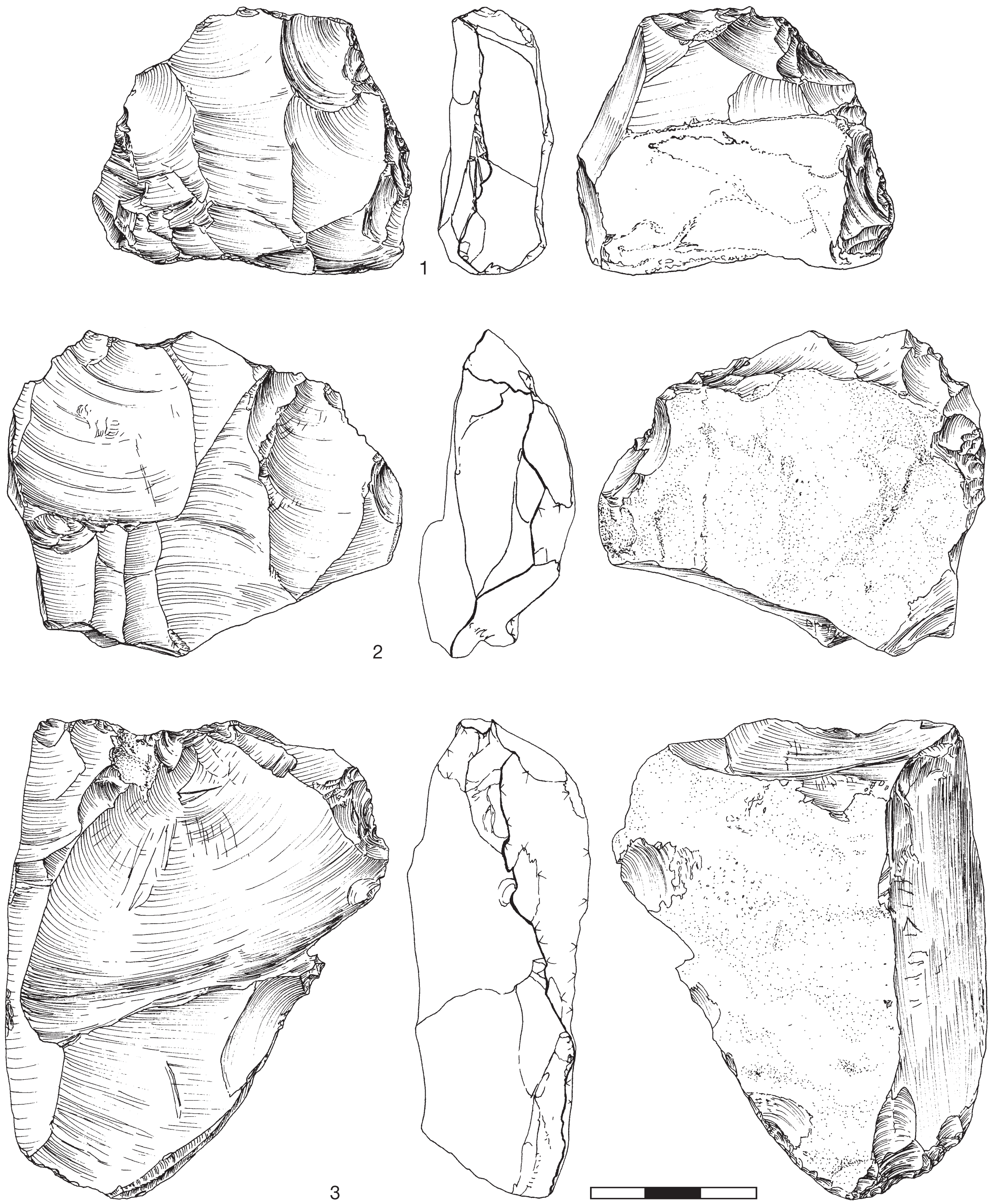

Fig. 9-2 Kabazi V, sub-unit III/3: levels III/3-1 (1); III-3-1A (3); III/3-3 (2). Cores: convergent transverse fan-shaped (1); bi-directional transverse rectangular (2); parallel unidentifiable (3).

core with two opposed striking platforms and one flaking surface. However, due to the negatives from a large number of heavily hinged removals on the flaking surface, a Middle Palaeolithic flintknapper continued primary reduction from one of the already used striking platforms in the direction of the reverse side of the core, thus creating an additional flaking surface. Therefore, the core displays two striking platforms and two flaking surfaces where the reduction on each flaking surface runs in opposite directions. Without doubt, the core is in a very exhausted state (4.2 cm long, 4.7 cm wide, 1.9 cm thick) and it is likely that supplementary platforms are simply not preserved. The characteristics of the striking platforms are as follows: the first is crudely faceted (4.6 cm wide, 0.6 cm thick) and, although the negative from the longest removal is 3.8 cm, the last series of negatives is hinged and just 1.4 cm long. The second striking platform is also crudely faceted (2.6 cm wide, 1.0 cm thick) from which all negatives result from hinged removals (1.9 cm long). The core was discarded due to the heavily hinged state of both its flaking surfaces.

The bi-directional alternate core with a rectangular shape from level III/3-2A is less exhausted and even displays a supplementary platform. Actually, the core might be described as "double unidirectional"; whereas initially a wide striking platform and one flaking surface were used for primary reduction, there then followed, at the narrow end of the flaking surface, the application of a second striking platform, and reduction was continued through one more flaking surface. The core is 4.4 cm long, 3.9 cm wide and 2.5 cm thick. Its first striking platform is crudely faceted (5.3 cm wide, 2.0 cm thick) with a series of regular negatives running from it (3.2 cm long). The second striking platform is also crudely faceted (2.5 cm wide, 2.1 cm thick), again associated with regular negatives (2.7 cm long). The only supplementary platform is connected to the second flaking surface and it is cortical (1.2 cm wide, 1.6 cm thick). Removals struck from this platform (1.2 cm long) were designed to raise the flaking surface. It is unclear why this core was discarded.

Unidirectional cores (Table 9-2) are known from level III/3-1 (N=1) and from level III/3-3A (N=2). Thus, these pieces occur at two opposite edges of the subunit III/3 archaeological sequence – at its uppermost part and its lowermost part. Two of the cores are characterised by a non-volumetric flaking surface (rectangular shape), while one core from level III/3-3A has a sub-cylindrical volumetric flaking surface.

In the following section, unidirectional non-volumetric cores are described.

The core from level III/3-1 is unidirectional transverse, of a rectangular shape, and 3.6 cm long, 4.6 cm wide and 1.1 cm thick. Its striking platform is crudely faceted (3.6 cm wide, 1.4 cm thick) with a series of regular negatives (3.6 cm long) which run over the whole length of the flaking surface. The last of these removals was heavily overpassed and practically splinted the core. The peculiar thing about this core is that its reverse side shows a previous, bi-directional stage of reduction. Therefore, this bears witness to the transformation of this core from bi-directional reduction strategies to a unidirectional reduction, thus optimising the potential number of blanks that can be produced from this one core. We can also note that the last striking platform for unidirectional reduction was formed on one of the lateral edges of the bi-directional core, while another lateral was cut off by the last ever flake to be removed. Due to these factors, there are no traces of supplementary platforms for the bi-directional stage of the core.

The unidirectional rectangular core from level III/3-3A (Fig. 9-3, 2) shows a naturally flat undersurface (natural break in the flint with no primary cortex). It is 10.0 cm long, 7.7 cm wide and 2.7 cm thick. The striking platform is finely faceted (4.8 cm wide and 1.1 cm thick) and had a series of regular removals struck from it (up to 9.4 cm long). The core displays one supplementary platform. This is situated at its distal end and is crudely faceted (3.9 cm wide, 2.1 cm thick); once again, short negatives of removals (2.0 cm long) struck from it were meant to raise the flaking surface. The placement of the supplementary platform at the core's distal end is a good indication of WCM technological variability in realisation of intensive parallel flaking methods.

The unidirectional core from level III/3-3A, which features a sub-cylindrical volumetric flaking surface, is 4.6 cm long, 3.0 cm wide and 1.7 cm thick. The only striking platform is crudely faceted (2.9 cm wide, 1.9 cm thick) with some negatives resulting from regular removals running from it. At the same time, some of the finally struck removals were so heavily hinged that the core was discarded. Although the core is the only one with volumetric flaking surface known from the Sub-Unit III/3 assemblages, there are neither actual traces of either core tablets or *lames à crete*, nor are there supplementary platforms.

The final two examples of typologically identifiable cores are orthogonal and sub-crossed cores with non-volumetric flaking surfaces.

The rectangular shaped orthogonal core, with naturally convex undersurface (covered by primary cortex), from level III/3-3A is rather small – 3.9 cm long, 3.4 cm wide, and 2.8 cm thick. The two

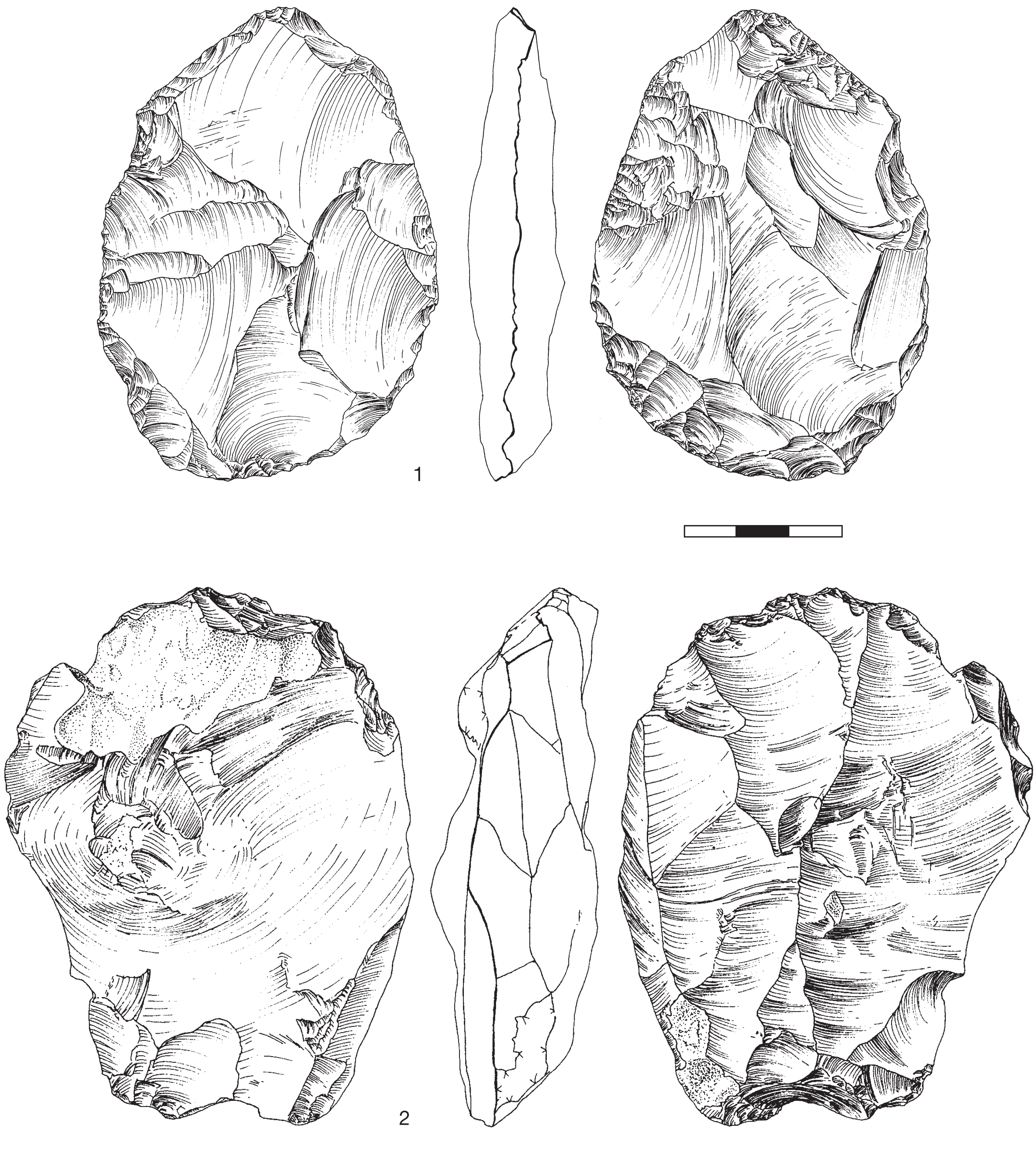

Fig. 9-3 Kabazi V, sub-unit III/3: levels III/3-3 (1); III/3-3A (2). Tools: simple straight scraper on a radial core (1). Cores: uni-directional rectangular (2).

adjacently situated striking platforms, both serving the one flaking surface, are quite similar one to another; both are crudely faceted with similar dimensions (3.5 cm wide, 1.3 cm thick, and 3.3 cm wide and 1.3 cm thick, respectively). Negatives of removals from these platforms are, however, different: whereas the negatives (2.2 cm long) of removals struck from the first platform can be described as regular, those from the second platform (2.5 cm) are heavily hinged. There are no traces of supplementary platform(s) on the core, although taking into consideration its rather small overall size of the piece, and the location of the striking platforms, one might suggest that this was sufficient to exhaust this particular core. The core was discarded because all the last removals from it were small and heavily hinged, further, its small size meant that reduction was no longer possible.

The sub-crossed core with rectangular shape and naturally flat undersurface (from a natural break in the flint) from level III/3-3 is relatively large – 6.4 cm long, 6.6 cm wide, 2.2 cm thick. A clear technological understanding of this core is not possible. Each striking platform is unique. The first striking platform is crudely faceted (6.3 cm wide, 1.6 cm thick) with negatives from hinged removals running from it (3.9 cm long). The second striking platform is plain (4.5 cm wide, 0.7 cm thick) and is also associated with the negatives from hinged removals (3.8 cm long). The third striking platform is finely faceted (6.0 cm wide, 0.7 cm thick); once again negatives stem from (regular) hinged removals (3.4 cm long). Considering the core's size and its obvious history, one might suggest that it is representative of an initial core reduction, somewhere between parallel and radial flaking methods, which, however, was stopped for uncertain reasons.

Finally, the description of the parallel cores ends with the seven parallel unidentifiable pieces. These are subdivided into three groups.

The first group is composed of four heavily fragmented pieces. These stem from levels III/3-1 (N=1), III/3-3 (N=1), and III/3-3A (N=2). A fragmentation of the cores occurred during the removal of a large overpassed flake that not only seriously destroyed the cores' flaking surfaces, but also caused longitudinal and/or transversal breakage.

The second group is composed of two pieces from levels III/3-1A and III/3-3A. These cores are also characterised by the removal of a final, large overpassed flake from a prepared striking platform, and a resulting negative which covers no less than 80 – 90% of the whole flaking surface of the cores. This, however, did not result in the breakage of the cores as happened to those from the first group. It was simply an unfortunate and bad removal that completely damaged the flaking surface. Very similar cores are well known from the Crimean Middle Palaeolithic, and they occur both in assemblages from the Micoquian (e.g. Demidenko 2004a: Fig. 9-3 : 4-5 on p. 118 for Buran Kaya III, layer B) and the Western Crimean Mousterian (Chabai 1998b: Fig. 9-9 : 2 on p. 224 for Kabazi II, Unit II, level II/7F8).

Finally, the third group among parallel unidentifiable cores is represented by one piece from level III/3-1A (Fig. 9-2, *3*). This core demonstrates a very rare attempt to continue primary reduction following the removal of a last overpassed flake. This attempt was, however, unsuccessful as the new flake not only heavily hinged, resulting in a great concavity in the middle of the core's flaking surface, but also reduced considerably the thickness of the flaking surface – from 3.2 cm to 1.6 cm. It also shows that the abandonment by Middle Palaeolithic flintknappers of these parallel unidentifiable cores following the unfortunate removal of an overpassed flake was perfectly legitimate, it proving quite impossible to continue any form of true reduction on them.

Convergent cores

Convergent cores (N=2) occur only in the uppermost part of the Sub-Unit III/3 archaeological sequence, in levels III/3-1 and III/3-1A (Table 9-2). Both pieces display transverse proportions and neither have supplementary platforms.

The convergent core from level III/3-1 is fan-shaped, with a naturally flat undersurface (covered by primary cortex). It is 4.5 cm long, 5.7 cm wide and 1.5 cm thick (Fig. 9-2, *1*). The core's striking platform is finely faceted (5.7 cm wide, 1.3 cm thick) from which a series of very regular convergent removals were struck (4.5 cm long). The reason behind the discard of this particular core is unclear; however, it may be linked to the quite flat flaking surface of the core which would have required a serious re-preparation if a new stage of reduction was to be realised.

The convergent core from level III/3-1A is of an ovoid shape, with a naturally flat undersurface that is covered by primary cortex. It is 4.8 cm long, 6.2 cm wide and 2.9 cm thick. Its striking platform is crudely faceted (6.5 cm wide, 2.0 cm thick) with the negatives of a number of regular convergent removals running from it (4.8 cm long). As above, it is unclear why this core was abandoned.

Unsystematic cores

Unsystematic cores (N=2) are related stratigraphically to the two margins of the Sub-Unit III/3 archaeological sequence; they occur in its uppermost level III/3-1 and in the lowermost level III/3-3A (Table 9-2). These pieces are also worth describing in more detail.

The core from level III/3-1 is characterised by three striking platforms (2 plain and 1 crudely faceted) and three flaking surfaces. This has resulted in the cubical-like shape of this core. Its dimensions are as follows: length – 4.3 cm, width – 3.7 cm, thickness – 5.5 cm. All three flaking surfaces were used in the removal of heavily hinged pieces, resulting ultimately in the discard of this core.

The core from level III/3-3A is in an even more advanced state of exhaustion than that from level III/3-1. It has four striking platforms (3 plain and 1 crudely faceted) and four flaking surfaces, which again give the core a cubical-like shape. This piece is 4.0 cm long, 3.8 cm wide and 4.3 cm thick. The only morphological peculiarity regarding this core is that all four of its flaking surfaces are associated with the negatives from regular (non-hinged) removals. Therefore, one might suggest that the core had been subject to a successful multiple and intensive reduction, which even in the very final and complex stage of reduction was well managed. The only possible reason for discard seems to be connected with a required re-preparation for flaking continuation; this, however, was not possible due to the reduced overall size of this piece.

Core fragments

Core Fragments (N=16) are well distributed throughout the whole archaeological sequence of Sub-Unit III/3, and are observed in each of the individual levels (Table 9-2). This rather large number of core fragments is certainly linked to the intensive character of primary flaking processes performed by Middle Palaeolithic human groups at Kabazi V during the deposition of Sub-Unit III/3 culture bearing sediments. If we add to these the 16 core fragments and four heavily fragmented parallel unidentifiable cores, we must come to the conclusion that almost a half (47.6%) of the overall total of cores from Sub-Unit III/3 are merely fragments (20 of 42 pieces). This figure needs to be compared with some similar core data from the already published materials on Kabazi II, Unit II WCM assemblages (Chabai 1998b), and is discussed further below.

Some considerations on core assemblage structure and features

The typological, morphological and metrical data presented above allow to make some statements regarding core reduction strategies as applied by Middle Palaeolithic human groups at the time of accumulation of the Kabazi V, Sub-Unit III/3 sediments.

For a detailed core summary, and to get a sense of the basic technological trends of the assemblage under discussion, we need to restrict our attention to just a few particular pieces. In this case we must disregard all core fragments, as well as the parallel unidentifiable and unsystematic cores. We are left with three parallel unidirectional cores, ten bi-directional cores, one orthogonal core, one sub-crossed core, and two convergent cores.

First, an overall dominance of parallel primary flaking methods should be noted. This is particularly obvious when considering that there is a complete absence of Levallois and non-Levallois radial / centripetal and discoidal cores. Moreover, most parallel cores are bi-directional cores, although their quantitative prevalence over other parallel core types (ten pieces *versus* five pieces) might be much reduced if we were to consider bi-directional alternate cores as double unidirectional pieces (eight pieces *versus* seven pieces). On the other hand, we also see a kind of transformation from a bi-directional to a unidirectional reduction; this can be observed quite clearly on one of the bi-directional alternate cores (from level III/3-1A) and one of the unidirectional cores (from level III/3-1). Thus, it is reasonable to conclude that there is a combination of unidirectional and bi-directional variations within the general parallel reduction in the core assemblage of sub-unit III/3. In this respect, we may surmise that the unidirectional and bi-directional cores constitute the main body of the definite cores (13 of 17 cores, or 76.5%).

Second, there is also a very distinctive technological feature among the parallel cores; this is the frequent occurrence of supplementary platforms. Among the ten bi-directional cores (including two bi-directional alternate ones) there have been distinguished four cores with two lateral supplementary platforms and four cores with one lateral supplementary platform: The remaining two cores, which have no defined supplementary platform(s), are heavily influenced by their advanced state of exhaustion (a bi-directional alternate core from level III/3-1A and a bi-directional transverse rectangular core from level III/3-2) and therefore we can hardly expect to observe remains of such features. A different situation with regard to supplementary platforms is noted for three unidirectional cores. Only one unidirectional rectangular core from level III/3-3A has a supplementary platform, and this is located at its distal end, and therefore contrary to the usual placement as observed on bi-directional cores where they are applied to the lateral edges. A further unidirectional rectangular, but transverse, core from level III/3-1 was subjected to a very long reduction sequence. Having first been bi-directional in nature, this piece does not display supplementary platform(s). The third unidirectional core has a volumetric flaking surface (level III/3-3A) and, by its "volumetric definition", has no supplementary platform(s).

All the above data on the supplementary platforms and transformation reductions of cores lead us to some conclusions regarding the unified parallel reduction method with its two variations – unidirectional and bi-directional. The latter variation seems to be dominant in combination with non-volumetric flaking surface reduction based on systematic usage of supplementary platforms and good preparation of striking platforms. The unidirectional variation, on the other hand, seems to be used either during initial parallel core primary flaking stages or at the end of core exploitation when bi-directional reduction on one side of the core continues on its reverse side with unidirectional reduction. Additionally, single parallel orthogonal and sub-crossed cores fulfil similar roles to unidirectional cores within unified parallel reduction – these reflect either an early (the sub-crossed core) or a late (the orthogonal core) stage of parallel reduction. Also, it is impossible to define the role of convergent cores in the unidirectional variant of reduction sequence. The only seemingly distinct feature of the convergent cores is that they lack supplementary platforms. However, from a technological perspective, the distinction is not a serious one due to convergent flaking being a sort of unidirectional primary flaking where supplementary platforms are not required – this is due to the fact that the fan-shaped flaking surfaces of convergent cores and the lateral removals (as a rule, simple *débordantes*) raise the flaking surfaces required for a continuous reduction and only a wide striking platform is the main technologically element needed in this process. From here we can observe a technological variability within general parallel flaking. Basically, there are lateral supplementary platforms for bi-directional cores, a distal supplementary platform for one unidirectional core, and convergent cores that do not require supplementary platforms.

Thus, the following final conclusions can be drawn from the typological and morphological data of the cores from Kabazi V, Sub-Unit III/3. There is possibly one basic core reduction strategy – parallel bi-directional reduction with non-volumetric flaking surfaces, but with some variability becoming apparent, for example, in unidirectional and convergent reductions. For the WCM assemblages at Kabazi II, Unit II, the strategy has been defined as *"Biache Method, Bi-Polar Variant"* (Chabai 1998b, pp. 247-249). Also, the occurrence of one unidirectional sub-cylindrical core with a volumetric flaking surface is a possible indication of the *"Volumetric Flaking Method"*, which also features in WCM assemblages at Kabazi II, Unit II (Chabai 1998b, pp. 239-242). More detailed features of primary reduction strategies of Kabazi V, Sub-Unit III/3 will be seen through analyses of debitage and tool blanks.

A summary of the morphological features and overall metrics of striking platforms is listed below.

From a total of 17 cores with 29 striking platforms the following types and ratios of striking platforms have been identified (1 partially broken bi-directional core has just 1 platform):

plain – 5 / 17.3%;
crudely faceted – 17 / 58.6%;
finely faceted – 7 / 24.1%.

The dominance of crudely faceted striking platforms, with some occurrence of plain striking platforms, is linked technologically to the peculiarities of platform preparation. Namely, they are usually faceted only along their edges, leaving mainly unprepared the remaining, thickest parts of the platforms. Further, it should not be forgotten that a hard hammer technique leads to striking off pieces with rather thick butts. Therefore, a series of removed debitage pieces from a finely faceted striking platform often leads to its view as either a crudely faceted or even a plain one. Nevertheless, the combined data on all prepared striking platforms (82.7% – crudely and finely faceted ones together) is very indicative of a consistently applied special preparation during primary reduction processes.

Overall metrics for 16 cores are represented in two ways – by average indices and by individual metrical intervals.

Average metrics are as follows: length – 5.4 cm, width – 5.3 cm, thickness – 2.0 cm.
Metrical intervals are, however, more informative:

Length: 3.0 – 3.9 cm – 2 pieces / 12.5%;
4.0 – 4.9 cm – 6 pieces / 37.5%;
5.0 – 5.9 cm – 3 pieces / 18.8%;
6.0 – 6.9 cm – 4 pieces / 25.0%;
10.0 cm – 1 piece / 6.2%.

Width: 3.0 – 3.9 cm – 4 pieces / 25.0%;
4.0 – 4.9 cm – 2 pieces / 12.5%;
5.0 – 5.9 cm – 4 pieces / 25.0%;
6.0 – 6.9 cm – 5 pieces / 31.3%;
7.7 cm – 1 piece / 6.2%.

Thickness: 1.0 – 1.5 cm – 4 pieces / 25.0%;
1.6 – 1.9 cm – 4 pieces / 25.0%;
2.0 – 2.5 cm – 3 pieces / 18.8%;
2.6 – 2.9 cm – 4 pieces / 25.0%;
3.2 cm – 1 piece / 6.2%.

Both the length and width data show that only single pieces exceed 7 cm. Length indices alone show that 50% of cores do not exceed 5 cm in length, while width indices are larger – only 37.5% of cores are no wider than 5 cm. Data on core thickness shows a subdivision into two categories: rather thin (no more than 2 cm) and rather thick (more than 2 cm).

Thus, according to the metrical data, we can state that the Kabazi V, Sub-Unit III/3 core assemblage is characterised by some quite exhausted cores and some cores that did not go through a multiple and intensive reduction. In the case of the latter, this is probably due to the occurrence of hinged removals on their flaking surfaces, but also to other reasons.

Debitage, including Tools

There follows a review of debitage data from the six levels from Kabazi V, Sub-Unit III/3.

It is stressed that our debitage tables (Tables 9-3 through 9-36) are composed in such a way that, first, data on flakes and blades with no any secondary treatment are presented, followed by data on tool blanks. This has the advantage that morphological and metrical differences can be observed between pure debitage and typologically defined tools.

Flakes

In total, the sample of flakes from all six levels of Sub-Unit III/3 numbers 984 pieces (see Tables 9-3 through 9-19). Aside from 810 flakes with no secondary treatment, this also includes 174 tool blanks of flake metrical proportions. On the basis of this numerical relationship, we see that, on average, at least one out of every 5.7 flakes was selected for tool processing.

Condition

Well over 50% of all flakes from sub-unit III/3 are complete (Table 9-3). Only for level III/3-2A is there a prevalence of fragmented blanks over complete blanks for tools made on flakes. The presence of a large number of flakes broken longitudinally, or broken both longitudinally and latitudally, is a good indicator of a hard hammer technique applied during primary flaking processes.

Dorsal scar patterns

The most dominant scar pattern is unidirectional; this occurs in ca. one third of all ten types defined for a total sample of 903 items (Table 9-4). The second most common scar pattern is the cortical type; except for the lowermost level III/3-3A, its indices lay between ca. 20 and 28%, which is a good signature for a predominantly on-site primary reduction. A comparison of the debitage sample with debitage with tool blanks also shows that a considerably smaller number of primary flakes were selected for tool retouching, with the only exception of level III/3-3. Scar patterning of a unidirectional-crossed type is the third most frequent in the Kabazi V, Sub-Unit III/3 assemblages, comprising ca. 14 – 15% of all recognised types. Of the remaining scar pattern types, only converging, bi-directional and lateral scar-patterning are here worthy of mention, these constituting together a sizable representation. These three types make up between ca. 5-7 and 11% in all levels, with an average value of 8.7% for converging scar patterning, and ca. 2 – 10% (average 5 - 6%) for both bi-directional and lateral scar patterning types. The latter, rather high indices for lateral scar pattern may be associated with intensive re-preparation of flaking surfaces on cores in the course of multiple reductions. Finally, it is worth noting the occurrence of a real rarity, the radial scar pattern, which is a good signature of the Levallois classical method. It accounts for no more than 2% of scar patterns observed in each level, with the exception of the uppermost level III/3-1 where it makes up 3.2% of all observable scar patterns. On the other hand, the presence of ca. 4 – 5% of a 3-directional type, except in the lowermost level III/3-3A (ca. 1%), is also indicative of a complex scar pattern peculiar to Levallois flakes. To sum up, we can observe that the common occurrence of parallel reduction, that was already observed for the core assemblages, is also characteristic among flakes – unidirectional, unidirectional-crossed and bi-directional scar patterning dominate, comprising ca. 55% of the entire flake assemblage, and ca. 75% when not taking into account cortical blanks.

Surface cortex placement & location

In total, non-cortical items are ca. 1.7 – 1.9 more frequent than cortical ones (Table 9-5). Taken together, 351 non-cortical and 181 cortical flakes comprise ca. 54.1% of the whole sample of 984 flakes. Accordingly, the remaining 452 flakes are covered partially by cortex. Of all 14 cortex placement types, around two thirds can be affiliated to just two types: lateral and distal, with the former slightly more numerous than the latter. Two further types (central and proximal) are much less frequent, but occur in similar amounts, between ca. 6 – 8%, respectively. All remaining types are complex variations of lateral and distal types, whereby only two are of any

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Complete	73 / 53.7%	95 / 55.9%	87 / 62.6%	101 / 62.0%	57 / 58.8%	67 / 58.8%	27 / 51.9%	29 / 46.0%
Broken length	47 / 34.5%	56 / 32.9%	27 / 19.4%	35 / 21.5%	21 / 21.6%	28 / 24.5%	20 / 38.5%	27 / 42.9%
Broken width	6 / 4.4%	8 / 4.7%	10 / 7.2%	10 / 6.1%	10 / 10.3%	10 / 8.8%	3 / 5.8%	4 / 6.3%
Broken both	10 / 7.4%	11 / 6.5%	15 / 10.8%	17 / 10.4%	9 / 9.3%	9 / 7.9%	2 / 3.8%	3 / 4.8%
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A		Total	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Complete	117 / 69.6%	135 / 67.5%	148 / 67.9%	184 / 67.2%	509 / 62.8%	611 / 62.1%
Broken length	40 / 23.8%	50 / 25.0%	55 / 25.2%	72 / 26.3%	210 / 25.9%	268 / 27.2%
Broken width	7 / 4.2%	11 / 5.5%	10 / 4.6%	13 / 4.7%	46 / 5.7%	56 / 5.7%
Broken both	4 / 2.4%	4 / 2.0%	5 / 2.3%	5 / 1.8%	45 / 5.6%	49 / 5.0%
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-3 Kabazi V, Unit III/3: flake conditions as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Cortical	26 / 20.6%	30 / 19.1%	31 / 25.2%	31 / 21.7%	20 / 22.0%	21 / 20.0%	13 / 28.3%	13 / 25.5%
Radial	4 / 3.2%	5 / 3.2%	1 / 0.8%	3 / 2.1%	–	1 / 1.0%	1 / 2.2%	1 / 2.0%
Converging	6 / 4.8%	10 / 6.4%	8 / 6.5%	10 / 7.0%	9 / 9.9%	9 / 8.6%	4 / 8.7%	4 / 7.8%
Lateral	7 / 5.6%	8 / 5.1%	9 / 7.3%	10 / 7.0%	3 / 3.3%	3 / 2.8%	5 / 10.9%	5 / 9.8%
Bilateral	1 / 0.8%	1 / 0.6%	–	–	–	–	–	–
Unidirectional	41 / 32.5%	52 / 33.2%	45 / 36.6%	54 / 37.7%	32 / 35.2%	36 / 34.3%	16 / 34.7%	20 / 39.2%
Unidirectional-crossed	17 / 13.5%	23 / 14.6%	16 / 13.0%	19 / 13.3%	11 / 12.1%	16 / 15.2%	3 / 6.5%	4 / 7.8%
3-directional	8 / 6.3%	11 / 7.0%	5 / 4.1%	8 / 5.6%	6 / 6.5%	8 / 7.6%	2 / 4.3%	2 / 3.9%
Bi-directional	7 / 5.6%	8 / 5.1%	3 / 2.4%	3 / 2.1%	5 / 5.5%	5 / 4.8%	1 / 2.2%	1 / 2.0%
Crested	9 / 7.1%	9 / 5.7%	5 / 4.1%	5 / 3.5%	5 / 5.5%	6 / 5.7%	1 / 2.2%	1 / 2.0%
Unidentifiable	10 / -	13 / -	16 / -	20 / -	6 / -	9 / -	6 / -	12 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A		Total	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Cortical	32 / 19.8%	40 / 20.9%	40 / 19.2%	44 / 17.2%	162 / 21.4%	179 / 19.8%
Radial	1 / 0.6%	2 / 1.0%	3 / 1.4%	3 / 1.2%	10 / 1.3%	15 / 1.7%
Converging	19 / 11.7%	20 / 10.5%	21 / 10.1%	27 / 10.5%	67 / 8.9%	80 / 8.9%
Lateral	8 / 4.9%	9 / 4.7%	12 / 5.8%	12 / 4.7%	44 / 5.8%	47 / 5.2%
Bilateral	–	–	1 / 0.5%	1 / 0.4%	2 / 0.3%	2 / 0.2%
Unidirectional	56 / 34.6%	65 / 34.1%	68 / 32.7%	87 / 34.0%	258 / 34.1%	314 / 34.8%
Unidirectional-crossed	22 / 13.6%	26 / 13.6%	38 / 18.3%	49 / 19.1%	107 / 14.2%	137 / 15.2%
3-directional	8 / 4.9%	9 / 4.7%	2 / 1.0%	3 / 1.2%	31 / 4.1%	41 / 4.5%
Bi-directional	9 / 5.6%	11 / 5.8%	14 / 6.7%	21 / 8.2%	39 / 5.1%	49 / 5.4%
Crested	7 / 4.3%	9 / 4.7%	9 / 4.3%	9 / 3.5%	36 / 4.8%	39 / 4.3%
Unidentifiable	6 / -	9 / -	10 / -	18 / -	54 / -	81 / -
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-4 Kabazi V, sub-unit III/3: flake dorsal scar patterns as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Non-cortical	47 / -	62 / -	52 / -	65 / -	30 / -	37 / -	11 / -	16 / -
Cortical	26 / -	30 / -	31 / -	31 / -	20 / -	21 / -	14 / -	14 / -
Central	7 / 11.1%	8 / 10.2%	3 / 5.3%	6 / 8.9%	6 / 12.8%	6 / 12.8%	2 / 7.4%	4 / 12.1%
Proximal	5 / 7.9%	7 / 9.0%	1 / 1.8%	1 / 1.5%	3 / 6.4%	5 / 8.9%	1 / 3.7%	2 / 6.1%
Distal	20 / 31.7%	23 / 29.4%	24 / 42.9%	27 / 40.3%	14 / 29.8%	15 / 26.8%	7 / 25.9%	7 / 21.2%
Distal + Proximal	1 / 1.6%	1 / 1.3%	1 / 1.8%	1 / 1.5%	–	–	–	–
Lateral	17 / 27.0%	24 / 30.7%	15 / 26.9%	18 / 26.9%	12 / 25.5%	17 / 30.4%	15 / 55.6%	16 / 48.5%
Bilateral	–	–	3 / 5.3%	3 / 4.5%	–	1 / 1.8%	–	–
Bilateral + Central	1 / 1.6%	1 / 1.3%	–	–	–	–	–	–
Lateral + Central	1 / 1.6%	2 / 2.6%	–	1 / 1.5%	2 / 4.2%	2 / 3.6%	1 / 3.7%	1 / 3.0%
Lateral + Distal	6 / 9.5%	6 / 7.7%	5 / 8.9%	6 / 8.9%	6 / 12.8%	6 / 10.7%	1 / 3.7%	2 / 6.1%
Lateral + Proximal	2 / 3.2%	2 / 2.6%	3 / 5.3%	3 / 4.5%	3 / 6.4%	3 / 5.3%	–	–
Central + Distal	2 / 3.2%	2 / 2.6%	1 / 1.8%	1 / 1.5%	–	–	–	–
Bilateral + Proximal	1 / 1.6%	1 / 1.3%	–	–	1 / 2.1%	1 / 1.8%	–	–
Proximal + Central	–	1 / 1.3%	–	–	–	–	–	1 / 3.0%
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Non-cortical	64 / -	75 / -	67 / -	96 / -	271 / -	351 / -
Cortical	33 / -	41 / -	40 / -	44 / -	164 / -	181 / -
Central	2 / 2.8%	3 / 3.6%	5 / 4.5%	9 / 6.7%	25 / 6.6%	36 / 8.0%
Proximal	6 / 8.5%	8 / 9.5%	6 / 5.4%	11 / 8.2%	22 / 5.9%	34 / 7.5%
Distal	24 / 33.8%	25 / 29.8%	34 / 30.6%	38 / 28.4%	123 / 32.8%	135 / 29.9%
Distal + Proximal	2 / 2.8%	2 / 2.4%	2 / 1.8%	2 / 1.5%	6 / 1.6%	6 / 1.3%
Lateral	28 / 39.5%	32 / 38.0	43 / 38.8%	51 / 38.2%	130 / 34.7%	158 / 35.0%
Bilateral	–	–	2 / 1.8%	2 / 1.5%	5 / 1.3%	6 / 1.3%
Bilateral + Central	–	–	–	–	1 / 0.3%	1 / 0.2%
Lateral + Central	2 / 2.8%	3 / 3.6%	7 / 6.3%	7 / 5.2%	13 / 3.5%	16 / 3.5%
Lateral + Distal	4 / 5.6%	5 / 5.9%	7 / 6.3%	9 / 6.7%	29 / 7.7%	34 / 7.5%
Lateral + Proximal	1 / 1.4%	3 / 3.6%	3 / 2.7%	3 / 2.2%	12 / 3.2%	14 / 3.1%
Central + Distal	–	1 / 1.2%	–	–	3 / 0.8%	4 / 0.9%
Bilateral + Proximal	–	–	1 / 0.9%	1 / 0.7%	3 / 0.8%	3 / 0.7%
Proximal + Central	2 / 2.8%	2 / 2.4%	1 / 0.9%	1 / 0.7%	3 / 0.8%	5 / 1.1%
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-5 Kabazi V, sub-unit III/3: flake cortex placement as numbers and percentages of each type.

particular relevance, the lateral + distal type, and lateral + central type make up ca. 7.5% and ca. 3.5% of the total amount, respectively. This cortex data are a good indication for the presence of regular parallel reduction in the core assemblage, e.g. many flakes with lateral cortex. At the same time, fewer flakes with distal cortex might be indicative of more complex processes applied during the preparation and re-preparation of cores.

Cortex surface area data (Table 9-6) are characterised by very stable indices for only unretouched flakes and the sample with added retouched flakes. Accordingly, the area of a flake covered by cortex was not an important factor when selecting flakes for tool processing, although the most numerically representative sample is related to flakes with a minor occurrence of cortex (1 – 25% coverage) which make up ca. 40%, but at the same time, the number of cortical flakes (> 75% coverage) is quite high – ca. 28 – 30%.

Shape & axis

The shape of individual flakes could be identified in 707 cases (Table 9-7). Here, trapezoidal flakes are the predominant type, comprising ca. 31 – 33% of the total. If we were to add to these number flakes of elongated trapezoidal shape, generally trapezoidal flakes would make up together ca. 41% of all

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
1 - 25%	33 / 37.1%	41 / 38.0%	31 / 35.6%	39 / 39.8%	25 / 37.3%	32 / 41.5%	14 / 34.1%	18 / 38.3%
26 - 50%	18 / 20.2%	23 / 21.3%	17 / 19.6%	19 / 19.4%	12 / 17.9%	14 / 18.2%	8 / 19.5%	10 / 21.3%
51 - 75%	12 / 13.5%	14 / 13.0%	8 / 9.2%	9 / 9.2%	10 / 14.9%	10 / 13.0%	5 / 12.3%	5 / 10.6%
> 75%	26 / 29.2%	30 / 27.7%	31 / 35.6%	31 / 31.6%	20 / 29.9%	21 / 27.3%	14 / 34.1%	14 / 29.8%
non-cortical	47 / -	62 / -	52 / -	65 / -	30 / -	37 / -	11 / -	16 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
1 - 25%	41 / 39.5%	50 / 40.0%	66 / 43.7%	82 / 46.0%	210 / 39.0%	262 / 41.4%
26 - 50%	23 / 22.1%	25 / 20.0%	29 / 19.2%	35 / 19.7%	107 / 19.8%	126 / 19.9%
51 - 75%	7 / 6.7%	9 / 7.2%	16 / 10.6%	17 / 9.6%	58 / 10.8%	64 / 10.1%
> 75%	33 / 31.7%	41 / 32.8%	40 / 26.5%	44 / 24.7%	164 / 30.4%	181 / 28.6%
non-cortical	64 / -	75 / -	67 / -	96 / -	271 / -	351 / -
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-6 Kabazi V, sub-unit III/3: flake cortex surface area as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Ovoid	14 / 14.7%	18 / 15.1%	14 / 14.3%	19 / 16.7%	6 / 8.6%	9 / 11.2%	7 / 21.2%	9 / 25.7%
Triangular	5 / 5.3%	5 / 4.2%	12 / 12.2%	12 / 10.5%	7 / 10.0%	8 / 10.0%	2 / 6.1%	2 / 5.7%
Rectangular	7 / 7.4%	10 / 8.4%	5 / 5.1%	5 / 4.4%	7 / 10.0%	9 / 11.2%	1 / 3.0%	1 / 2.9%
Trapezoidal	35 / 36.8%	41 / 34.5%	35 / 35.8%	41 / 35.9%	21 / 30.0%	22 / 27.5%	8 / 24.2%	8 / 22.9%
Trapezoidal elongated	7 / 7.4%	11 / 9.2%	7 / 7.1%	9 / 7.9%	9 / 12.8%	10 / 12.5%	2 / 6.1%	2 / 5.7%
Leaf shaped	–	–	1 / 1.0%	1 / 0.9%	–	–	–	–
Crescent	3 / 3.1%	4 / 3.4%	9 / 9.2%	10 / 8.8%	3 / 4.3%	3 / 3.8%	2 / 6.1%	2 / 5.7%
Irregular	24 / 25.3%	30 / 25.2%	15 / 15.3%	17 / 14.9%	17 / 24.3%	19 / 23.8%	11 / 33.3%	11 / 31.4%
Unidentifiable	41 / -	51 / -	41 / -	49 / -	27 / -	34 / -	19 / -	28 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Ovoid	22 / 16.9%	28 / 18.4%	11 / 6.4%	17 / 8.2%	74 / 12.4%	100 / 14.1%
Triangular	7 / 5.4%	8 / 5.3%	12 / 7.0%	16 / 7.7%	45 / 7.5%	51 / 7.2%
Rectangular	2 / 1.5%	5 / 3.3%	14 / 8.2%	16 / 7.7%	36 / 6.0%	46 / 6.5%
Trapezoidal	35 / 26.9%	41 / 27.0%	60 / 35.1%	67 / 32.4%	194 / 32.5%	220 / 31.2%
Trapezoidal elongated	12 / 9.2%	12 / 7.9%	14 / 8.2%	20 / 9.7%	51 / 8.6%	64 / 9.1%
Leaf shaped	–	–	–	–	1 / 0.2%	1 / 0.1%
Crescent	14 / 10.8%	16 / 10.5%	6 / 3.5%	9 / 4.3%	37 / 6.2%	44 / 6.2%
Irregular	38 / 29.3%	42 / 27.6%	54 / 31.6%	62 / 30.0%	159 / 26.6%	181 / 25.6%
Unidentifiable	38 / -	48 / -	47 / -	67 / -	213 / -	277 / -
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-7 Kabazi V, sub-unit III/3: flake shapes as numbers and percentages of each type.

pieces. Irregular flakes are the second most common type of flakes, constituting ca. 25 – 27% of the overall amount. These are followed by ovoid flakes (in average ca. 12 – 14% of the total) which, taking into account the already observed rarity of items with radial dorsal scar pattern, is quite notable.

Regarding the axis data, which was identified for a total of 730 artefacts (Table 9-8), it is worth noting a prevalence of off-axis pieces over on-axis pieces for the entire sample from Sub-Unit III/3. On one hand, this is in a good accordance with a dominance of different trapezoidal and irregular flakes. On the other hand, the noted prevalence of off-axis flakes is characteristic for five levels, and only flakes from the uppermost level III/3-1 contain more on-axis items. There is also a general tendency, however, towards the selection of on-axis flakes for tool production.

	III/3-1		**III/3-1A**		**III/3-2**		**III/3-2A**	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
On-axis	59 / 61.5%	75 / 61.5%	35 / 34.0%	42 / 34.7%	28 / 40%	33 / 40.2%	11 / 32.3%	13 / 35.1%
Off-axis	37 / 38.5%	47 / 38.5%	68 / 66.0%	79 / 65.3%	42 / 60%	49 / 59.8%	23 / 67.7%	24 / 64.9%
Unidentifiable	40 / -	48 / -	36 / -	42 / -	27 / -	32 / -	18 / -	26 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		**III/3-3A**		**Total:**	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
On-axis	52 / 38.5%	64 / 40.5%	63 / 37.3%	86 / 40.9%	248 / 40.9%	313 / 42.9%
Off-axis	83 / 61.5%	94 / 59.5%	106 / 62.7%	124 / 59.1%	359 / 59.1%	417 / 57.1%
Unidentifiable	33 / -	42 / -	49 / -	64 / -	203 / -	254 / -
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-8 Kabazi V, sub-unit III/3: flake axis as numbers and percentages of each type.

	III/3-1		**III/3-1A**		**III/3-2**		**III/3-2A**	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Flat	24 / 20.7%	30 / 21.1%	27 / 24.8%	33 / 26.2%	23 / 29.9%	27 / 30.3%	6 / 17.1%	8 / 20.0%
Convex	10 / 8.6%	11 / 7.7%	9 / 8.2%	9 / 7.1%	4 / 5.2%	4 / 4.5%	3 / 8.6%	3 / 7.5%
Incurvate medial	54 / 46.6%	64 / 45.1%	45 / 41.3%	51 / 40.5%	32 / 41.5%	38 / 42.8%	14 / 40.0%	17 / 42.5%
Incurvate distal	16 / 13.8%	21 / 14.8%	17 / 15.6%	19 / 15.1%	5 / 6.5%	6 / 6.7%	4 / 11.4%	4 / 10.0%
Twisted	12 / 10.3%	16 / 11.3%	11 / 10.1%	14 / 11.1%	13 / 16.9%	14 / 15.7%	8 / 22.9%	8 / 20.0%
Unidentifiable	20 / -	28 / -	30 / -	37 / -	20 / -	25 / -	17 / -	23 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		**III/3-3A**		**Total:**	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Flat	24 / 16.9%	32 / 19.0%	62 / 34.6%	73 / 32.7%	166 / 25.2%	203 / 25.8%
Convex	12 / 8.5%	12 / 7.1%	7 / 3.9%	7 / 3.1%	45 / 6.8%	46 / 5.8%
Incurvate medial	57 / 40.1%	73 / 43.5%	67 / 37.5%	91 / 40.9%	269 / 40.9%	334 / 42.4%
Incurvate distal	20 / 14.1%	22 / 13.1%	20 / 11.2%	23 / 10.3%	82 / 12.5%	95 / 12.0%
Twisted	29 / 20.4%	29 / 17.3%	23 / 12.8%	29 / 13.0%	96 / 14.6%	110 / 14.0%
Unidentifiable	26 / -	32 / -	39 / -	51 / -	152 / -	196 / -
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-9 Kabazi V, sub-unit III/3: flake general profiles as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A		III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Feathering	58 / 60.4%	68 / 59.6%	65 / 60.2%	71 / 60.2%	35 / 53.1%	41 / 53.9%	24 / 60.0%	25 / 59.5%	73 / 55.3%	81 / 54.8%	97 / 53.3%	108 / 53.0%	352 / 56.4%	394 / 56.1%
Hinged	27 / 28.1%	31 / 27.2%	30 / 27.8%	32 / 27.1%	22 / 33.3%	23 / 30.3%	9 / 22.5%	10 / 23.8%	38 / 28.8%	44 / 29.7%	53 / 29.1%	58 / 28.4%	179 / 28.7%	198 / 28.2%
Blunt	11 / 11.5%	15 / 13.2%	10 / 9.2%	12 / 10.2%	7 / 10.6%	10 / 13.2%	7 / 17.5%	7 / 16.7%	17 / 12.9%	19 / 12.8%	31 / 17.0%	37 / 18.1%	83 / 13.3%	100 / 14.3%
Overpassed	–	–	3 / 2.8%	3 / 2.5%	2 / 3.0%	2 / 2.6%	–	–	4 / 3.0%	4 / 2.7%	1 / 0.6%	1 / 0.5%	10 / 1.6%	10 / 1.4%
Missing by retouch	–	10 / -	–	9 / -	–	3 / -	–	2 / -	–	10 / -	–	23 / -	–	57 / -
Unidentifiable	40 / -	46 / -	31 / -	36 / -	31 / -	35 / -	12 / -	19 / -	36 / -	42 / -	36 / -	47 / -	186 / -	225 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-10 Kabazi V, sub-unit III/3: flake profiles at distal end as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A		III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Triangular	18 / 14.7%	22 / 14.5%	20 / 17.7%	21 / 15.9%	18 / 20.9%	19 / 19.0%	7 / 15.6%	9 / 17.6%	20 / 12.6%	24 / 12.7%	29 / 14.3%	37 / 14.8%	112 / 15.4%	132 / 15.1%
Trapezoidal	25 / 20.3%	32 / 21.1%	14 / 12.4%	19 / 14.4%	9 / 10.5%	12 / 12.0%	9 / 20.0%	11 / 21.6%	27 / 17.0%	31 / 16.4%	32 / 15.8%	41 / 16.4%	116 / 15.9%	146 / 16.7%
Multifaceted	20 / 16.3%	20 / 13.1%	17 / 15.0%	24 / 18.2%	10 / 11.6%	13 / 13.0%	5 / 11.1%	5 / 9.8%	22 / 13.8%	25 / 13.2%	27 / 13.3%	35 / 14.0%	101 / 13.8%	122 / 13.9%
Lateral steep	8 / 6.5%	9 / 5.9%	9 / 8.0%	9 / 6.8%	7 / 8.1%	8 / 8.0%	3 / 6.7%	3 / 5.9%	12 / 7.5%	16 / 8.5%	18 / 8.9%	23 / 9.2%	57 / 7.8%	68 / 7.8%
Convex	19 / 15.4%	22 / 14.5%	10 / 8.8%	10 / 7.6%	11 / 12.8%	12 / 12.0%	7 / 15.6%	7 / 13.7%	27 / 17.0%	31 / 16.4%	30 / 14.8%	34 / 13.6%	104 / 14.3%	116 / 13.3%
Flat	8 / 6.5%	10 / 6.6%	21 / 18.6%	21 / 15.9%	6 / 7.0%	6 / 6.0%	6 / 13.3%	6 / 11.8%	14 / 8.8%	17 / 9.0%	10 / 4.9%	10 / 4.0%	65 / 8.9%	70 / 8.0%
Irregular	25 / 20.3%	37 / 24.3%	22 / 19.5%	28 / 21.2%	25 / 29.1%	30 / 30.0%	8 / 17.7%	10 / 19.6%	37 / 23.3%	45 / 23.8%	57 / 28.0%	70 / 28.0%	174 / 23.9%	220 / 25.2%
Unidentifiable	13 / -	18 / -	26 / -	31 / -	11 / -	14 / -	7 / -	12 / -	9 / -	11 / -	15 / -	24 / -	81 / -	110 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-11 Kabazi V, sub-unit III/3: flake profiles at midpoint as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Cortex	15 / 18.5%	19 / 18.4%	12 / 13.3%	12 / 11.5%	7 / 11.3%	7 / 9.5%	–	–
Plain	29 / 35.9%	34 / 33.0%	42 / 46.7%	43 / 41.4%	30 / 48.5%	32 / 43.2%	10 / 50.0%	12 / 44.5%
Punctiform	1 / 1.2%	1 / 1.0%	–	–	–	–	1 / 5.0%	1 / 3.7%
Dihedral	3 / 3.7%	4 / 3.9%	13 / 14.4%	15 / 14.4%	8 / 12.9%	8 / 10.8%	3 / 15.0%	4 / 14.8%
Crude-multifaceted	19 / 23.5%	23 / 22.3%	15 / 16.7%	18 / 17.3%	11 / 17.7%	15 / 20.3%	6 / 30.0%	8 / 29.6%
Faceted straight	4 / 4.9%	5 / 4.9%	3 / 3.3%	3 / 2.9%	3 / 4.8%	6 / 8.1%	–	–
Faceted convex	10 / 12.3%	17 / 16.5%	5 / 5.6%	13 / 12.5%	3 / 4.8%	6 / 8.1%	–	2 / 7.4%
Missing by retouch	–	1 / -	–	–	–	1 / -	–	–
Crushed	20 / -	23 / -	17 / -	19 / -	18 / -	18 / -	11 / -	11 / -
Missing	35 / -	43 / -	32 / -	40 / -	17 / -	21 / -	21 / -	25 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Cortex	19 / 17.0%	19 / 14.3%	17 / 13.2%	19 / 11.4%	70 / 14.2%	76 / 12.5%
Plain	50 / 44.7%	58 / 43.6%	57 / 44.1%	68 / 40.6%	218 / 44.1%	247 / 40.6%
Punctiform	1 / 0.9%	2 / 1.5%	–	–	3 / 0.6%	4 / 0.6%
Dihedral	8 / 7.1%	9 / 6.8%	9 / 7.0%	12 / 7.2%	44 / 8.9%	52 / 8.6%
Crude-multifaceted	23 / 20.5%	29 / 21.8%	19 / 14.7%	25 / 15.0%	93 / 18.8%	118 / 19.4%
Faceted straight	3 / 2.7%	4 / 3.0%	9 / 7.0%	13 / 7.8%	22 / 4.5%	31 / 5.1%
Faceted convex	8 / 7.1%	12 / 9.0%	18 / 14.0%	30 / 18.0%	44 / 8.9%	80 / 13.2%
Missing by retouch	–	1 / -	–	2 / -	–	5 / -
Crushed	25 / -	27 / -	42 / -	47 / -	133 / -	145 / -
Missing	31 / -	39 / -	47 / -	58 / -	183 / -	226 / -
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-12 Kabazi V, sub-unit III/3: flake butt types as numbers and percentages of each type.

General profiles

In total, the general profile of 788 flakes could be identified (Table 9-9). The basic characteristic of this attribute is the poor sample of twisted flakes – on average only ca. 14 – 15%, though there is a marked deviation of between 10 and 23% in all levels. At the same time, the rarity of convex profiles (ca. 3 – 9% for different levels) indicates a rather good reduction control. That is, the convex profiles are of occasional character and mostly originated during final exploitation of the core.

Profiles at distal end

Among 759 flakes (Table 9-10) an average of ca. 56% display feathered profiles at their distal ends. Hinged distal ends make up an average of ca. 29%, or fluctuate between 22 and 33% in any given level. This is in stark contrast to the rare occurrence of convex general profiles as observed above. This might mean that only distal terminations of flakes mostly hinged, and this did not lead to a dramatic change of their general profiles. This hypothesis also finds some substantiation in the rare frequency of overpassed distal ends which occur on average only in ca. 1.5%, and in any given level from 0 to just 3% of cases. Blunt flakes occur in a moderate number, ca. 13 – 14% on average. Therefore, generally speaking, these data are indicative of well controlled primary flaking processes at the site.

Profiles at midpoint

For 874 definable flakes (Table 9-11), there is only one type of profile at midpoint of any significance. The "irregular type" makes up near to ca. 25% of the total. All remaining six types are, however, insignificant. The combined data for trapezoidal and multifaceted types (indicators of an intensive and regular core reduction) constitute no more than 30%.

Platform preparation, lipping & angle

There are 608 flakes with identifiable butts (Table 9-12). Butts can be grouped into 3 basic categories

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Not lipped	25 / 30.9%	30 / 29.4%	14 / 15.4%	18 / 17.3%	18 / 30.5%	22 / 31.0%	1 / 5.0%	3 / 11.1%
Lipped	3 / 3.7%	4 / 3.9%	2 / 2.2%	4 / 3.8%	1 / 1.7%	1 / 1.4%	–	–
Semi-lipped	53 / 65.4%	68 / 66.7%	75 / 82.4%	82 / 78.9%	40 / 67.8%	48 / 67.6%	19 / 95.0%	24 / 88.9%
Unidentifiable	55 / -	68 / -	48 / -	59 / -	38 / -	43 / -	32 / -	36 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Not lipped	14 / 12.6%	20 / 15.5%	48 / 37.2%	58 / 34.9%	120 / 24.4%	151 / 25.2%
Lipped	3 / 2.7%	3 / 2.3%	2 / 1.6%	3 / 1.8%	11 / 2.3%	15 / 2.5%
Semi-lipped	94 / 84.7%	106 / 82.2%	79 / 61.2%	105 / 63.3%	360 / 73.3%	433 / 72.3%
Unidentifiable	57 / -	71 / -	89 / -	108 / -	319 / -	385 / -
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-13 Kabazi V, sub-unit III/3: flake butt lipping as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Right	69 / 85.2%	85 / 83.3%	81 / 89.0%	91 / 87.5%	52 / 88.1%	63 / 88.7%	16 / 80.0%	23 / 85.2%
Acute	12 / 14.8%	17 / 16.7%	10 / 11.0%	13 / 12.5%	7 / 11.9%	8 / 11.3%	4 / 20.0%	4 / 14.8%
Unidentifiable	55 / -	68 / -	48 / -	59 / -	38 / -	43 / -	32 / -	36 / -
Total:	**136**	**170**	**139**	**163**	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Right	95 / 85.6%	113 / 87.6%	114 / 89.1%	146 / 88.6%	427 / 87.1%	521 / 87.1%
Acute	16 / 14.4%	16 / 12.4%	14 / 10.9%	19 / 11.4%	63 / 12.9%	77 / 12.9%
Unidentifiable	57 / -	71 / -	90 / -	109 / -	320 / -	386 / -
Total:	**168**	**200**	**218**	**274**	**810**	**984**

Table 9-14 Kabazi V, sub-unit III/3: flake butt angles as numbers and percentages of each type.

which are as follows: unprepared butts, roughly treated butts, and proper faceted butts. Unprepared butts (cortical, plain, punctiform) predominate, – comprising on average 58.9% of butts on unretouched flakes, and 53.7% of the total sample on tool blanks. With respect to these types of butt two important points should be noted. First, the index decreases with added tool blanks, and second, very few flakes have punctiform butts (3 – 4 pieces / 0.6 %!). Roughly treated butts (dihedral and crudely-multifaceted) occur in moderate and stable frequencies – 27.7% for unretouched flakes and 28.0% for all flakes including tool blanks. Finally, finely faceted butts (straight and convex faceted items) show an increasing tendency from just flakes, to unretouched flakes and tools on flakes taken together – 13.4% and 18.3%, respectively. Accordingly, faceting indices are as follows: IFl = 41.1% and IFst = 13.4% for unretouched flakes, and IFl = 46.3% and IFst = 18.3% for the total flake sample. Thus, we can reasonably state an obvious selection of flakes with finely, and especially convex, varieties of faceted butts for subsequent retouching processes.

Lipping data for 599 butts (Table 9-13) show, with some minor deviations, a pattern where almost three quarters of butts are semi-lipped, and about one quarter have no lip. On the other hand, lipped butts, that are practically direct evidence of bifacial tool production and rejuvenation, are known through a few pieces in each level, although they are absent in level III/3-2A. Respectively, there is very little evidence at all for a Micoquian admixture in WCM levels in sub-unit III/3 through this very important morphological attribute.

Indices for the angles observed on 598 butts (Table 9-14) show that, on average, ca. 13% of butts are characterised by acute angles and ca. 87% by right angles. The index for acute angles is not high and therefore not indicative of a great Micoquian influence.

Returning once more to lipped butts with acute angles in the flake assemblage, it is worth noting a case of such a butt from a core trimming flake from level III/3-3A. This again points to a mainly WCM technology in sub-unit III/3 artefacts.

Butt Sizes

For a sample of 587 butts (Tables 9-15 and 9-16) there is clear pattern for each level, with a clear prevalence of flakes with wider butts for tool production: on average, from 1.70 cm for unretouched flakes to 1.75 cm for the combined flake sample with tool blanks. This pattern is not so obvious at all among butt thickness indices – on average “a drift” from 0.57 cm to 0.58 cm for the respective flake samples. This might indicate that flakes from sub-unit III/3 are not characterised by thick butts.

Flake Dimensions

A total sample of 611 complete flakes was used for flake dimension determinations (Tables 9-17, 9-18 and 9-19). Again, a tendency is observed, this time in all levels of Sub-Unit III/3, for tool processing selection of those flakes with longer and wider metrical data. Average dimensions of unretouched flakes and of the combined flake sample including tool blanks is as follows: length fluctuates between 3.38 and 3.56 cm (Table 9-17); width ranges from 3.23 to 3.32 cm (Table 9-18); and flakes are on average 0.80 to 0.83 cm thick (Table 9-19).

	III/3-1		**III/3-1A**	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	1.72 cm for 80 pieces	1.75 cm for 100 pieces	1.78 cm for 85 pieces	1.85 cm for 98 pieces
Unidentifiable	56	70	54	65
Total:	**136**	**170**	**139**	**163**

	III/3-2		**III/3-2A**	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	1.66 cm for 56 pieces	1.69 cm for 67 pieces	1.75 cm for 20 pieces	1.83 cm for 27 pieces
Unidentifiable	41	47	32	36
Total:	**97**	**114**	**52**	**63**

	III/3-3		**III/3-3A**	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	1.72 cm for 109 pieces	1.76 cm for 127 pieces	1.67 cm for 130 pieces	1.73 cm for 168 pieces
Unidentifiable	59	73	88	106
Total:	**168**	**200**	**218**	**274**

	Total:	
	Flakes	Flakes & Flake Tools
Definable	1.70 cm for 480 pieces	1.75 cm for 587 pieces
Unidentifiable	328	397
Total:	**810**	**984**

Table 9-15 Kabazi V, sub-unit III/3: flake butt width as numbers and average indices.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.62 cm for 80 pieces	0.61 cm for 100 pieces	0.59 cm for 85 pieces	0.60 cm for 98 pieces
Unidentifiable	56	70	54	65
Total:	**136**	**170**	**139**	**163**

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.57 cm for 56 pieces	0.58 cm for 67 pieces	0.46 cm for 20 pieces	0.55 cm for 27 pieces
Unidentifiable	41	47	32	36
Total:	**97**	**114**	**52**	**63**

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.60 cm for 109 pieces	0.61 cm for 127 pieces	0.53 cm for 130 pieces	0.55 cm for 168 pieces
Unidentifiable	59	73	88	106
Total:	**168**	**200**	**218**	**274**

	Total:	
	Flakes	Flakes & Flake Tools
Definable	0.57 cm for 480 pieces	0.58 cm for 587 pieces
Unidentifiable	328	397
Total:	**810**	**984**

Table 9-16 Kabazi V, sub-unit III/3: flake butt thickness as numbers and average indices.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	3.21 cm for 73 pieces	3.38 cm for 95 pieces	3.25 cm for 87 pieces	3.37 cm for 101 pieces
Transversal Flakes	40 / 54.8%	45 / 47.4%	48 / 55.2%	55 / 54.5%

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	3.55 cm for 57 pieces	3.65 cm for 66 pieces	3.12 cm for 27 pieces	3.30 cm for 29 pieces
Transversal Flakes	19 / 33.3%	21 / 31.8%	13 / 48.1%	13 / 44.8%

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	3.31 cm for 117 pieces	3.50 cm for 136 pieces	3.58 cm for 148 pieces	3.80 cm for 184 pieces
Transversal Flakes	48 / 41.0%	54 / 39.7%	57 / 38.5%	63 / 34.2%

	Total:	
	Flakes	Flakes & Flake Tools
Definable	3.38 cm for 509 pieces	3.56 cm for 611 pieces
Transversal Flakes	225 / 44.2%	251 / 41.1%

Table 9-17 Kabazi V, sub-unit III/3: flake length as numbers and average indices for complete pieces.

At the same time, we should also note that for the production of tools more elongated flakes were usually selected. The pieces with shortened, transversal proportions for unretouched flakes compose 44.2%, while for the combined sample of all flakes, these pieces is slightly lesser – 41.1%. There is also a pronounced pattern in the occurrence of shortened, transversal pieces in different levels of Sub-Unit III/3. These pieces prevail only in the uppermost two levels (III/3-1 and III/3-1A), while the remaining four levels are clearly dominated by rather elongated flakes.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	3.28 cm for 73 pieces	3.34 cm for 95 pieces	3.36 cm for 87 pieces	3.44 cm for 101 pieces
Transversal Flakes	40 / 54.8%	45 / 47.4%	48 / 55.2%	55 / 54.5%

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	3.15 cm for 57 pieces	3.19 cm for 66 pieces	3.20 cm for 27 pieces	3.25 cm for 29 pieces
Transversal Flakes	19 / 33.3%	21 / 31.8%	13 / 48.1%	13 / 44.8%

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	3.18 cm for 117 pieces	3.36 cm for 136 pieces	3.19 cm for 148 pieces	3.25 cm for 184 pieces
Transversal Flakes	48 / 41.0%	54 / 39.7%	57 / 38.5%	63 / 34.2%

	Total	
	Flakes	Flakes & Flake Tools
Definable	3.23 cm for 509 pieces	3.32 cm for 611 pieces
Transversal Flakes	225 / 44.2%	251 / 41.1%

Table 9-18 Kabazi V, sub-unit III/3: flake width as numbers and average indices for complete pieces.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.84 cm for 73 pieces	0.87 cm for 95 pieces	0.87 cm for 87 pieces	0.89 cm for 101 pieces

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.81 cm for 57 pieces	0.83 cm for 66 pieces	0.72 cm for 27 pieces	0.77 cm for 29 pieces

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.84 cm for 117 pieces	0.87 cm for 136 pieces	0.72 cm for 148 pieces	0.76 cm for 184 pieces

	Total:	
	Flakes	Flakes & Flake Tools
Definable	0.80 cm for 509 pieces	0.83 cm for 611 pieces

Table 9-19 Kabazi V, sub-unit III/3: flake thickness as numbers and average indices for complete pieces.

Flakes: some additional notes

In the following, so as to provide a better overview of the composition of the flake assemblages, some of the most indicative morphological types of flake to have been identified in each level of Sub-Unit III/3 are presented. These types can be grouped into three different categories: bifacial treatment pieces, Levallois pieces, and core maintenance products. The respective data, which follows level for level, are given in stratigraphical order and from top to bottom.

Level III/3-1 (16 pieces):
bifacial shaping / thinning flakes (N=2);
Levallois flakes with radial scar pattern (N=1);
Levallois flakes with 3-directional scar pattern (N=3);
Levallois atypical points with converging scar pattern (N=1);
lateral *débordante* (type 2a) (N=1);
lateral crested flakes (type 1) (N=3 + 1);
core trimming elements (N=2);
core tablets (N=2).

Level III/3-1A (17 pieces):
Levallois flakes with radial scar pattern (N=1);
Levallois flakes with 3-directional scar pattern (N=0 + 2) (Fig. 9-4, *1*);
Levallois atypical points with converging scar pattern (N=3 + 1);
lateral *débordante* (type 2) (N=2);
lateral *débordante* (type 2a) (N=1);
lateral crested flakes (type 1) (N=4 + 1);
central crested flakes with unilateral crested ridge (sub-type 2A) (N=1);
secondary crested flakes (N=1).

Level III/3-2 (12 pieces):
Levallois flakes with 3-directional scar pattern (N=1 + 1) (Fig. 9-4, *2*);
Levallois atypical points with converging scar pattern (N=1);
pseudo-Levallois points (N=1);
simple natural lateral *débordante* (type 1) (N=1);
lateral *débordante* (type 2) (N=1);
lateral crested flakes (type 1) (N=2);
central crested flakes with unilateral crested ridge (sub-type 2A) (N=1);
secondary crested flakes (N=1);
core trimming elements (N=2).

Level III/3-2A (3 pieces):
simple natural lateral *débordante* (type 1) (N=1);
lateral crested flakes (type 1) (N=1);
core trimming elements (N=1).

Level III/3-3 (24 pieces):
bifacial shaping / thinning flakes (N=2 + 1);
Levallois flakes with radial scar pattern (N=0 + 1) (Fig. 9-4, *3*);
Levallois flakes with unidirectional-crossed scar pattern (N=1);
Levallois atypical points with converging scar pattern (N=2);
simple natural lateral *débordante* (type 1) (N=7 + 1);
lateral *débordante* (type 2) (N=1);
lateral crested flakes (type 1) (N=4);
secondary crested flakes (N=1);
core trimming elements (N=2);
core tablets (N=1).

Level III/3-3A (31 pieces):
bifacial shaping / thinning flakes (N=2);
Levallois atypical points with converging scar pattern (N=0 + 2);
pseudo-Levallois points (N=1);
simple natural lateral *débordante* (type 1) (N=10 + 2 + 1);
lateral *débordante* (type 2) (N=0 + 1) (Fig. 9-4, *5*);
lateral crested flakes (type 1) (N=6 + 1);
core trimming elements (N=3); core tablets (N=2).

This aforementioned flake sample, which comprises a total 103 pieces, can be broken down as follows:
bifacial treatment pieces (N=7 or 6.9%);
Levallois pieces (N=23 or 21.6%);
core maintenance products (N=73 items or 71.5%).

Bifacial treatment pieces consist of bifacial shaping / thinning flakes (N=7).

Levallois pieces are subdivided into:
Levallois flakes with radial scar pattern (N=4),
Levallois flakes with 3-directional scar pattern (N=6),
Levallois flakes with unidirectional-crossed scar pattern (N=1),
Levallois atypical points with converging scar pattern (N=10),
and pseudo-Levallois points (N=2).

The core maintenance products are represented by:
simple natural lateral *débordante* (type 1) (N=23),
lateral *débordante* (type 2) (N=5),
lateral *débordante* (type 2a) (N=2),
lateral crested flakes (type 1) (N=23),
central crested flakes with unilateral crested ridge (sub-type 2A) (N=2),
secondary crested flakes (N=3),
core trimming elements (N=10),
and core tablets (N=5).

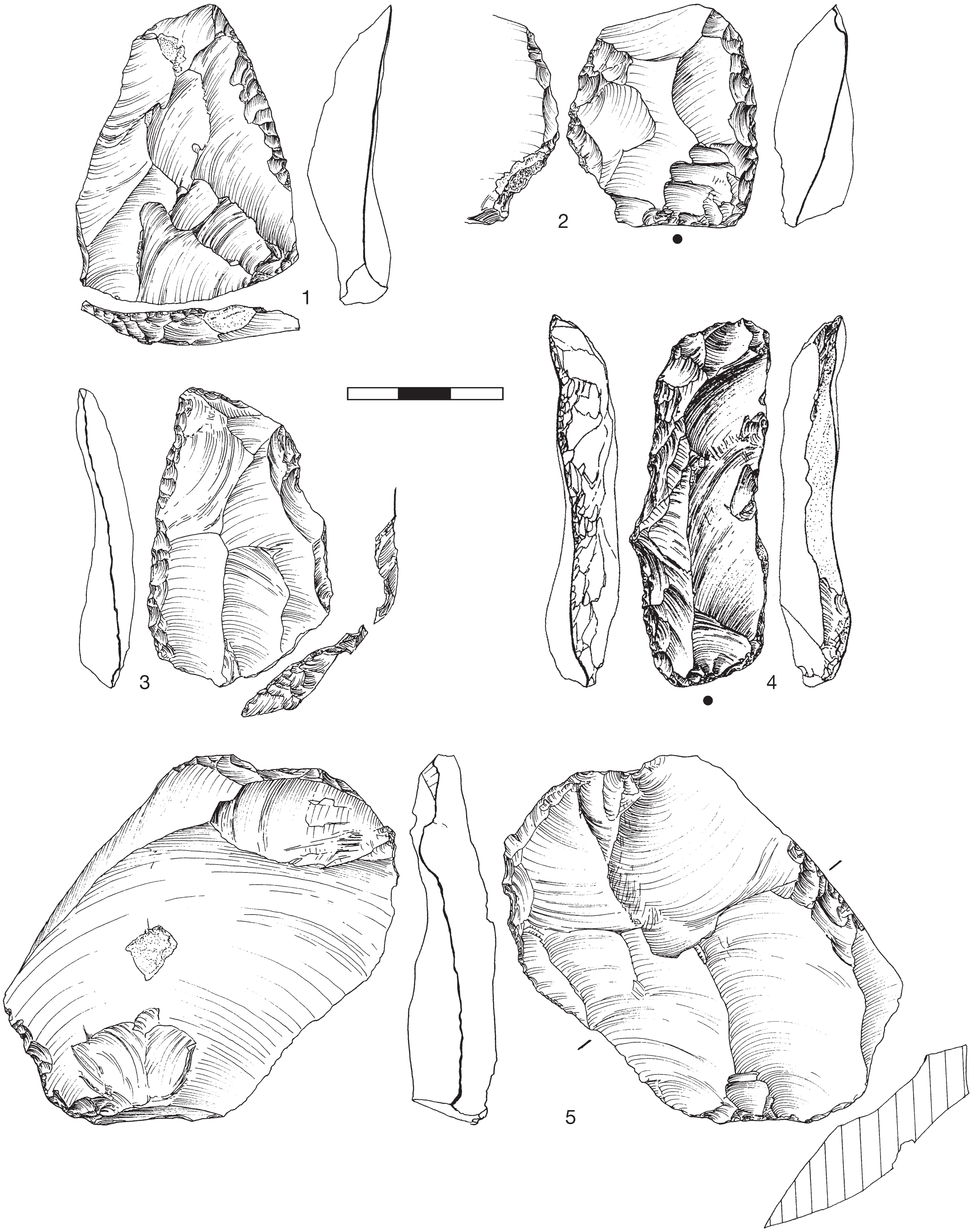

Fig. 9-4 Kabazi V, sub-unit III/3: levels III/3-1A (1); III/3-2 (2); III/3-3 (3); III/3-3A (4-5). Tools: simple convex scraper on Levallois flake with 3-directional scar pattern (1); simple convex scraper with truncated-faceted lateral edge on Levallois flake with 3-directional scar pattern (2); simple convex scraper on Levallois flake with radial scar pattern (3); semi-rectangular scraper, naturally backed on blade simple natural lateral debordante, type 1 (4); retouched flake with irregular retouch on lateral *débordante* flake, type 2 (5).

The following conclusions can be drawn with regard to the occurrence of specific flake type pieces throughout the archaeological sequence of sub-unit III/3.

First, a very minor presence of bifacial shaping / thinning flakes is only noted for the uppermost level III/3-1 and for the two lowermost levels III/3-3 and III/3-3A. This fact can be explained in WCM Sub-Unit III/3 due to admixture from over- und underlying Micoquian occupations (Sub-Units III/2 and III/4). It should also be noted that of all seven bifacial shaping / thinning flakes only one piece was subsequently retouched.

Second, Levallois pieces are characterised by their internal composition and morphological features. Levallois flakes of Levallois centripetal method are the only true Levallois products among the flakes, though numerically they occur only rarely (just 11 pieces from a total of 984 flakes, or 1.1%, from Sub-Unit III/3). Along with this, however, Levallois flakes are only absent in levels III/3-2A and III/3-3A. This absence in level III/3-2A is surely understandable due to the flake sample only comprising 52 items – the smallest flake sample in the whole sequence of sub-unit III/3. On the other hand, their absence in level III/3-3A, this with the most numerous flake sample (218 items) within Sub-Unit III/3, gives cause for concern. We should also note that out of eleven Levallois flakes, five were subsequently retouched. Ten Levallois atypical points were also defined among sub-unit III/3 flakes. Only the sparse flake sample from level III/3-2A is noted for its absence of these Levallois atypical points. This could be an indication of their quite regular occurrence throughout Sub-Unit III/3 levels. Also, three Levallois atypical points are retouched. However, it must be underlined that Levallois points are actually defined here more traditionally than it really reflects any actual purposeful production of Levallois points. The matter is that not one of them is a true Levallois point, they being asymmetrical and irregular, and lacking any sign of triangular configuration. Therefore, it can be stated that Levallois points are only of occasional character, and a coincidental result from a convergent flake resembling a Levallois point. Principally, from a technological perspective, similar conclusions can also be drawn with regard to two pseudo-Levallois points. These pieces, with a rough *déjéte* shape, actually originate from the edge of the flaking surface of a core, and resemble something between a regular flake and a *débordante* piece. Accordingly, at Kabazi V, sub-unit II/3, the pseudo-Levallois points are merely by-products of general parallel core reduction. As such, they should not be related to any radial and/or discoidal core reduction, which, in any case, has not been identified in the sub-unit III/3 archaeological sequence.

Third, the clear numerical dominance of core maintenance products among the specifically defined flakes is also particularly worthy of note. The presence of so many such pieces is suggestive of the existence of a regular and continuous parallel reduction of cores that is a distinct feature of WCM industries. The occurrence of various *débordantes* and lateral crested pieces is an indication of Middle Palaeolithic WCM flake technologies at Kabazi V, Sub-Unit III/3. This conclusion also finds substantiation in the occurrence of only very few Upper Palaeolithic technological features, i.e. rare central crested flakes and core tablets, although the fact that they do occur is also of some significance. However, a closer look at these core maintenance products tells us that they are not representative of true Upper Palaeolithic technological elements. On one hand, the central crested flakes occur only very seldomly, and therefore there are too few pieces in comparison to the much more numerous lateral *débordante* and crested flakes. Further, they display an unilateral crested treatment only. This point is also inferred by the complete absence of re-crested flakes. On the other hand, the five defined core tablets are of so-called initial character, i.e. they were struck from the striking platforms of cores from which only a few flakes had been removed, at least to judge by the removal negatives. Respectively, the core tablet technique was only required for the first steps of parallel reduction, and was not applied regularly during multiple and continuous core reduction, as is well documented among Upper Palaeolithic industries. Finally, let us also mention retouched core maintenance products. There are just eight items with retouch, and all these are *débordantes* and lateral crested flakes, while all the remaining pieces are unretouched CMP types.

Thus, to judge from these specific flakes, it should be acknowledged that there is only a very minor mixture of Micoquian pieces within the flake sample and, at the same time, flakes are fully within the technological frame common to WCM industries.

Blades (Tables 9-20 through 9-36)

The blade sample from all six levels of Sub-Unit III/3 is composed of 296 artefacts which comprise 254 unretouched and 42 retouched pieces. Accordingly, the selection rate for tool selection from blade sample is 7.0, i.e below that noted for flakes (5.7). The total debitage sample in Sub-Unit III/3, including tool blanks, amounts to 1,280 items (984 flakes and 296 blades). Consequently, the blade index (Ilam) is 23.1% for sub-unit III/3. Also, an addition of all debitage pieces used for tool manufacture (174 flakes and 42 blades) leads to a separate blade index for tools of 19.4%.

Condition (Table 9-20)

Blades are characterised by a predominance of complete specimens, on average 57.1% of the total. With the exception of only a very few longitudinally fragmented blades (1.0 – 1.2% of blades are broken latitudinally), all remaining blades are fragmented along their length.

Dorsal scar patterns (Table 9-21)

More than half of all 284 identified blades display unidirectional scar patterns (52.1%). Unidirectional-crossed and converging types are the second and third most frequently occurring scar patterns, with indices of only around 12.0% and 10.0%, respectively. These are followed by cortical and bi-directional types (7.4% and 6.7%, respectively). Generally speaking, other types are represented by single pieces only, with exception of the 3-directional type which occurs in ca. 5% of the 284 pieces. Thus, general parallel core reduction is well attested by dorsal scar pattern types on blades, which taken altogether (unidirectional, unidirectional-crossed, bi-directional and the technologically adjacent convergent type) account for on average ca. 81% of dorsal scar pattern types. At the same time, less than 10% of all blades are cortical/primary blades (7.4%), which is 2.6 times lower than noted previously for cortical flakes (19.6%). Accordingly, we can assume a more intended blade flaking in core reduction than can be supposed for flakes.

Surface cortex (Table 9-22)

There is a dramatic difference between non-cortical and cortical blades within the sub-unit III/3 blade assemblage; this amounts to 5.9 : 1. Also, altogether pieces with no cortex at all and cortical ones account for 49.7% of all blades, which is lower than the respective index among flakes (53.6%). Accordingly, the slightly larger number of more than 50% of partially cortical blades also attests to generally more combined blade and flake reduction during the primary flaking processes. Of the eleven types to have been differentiated on the basis of the extent and position of cortex, the most frequently occurring, on 151 partially cortical blades, is the lateral type with 49.8%, while the distal type, which was almost equally represented among flakes, was observed on just 23.8% of these artefacts. A further important type is the lateral + distal type which is noted on 9.9% of blades. All remaining types are represented with less than 5% each, which accounts for less than ten actual pieces assigned to each of these types. This data is therefore indicative of the role of blades in regular and re-preparation core reduction processes at the site.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Complete	18 / 51.4%	22 / 52.4%	21 / 63.6%	21 / 63.6%	17 / 63.0%	19 / 63.4%	7 / 77.8%	9 / 81.8%
Broken length	17 / 48.6%	20 / 47.6%	12 / 36.4%	12 / 36.4%	9 / 33.3%	10 / 33.3%	2 / 22.2%	2 / 18.2%
Broken width	–	–	–	–	1 / 3.7%	1 / 3.3%	–	–
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Complete	32 / 58.2%	35 / 56.5%	49 / 51.6%	63 / 53.4%	144 / 56.7%	169 / 57.1%
Broken length	23 / 41.8%	27 / 43.5%	44 / 46.3%	53 / 44.9%	107 / 42.1%	124 / 41.9%
Broken width	–	–	2 / 2.1%	2 / 1.7%	3 / 1.2%	3 / 1.0%
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-20 Kabazi V, sub-unit III/3: blade conditions as numbers and percentages of each type.

Cortex surface area data (Table 9-23) are characterised by a clear trend away from blades, with more blades covered by in excess of 25% cortex preferred for tool processing. At the same time, it should also be noted that roughly the same ratio of blades were covered by minor amounts of cortex (1-25% cortex) (ca. 43 – 45%) as was previously the case among the respective flakes (39 – 42%), while cortical items among blades occur less frequently (12 – 13%) than among flakes (28 – 30%). Thus, once again blades appear to have been more carefully "planned" than was the case for flakes.

Shape & axis (Table 9-24)

Among the various shapes observed among 219 blades, no one form proves predominant. Generally speaking, however, the irregular type, with its ca. 29%, is more indicative of technological problems encountered during core reduction than it is of their purposeful production. Leaving aside the irregular pieces, four other shape types (triangular – ca. 24%, rectangular – ca. 18%, trapezoidal – ca. 14%, and crescent – ca. 11%) should be regarded as the most typical shapes among blades.

The axis data of a total of 231 blades were considered (Table 9-25). In the sample from sub-unit III/3, on-axis pieces (ca. 52%) prevail slightly over off-axis pieces (ca. 48%). At the same time, this attribute is marked by some variability within the different levels. The two uppermost levels III/3-1 to III/3-1A and the lowermost level III/3-3A are all characterised by on-axis blades, while in three so-called inner levels (III/3-2, III/3-2A, III/3-3) off-axis blades are dominant. Here again, blade primary reduction was not very stable. It is also worth noting that not many more on-axis pieces were selected for tool production than is encountered among off-axis pieces. This latter observation might indicate the greater importance of longer pieces, whereby main interest would probably have been directed at the length of the lateral edges of these pieces rather than their axis.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Cortical	2 / 6.1%	2 / 5.1%	3 / 9.4%	3 / 9.4%	1 / 3.8%	2 / 7.1%	–	–
Radial	1 / 3.0%	1 / 2.6%	–	–	–	–	–	–
Converging	3 / 9.1%	3 / 7.7%	2 / 6.2%	2 / 6.2%	2 / 7.7%	2 / 7.1%	–	–
Lateral	2 / 6.1%	2 / 5.1%	1 / 3.1%	1 / 3.1%	1 / 3.8%	1 / 3.6%	–	–
Unidirectional	13 / 39.3%	15 / 38.6%	18 / 56.4%	18 / 56.4%	13 / 50.0%	14 / 50.0%	4 / 50%	4 / 40%
Unidirectional-crossed	5 / 15.1%	6 / 15.3%	4 / 12.5%	4 / 12.5%	5 / 19.3%	5 / 17.9%	2 / 25%	4 / 40%
3-directional	1 / 3.0%	1 / 2.6%	3 / 9.4%	3 / 9.4%	1 / 3.8%	1 / 3.6%	2 / 25%	2 / 20%
Bidirectional	4 / 12.1%	6 / 15.3%	1 / 3.1%	1 / 3.1%	2 / 7.7%	2 / 7.1%	–	–
Crested	2 / 6.1%	3 / 7.7%	–	–	1 / 3.8%	1 / 3.6%	–	–
Unidentifiable	2 / -	3 / -	1 / -	1 / -	1 / -	2 / -	1 / -	1 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Cortical	9 / 16.7%	9 / 15.0%	5 / 5.4%	5 / 4.3%	20 / 8.1%	21 / 7.4%
Radial	–	–	–	–	1 / 0.4%	1 / 0.4%
Converging	6 / 11.1%	6 / 10.0%	13 / 14.0%	16 / 13.9%	26 / 10.6%	29 / 10.2%
Lateral	–	–	–	1 / 0.9%	4 / 1.6%	5 / 1.8%
Unidirectional	28 / 52.0%	32 / 53.4%	51 / 54.8%	65 / 56.6%	127 / 51.6%	148 / 52.1%
Unidirectional-crossed	5 / 9.2%	5 / 8.3%	10 / 10.8%	11 / 9.6%	31 / 12.6%	35 / 12.3%
3-directional	1 / 1.8%	2 / 3.3%	3 / 3.2%	5 / 4.3%	11 / 4.5%	14 / 4.9%
Bidirectional	4 / 7.4%	4 / 6.7%	5 / 5.4%	6 / 5.2%	16 / 6.5%	19 / 6.7%
Crested	1 / 1.8%	2 / 3.3%	6 / 6.4%	6 / 5.2%	10 / 4.1%	12 / 4.2%
Unidentifiable	1 / -	2 / -	2 / -	3 / -	8 / -	12 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-21 Kabazi V, sub-unit III/3: blade dorsal scar patterns as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Non-cortical	11 / -	14 / -	14 / -	14 / -	12 / -	12 / -	4 / -	5 / -
Cortical	2 / -	2 / -	3 / -	3 / -	1 / -	2 / -	–	–
Central	2 / 9.1%	3 / 11.5%	–	–	–	1 / 6.2%	–	–
Proximal	2 / 9.1%	2 / 7.7%	–	–	1 / 7.1%	1 / 6.2%	–	–
Distal	3 / 13.6%	4 / 15.5%	4 / 25.0%	4 / 25.0%	6 / 42.9%	6 / 37.5%	2 / 40%	2 / 33.3%
Lateral	10 / 45.4%	12 / 46.2%	6 / 37.5%	6 / 37.5%	7 / 50.0%	7 / 43.9%	2 / 40%	3 / 50.0%
Bilateral	–	–	–	–	–	1 / 6.2%	–	–
Bilateral + Distal	–	–	1 / 6.2%	1 / 6.2%	–	–	–	–
Lateral + Central	1 / 4.6%	1 / 3.8%	–	–	–	–	–	–
Lateral + Distal	3 / 13.6%	3 / 11.5%	4 / 25.0%	4 / 25.0%	–	–	–	–
Lateral + Proximal	–	–	–	–	–	–	1 / 20%	1 / 16.7%
Central + Distal	1 / 4.6%	1 / 3.8%	1 / 6.2%	1 / 6.2%	–	–	–	–
Proximal + Central	–	–	–	–	–	–	–	–
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Non-cortical	20 / -	25 / -	43 / -	54 / -	104 / -	124 / -
Cortical	9 / -	9 / -	5 / -	5 / -	20 / -	21 / -
Central	–	1 / 3.6%	–	2 / 3.4%	2 / 1.5%	7 / 4.6%
Proximal	–	–	–	–	3 / 2.3%	3 / 2.0%
Distal	6 / 23.1%	6 / 21.4%	9 / 19.2%	14 / 23.7%	30 / 23.2%	36 / 23.8%
Lateral	14 / 53.9%	15 / 53.6%	27 / 57.5%	32 / 54.2%	66 / 50.9%	75 / 49.8%
Bilateral	1 / 3.8%	1 / 3.6%	1 / 2.1%	1 / 1.7%	2 / 1.5%	3 / 2.0%
Bilateral + Distal	–	–	1 / 2.1%	1 / 1.7%	2 / 1.5%	2 / 1.3%
Lateral + Central	–	–	–	–	1 / 0.8%	1 / 0.7%
Lateral + Distal	2 / 7.7%	2 / 7.1%	6 / 12.8%	6 / 10.2%	15 / 11.5%	15 / 9.9%
Lateral + Proximal	–	–	1 / 2.1%	1 / 1.7%	2 / 1.5%	2 / 1.3%
Central + Distal	2 / 7.7%	2 / 7.1%	1 / 2.1%	1 / 1.7%	5 / 3.8%	5 / 3.3%
Proximal + Central	1 / 3.8%	1 / 3.6%	1 / 2.1%	1 / 1.7%	2 / 1.5%	2 / 1.3%
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-22 Kabazi V, sub-unit III/3: blade cortex placement as numbers and percentages of each type.

General profiles (Table 9-26)

The general profiles of 262 blades could be identified. Peculiar were observations made regarding twisted blades. Contrary to the poor representation of twisted profiles among flakes (in average ca. 14 – 15%), on average, twisted blades compose ca. 32 – 33% of the blade material. Moreover, there is a growing trend throughout the archaeological sequence of sub-unit III/3 for twisted blades – from ca. 24 – 27% in the lowermost level III/3-3A, and rising to ca. 44% in the uppermost level III/3-1. At the same time, we must also note that, with exception of level III/3-2, in all other levels twisted blades are not commonly selected for tool production. Regarding other general profile types, incurvate medial blades are also frequently represented (ca. 42 – 44%), and a significant role is also played by flat blades (almost 20%). The high ratio of incurvate medial blades is additionally confirmed by their frequent selection for tool production at the site. Notable are also the convex and incurvate distal types for blades, which might suggest a good control of flaking surfaces during core reduction processes.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
1 - 25%	12 / 50.0%	14 / 50.0%	6 / 31.6%	6 / 31.6%	8 / 53.3%	9 / 50.0%	3 / 60%	4 / 66.7%
26 - 50%	7 / 29.2%	9 / 32.2%	7 / 36.8%	7 / 36.8%	4 / 26.7%	5 / 27.8%	2 / 40%	2 / 33.3%
51 - 75%	3 / 12.5%	3 / 10.7%	3 / 15.8%	3 / 15.8%	2 / 13.3%	2 / 11.1%	–	–
> 75%	2 / 8.3%	2 / 7.1%	3 / 15.8%	3 / 15.8%	1 / 6.7%	2 / 11.1%	–	–
Non-cortical	11 / -	14 / -	14 / -	14 / -	12 / -	12 / -	4 / -	5 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
1 - 25%	16 / 45.7%	17 / 46.0%	19 / 36.5%	27 / 42.2%	64 / 42.7%	77 / 44.8%
26 - 50%	5 / 14.3%	5 / 13.5%	21 / 40.4%	23 / 35.9%	46 / 30.7%	51 / 29.6%
51 - 75%	5 / 14.3%	6 / 16.2%	7 / 13.5%	9 / 14.1%	20 / 13.3%	23 / 13.4%
> 75%	9 / 25.7%	9 / 24.3%	5 / 9.6%	5 / 7.8%	20 / 13.3%	21 / 12.2%
Non-cortical	20 / -	25 / -	43 / -	54 / -	104 / -	124 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-23 Kabazi V, sub-unit III/3: blade cortex surface area as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Ovoid	–	–	1 / 3.8%	1 / 3.8%	1 / 5%	1 / 4.5%	–	1 / 11.1%
Triangular	8 / 26.6%	8 / 22.9%	6 / 23.2%	6 / 23.2%	2 / 10%	3 / 13.7%	1 / 14.3%	1 / 11.1%
Rectangular	4 / 13.3%	4 / 11.4%	3 / 11.5%	3 / 11.5%	4 / 20%	5 / 22.7%	1 / 14.3%	2 / 22.2%
Trapezoidal	2 / 6.7%	2 / 5.7%	–	–	–	–	–	–
Trapezoidal elongated	2 / 6.7%	2 / 6.7%	4 / 15.4%	4 / 15.4%	4 / 20%	4 / 18.2%	3 / 42.8%	3 / 33.3%
Leaf Shaped	2 / 6.7%	2 / 5.7%	–	–	–	–	–	–
Crescent	–	2 / 5.7%	7 / 26.9%	7 / 26.9%	2 / 10%	2 / 9.1%	–	–
Irregular	12 / 40.0%	15 / 42.9%	5 / 19.2%	5 / 19.2%	7 / 35%	7 / 31.8%	2 / 28.6%	2 / 22.2%
Unidentifiable	5 / -	7 / -	7 / -	7 / -	7 / -	8 / -	2 / -	2 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Ovoid	1 / 2.6%	1 / 2.3%	3 / 4.4%	3/ 3.6%	6 / 3.2%	7 / 3.2%
Triangular	11 / 28.2%	12 / 27.9%	17 / 25.0%	22 / 26.2%	45 / 23.7%	52 / 23.7%
Rectangular	5 / 12.8%	6 / 13.9%	15 / 22.1%	19 / 22.6%	32 / 16.8%	39 / 17.8%
Trapezoidal	–	–	–	–	2 / 1.1%	2 / 0.9%
Trapezoidal elongated	4 / 10.2%	4 / 9.3%	10 / 14.7%	12 / 14.3%	27 / 14.2%	29 / 13.2%
Leaf Shaped	–	–	–	–	2 / 1.1%	2 / 0.9%
Crescent	9 / 23.1%	10 / 23.3%	3 / 4.4%	4 / 4.8%	21 / 11.0%	25 / 11.4%
Irregular	9 / 23.1%	10 / 23.3%	20 / 29.4%	24 / 28.5%	55 / 28.9%	63 / 28.9%
Unidentifiable	16 / -	19 / -	27 / -	34 / -	64 / -	77 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-24 Kabazi V, sub-unit III/3: blade shapes as numbers and percentages of each type.

Profiles at distal end (Table 9-27)

Distal end profiles were observed for a total of 190 blades. The distal end profile types identified very much mirror those already noted for flakes; for the blades the types and percentages are as follows: feathering (ca. 57 – 59%), hinged (ca. 23 – 25%,) blunt (ca. 15%), overpassed (less than 2%). Thus, according to this attribute, we see the same success and mistakes in primary reduction for both flakes and blades.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
On-axis	21 / 70%	22 / 66.7%	19 / 61.3%	19 / 61.3%	9 / 42.8%	10 / 43.5%	2 / 28.6%	3 / 33.3%
Off-axis	9 / 30%	11 / 33.3%	12 / 38.7%	12 / 38.7%	12 / 57.2%	13 / 56.5%	5 / 71.4%	6 / 66.7%
Unidentifiable	5 / -	9 / -	2 / -	2 / -	6 / -	7 / -	2 / -	2 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
On-axis	12 / 30.8%	15 / 34.1%	41 / 56.2%	52 / 57.1%	104 / 51.7%	121 / 52.4%
Off-axis	27 / 69.2%	29 / 65.9%	32 / 43.8%	39 / 42.9%	97 / 48.3%	110 / 47.6%
Unidentifiable	16 / -	18 / -	22 / -	27 / -	53 / -	65 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-25 Kabazi V, sub-unit III/3: blade axis as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Flat	3 / 8.8%	3 / 7.6%	6 / 19.4%	6 / 19.4%	7 / 28%	8 / 28.6%	–	–
Convex	1 / 2.9%	1 / 2.6%	1 / 3.2%	1 / 3.2%	2 / 8%	2 / 7.1%	–	–
Incurvate medial	14 / 41.3%	17 / 43.6%	13 / 41.9%	13 / 41.9%	8 / 32%	8 / 28.6%	4 / 50.0%	6 / 60%
Incurvate distal	1 / 2.9%	1 / 2.6%	1 / 3.2%	1 / 3.2%	–	–	1 / 12.5%	1 / 10%
Twisted	15 / 44.1%	17 / 43.6%	10 / 32.3%	10 / 32.3%	8 / 32%	10 / 35.7%	3 / 37.5%	3 / 30%
Unidentifiable	1 / -	3 / -	2 / -	2 / -	2 / -	2 / -	1 / -	1 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Flat	7 / 15.6%	8 / 15.7%	21 / 25.3%	24 / 23.3%	44 / 19.5%	49 / 18.7%
Convex	–	1 / 2.0%	2 / 2.4%	2 / 1.9%	6 / 2.6%	7 / 2.7%
Incurvate medial	21 / 46.7%	23 / 45.1%	35 / 42.2%	50 / 48.6%	95 / 42.1%	117 / 44.6%
Incurvate distal	1 / 2.2%	1 / 2.0%	2 / 2.4%	2 / 1.9%	6 / 2.6%	6 / 2.3%
Twisted	16 / 35.5%	18 / 35.3%	23 / 27.7%	25 / 24.3%	75 / 33.2%	83 / 31.7%
Unidentifiable	10 / -	11 / -	12 / -	15 / -	28 / -	34 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-26 Kabazi V, sub-unit III/3: blade general profiles as numbers and percentages of each type.

Profiles at midpoint (Table 9-28)

Profiles at midpoint were observed on 293 blades. Regarding this feature, blades differ quite significantly from flakes. Although the triangular type is the most common to feature among the analysed pieces (ca. 41 – 43%), the sum of trapezoidal and multifaceted types (ca. 31 – 33%) is worthy of mention, it being a clear indication for intensive parallel reduction. Moreover, we see a distinct trend that sees the selection of those blades for secondary treatment processes with these two aforementioned profile at midpoint types (i.e. trapezoidal and multifaceted), as well as of those pieces characterised by the lateral steep type (mostly, *débordantes* and crested pieces). Thus, with regard to this feature, blades make a well organised impression, with the production of desired blanks during core reduction better than that observed for flakes.

Platform preparation, lipping & angle (Table 9-29)

The butts of 149 blades could be attributed to one of three basic groups. An average of 49.3% of unretouched blades display unprepared butts (cortical, plain, punctiform), with 48.4% of the combined sample of all blades, including tool blanks, also belonging to this group. Among this group, butt types with plain butts are predominant, while cortical and punctiform butts are known through only single examples. At the same time, there is a clear trend to a lower involvement of blades with unprepared butts in tool production. Butts with rough preparation (dihedral and crudely-multifaceted) are of a medium significance (26.9% for unretouched blades and 24.8% for the entire blade assemblage considered). Again we see less retouching of blades with dihedral and crudely-multifaceted butts, whereby the latter are slightly more numerous than the former. Finely faceted butts (straight and convex faceted items) occur more or less equally as common as prepared butts (23.8% for unretouched blades and 26.8% for all blades). All in all, the following faceting indices were calculated: IFl = 50.7% and IFst = 23.8% for unretouched blades, and IFl = 51.6% and IFst = 26.8% for the total blade sample. Brief and preliminary comparisons of these data testify to two basic points. First, they indicate that the general preparation of blade butts (IFl) is only ca. 5% higher than for flake butts (51.6% versus 46.3%); here, it is worth remembering that both these indices are higher than 45%. On the other hand, strict and real faceting preparation of blade butts (IFst) is 1.5 times higher than it is for flakes (26.8% versus 18.3%), and only the former of these indices is close to 30%. Thus, we can conclude a more careful general butt preparation, and especially fine faceting, for blades than for flakes. Second, both flakes and blades show undoubtedly a special selection of those blanks for tool production with convex faceted butts.

Finally, there follows the combined indices for butt preparation data for both flakes and blades: IFl = 43.1% and IFst = 15.5% for all unretouched blanks; IFl = 47.3% and IFst = 19.9% for the total blanks sample.

Thus, the final butt preparation calculations leave a twofold impression based on the well known and still valid criteria for faceted and unfaceted Middle Palaeolithic industries established long ago by F. Bordes (1953, p. 459), i.e. that faceted industries are characterised by IFl > 45% and IFst > 30%, and unfaceted industries by IFl < 45% and IFst < 30%. On the one hand, the strict faceting index (IFst) for sub-unit III/3 of Kabazi V is too low for faceted Middle Palaeolithic industries, only ca. 20%, but on the other hand, the large faceting index from Kabazi V exceeds slightly the 45% mark. Accordingly, one questions arise as to the actual core preparation technique applied the assemblages from sub-unit III/3 of Kabazi V; this will be discussed below in more detail.

The observed lipping features for 187 blade butts (Table 9-30) mirror totally the respective lipping data for flake butts. Again, one quarter has no lipped butts, and three quarters comprise semi-lipped butts. There is only one artefact that displays a real lipped butt. These records indicate an absence of bifacial tool processing in the analysed blade collections.

Angle data for 147 butts (Table 9-31) are characterised by a complete dominance of right angles (ca. 95%), while acute angles are known from just seven blade butts (ca. 5%). These data are in a good correspondence with the respective angles of flake butts, acute angles occur slightly more often (ca. 12%).

Butt sizes

On the basis of butt measurements on 149 blades (Tables 9-32 and 9-33), we arrive at the following data: average width – 1.00 cm, average thickness – 0.40 cm. At the same time, no trends among tool blanks with wider and thicker butts could be established. Also, butts on blades are characterised by smaller indices for width and thickness than was observed among butts on flakes – width: 1.75 cm, thickness: 0.58 cm.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Feathering	14 / 60.9%	14 / 53.9%	16 / 66.7%	16 / 66.7%	13 / 65%	13 / 61.9%	3 / 50.0%	3 / 42.8%
Hinged	6 / 26.1%	7 / 26.9%	3 / 12.5%	3 / 12.5%	6 / 30%	7 / 33.3%	1 / 16.7%	2 / 28.6%
Blunt	2 / 8.7%	4 / 15.4%	3 / 12.5%	3 / 12.5%	1 / 5.0%	1 / 4.8%	2 / 33.3%	2 / 28.6%
Overpassed	1 / 4.3%	1 / 3.8%	2 / 8.3%	2 / 8.3%	–	–	–	–
Missing by Retouch	–	2 / -	–	–	–	1 / -	–	–
Unidentifiable	12 / -	14 / -	9 / -	9 / -	7 / -	8 / -	3 / -	4 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Feathering	15 / 53.6%	16 / 53.3%	35 / 57.4%	42 / 57.5%	96 / 59.3%	104 / 57.5%
Hinged	7 / 25.0%	8 / 26.7%	15 / 24.6%	19 / 26.0%	38 / 23.5%	46 / 25.4%
Blunt	6 / 21.4%	6 / 20.0%	11 / 18.0%	12 / 16.5%	25 / 15.4%	28 / 15.5%
Overpassed	–	–	–	–	3 / 1.8%	3 / 1.6%
Missing by Retouch	–	2 / -	–	4 / -	–	9 / -
Unidentifiable	27 / -	30 / -	34 / -	41 / -	92 / -	106 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-27 Kabazi V, sub-unit III/3: blade profiles at distal end as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Triangular	15 / 42.8%	17 / 40.5%	19 / 57.6%	19 / 57.6%	15 / 55.6%	15 / 51.8%	3 / 33.3%	3 / 27.3%
Trapezoidal	12 / 34.3%	14 / 33.3%	5 / 15.2%	5 / 15.2%	8 / 29.6%	8 / 27.6%	1 / 11.1%	3 / 27.3%
Multifaceted	1 / 2.9%	1 / 2.4%	4 / 12.1%	4 / 12.1%	–	–	1 / 11.1%	1 / 9.1%
Lateral Steep	2 / 5.7%	4 / 9.5%	–	–	–	1 / 3.4%	3 / 33.3%	3 / 27.3%
Convex	–	–	1 / 3.0%	1 / 3.0%	1 / 3.7%	1 / 3.4%	–	–
Flat	1 / 2.9%	1 / 2.4%	–	–	–	–	–	–
Irregular	4 / 11.4%	5 / 11.9%	4 / 12.1%	4 / 12.1%	3 / 11.1%	4 / 13.8%	1 / 11.1%	1 / 9.1%
Unidentifiable	–	–	–	–	–	1 / -	–	–
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Triangular	22 / 40.0%	24 / 38.7%	34 / 36.6%	42 / 36.2%	108 / 42.9%	120 / 40.9%
Trapezoidal	10 / 18.2%	12 / 19.3%	25 / 26.9%	32 / 27.6%	61 / 24.2%	74 / 25.3%
Multifaceted	3 / 5.4%	4 / 6.4%	8 / 8.6%	13 / 11.2%	17 / 6.7%	23 / 7.8%
Lateral Steep	11 / 20.0%	12 / 19.4%	10 / 10.8%	13 / 11.2%	26 / 10.3%	33 / 11.3%
Convex	4 / 7.3%	5 / 8.1%	5 / 5.4%	5 / 4.3%	11 / 4.4%	12 / 4.1%
Flat	–	–	2 / 2.1%	2 / 1.7%	3 / 1.2%	3 / 1.0%
Irregular	5 / 9.1%	5 / 8.1%	9 / 9.6%	9 / 7.8%	26 / 10.3%	28 / 9.6%
Unidentifiable	–	–	2 / -	2 / -	2 / -	3 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-28 Kabazi V, sub-unit III/3: blade profiles at midpoint as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Cortex	2 / 13.3%	2 / 12.5%	–	–	1 / 6.7%	1 / 6.25%	–	–
Plain	7 / 46.6%	8 / 50.0%	6 / 37.5%	6 / 37.5%	9 / 60.0%	9 / 56.25%	2 / 40%	2 / 33.2%
Punctiform	–	–	–	–	–	–	–	1 / 16.7%
Dihedral	1 / 6.7%	1 / 6.25%	3 / 18.75%	3 / 18.75%	2 / 13.3%	3 / 18.75%	1 / 20%	1 / 16.7%
Crude-multifaceted	1 / 6.7%	1 / 6.25%	6 / 37.5%	6 / 37.5%	1 / 6.7%	1 / 6.25%	1 / 20%	1 / 16.7%
Faceted Straight	–	–	–	–	–	–	1 / 20%	1 / 16.7%
Faceted Convex	4 / 26.7%	4 / 25.0%	1 / 6.25%	1 / 6.25%	2 / 13.3%	2 / 12.5%	–	–
Missing by Retouch	–	1 / -	–	–	–	1 / -	–	–
Crushed	5 / -	9 / -	9 / -	9 / -	6 / -	6 / -	2 / -	3 / -
Missing	15 / -	16 / -	8 / -	8 / -	6 / -	7 / -	2 / -	2 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Cortex	–	–	–	–	3 / 2.3%	3 / 2.0%
Plain	11 / 36.7%	12 / 36.4%	23 / 46.9%	26 / 41.9%	58 / 44.7%	63 / 42.4%
Punctiform	2 / 6.7%	2 / 6.1%	1 / 2.0%	3 / 4.8%	3 / 2.3%	6 / 4.0%
Dihedral	4 / 13.3%	4 / 12.1%	4 / 8.2%	5 / 8.1%	15 / 11.5%	17 / 11.4%
Crude-multifaceted	7 / 23.3%	7 / 21.2%	4 / 8.2%	4 / 6.5%	20 / 15.4%	20 / 13.4%
Faceted Straight	2 / 6.7%	2 / 6.1%	6 / 12.2%	7 / 11.3%	9 / 6.9%	10 / 6.7%
Faceted Convex	4 / 13.3%	6 / 18.2%	11 / 22.5%	17 / 27.4%	22 / 16.9%	30 / 20.1%
Missing by Retouch	–	–	–	–	–	2 / -
Crushed	8 / -	9 / -	19 / -	22 / -	49 / -	58 / -
Missing	17 / -	20 / -	27 / -	34 / -	75 / -	87 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-29 Kabazi V, sub-unit III/3: blade butt types as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Not lipped	3 / 21.4%	4 / 26.7%	3 / 18.7%	3 / 18.7%	2 / 13.3%	2 / 12.5%	–	1 / 16.7%
Lipped	–	–	–	–	–	–	–	–
Semi-lipped	11 / 78.6	11 / 73.3%	13 / 81.3%	13 / 81.3%	13 / 86.7%	14 / 87.5%	5 / 100%	5 / 83.3%
Unidentifiable	21 / -	27 / -	17 / -	17 / -	12 / -	14 / -	4 / -	5 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Not lipped	5 / 17.2%	5 / 15.6%	18 / 36.0%	22 / 35.5%	31 / 24.0%	37 / 25.2%
Lipped	1 / 3.4%	1 / 3.1%	–	–	1 / 0.8%	1 / 0.7%
Semi-lipped	23 / 79.4%	26 / 81.3%	32 / 64.0%	40 / 64.5%	97 / 75.2%	109 / 74.1%
Unidentifiable	26 / -	30 / -	45 / -	56 / -	125 / -	149 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-30 Kabazi V, sub-unit III/3: blade butt lipping as numbers and percentages of each type.

	III/3-1		III/3-1A		III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Right	13 / 92.9%	14 / 93.3%	16 / 100%	16 / 100%	14 / 93.3%	15 / 93.75%	3 / 60%	4 / 66.7%
Acute	1 / 7.1%	1 / 6.7%	–	–	1 / 6.7%	1 / 6.25%	2 / 40%	2 / 33.3%
Unidentifiable	21 / -	27 / -	17 / -	17 / -	12 / -	14 / -	4 / -	5 / -
Total:	**35**	**42**	**33**	**33**	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A		Total:	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Right	27 / 93.1%	30 / 93.8%	49 / 98%	61 / 98.4%	122 / 94.6%	140 / 95.2%
Acute	2 / 6.9%	2 / 6.2%	1 / 2.0%	1 / 1.6%	7 / 5.4%	7 / 4.8%
Unidentifiable	26 / -	30 / -	45 / -	56 / -	125 / -	149 / -
Total:	**55**	**62**	**95**	**118**	**254**	**296**

Table 9-31 Kabazi V, sub-unit III/3: blade butt angles as numbers and percentages of each type.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	1.06 cm for 14 pieces	1.03 cm for 15 pieces	1.04 cm for 16 pieces	1.04 cm for 16 pieces
Unidentifiable	21	27	17	17
Total:	**35**	**42**	**33**	**33**

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.87 cm for 15 pieces	0.86 cm for 16 pieces	0.86 cm for 5 pieces	0.73 cm for 6 pieces
Unidentifiable	12	14	4	5
Total:	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.89 cm for 30 pieces	0.93 cm for 33 pieces	1.07 cm for 50 pieces	1.07 cm for 63 pieces
Unidentifiable	25	29	45	55
Total:	**55**	**62**	**95**	**118**

	Total:	
	Flakes	Flakes & Flake Tools
Definable	0.99 cm for 130 pieces	1.00 cm for 149 pieces
Unidentifiable	124	147
Total:	**254**	**296**

Table 9-32 Kabazi V, sub-unit III/3: blade butt width as numbers and average indices.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.44 cm for 14 pieces	0.43 cm for 15 pieces	0.46 cm for 16 pieces	0.46 cm for 16 pieces
Unidentifiable	21	27	17	17
Total:	**35**	**42**	**33**	**33**

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.34 cm for 15 pieces	0.36 cm for 16 pieces	0.38 cm for 5 pieces	0.33 cm for 6 pieces
Unidentifiable	12	14	4	5
Total:	**27**	**30**	**9**	**11**

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.37 cm for 30 pieces	0.38 cm for 33 pieces	0.42 cm for 50 pieces	0.40 cm for 63 pieces
Unidentifiable	25	29	45	55
Total:	**55**	**62**	**95**	**118**

	Total:	
	Flakes	Flakes & Flake Tools
Definable	0.40 cm for 130 pieces	0.40 cm for 149 pieces
Unidentifiable	124	147
Total:	**254**	**296**

Table 9-33 Kabazi V, sub-unit III/3: blade butt thickness as numbers and average indices.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	4.42 cm for 18 pieces	4.66 cm for 21 pieces	4.90 cm for 21pieces	4.90 cm for 21 pieces

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	4.19 cm for 17 pieces	4.27 cm for 19 pieces	4.16 cm for 7 pieces	4.51 cm for 9 pieces

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	4.33 cm for 32 pieces	4.47 cm for 35 pieces	4.85 cm for 49 pieces	5.18 cm for 63 pieces

	Total:	
	Flakes	Flakes & Flake Tools
Definable	4.57 cm for 144 pieces	4.79 cm for 168 pieces

Table 9-34 Kabazi V, sub-unit III/3: blade length as numbers and average indices for complete pieces.

Blade dimensions

All 144 complete blades were measured and their average length, width and thickness parameters established (Tables 9-34, 9-35 and 9-36). The summarised data for the whole sub-unit III/3 are as follows.

Length: 4.57 cm for unretouched blades and 4.79 cm for the total blade sample (Table 9-34).

Width: 1.80 cm for unretouched blades and 1.90 cm for the total blade sample (Table 9-35).

Thickness: 0.60 cm for unretouched blades and 0.61 cm for the total blade sample (Table 9-36).

The data are very homogeneous for all six levels and show a clear selection of longer and wider items for tool production.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	1.86 cm for 18 pieces	1.95 cm for 21 pieces	2.02 cm for 21 pieces	2.02 cm for 21 pieces

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	1.64 cm for 17 pieces	1.67 cm for 19 pieces	1.77 cm for 7 pieces	1.96 cm for 9 pieces

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	1.70 cm for 32 pieces	1.75 cm for 35 pieces	1.84 cm for 49 pieces	2.00 cm for 63 pieces

	Total:	
	Flakes	Flakes & Flake Tools
Definable	1.80 cm for 144 pieces	1.90 cm for 168 pieces

Table 9-35 Kabazi V, sub-unit III/3: blade width as numbers and average indices for complete pieces.

	III/3-1		III/3-1A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.59 cm for 18 pieces	0.60 cm for 21 pieces	0.80 cm for 21 pieces	0.80 cm for 21 pieces

	III/3-2		III/3-2A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.52 cm for 17 pieces	0.55 cm for 19 pieces	0.56 cm for 7 pieces	0.54 cm for 9 pieces

	III/3-3		III/3-3A	
	Flakes	Flakes & Flake Tools	Flakes	Flakes & Flake Tools
Definable	0.51 cm for 32 pieces	0.53 cm for 35 pieces	0.64 cm for 49 pieces	0.64 cm for 63 pieces

	Total:	
	Flakes	Flakes & Flake Tools
Definable	0.60 cm for 144 pieces	0.61 cm for 168 pieces

Table 9-36 Kabazi V, sub-unit III/3: blade thickness as numbers and average indices for complete pieces.

Blades: Some additional notes

As already shown for flakes, among the blades there were also distinguished various specific pieces. These are as follows for each of the six levels, in stratigraphical order from top to bottom:

Level III/3-1 (N=5):
lateral *débordante* (type 2) – 1 piece;
lateral crested blades (type 1) – 0 + 1 piece;
central crested blades with unilateral crested ridge (sub-type 2A) – 1 piece;
secondary crested blades – 1 piece;
re-crested blades – 1 piece.

Level III/3-1A (N=2):
simple natural lateral *débordante* (type 1) – 2 pieces.

Level III/3-2 (N=3):
simple natural lateral *débordante* (type 1) – 2 pieces;
central crested blades with bilateral crested ridge (sub-type 2B) – 1 piece.

Level III/3-2A (N=3):
simple natural lateral *débordante* (type 1) – 2 pieces;
secondary crested blades – 1 piece.

Level III/3-3 (N=10):
Levallois blades with 3-directional scar pattern – 0 + 1 piece;
simple natural lateral *débordante* (type 1) – 7 pieces;
lateral crested blades (type 1) – 1 + 1 pieces (Fig. 9-5, *8*).

Level III/3-3A (N=19):
Levallois blades with 3-directional scar pattern – 0 + 1 piece;
simple natural lateral *débordante* (type 1) – 9 + 3 pieces (Fig. 9-4, *4*; 9-5, *1, 3*);
lateral *débordante* (type 2) – 1 + 1 pieces;
lateral *débordante* (type 2a) – 1 piece;
lateral crested blades (type 1) – 1 piece;
central crested blades with unilateral crested ridge (sub-type 2A) – 2 pieces.

Thus, the entire sub-unit III/3 specific blade sample (42 pieces) can be represented in the following way:
bifacial treatment pieces – absent;
Levallois pieces – 2 items / 4.8% (these being Levallois blades with 3-directional scar pattern);
core maintenance products – 40 items / 95.2%.

Core maintenance products comprise:
simple natural lateral *débordante* (type 1) – 25 pieces;
lateral *débordante* (type 2) – 3 pieces;
lateral *débordante* (type 2a) – 1 piece;
lateral crested blades (type 1) – 4 pieces;
central crested blades with unilateral crested ridge (sub-type 2A) – 3 pieces;
central crested blades with bilateral crested ridge (sub-type 2B) – 1 piece;
secondary crested blades – 2 pieces;
re-crested blades – 1 piece.

These data on the so-called specific blades bear witness to some similarities and dissimilarities with the already represented respective flake data. Starting with the dissimilarities, these include the complete absence of bifacial shaping / thinning blades among the analysed blades. This is very important, as Crimean Micoquian assemblages are characterised by a very pronounced bifacial debitage where, besides numerous such flakes, there are always some very indicative bifacial treatment blades (e.g. Marks, Monigal 1998: Fig. 7-14 on p. 148 for Starosele site, level 1; Chabai 2004b: Fig. 24-3: 6 on p. 381; Fig. 24-10: 4 on p. 398 for Chokurcha I, Unit IV; Demidenko 2004a: Fig. 9-4: 5-6 on p. 119 for Buran-Kaya III rock-shelter, layer B). Thus, the observed absence of bifacial treatment blades throughout the archaeological sequence of sub-unit III/3 definitely points to only a minor Micoquian admixture within the general WCM artefacts or, at least, a very minimal bifacial tool production and/or rejuvenation processes performed by Middle Palaeolithic Micoquian people at the site.

Then, there are very few Levallois items among the blade sample – only 2 pieces, although, when we take into account the overall number of blades in sub-unit III/3, we arrive at a value of 0.68% for the whole blade sample of 296 items, and about the same index (0.70%) for 284 blades with identifiable dorsal scar pattern. Indeed, this is not too different statistically from Levallois indices for flakes – 1.1 and 1.2%. In having a Levallois blade in level III/3-3A, we are filling the lacuna with no Levallois flakes for the level. The two Levallois blades are, however, peculiar for the following three reasons. First, Levallois blades only display 3-directional dorsal scar patterns, and no one piece has a radial scar pattern. Second, the Levallois blades were only identified in blade samples from the lowermost levels III/3-3 and III/3-3A of sub-unit III/3, although this point should not be over-exaggerated given that these two levels have yielded the highest number of blade samples anyway. Third, the two Levallois blades are retouched. This implies their complete involvement in tool production. Finally, it is necessary to note the absence among Levallois products with blady metrical proportions of both Levallois points

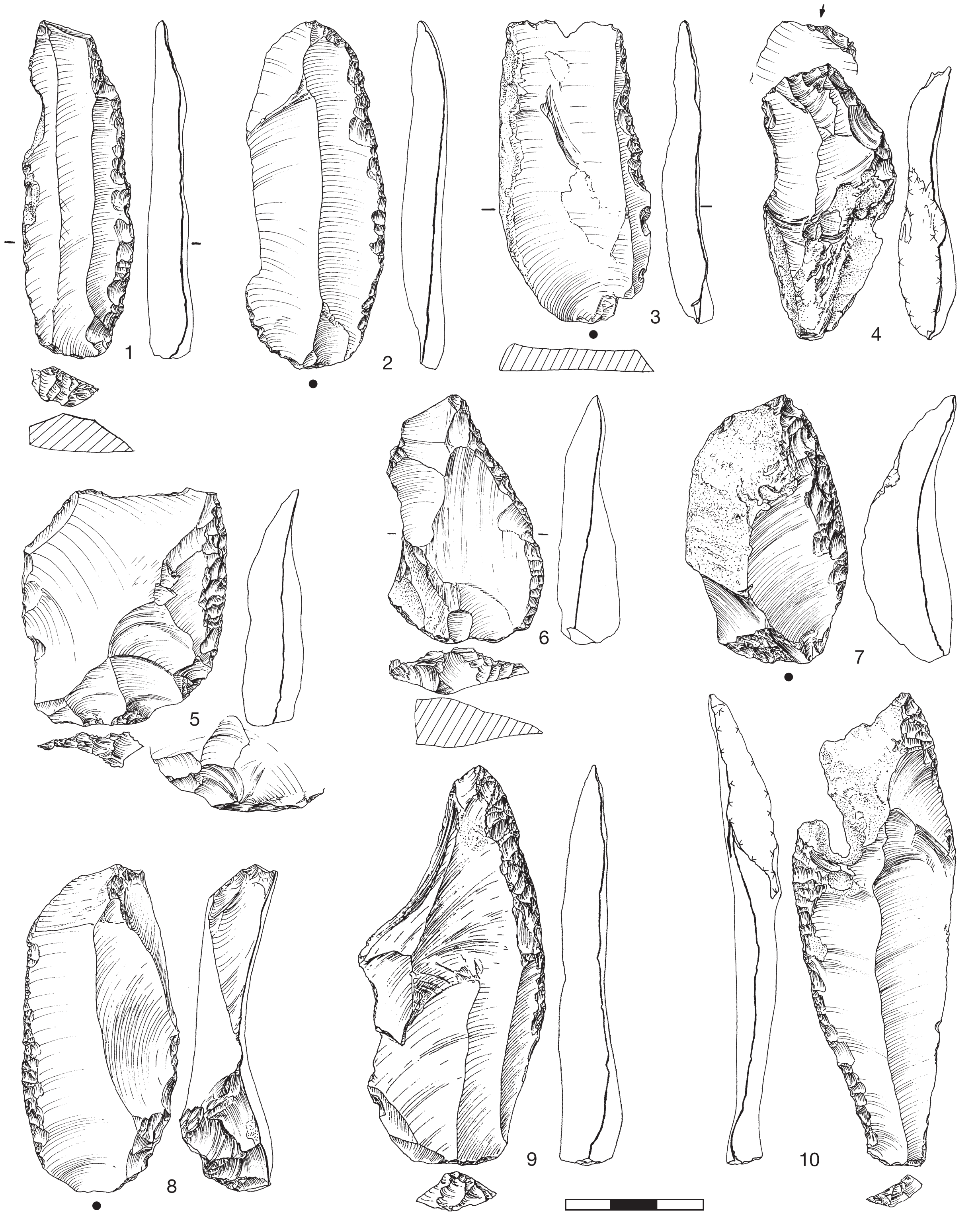

Fig. 9-5 Kabazi V, sub-unit III/3: levels III/3-1 (4); III/3-1A (5-6); III/3-3 (8); III/3-3A (1-2, 3, 7, 9-10). Tools: simple convex scraper on blade simple natural lateral debordante, type 1 (1); simple convex scrapers on complete blades (2, 9-10); simple concave denticulate on blade simple natural lateral debordante, type 1 (3); simple convex scraper with truncated-faceted base on complete blade (4); simple convex scraper with thinned base on complete flake (5); simple wavy scraper on complete flake (6); simple convex scraper on complete flake (7); simple convex scraper on lateral crested blade, type 1 (8).

(even in any atypical form) and pseudo-Levallois points. The absence of such pieces is fully understandable considering the occasional technological character of Levallois atypical points on flakes and on pseudo-Levallois points, which occurred only on flakes as technological waste. Thus, it is possible to state that Levallois blades have actually more similarities than dissimilarities with the respective data from Levallois products on flakes.

Turning to core maintenance products on blades, we see some changes in the occurrence of their types in comparison to flakes. Of course, core trimming elements are "rare guests" on blades, because various core maintenance products on blades are usually easily discernible morphologically and, at the same time, serial core tablets on blades only occur in Upper Palaeolithic industries with pronounced bladelet core and/or carinated piece (mostly, tools typologically) reduction (e.g. Unit F Evolved Aurignacian of Krems-Dufour type materials from Siuren I rock-shelter in Crimea – Demidenko et al. 1998; Demidenko, Otte 2000-2001), and this is certainly not the case for WCM materials from Kabazi V, sub-unit III/3. On the other hand, simple natural lateral *débordantes* absolutely prevail among *débordantes* and crested items on blades – 25 out of 40 pieces (62.5%). Adding to these some other *débordantes* and lateral crested blades (8 more items), we arrive at a total of 33 core maintenance product types that are, technologically speaking, wholly in the range of Middle Palaeolithic technologies. There are also some other crested items that are usually associated with Upper Palaeolithic technological features – central crested blades, secondary and re-crested blades. However, these occur only in very small numbers and, therefore, central crested pieces can be considered as occasional items, especially considering the presence of just three secondary and re-crested blades, which in a case of real *"lame à crête technique"* application would be much more numerous.

Thus, we should state that in spite of some technological differences, flakes and blades from sub-unit III/3 still share much in common.

Now, this data on debitage and tool blanks, together with information on core-like pieces, allows us to draw some conclusions with regard to core reduction strategies in sub-unit III/3at Kabazi V.

Core Reduction Strategies

Core-like pieces are an important source for the recognition of core reduction strategies. It has already been assumed that there existed one main core reduction strategy – parallel bi-directional with non-volumetric flaking surface exploitation and the application of regular supplementary platforms, the so-called *"Biache Method, Bi-Polar Variant"*, which is well attested for Unit II WCM materials at Kabazi II. Additionally, the presence of some unidirectional and convergent cores was considered as expressing some technological variability within the bi-directional method. It was also supposed that the so-called *"Volumetric Flaking Method"* was a feature of the Kabazi V materials, which according to V. P. Chabai's data is also observed in the Unit II WCM assemblage from Kabazi II. In sub-unit III/3 at Kabazi V, this method was implied through the presence of a unidirectional sub-cylindrical core.

However, following the analysis of the debitage and tool blanks, the aforementioned conclusions concerning core reduction strategies, must be revised. First, the single unidirectional sub-cylindrical core cannot be considered as really representing a true *"Volumetric Flaking Method"*, as related data on central crested pieces and core tablets are far too poor to make such a conclusion. Therefore, it is better to be on the safe side in this regard and to consider the core as an incidental piece within the basic parallel core reduction. Second, a consideration of the debitage data, and especially its dorsal scar pattern indices, means that we cannot conclude that the bi-directional *"Biache Method, Bi-Polar Variant"* of core reduction was predominant. Therefore, it is reasonable to suggest that the basic core reduction strategy is characterised by implication of a parallel unidirectional *"Biache Method, Uni-Polar Variant"*. After the exhaustion of either a striking platform or a flaking surface of a unidirectional core these were then visually transformed into a bi-directional core with exploitation of an opposite striking platform with further debitage reduction through the same flaking surface. These now double unidirectional cores might then be subjected to one further unidirectional flaking stage. Moreover, sometimes the reduction of Levallois flakes and blades with mostly 3-directional (not classical!) dorsal scar pattern is incorporated into the *"Biache Method"*. For this reason, this method and not a different parallel one is applied. At the same time, also morphologically defined Levallois atypical points and pseudo-Levallois points are products and by-products of the parallel unidirectional reduction *"Biache Method, Uni-Polar Variant"*.

In conclusion the core reduction strategy in sub-unit III/3 at Kabazi V is parallel unidirectional, with some variability, as expressed by some bi-directional and convergent cores. Core exploitation was directed at producing unidirectional flakes and blades which involved the fine and rough faceting of striking platforms and the regular application of both supplementary striking platforms and *débordantes* and/or lateral crested pieces. Removals were also made in order to raise flaking surfaces on cores during intensive and multiple parallel core reduction processes. Within the frame of this *"Biache Method"* of core reduction, a few Levallois flakes and blades were produced, as well as a few conventionally defined atypical Levallois points and an even smaller number of pseudo-Levallois points. This testifies to an obvious complexity of blank types produced during this parallel core reduction strategy.

Finally, it should once again be noted that the rare bifacial shaping/thinning flakes from the assemblage are only associated with the uppermost level III/3-1 and two lowermost levels III/3-3 and III/3-3A. Their occurrence in these levels is most probably due to a minor admixture from stratigraphically overlying and underlying Micoquian sub-units III/2 and III/4, respectively. Therefore, we believe that the flint artefact assemblages from sub-unit III/3 at Kabazi V site are of a rather homogeneous industrial character that is definitely related to the Western Crimean Mousterian.

Tools

A total of 267 pieces with secondary treatment and/or use traces were recovered from the six levels of sub-unit III/3. The lowermost level III/3-3A yielded the most tools (N= 103), followed by two levels with almost fifty tools (uppermost level III/3-1: 49 pieces; second from bottom level III/3-3: 48 pieces). At the same time, the middle part of the sub-unit III/3 sequence is characterised by very low numbers of tools: – 25 pieces in each of the levels III/3-1A and III/3-2 , and 17 pieces in level III/3-2A (see Tables 9-1 and 9-37). Nevertheless, the proportional occurrence of tools within the assemblages of the particular levels varies from 1.5 to 3.2% for all finds included and from 12.0 to 24.2% for essential calculations. Considering the stark variation observed in the tool numbers in each particular level, in the following, tool assemblages will be discussed in reference to both the total for the Unit, as well as to the individual levels.

Tool data are presented in detail in Table 9-37. The whole sub-unit III/3 tool assemblage comprises the following ten categories: points, scrapers, denticulates, notches, end-scrapers, burins, truncated pieces, truncated-faceted pieces, retouched pieces, and unidentifiable tools. Of the total 267 pieces with secondary treatment and/or use traces, more than a half have been assigned to retouched pieces (items with marginal and/or irregular retouch) and unidentifiable tools (significantly fragmented pieces) – 41.2% and 18.7%, respectively. In other words, 59.9% of the total tool assemblages comprise items that are not tools in the strictest sense, although they do provide information on tool use at the site. Thus, we have to deal with a twofold tool structure, firstly a structure with all 267 tools, and alternatively, a more restricted structure which disregards retouched pieces and unidentifiable tools.

Let us first start with the restricted tool sample with just the typologically well defined tools – in total 107 pieces. This restricted assemblage is characterised by a great prevalence of scrapers (68.3%), a moderate number of points (15.9%), a representative sample of denticulates (9.4%), a couple of notches (2.8%), and the single occurrence of end-scrapers, burins, truncated and truncated-faceted pieces, respectively (0.9% each). However, there is some variability among the individual levels. That is why each tool class, along with its categories and groups, will be analysed both for the total sub-unit III/3 and for each particular level.

Scrapers

The 73 scrapers are divided into the following four basic categories: 39 simple scrapers (53.4%), seven transverse scrapers (9.6%), seven double scrapers (9.6%), and 20 various convergent scrapers (27.4%). This subdivision clearly testifies to the dominance of simple forms, a significant share of convergent forms, and the minor representation of both transverse and double types.

Simple scrapers

These 39 scrapers are subdivided into four types according to the shape of their retouched edges: straight type – 3 artefacts, convex type – 32 artefacts, concave type – 2 artefacts, and wavy type – also 2 artefacts. Thus, the simple convex type is the most dominant, while all remaining types are known through an insignificant number of pieces. It should be underlined that all simple scrapers, except for one straight ventral piece, bear retouch on their dorsal sides.

	III/3-1	III/3-1A	III/3-2	III/3-2A	III/3-3	III/3-3A	Total:	%	ess %
Points							**17**	**6.4**	**15.9**
Levallois atypical retouched	·	1	·	·	·	2	3		
Lateral	·	·	·	·	1	·	1		
Distal	·	·	·	·	·	1	1		
Semi-trapezoidal	1	·	[1]	·	·	[1]	3		
Semi-crescent	·	·		·	·	3	3		
Sub-leaf	·	·	1	·	·	1	2		
Unidentifiable	1	·	·	1	·	2	4		
Scrapers							**73**	**27.3**	**68.3**
Simple-straight	·	·	·	·	1	·	1		
Simple-straight-ventral	·	·	1	·	·	·	1		
Simple-straight (on core)	·	·	·	·	1	·	1		
Simple-convex	7	5	1	2	6	11	32		
Simple-concave	·	1	·	·	1	·	2		
Simple-wavy	1	1	·	·	·	·	2		
Transverse-convex	·	·	·	·	2	·	2		
Transverse-oblique-straight	2	1	·	·	·	1	4		
Transverse-oblique-convex	·	·	·	·	·	1	1		
Double-straight	·	·	·	·	·	1	1		
Double-convex	·	·	·	·	2	·	2		
Straight-concave	·	·	1	·	·	·	1		
Convex-concave	3	·	·	·	·	·	3		
Semi-trapezoidal	2	·	1	·	·	[1]	4		
Sub-trapezoidal	·	[2]	·	·	·	·	2		
Trapezoidal	·	·	·	·	·	[1]	1		
Semi-rectangular	·	·	·	·	·	2	2		
Sub-rectangular	1	1	·	·	·	·	2		
Semi-crescent	·	1	·	·	·	·	1		
Sub-crescent	·	·	·	·	·	2	2		
Sub-triangular	·	·	·	·	·	1	1		
Triangular	·	·	1	·	·	·	1		
Semi-leaf	·	·	1	·	·	·	1		
Sub-leaf	·	·	·	·	·	1	1		
Convergent (unidentifiable)	·	·	·	·	1	1	2		
Denticulates	·	·	1	·	5	4	10	3.7	9.4
Notches	1	·	·	·	1	1	3	1.1	2.8
End-scrapers	·	·	·	·	·	1	1	0.4	0.9
Burins	·	1	·	·	·	·	1	0.4	0.9
Truncated pieces	·	·	·	·	·	1	1	0.4	0.9
Truncated-faceted	·	·	·	·	·	1	1	0.4	0.9
Sub-Total:	**19**	**14**	**9**	**3**	**21**	**41**	**107**		**100.0** %
Retouched pieces	23	10	11	7	20	39	110	41.2	
Unidentifiable tools	7	1	5	7	7	23	50	18.7	
Total:	**49**	**25**	**25**	**17**	**48**	**103**	**267**	**100.0** %	

□ marks tool attribution to Crimean Micoquian industrial component

Table 9-37 Kabazi V, sub-unit III/3: tool assemblages by levels.

Simple straight scrapers

These have been observed in only two levels. The single ventral example stems from level III/3-2 and is made on a proximal part of a flake with scalar and semi-steep retouch. Two other straight scrapers were found in level III/3-3. Whereas one of these is a "regular" dorsal scraper made on the distal part of a blade with stepped and steep retouch, the other tool is made on a quite flat radial core which displays a clear strip of sub-parallel and flat retouch along part of one of its edges (Fig. 9-3, *1*). So-called accommodation elements (various thinnings and/or backing) were absent. Therefore, simple straight scrapers are a heterogeneous tool category, and might be considered as *ad hoc*-like scrapers.

Simple convex scrapers

This scraper type is the most dominant in sub-unit III/3, they having been identified in each level of sub-unit III/3, and is in fact the only tool type to do so (Table 9-37).

Blank types are:
flakes – 9 (Fig. 9-5, *5, 7*);
Levallois flakes – 4 (Fig. 9-4, *1, 2, 3*);
débordante / crested flakes – 1;
flake fragments – 4;
blades – 6 (Fig. 9-5, *2, 4, 9, 10*);
Levallois blades – 2;
débordante / crested blades – 2 (Fig. 9-5, *1, 8*);
blade fragments – 3;
core fragments – 1.

Thus, according to their metrical dimensions, these blanks have flaky general proportions (18/56.3%) and blady metrical proportions (13/40.6%). One further piece is fabricated on a core fragment (3.1%). This assemblage has revealed a very significant ratio of blady blanks for the Middle Palaeolithic.

Retouch types and angles are also very demonstrative.

Identified types show both a great dominance of scalar retouch and a minor presence of a heavy stepped retouch:

scalar – 23 / 71.9%;
sub-parallel – 4 / 12.5%;
parallel – 1 / 3.1%;
stepped – 4 / 12.5%.

Angles confirm the aforementioned retouch types, with again the infrequent occurrence of steep angle, usually independent of stepped retouch (just 1 such case is known):

flat – 13 / 40.6%;
semi-steep – 16 / 50.0%;
steep – 3 / 9.4%.

Finally, accommodation elements are not a frequent element among the simple convex scrapers. There is one naturally backed scraper (Fig. 9-5, *1*) and six scrapers with the following thinnings: one item with a truncated-faceted base (Fig. 9-5, *4*), one item with a truncated-faceted lateral edge (Fig. 9-4, *2*), one item with a truncated-faceted terminal part, one item with a thinned base (Fig. 9-5, *5*), one item with a thinned back and one item with biterminally thinned ends. Thus, only 18.75% of simple convex scrapers are characterised by various thinnings, although, as will be seen below, all remaining tool classes and categories, except for convergent scrapers, are cha-racterised by less frequent occurrence of accommodation elements.

Simple concave scrapers

Two such scrapers have been recognised in levels III/3-1A and III/3-3. The scraper from level III/3-1A is on a Levallois flake with scalar and semi-steep retouch, while the piece from level III/3-3 is on a flake with sub-parallel and steep retouch. Accommodation elements are not noted for these two scrapers.

Simple wavy scrapers

Two such scrapers were distinguished in the two uppermost levels III/3-1 and III/3-1A. The artefact from level III/3-1 is on a blade with scalar and semi-steep retouch, and that from level III/3-1A is on a flake (Fig. 9-5, *6*), also with scalar and semi-steep retouch. Again, no accommodation elements were recognised.

There follows a summary of all data for all 39 simple scrapers.

Blank types:
flakes (N=11);
Levallois flakes (N=5);
débordante / crested flakes (N=1);
flake fragments (N=5);
blades (N=7);
Levallois blades (N=2);
débordante / crested blades (N=2);
blade fragments (N=4);
cores (N=1);
core fragments (N=1).

Thus, all 39 simple scrapers were made on blanks with metrics characteristic of flakes (22 / 56.4%), on blanks with metrics characteristic of blades (15 / 38.5%), and on a couple of cores (2 / 5.1%). Thus, this data is very similar to that for simple convex scrapers.

Average metrical indices for 16 complete pieces with flake-like proportions and 11 complete pieces with blade-like proportions are given below.

Flaky blanks. Length – 4.66 cm; width – 3.56 cm, with only two flakes with shortened, transversal metrics where L ≤ W; thickness – 1.04 cm. All these metrical data are considerably higher than those noted for unretouched flakes (see Tables 9-17, 9-18 and 9-19).

Blady blanks. Length – 6.70 cm; width – 2.66 cm; thickness – 0.78 cm. Again, the given metrics are greater than those for unretouched blades (see Tables 9-34, 9-35 and 9-36).

Retouch types and angles for the working edges of all 39 simple scrapers are as follows:

scalar – 27 / 69.2%;
sub-parallel – 6 / 15.4%;
parallel – 1 / 2.6%;
stepped – 5 / 12.8%;
flat – 14 / 35.9%;
semi-steep – 20 / 51.3%;
and steep – 5 / 12.8%.

Once again, these retouch indices mirror the aforementioned data for simple convex scarpers, with only a minor role played by both stepped and steep retouch (only two tools).

Accommodation elements also remain quantitatively the same as observed for simple convex scrapers. No such element is observed for any straight, concave and wavy simple scraper. In this case, six thinnings for all 39 simple scrapers only constitute 15.4%.

All in all, simple scrapers are basically convex ones, while a few straight, concave and wavy types can be interpreted as *ad hoc*-like types. In spite of the fact that many of these scrapers are made on flaky blanks, a significant proportion of them (almost ca. 40%) was produced on blady blanks. Scalar retouch with semi-steep and flat angles are predominant, whereas stepped and steep retouch is insignificant. Also, ca. 15% of simple scrapers display various thinnings, whereby half of them (3 out of 6) show truncated-faceted elements, with just a single naturally backed piece among them.

Transverse scrapers

The seven items constituting this scraper category are characterised by retouch placement at the distal wide edge of blanks, and can be subdivided into either proper transverse scrapers (2 items) or transverse oblique scrapers (5 items).

Both transverse scrapers have convex working edges, and were identified only in level III/3-3. Both tools were produced on complete flakes. Whereas one of them displays a stepped and semi-steep retouch (Fig. 9-6, *7*), the other has a scalar and steep retouch.

Transverse oblique scrapers (see Table 9-37) occur at two extremities of the sub-unit III/3 sequence – in its upper part (levels III/3-1 and III/3-1A) and in its lowermost part (level III/3-3A). There are four such scrapers with straight working edges (Fig. 9-6, *1, 2*) and only a single example with a convex working edge (Fig. 9-6, *3*).

In total, according to their blank types, retouch data and accommodation characteristics, these five scrapers are, morphologically speaking, roughly identical to the two proper transverse scrapers; therefore, the combined characteristics for all seven scrapers is as follows.

Blank types: flakes – 6 / 85.7%; flake fragment – 1 / 14.3% (Fig. 9-6, *1*).

Average metrical dimensions of all six complete flake blanks are as follows: length – 4.70 cm, width – 4.53 cm, thickness – 0.97 cm. There are two flake blanks among them (2 transverse convex scrapers) with shortened, transversal metrics where L ≤ W. The transverse scrapers on flakes have greater dimensions than unretouched flakes (see Tables 9-17, 9-18 and 9-19).

Retouch types and angles for the working edges of these seven scrapers are as follows:

scalar – 6 / 85.7%;
stepped – 1 / 14.3% and
flat – 1 / 14.3%;
semi-steep – 5 / 71.4%;
steep – 1 / 14.3%.

These retouch data signify that the most characteristic retouch for all the transverse scrapers is scalar and semi-steep. The single occurrence of stepped retouch for a transverse convex scraper from level III/3-3 is not of a great importance, because it too is associated with semi-steep retouch. Thus, indices for transverse retouch on scrapers are similar to the respective indices for simple scrapers. It should also be noted that some transverse oblique scrapers resemble truncated pieces (Fig. 9-6, *1, 2*), although their retouch angles only approach semi-steep, and not one of them displays a true steep / abrupt retouch. For this reason, these pieces are classified as transverse oblique scrapers.

Accommodation elements are not noted among the transverse scrapers.

Thus, we are dealing with a group of regular transverse scrapers that is practically lacking any specific features. It is only left to underline that they are fabricated on flakes, and without the application of Quina retouch.

Double scrapers

These seven scrapers show different configurations with regard to their working edges and no regularity in level distribution; nevertheless, they represent an interesting tool category.

First of all, concerning blank types, there is a single complete flake, five flake fragments (comprising

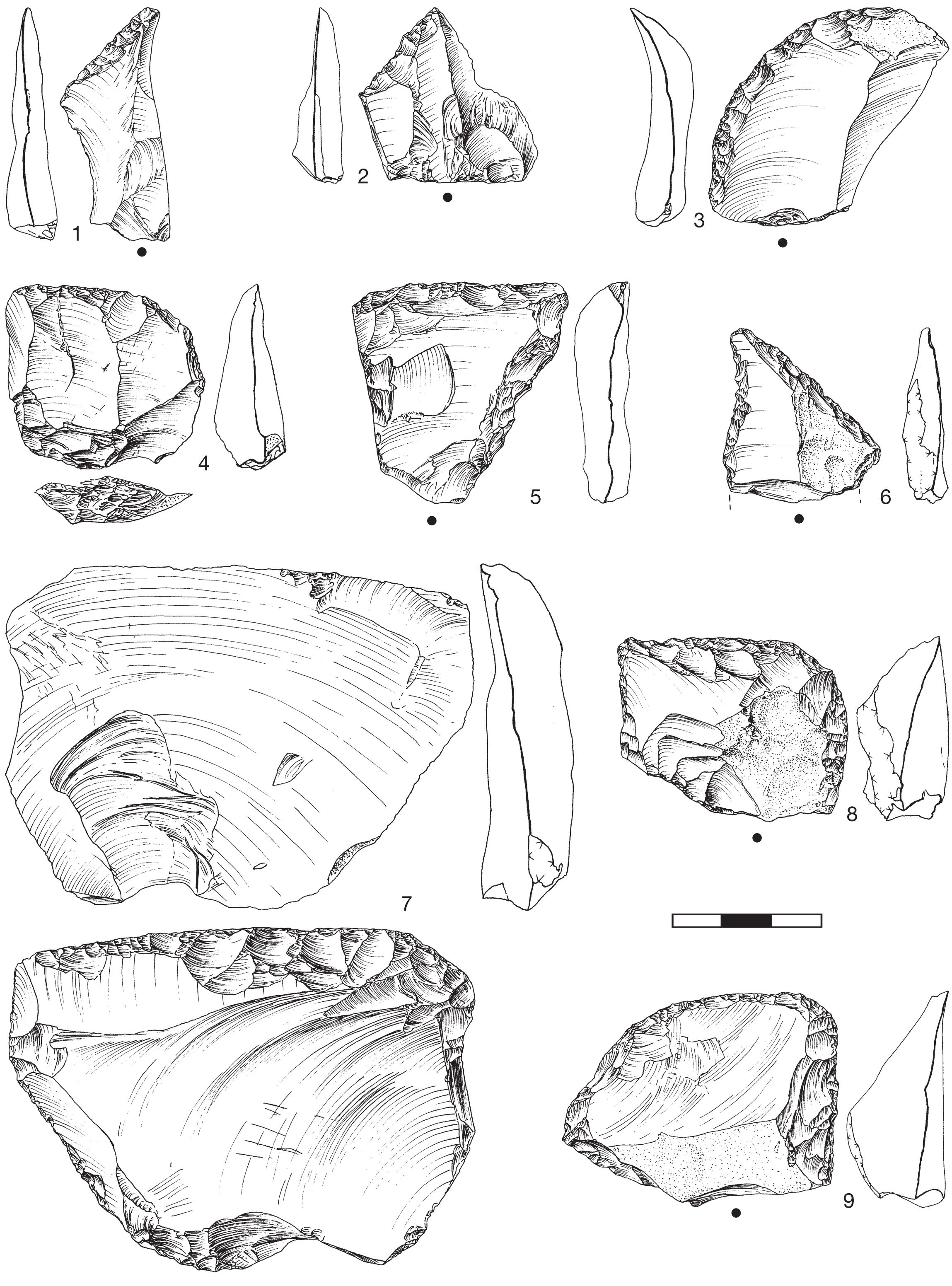

Fig. 9-6 Kabazi V, sub-unit III/3: levels III/3-1 (1, 4, 6); III/3-1A (8-9); III/3-3 (7); III/3-3A (2-3, 5). Tools: transverse oblique scraper with straight working edge on longitudinally fragmented flake (1); transverse oblique scraper with straight working edge on complete flake (2); transverse oblique scraper with convex working edge on complete (3); semi-trapezoidal scraper on complete flake (4); semi-trapezoidal scraper with retouched back on complete flake (5); semi-trapezoidal scraper on flake fragment (6); transverse convex scraper on complete flake (7); sub-trapezoidal scrapers on complete flakes (8-9).

3 proximal parts, 1 medial part and 1 distal part), and one blade fragment (a medial part). The pieces on a complete flake and on a flake's distal parts can be considered as double scrapers (Chabai, Demidemko 1998). The remaining pieces, referred to as double scrapers, should perhaps better be affiliated to the unidentifiable tools, because missing distal parts of these tools possibly represent convergent scrapers and/or points. The fragmented double scrapers identified here are quite sizable, and it is actually suspected that they are true to this scraper type.

Now let us consider the retouch data of these scrapers on the basis of their 14 working edges:

scalar – 11 / 78.6%;
sub-parallel – 2 / 14.3%;
stepped – 1 / 7.1% and
flat – 6 / 42.9%;
semi-steep – 5 / 35.7%;
steep – 3 / 21.4%.

The data again show a dominance of scalar retouch with a flat and/or semi-steep angle. There is only a single case in which there occurs stepped and steep retouch type with an angle; this is known from one of the working edges of a double scraper on a complete flake.

Finally, the metric measurements of the only complete flake blank is again comparable to the data for simple and transverse scrapers: length – 5.1 cm, width – 3.9 cm, thickness – 1.3 cm.

Thus, the characteristics of the double scrapers do not contradict the already observed data for simple and transverse scrapers, and one might argue that when considered together, they all compose a homogeneous set of scrapers.

Convergent scrapers

This scraper category comprises a good sample of 20 pieces which are only absent in level III/3-2A (the level within sub-unit III/3 with the least tools), and with only a single such scraper from level III/3-3 (see Table 9-37). There is nothing simple in the classification of these scrapers, particularly considering the problem of possible Micoquian admixture within the WCM levels of sub-unit III/3; in fact this category of scraper is the best possible candidate for revealing "Micoquian influence".

The convergent scrapers will be described below in line with listings in Table 9-37.

"Trapezoidal" scrapers

These seven scrapers stem from four different levels of sub-unit III/3 (see Table 9-37) and comprise four semi-trapezoidal, two sub-trapezoidal and one trapezoidal item.

Semi-Trapezoidal scrapers with two retouched working edges are as follows:

Blanks: flakes – 2 (Fig. 9-6, *4, 5*) and flake fragments – 2 (Fig. 9-6, *6*).

By their metric measurements: 2 complete flakes are regular, with L > W: length – 4.6 cm, width – 4.0 cm, thickness – 0.7 cm (Fig. 9-6, *5*); and 1 item is shortened, transversal, with L < W: length – 3.2 cm, width – 3.7 cm, thickness – 1.2cm (Fig. 9-6, *4*).

Regarding accommodation elements, two of the four semi-trapezoidal scrapers have additional treatment: one semi-trapezoidal scraper on a flake fragment displays terminal thinning, and one on a complete flake has a retouched back (Fig. 9-6, *5*).

Eight retouched edges are as follows: scalar (N=5), sub-parallel (N=1), stepped (N=2), flat (N=2), semi-steep (N=3), steep (N=3). There is one association of a stepped and a steep retouch for a distal edge of a semi-trapezoidal scraper with retouched back from level III/3-3A (Fig. 9-6, *5*). These characteristics are seriously indicative of Micoquian admixture in this lowermost level of sub-unit III/3.

Sub-trapezoidal scrapers (2 items) with 3 retouched working edges were only identified in level III/3-1A (Fig. 9-6, *8, 9*). Both are on complete flakes with shortened, transversal proportions: length – 3.9 and 3.3 cm, width – 5.9 and 4.5 cm, thickness – 1.7 and 1.5 cm. The following are their retouch types and angles: scalar – 3, sub-parallel – 1, stepped – 2 and flat – 2, semi-steep – 4. No accommodation elements were observed.

Considering the complete absence of sub-trapezoidal scrapers for the WCM from Unit II at Kabazi II (see Chabai 2004c: Table II-5 on p. 62), their presence here on shortened, transversal, ra-ther thick flakes, with 3 well retouched edges, from the uppermost levels of sub-unit III/3 is indicative of Micoquian origins.

The single trapezoidal scraper stems from the lowermost level III/3-3A; this artefact is also regarded as Micoquian. It is on the distal part of a flake that was reused after breakage, it being retouched to produce a tool with four working edges. Its overall size is 3.8 cm long (the preserved length), 3.9 cm wide and 1.0 cm thick. The re-utilised basal part and both laterals display scalar and flat retouch, while the distal edge has a stepped and semi-steep retouch. With exception of the re-utilisation of the proximal end, no other accommodations are evident.

All in all, the seemingly well represented series of seven "trapezoidal" scrapers turned out to be not so good. Four of these artefacts are considered by us to be Micoquian, and stem either from one of the uppermost levels (III/3-1A) or the lowermost level III/3-3A (1 semi-trapezoidal, 2 sub-trapezoidal and 1 trapezoidal scrapers), leaving only three semi-tra-pezoidal scrapers as possibly WCM in origin.

"Rectangular" scrapers (Table 9-37)

The four "rectangular" scrapers occur only in the two uppermost levels III/3-1 and III/3-1A, and in the lowermost level III/3-3A .

The two scrapers from level III/3-3A are semi-rectangular. One of these pieces (Fig. 9-7, *7*) is made on a large, elongated flake (length – 7.2 cm, width – 4.7 cm, thickness – 1.0 cm) that morphologically combines features of both a lateral crested flake and a specific *enlèvement deux* flake, i.e. characteristic for WCM debitage. Its retouch types and angles are scalar and steep, and stepped and semi-steep. The second piece (Fig. 9-4, *4*) is again on a typical WCM debitage – a simple lateral *débordante* blade (length – 7.0 cm, width – 2.4 cm, thickness – 0.8 cm). The scraper has scalar and steep retouch, and stepped and steep retouch. This semi-rectangular scraper is also naturally backed.

Sub-rectangular scrapers (2 items) with three retouched working edges occur in levels III/3-1 and III/3-1A. The piece from level III/3-1 (Fig. 9-7, *9*) is on a primary flake (4.3 cm long, 3.9 cm wide, 1.2 cm thick) with a variety of retouch types and angles: scalar and steep, stepped and semi-steep, scalar and semi-steep. This piece would be equally at home in both a WCM and a Crimean Micoquian tool-kit. However, considering the clear absence of features common to Micoquian unifacial scrapers (e.g. often invasive retouch and accommodation thinning), the piece is probably better assigned to the WCM. The item from level III/3-1A (Fig. 9-7, *5*) certainly belongs to the WCM tool-kit. It is a distal part of an elongated flake with a pronounced parallel scar pattern – a feature that is not at all typical for the Crimean Micoquian. Its retouch types and angles are as follows: stepped and steep, scalar and flat, stepped and flat.

"Crescent" scrapers

These are encountered in levels III/3-1A (one semi-crescent scraper) and III/3-3A (two 2 sub-crescent scrapers).

The semi-crescent is on the distal part of a flake and displays two scalar and two semi-steep retouched working edges.

The two sub-crescent pieces are on complete flakes. The first flake blank is of shortened, transversal proportions (length – 3.5 cm, width – 3.9 cm, thickness – 1.0 cm), whereas the second flake blank is regular – 3.8 cm long, 2.2 cm wide, 1.0 cm thick. The first sub-crescent scraper has a truncated-faceted base and its two other secondary treated edges both show sub-parallel and semi-steep retouch characteristics. The second sub-crescent scraper displays no accommodation elements, but was subjected to a heavy secondary treatment – all three edges have a stepped and semi-steep retouch.

This scraper group is well attested in both Crimean Middle Palaeolithic industries (WCM and Crimean Micoquian), but considering their rather infrequent occurrence within the Kabazi V, sub-unit III/3 tool-kit, we may actually relate them to the WCM assemblage.

"Triangular" scrapers

There are only two convergent scrapers from sub-unit III/3. The first stems from level III/3-3A (sub-triangular) and the second from level III/3-2 (triangular).

The sub-triangular piece (Fig. 9-7, 8) is made on an almost complete flake (5.5 cm long, 4.1 cm wide, 1.6 cm thick) and bears scalar and semi-steep, and stepped and semi-steep retouch types.

The triangular piece (Fig. 9-7, 2) is on a complete blade (5.4 cm long, 2.6 cm wide, 0.9 cm thick), is basally thinned, and its three retouched edges are as follows: stepped and steep, sub-parallel and semi-steep, stepped and flat.

The affiliation of these two "triangular" scrapers to the WCM tool-kit follows along the same line of argumentation as noted for the "crescent" scrapers.

"Leaf shaped" scrapers

A semi-leaf scraper comes from level III/3-2, and a sub-leaf scraper is from level III/3-3A.

The semi-leaf piece (Fig. 9-7, 3) is on a small complete flake (length – 3.2 cm, width – 2.4 cm, thickness – 0.4 cm) and was treated using scalar and semi-steep, and stepped and steep retouch.

The sub-leaf scraper with a notched base is again on a small flake (3.5 cm long, 2.4 cm wide, 0.9 cm thick) and has three working edges which show the following retouch: 2 sub-parallel and 2 semi-steep, and sub-parallel and steep.

Such small "leaf shaped" scrapers can appear in both WCM and Crimean Micoquian tool-kits and once again, due to their small number we rather connect them with the WCM industry.

Convergent (unidentifiable) scrapers

These scrapers were identified in the two lowermost levels III/3-3 and III/3-3A. Both pieces take the form of just the small distal parts of flakes. Their tips, although convergent, are not sharp and pointed, and for this reason these pieces are identified as scrapers and not as points. The scraper from level III/3-3 displays scalar and semi-steep, and scalar and flat retouch. The item from level III/3-3A has scalar and semi-steep retouch.
To summarise, the are 16 WCM convergent scrapers from sub-unit III/3 at Kabazi V; this number excludes from the overall total of 20 pieces the one semi-trapezoidal, two sub-trapezoidal and one trapezoidal

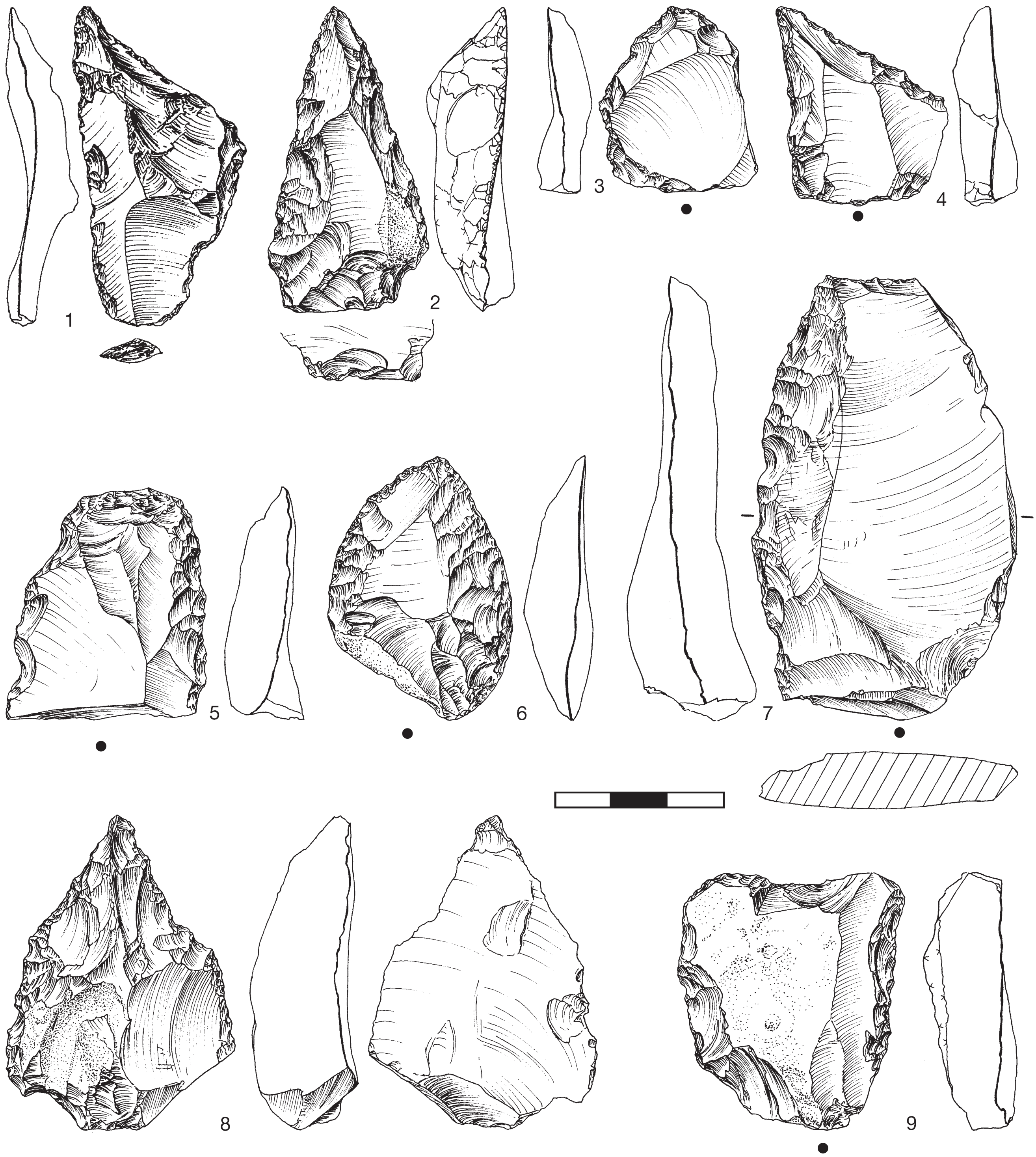

Fig. 9-7 Kabazi V, sub-unit III/3: levels III/3-1 (4, 9); III/3-1A (5); III/3-2 (2-3, 6); III/3-3A (1, 7-8). Tools: distal point on complete blade (1); triangular scraper on complete blade (2); semi-leaf scraper on complete flake (3); semi-trapezoidal point on complete flake (4); sub-rectangular scraper on flake fragment (5); sub-leaf point on complete flake (6); semi-rectangular scraper on complete flake (7); sub-triangular scraper on complete flake (8); sub-rectangular scraper on complete primary flake (9).

scraper assigned to the Crimean Micoquian.

Blank types: flakes – 8; flake fragments – 6; blades – 1; *débordante* / crested blades – 1.

Accordingly, the 16 convergent scrapers were made on 87.5% of blanks with flaky metrical proportions and only on 12.5% of blanks with blady metrical proportions.

Average metrics for 8 complete flakes and 2 complete blades are as follows:

Flaky blanks. Length – 4.28 cm; width – 3.41 cm with two flakes with shortened, transversal metrics where L ≤ W; thickness – 1.04 cm. The metrical measurements are higher than those for unretouched flakes (see Tables 9-17, 9-18 and 9-19), as it is for each scraper category in the tool-kit.

Blady blanks. Length – 6.20 cm; width – 2.50 cm; thickness – 0.85 cm. Again, the measurements are larger than for unretouched blades (see Tables 9-34, 9-35 and 9-36), as it is also true for each scraper category produced on blades.

Retouch types and angles for the 16 convergent scrapers with their 37 working edges are as follows:

scalar – 18 / 48.7%;
sub-parallel – 7 / 18.9%;
stepped – 12 / 32.4% and
flat – 6 / 16.2%;
semi-steep – 21 / 56.8%;
steep – 10 / 27.0%.

On the one hand, the retouch indices show a dominance of scalar retouch (however, with about one third of stepped retouch), and, on the other hand, a great dominance of the semi-steep retouch angle, which is followed by the steep retouch angle. At the same time, of all 37 retouch types and angle combinations, only 10.8% (4 cases) show the common occurrence of stepped and steep retouch.

Accommodation elements are registered for five convergent scrapers. These are one naturally backed example and four different thinnings and/or truncations: one truncated-faceted base, one terminally truncated, one basally thinned, and one notched base. Thus, four of these thinnings and/or truncations constitute 25% for the sample of 16 convergent scrapers; this is the highest ratio among all scraper categories.

On the whole, the convergent scrapers are characterised by a variety of forms ("trapezoidal", "rectangular", "crescent", "triangular" and "leaf shaped") with no prevalence of any one or two types. They are mostly secondary treated by scalar and semi-steep retouch, although the occurrence of stepped and steep retouch (not very often in combination) is notable, with the highest ratio of all scraper categories. The same also applies to the application of accommodation elements which is once more the highest for all the defined scraper categories. Therefore, we can conclude that the convergent scrapers represent the scraper category that underwent the most significant secondary modification.

Returning back to the ratios of the four scraper categories, these should be re-calculated, this time keeping in mind the four convergent scrapers from the Crimean Micoquian admixture component. Thus, we have in total 69 scrapers in the sub-unit III/3 WCM tool-kit from Kabazi V. There are 39 simple scrapers (56.6%), seven transverse scrapers (10.1%), seven double scrapers (10.1%), and 16 various convergent scrapers (23.2%).

Points

The 17 points represent a sample of various such tools; no particular type or series of points dominates (see Table 9-37). They occur randomly in each of first six levels (III/3-1 – III/3-3), being more numerically but not by type(s) in the lowermost level III/3-3A. It should be noted that all points bear retouch on the dorsal surface of the debitage blanks.

Levallois atypical retouched points

Rather conventionally, these three artefacts have been assigned to the points, as firstly they are not typical Levallois points, and secondly, they were not transformed into real points following retouch. They can be referred to as atypical Levallois points with some retouch. Whereas one of these pieces stems from level III/3-1A, the remaining two items were recovered from level III/3-3A (see Table 9-37).

The piece from level III/3-1A is a quite large distal part of a point (length – 6.1 cm, width – 4.6 cm, thickness – 0.8 cm) with a bilateral irregular continuous retouch.

One of the pieces from level III/3-3A is very similar to the one described above in its retouch characteristics. It is, however, a complete but smaller item (length – 3.7 cm, width – 2.5 cm, thickness – 0.5 cm) with a *chapeau de gendarme* butt and an irregular discontinuous retouch on its right lateral edge.

The third Levallois atypical point (also with a *chapeau de gendarme* butt on a complete item – 3.7 cm long, 2.5 cm wide and 0.5 cm thick) bears a regular scalar and semi-steep retouch at its distal edge, making it a transverse oblique convex scraper. In spite of this, it was decided to assign the object to the Levallois atypical retouched points.

Lateral points

The only lateral point stems from level III/3-3. It is a small distal part of a flake or a blade (2.8 cm long, 1.4 cm wide, 0.2 cm thick) with scalar and semi-steep lateral retouch.

Distal points

The only distal point comes from level III/3-3A (Fig. 9-7, 1). It bears a regular scalar and semi-steep retouch at the distal tip of the blank – a blade (5.6 cm long, 2.7 cm wide, 0.8 cm thick).

Semi-trapezoidal points

This point type is known through single examples from three levels of sub-unit III/3 – III/3-1, III/3-2, and III/3-3A. The piece from level III/3-2 is on the fragment of a flake, while the remaining two pieces are made on complete flakes. The fragmented item from level III/3-2 has a scalar and steep, and scalar and semi-steep retouch. In light of its fragmentation, we attribute this point to the WCM materials from sub-unit III/3. However, this is not the case with the two complete points which are believed to be Micoquian in origin. The point from level III/3-1 (Fig. 9-7, 4) is on a regular flake (3.3 cm long, 2.7 cm wide, 0.7 cm thick), with scalar and steep, and stepped and steep retouch. The point from level III/3-3A is on a shortened, transversal flake (3.0 cm long, 4.3 cm wide, 0.9 cm thick), with stepped and semi-steep, and scalar and semi-steep retouch.

Thus, the semi-trapezoidal points are made up of a significant Crimean Micoquian component.

Semi-crescent points

These are only observed in the lowermost level III/3-3A with three pieces. All three are made on quite similar debitage blanks of similar sizes and proportions. Two pieces are on rather elongated primary flakes (length – 6.0 cm, width – 3.1 cm, thickness – 0.6 cm; Fig. 9-8, 1, 3), while the third is made on a shortened (6.5 cm long, 3.2 cm wide and 0.9 cm thick) blade (Fig. 9-8, 2). Secondary treatment of all six working edges of these points are as follows: 3 stepped, 2 scalars, 1 sub-parallel retouch types, 4 flat, and 2 semi-steep retouch angles. We are inclined to assign all these semi-crescent points to the WCM tool-kit, due to their quite elongated proportions, overall similarity, and prevalence of a flat retouch angle.

Sub-leaf points

Two sub-leaf points were recovered from levels III/3-2 (Fig. 9-7, 6) and III/3-3A. Their flake blanks are practically identical (length – both 4.6 cm, width – both 3.2, thickness 1.0 and 1.5 cm), although there are some differences concerning retouch: sub-parallel and semi-steep, and scalar and flat for the thicker point, 2 stepped and 2 semi-steep for the thinner point. The points are assigned to the WCM tool-kit based on their frequency in the Unit II assemblages at Kabazi II (see Chabai 1998b; 2004c).

Unidentifiable points

These points are represented by just heavily fragmented examples: small distal parts and/or even tiny distal tips, and therefore cannot be classified in any objective way. They occur in 3 levels of sub-unit III/3: III/3-1 (N=1), III/3-2A (N=1), and III/3-3A (N=2).

There follows a short summary of the basic characteristics of points from sub-unit III/3. Disregarding the two presumably Micoquian semi-trapezoidal pieces, the total point sample amounts to 15 points for sub-unit III/3. Once again, it should be stressed that three retouched atypical Levallois points were also attributed to the points. Further, it should not be forgotten that four points were heavily fragmented. Thus, from a typological perspective, we have only eight pieces. This rather poor overall representation of points is an important factor when discussing the WCM status of the tool-kit; it is well known that points within various WCM assemblages account for ca. 20% of tools, excluding retouched pieces and unidentifiable tools. In sub-unit III/3 we have 15 points out of 101 identifiable tools, i.e. 14.85%, again recalling the inclusion of retouched atypical Levallois points and unidentifiable points. Morphologically, the eight points are characterised by the following data.

Blanks: flakes – 3, flake fragments – 2, blades – 1, blade fragments – 1, unidentifiable blank – 1.

In spite of the small number of artefacts we observe a notable ratio of blady blanks for points, and also, it should not be forgotten, an elongated flake and an elongated flake fragment for sub-leaf points.

Metrical data is even poorer and based on just three complete flakes and one blade. On average, flakes are 5.07 cm long, 3.17 cm wide, and 1.03 cm thick, although with respect to their length and thickness, they are larger than unretouched flakes. The only blade blank is 6.5 cm long, 3.2 cm wide and 0.9 cm thick that, in all three respects larger than unretouched blades. This testifies to the selection of longer, wider and thicker debitage blanks for tool production processes in sub-unit III/3.

Retouch types and angles for the eight points with 15 working edges are:

scalar – 18 / 48.7%;
sub-parallel – 7 / 18.9%;
stepped – 12 / 32.4% and
flat – 6 / 16.2%;
semi-steep – 21 / 56.8%;
steep – 10 / 27.0%.

These are very much similar to the retouch types

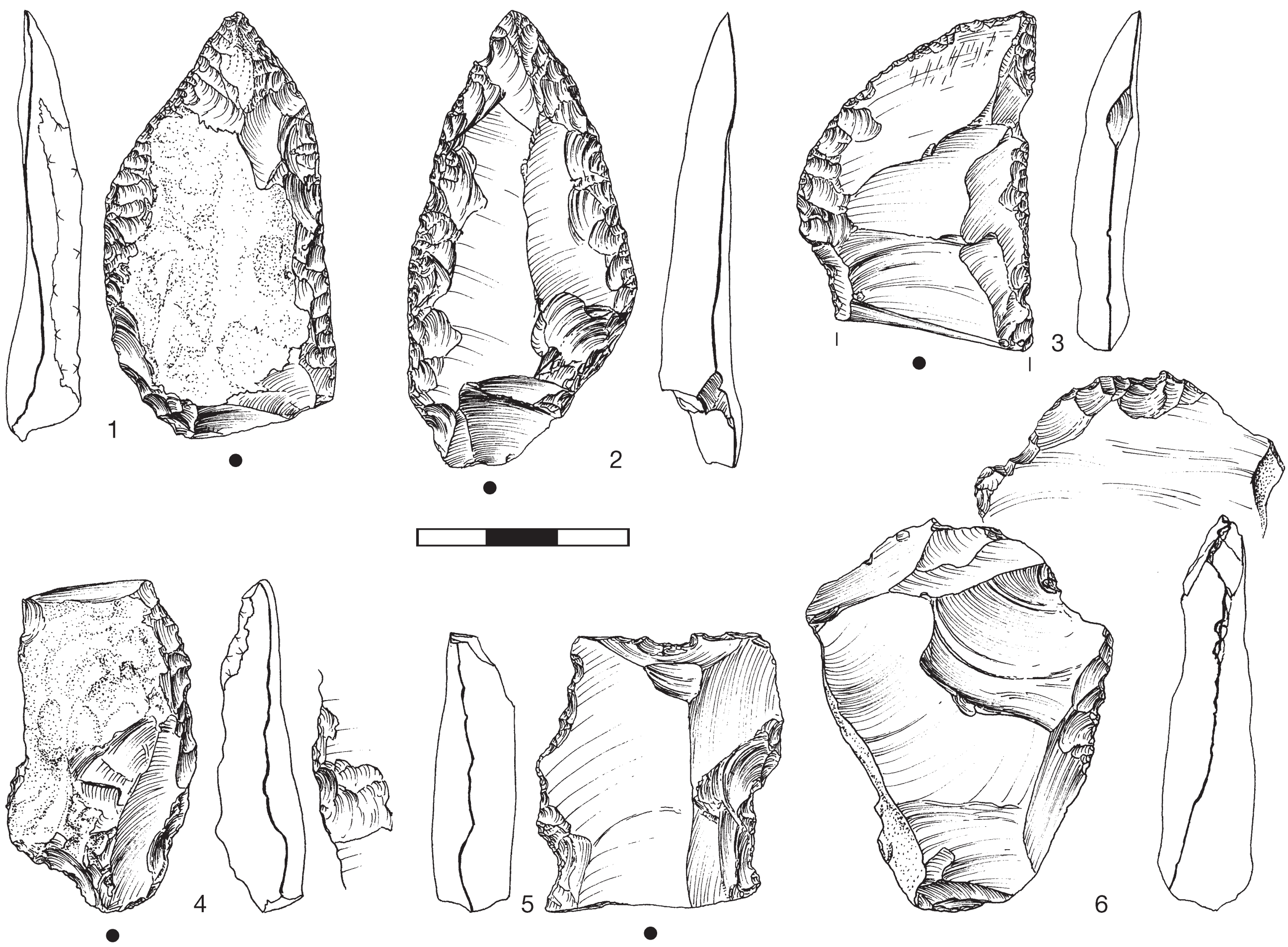

Fig. 9-8 Kabazi V, sub-unit III/3: levels III/3-1 (6); III/3-3 (4); III/3-3A (1-3, 5). Tools: semi-crescent point on complete primary flake (1); semi-crescent point on complete blade (2); semi-crescent point on flake fragment (3); simple convex denticulate on complete flake (4); sub-rectangular denticulate on flake fragment (5); retouched flake with irregular retouch and terminal truncated-faceted terminal part (6).

and angles noted for convergent scrapers, but with one exception – the share of steep retouch angle is five times higher for convergent scrapers than it is for the points. At the same time, none of the five edges with stepped retouch is associated with a steep angle for the points.

Further, no one point is backed or anyway thinned.

Denticulates

There are ten such tools which are irregularly distributed throughout the archaeological sequence of sub-unit III/3: one piece from level III/3-2, five pieces from level III/3-3, and four pieces from level III/3-3A (see Table 9-37). Basically, sub-unit III/3 denticulates are very much the same as scrapers.

In view of the single ventral scraper among all 68 WCM scrapers, the presence should be noted of a simple convex denticulate with alternating retouch placement and naturally backed accommodation element from level III/3-2. It is made on a rather big flake (6.3 cm long, 4.3 cm wide, 2.1 cm thick) with scalar and semi-steep retouch. All remaining nine denticulates from levels III/3-3 and III/3-3A are also made on flakes and flake fragments, are dorsally secondary treated tools, and are subdivided, as were the scrapers, into three categories: simple lateral (5 items), transversal (3 items) and convergent (1 item). No double denticulates were observed. The data for the combined denticulates sample from levels III/3-3 and III/3-3A are as follows:

Simple denticulates are made up of four convex pieces and one concave piece. The convex items (Fig. 9-8, *4*) are made on three complete flakes (length – 4.6 – 4.0 – 3.3 cm; width – 2.5 – 3.2 – 3.8 cm; thickness – 1.0 – 1.0 – 1.4 cm, respectively; the second of the artefacts is characterised by shortened, transversal metrical proportions) and a flake fragment. The concave item is on a complete simple lateral *débordante* blade (Fig. 9-5, 3) that is 6.6 cm long, 3.2 cm wide, and 0.5 cm thick. All five simple denticulates show the following retouch types and angles: 3 scalars, 2 stepped, and 1 flat, 3 semi-steep, 1 steep. Stepped and steep retouch occur together on one simple convex denticulate, only (Fig. 9-8, 4).

Transverse denticulates comprise two convex and one oblique convex pieces. Whereas one transverse denticulate is on a flake fragment, the two remaining items are on complete flakes (length – 3.9 – 5.9 cm; width – 5.4 – 3.4 cm; thickness – 0.6 – 0.7 cm, respectively), the first of which has shortened, transversal metric proportions. All three transverse denticulates display scalar and semi-steep retouch, only.

The single convergent denticulate (sub-rectangular) is on a flake fragment with scalar and steep, scalar and flat, and stepped and steep retouch of its three working edges (Fig. 9-8, *5*).

A notable feature of these nine denticulates is a complete absence of any accommodation elements.

The summary on all ten denticulates is given below.

Blanks: flakes – 6; flake fragments – 3; blades – 1.

As already seen, most denticulates are produced on flaky blanks.

The average metrical parameters for the six complete flakes are as follows: length – 4.67 cm, width – 3.77 cm, thickness – 1.13 cm. Again, this shows that denticulated tools are larger than unretouched flakes. The only blade is 6.6 cm long, 3.2 cm wide and 0.5 cm thick.

Retouch types and angles for the ten denticulates, with twelve working edges, are:

scalar – 9 / 75.0%;
stepped – 3 / 25.0% and
flat – 2 / 16.7%;
semi-steep – 7 / 58.3%;
steep – 3 / 25.0%.

Thus, scalar retouch clearly predominates among denticulates, although of three stepped retouched angles, two are associated with a steep angle.

The only accommodation element noticed among the ten denticulates is the naturally backed element of the alternating piece.

Notches

These three tools comprise single examples from three different levels of sub-unit III/3: III/3-1, III/3-3, and III/3-3A. All notches are characterised by dorsal retouch. On the other hand, notches are made on very different type blanks, with variable retouch disposal – a small complete flake (3.0 cm long, 2.4 cm wide, 1.0 cm thick) with distal scalar and steep retouch from level III/3-1; a pre-core with scalar and semi-steep retouch from level III/3-3; and a chip (2.5 cm long, 2.3 cm wide, 0.9 cm thick) with lateral scalar and semi-steep retouch from level III/3-3A. The characteristics of these notches testify to an occasional selection of various blanks for the manufacture and usage of notches. At the same time, the absence of stepped retouch on notches is suggestive of only short-term usage. No so-called "Clactonian notches" were distinguished. All in all, we may conclude that notches played only a very minor role in the tool-kit from sub-unit III/3 at Kabazi V.

Upper Palaeolithic Tool Types

These tool classes are represented by single pieces from throughout the sub-unit III/3 archaeological sequence. They include an end-scraper from level III/3-3A, a burin from level III/3-1a, and a truncated piece, again from level III/3-3A (see Table 9-37). The occurrence of such pieces shows how incidental their presence in sub-unit III/3 is.

End-scraper

The end-scraper is quite atypical. Its working edge displays sub-parallel and steep convergent retouch, and is situated not on one of the narrow edges of a debitage blank, as is usual for end-scrapers, but instead is upon the left lateral edge of a flake (length – 4.2 cm, width – 3.5 cm, thickness – 1.6 cm) At the same time, the flake's distal edge bears only an irregular partial dorsal retouch.

Burin

This tool is a regular angle burin. It was made on a shortened, transversal flake (length – 4.3 cm, width – 5.1 cm, thickness – 2.1 cm) from which a single burin facet had been struck from a natural terminal edge.

Truncated piece

This is a flake (4.1 cm long, 2.3 cm wide, 0.5 cm thick), the distal edge of which was treated obliquely by a scalar and steep retouch. Morphologically, the piece is similar to some transverse oblique straight scrapers (Fig, 9-6, *1, 2*), but with a single important exception – the truncated piece displays a steep angle retouch, while the transverse oblique straight scrapers are characterised by a semi-steep angle of retouch. Therefore, from a strictly typological perspective, this piece, which is unique for the whole sub-unit III/3 levels, is an example for a truncated piece.

Truncated-faceted piece

As noted above, truncated-faceted thinning is one of the most common features on scrapers. There is, however, one further artefact, a truncated-faceted piece from the lowermost level III/3-3A, which displays such treatment, but with no additional retouch. The piece is on a rather big flake (6.2 cm long, 3.7 cm wide and 1.0 cm thick) and displays a truncated-faceted modification at its (terminal) distal part. Whether the piece is an unfinished tool or must be classed as "an independent" tool is still unclear.

Some Considerations on the Structure & Typologically Indicative Features of the Tool Assemblage

There follows a brief summary of the aforementioned data on characteristic tools from Kabazi V, sub-unit III/3.

First, this involves a re-calculation of the composition of tool-kits, taking into account the exclusion from the WCM tool-list of some Micoquian scrapers and points, i.e. a total of six pieces. In this way, one arrives at a total of 101 tools. Accordingly, the representation of the tool classes is as follows:

scrapers – 69 / 68.3%,
points – 15 / 14.8%,
denticulates – 10 / 9.9%,
notches – 3 / 3.0%,
end-scrapers – 1 / 1.0%,
burins – 1 / 1.0%,
truncated pieces – 1 / 1.0%,
truncated-faceted pieces – 1 / 1.0%.

This general tool structure seems to be very similar to WCM tool-kits that are known from Unit II of Kabazi II, and from layers II/2 and III at Karabi Tamchin (see Chabai 2004c: Table II-5 on p. 62). Therefore, there is no doubt that the very basic body of tools from Kabazi V, sub-unit III/3 is affiliated to the WCM, in spite of a small number of Crimean Micoquian tools.

At this point, it is also useful to provide a summary on blanks, metrics, retouch and accommodation elements for the whole of this tool sample of 101 pieces.

Blanks:
flaky blanks – 72 / 75.0%,
blady blanks – 20 / 20.9%,
chips – 1 / 1.0%,
core-like pieces – 3 / 3.1%,
unidentifiable debitage pieces – 5 / – .

This structure testifies to the important role of blady blanks within the tool-kit. Here it should also be noted that the blady blanks (15 of 20 / 75.0%) are blanks mainly for simple scrapers.

Average metrical indices of debitage blanks for 47 complete flaky pieces and 15 complete blady pieces are given below.

Flaky pieces: *length* – 4.56 cm; *width* – 3.61 cm; thickness – 0.90 cm.
Blady pieces: *length* – 4.29 cm; *width* – 3.76 cm; thickness – 1.05 cm.

These general tool metrical data are larger than those known for just unretouched debitage (see Tables 9-17, 9-18 and 9-19): length – 3.38 cm, width – 3.23 cm, thickness – 0.80 cm. The share of flakes with shortened, transversal metrical proportions among these 47 flaky blanks among tools is not high – nine pieces (19.1%).

Blady pieces: *length* – 6.61 cm; *width* – 2.71 cm; thickness – 0.78 cm. Again, when taken as a whole, and upon comparison with unretouched blades, blady blanks are much larger in all three metrical parameters (see Tables 9-34, 9-35 and 9-36): length – 4.57 cm, width – 1.80 cm, thickness – 0.60 cm.

Retouch types and angles for all 151 working edges on 92 tools (69 scrapers, 8 points, 10 denticulates, 3 notches, 1 end-scraper, 1 truncated piece) are as follows:

scalar – 93 / 61.6%;
sub-parallel – 23 / 15.2%;
parallel – 1 / 0.7%;
stepped – 34 / 22.5% and
flat – 35 / 23.2%;
semi-steep – 81 / 53.6%;
steep – 35 / 23.2%.

Accordingly, these permit some general remarks on the retouch data.

Retouch types are characterised by a dominance of scalar type. Although the stepped type is the second most common, it is more than 2.5 times less frequent than the scalar type. Sub-parallel and parallel types together comprise the third most frequent retouch group.

Retouch angles are mostly semi-steep, while flat and stepped angles are equally represented, but even when combined are less frequent than the semi-steep angle. Only nine working edges were observed with a combination of stepped and steep retouch (ca. 25 – 26%).

Finally, accommodation elements are noted in the following variety and frequency for the 101 tools:

naturally backed (N=3) (1 simple scraper, 1 convergent scraper, 1 denticulate);
truncated-faceted (N=5) (3 simple scrapers, 1 convergent scraper, 1 proper truncated-faceted piece);
thinned base or back (N=3) (2 simple scrapers; 1 convergent scraper);
bi-terminally thinned ends (N=1) (1 simple scraper);
terminally truncated (N=1) (1 convergent scraper);
and notched base (N=1) (1 convergent scraper).

Therefore, only three tool categories (7 simple scrapers, 5 convergent scrapers and 1 denticulate) display accommodation elements. Thus, only simple and convergent scrapers are characterised by various thinnings; from twelve thinning cases, five are truncated-faceted. One further tool is just a truncated-faceted piece. This picture testifies to the typological link between simple and convergent scrapers. At the same time, a distinct typological position of points in relation to convergent scrapers is evident.

Retouched pieces

Numerically, this tool class (110 pieces) is even more numerous than all previously defined tool classes (107 pieces) from the Kabazi V, sub-unit III/3 toolkit. Moreover, retouched pieces occur in each level of sub-unit III/3. In the different levels of this sub-unit they comprise from between 37.9 and 46.9% of assemblages. Their classification is based on marginal retouch and irregular retouch, with complete and fragmented items analysed separately. Additionally, for each of these two categories retouch placement, type, possible accommodation elements and overall shape characteristics are noted.

Retouched pieces with marginal retouch (complete)

On the basis of retouch placement and type, together with the consideration of additional accommodation elements , these pieces are subdivided into the following groups:

dorsal lateral continuous (N=8),
dorsal lateral discontinuous (N=1),
dorsal lateral partial (N=2),
dorsal bilateral continuous (N=2),
dorsal distal continuous (N=2),
dorsal distal discontinuous (N=2),
ventral lateral continuous (N=1),
ventral lateral + distal continuous (N=1).

These data allow us to "construct" the shapes of these pieces according to the traditional typological subdivision for scrapers. In this way, the 19 complete retouched pieces with marginal retouch can be listed as follows: simple (N=12), transverse (N=4), double (N=2), convergent (N=1).

Blanks are 14 flaky items and five blady items. No distinction was made between proper flakes/blades and CMP with flake and blade metrical proportions.

The same classification approach is also applied to the rest of the retouched pieces.

Retouched pieces with marginal retouch (fragmented)

Type and accommodation elements of retouch placement comprise:

dorsal lateral continuous (N=6) (one piece displays a terminal truncated-faceted part),
dorsal lateral discontinuous (N=3),
dorsal lateral partial (N=3),
dorsal bilateral continuous (N=1),
dorsal lateral + distal continuous (N=1),
ventral lateral partial (N=1).

Observed shapes are: simple (N=13), double (N=1), convergent (N=1).

Blanks are ten flaky fragments and five blady fragments. Also, the single occurrence of a truncated-faceted accommodation element on one of the fragmented retouched pieces with dorsal lateral continuous marginal retouch is worthy of mention.

Retouched pieces with irregular retouch (complete)

According to retouch placement and type, as well as accommodation elements, these comprise:

dorsal lateral discontinuous (N=3),
dorsal lateral partial (N=20) (Fig. 9-4, *5*)
(2 with a terminal truncated-faceted part – Fig. 9-8, *6* and one piece is with basal truncated-faceting),
dorsal bilateral continuous (N=1),
dorsal bilateral discontinuous (N=1),
dorsal bilateral partial (N=3),
dorsal distal discontinuous (N=2),
dorsal distal partial (N=6),
dorsal lateral + distal discontinuous (N=2),
dorsal lateral + distal partial (N=2),
ventral lateral partial (N=2),
alternate bilateral partial (N=1) (this artefact displays a lateral truncated-faceted part),
alternating distal continuous (N=1).

Observed shapes are: simple – 25 pieces, transverse – 9 pieces, double (N=6), convergent (N=4).

Among the blank types there are 37 flaky items, four blady items and three chunks. Of particular not is the presence of four truncated-faceted elements on laterally and bilaterally irregularly retouched pieces, only.

Retouched pieces with irregular retouch (fragmented)

Consideration of retouch placement, type, and accommodation elements leads to the identification of the following:

dorsal lateral continuous (N=3),
dorsal lateral discontinuous (N=1),
dorsal lateral partial (N=13),
dorsal bilateral continuous (N=1),
dorsal bilateral partial (N=1) (this piece has a basal truncated-faceted part),
dorsal distal partial (N=3),
dorsal lateral + distal partial (N=1),
dorsal sub-rectangular partial (N=1),
ventral lateral continuous – 1 piece,
ventral lateral partial – (N=2),
ventral distal partial (N=4),
alternating lateral continuous (N=1).

Identified shapes are: simple (N=21), transverse – (N=7), double (N=2), convergent (N=2).

Blank types comprise 24 flaky fragments, 5 blady fragments, 1 chip, 1 core fragment, and 1 unidentifiable debitage piece. The truncated-faceted element was made on an obverse bilateral retouched piece.

The above data, with some additions, can be summarised in the following way.

Combined information for all 110 retouched pieces regarding shape:

simple – 71 / 64.5%,
transverse – 20 / 18.2%,
double – 11 / 10.0%,
convergent – 8 / 7.3%.

At the same time, this is confirmed by the data for the 63 complete retouched pieces:

simple – 37 / 58.7%,
transverse – 13 / 20.6%,
double – 8 / 12.7%,
convergent – 5 / 7.9%.

Thus, the shapes of retouched pieces show not only some similarty, but also some dissimilarity to scrapers from sub-unit III/3. One similarity is the ratio for the simple shape group (58.7 – 64.5% for retouched pieces and 56.6% for scrapers) and the double group (10.0 – 12.7% for retouched pieces and 10.1% for scrapers). On the other hand, they are shown to differ with respect to the ratio of transverse items among retouched pieces (18.2 – 20.6%) in comparison to transverse scrapers (10.1%) and, otherwise, in the prevalence of convergent scrapers (23.2%) over convergent retouched pieces (7.3 – 7.9%).

Regarding the retouch placement, dorsally elaborated specimens are the most dominant (95 pieces / 86.4%), while ventrally retouched items approach only 10.9% (12 pieces). There occur only very few items with alternating (2 pieces / 1.8%) and alternate retouch (1 piece / 0.9%).

Regarding blanks, all 110 retouched pieces can be affiliated to the following types:

flaky blanks – 85 / 78.0%,
blady blanks – 19 / 17.4%,
chips – 1 / 0.9%,
chunks – 3 / 2.8%,
core fragments – 1 / 0.9%,
unidentifiable debitage pieces – 1 /– 0.9%.

The blanks of the retouched pieces allow us to make some valuable statements. The complete absence of chips is strong evidence for the absence of Micoquian admixture, as tool-kits from many Crimean Micoquian assemblages are full of tools on chips. Moreover, these data are highly supported by the fact that no one retouched piece is made on a bifacial tool treatment flake or blade, while a series of the sub-unit III/3 retouched pieces were produced on various CMP. Thus, we do not see any "visible" Micoquian influence within the analysed retouched pieces and instead we can claim their proper WCM affinity.

Average metrical parameters of debitage blanks for 51 complete flaky pieces and 9 complete blady pieces are given below.

Flaky pieces: *length* – 4.29 cm; *width* – 3.76 cm; thickness – 0.90 cm. These data, as other tool classes and categories, are bigger than those observed among unretouched debitage (see Tables 9-17, 9-18 and 9-19). At the same time, it is worth noting that a share of shortened, transversal flakes among flaky blanks for retouched pieces is the highest among all tool classes and categories – 27.5% (14 of all 51 items).

Blady pieces: *length* – 5.19 cm; *width* – 1.99 cm; thickness – 0.48 cm. A comparison of these data with the unretouched blady pieces (see Tables 9-34, 9-35 and 9-36) shows that retouched blady blanks have higher indices for length and width, but not for thickness.

Accommodation elements do not occur very frequently among the 110 retouched tools, although these do have one peculiar feature; among the 110 retouched pieces, thinning elements were noted in only six cases (just 5.5%). However, all of these are truncated-faceted pieces and no other thinning type is noted. Taking into consideration a general prevalence of a truncated-faceted element among tools (primarily scrapers), there is no other conclusion than that at least some retouched pieces may represent half-finished scrapers.

Generally speaking, all the above data on retouched pieces point to their "mixed tool properties". On one hand, many of these items are flints used in an *ad hoc* fashion by humans at the site. This is suggested not only by the "bad retouch" of these pieces, but also by flakes with shortened, transversal metrical proportions being much less common among tools. On the other hand, some of the pieces are "big enough" or have elongated metrical proportions with truncated-faceted thinnings. These may be interpreted as half-finished scrapers.

Unidentifiable tools

Unidentifiable tools occur throughout the sub-unit III/3 archaeological sequence, comprising from 14.3% in level III/3-1 to 14.6 – 41.2% in levels III/2 through III/3-3A, the only exception being level III/3-1A (1 item / 4.0%) (Table 9-37). Thus, for the majority of sub-unit III/3 levels unidentifiable tools constitute a very significant ratio of tools. However, these specimens are mostly heavily fragmented and additionally a few of them are heavily burnt.

Chips

Numerous chips were recovered from all levels of sub-unit III/3 (more than 80% of all recovered flint artefacts from each level – see Table 9-1). These artefacts indicate intensive flint treatment processes at the site. However, in this chapter the morphological and metrical attributes of chips are not presented as, for example, has been done for some Crimean Micoquian flint assemblages – e.g. Buran-Kaya III, layer B (Demidenko 2004a). This is explained by the fact that the chips from sub-unit III/3 at Kabazi V do not contain specific bifacial tool treatment pieces. In other words, these artefacts do not provide evidence for on-site bifacial tool production and rejuvenation. This is one further indication for the absence of any true Crimean Micoquian occupation within the sub-unit III/3 WCM archaeological sequence. For this reason, the previously mentioned, rare Micoquian flints are obviously a foreign occurrence in the sequence, probably caused by natural depositional processes with infiltration from the overlying and underlying Micoquian sub-units III/2 and III/4. Here, the only exception relates to four rejuvenation chips from the tips of unifacial convergent tools (see Demidenko 2004a: Figure 9-13: 1, 3 – 4, 8 on p. 140 for Buran-Kaya III, layer B materials) – one from level III/3-1A, two from level III/3-3, and one from level III/3-3A. On the other hand, these very specific rejuvenation chips for unifacial tools are indeed well known and numerous in Crimean Micoquian assemblages, and there are a couple of such pieces from Unit II WCM assemblages at Kabazi II. Keeping in mind the discussed Micoquian admixture problem for sub-unit III/3 WCM materials, we cannot exclude that these peculiar chips are related to a Micoquian component, although their WCM affinity is not excluded either. This problem might only be resolved through future serial findings of such specific chips in new *in situ* cultural bearing sediments with undoubtedly homogeneous WCM materials.

Chunks

Chunks have been identified in all six levels of sub-unit III/3 (see Table 9-1). The four upper levels (from III/3-1 to III/3-2A) contain just small pieces (less than 4 cm in maximum dimension). Therefore, these chunks are probably only fragments of rather dry and bad conditioned flint nodules or plaquettes that had been brought to the site for primary flaking. Two lowermost levels (III/3-3 and III/3-3A) have each yielded two chunks, these exceed 5 cm in length and might be considered as a kind of raw material supply for further primary flaking processes at the site.

Non-flint archaeological artefacts

This artefact category comprises 2 retouchers on pebbles and 5 retouchers on animal bones. These stem from various levels in sub-unit III/3 (see Table 9-1). For a more detailed description of retouchers see Chapter 16, this volume.

Kabazi V, Sub-Unit III/3 in the Context of the Western Crimean Mousterian

There are two basic aspects that need to be analysed in order to better comprehend the position of Kabazi V, sub-unit III/3 within the frame of other WCM sites and assemblages. The first aspect, which is traditional for Palaeolithic archaeology, must be the consideration of techno-typological features of the WCM industry. Only then can the position of Kabazi V, sub-unit III/3 within the functional varia-bility system of WCM sites, which in the course of the last decade has been intensively studied by V. P. Chabai (e.g. Chabai, Marks 1988; Chabai 2004c: 212-222), be elucidated. This measure requires two successive analytical steps.

According to the basic technological and typological characteristics of both the Kabazi V, sub-unit III/3 artefacts and the three *in situ* series of levels from Kabazi II, Karabi Tamchin and Shaitan-Koba sites, there is doubt that in all general terms the Kabazi V, III/3 materials fit well into the early stage of WCM industry dated to a time period from the Hosselo Stadial to the Huneborg Interstadial (ca. 45-40 – 35 000 BP). In brief, its industrial characteristics are as follows (cf. Chabai, Marks 1988; Chabai 2000; Chabai 2004c). Technologically speaking, primary flaking processes are generally based upon three different core reduction strategies: Levallois Tortoise, parallel Biache, and parallel volumetric. These core reduction strategies are characterised by the following: production of elongated blanks, often blades (Ilam – ca. 20 – 25%); high faceting indices (IFl and IFstr – ca. 55 – 70%); cores with one main and supplementary platform (Parallel Biache method); core tablet technique (Parallel volumetric method); and the application of *débordante* and/or the crested technique. All these technological features do not occur within Crimean Micoquian technological approaches. Typologically, the tool-kits are generally characterised by a dominance of scrapers (ca. 60%) with a predominance of simple types made on elongated blanks, including blades and some Levallois pieces, a moderate number of points (ca. around 20%), as well as denticulates and notches (ca. 15% together), and a small number of mostly atypical Upper Palaeolithic tool classes (end-scrapers, burins, perforators).

Returning to the Kabazi V, sub-unit III/3 assemblages, we also see some variability within this early WCM industry. From a technological point of view, the Kabazi V materials are peculiar for early WCM assemblage, as they are characterised by the parallel Biache method, featuring a mainly uni-polar reduction strategy, and comprising some Levallois elements. At the same time, independent Levallois Tortoise and parallel volumetric methods are absent. Typologically, however, if we were to dismiss the few Micoquian scrapers and points from the tool-kits recovered from the sub-unit III/3 levels, Kabazi V implements would correlate well with the etalon-like tool assemblages discovered in levels II/7 – II/8C at Kabazi II (Chabai 1998b). This is also very evident if we consider Chabai's typological and structural observations for the early WCM which is based on *in situ* materials recovered from the three aforementioned sites (Chabai 2004c: 69-76), which is characterised by *"the complete absence of bifacial tools"*, *"a dominance of scrapers … from 53% to 67% of all the tool-kit"*, *"17 – 25.3% of points"*, and *"not numerous denticulates (7.9 – 11.3%), notches (0 – 10%) and Upper Palaeolithic tools (0 – 3.6%)"*. In comparison, here the related Kabazi V, sub-unit III/3 data: no bifacial tools; 68.3% scrapers, 15.9% points, 9.4% denticulates, 2.8% notches, 2.7% Upper Palaeolithic tool types. Thus, the only difference is a smaller ratio of points and a slightly higher percentage of scrapers. Then, we add some peculiarities of WCM typology noted by V. P. Chabai. *"Morphological base of point classification in WCM industries is based on three morphological groups: semi-, sub- and leaf shaped ones; semi- and sub-crescent ones; distal and lateral ones"*. These are mostly made on flakes, with just a very few Levallois points. At the same time, points were mostly subjected to a secondary treatment, i.e. by dorsal scalar and flat retouch, and *"ventral thinnings were used rarely"*. *"Basically, scrapers are represented by simple … types… Transverse, double … and convergent … scrapers are rare and/or not numerous. Frequently, scrapers of the early WCM industry stage are made on flakes, including Levallois ones… There are a few scrapers with various ventral thinnings … and naturally backed scrapers are also rare. As a rule, simple scrapers are made by flat* *and semi-steep scalar dorsal retouch"*. Simple scrapers account for ca. 62% of tool assemblages, while there are also ca. 4% transverse scrapers, ca. 20% double scrapers and ca. 14% convergent scrapers, with the dominance among the latter of sub-triangular and semi-crescent items. There are a rather high percentage of points, *"a share of convergent tools (points and convergent scrapers) is quite high and within 24 – 38% in relation to all numbers of scrapers and points"*. Therefore, the typological features of the WCM, as summarised by V. P. Chabai, again very much resemble those tool assemblages recovered from the sub-unit III/3 levels at Kabazi V (see Table 9-37). In fact, the only difference lies in the smaller number of points in the Kabazi V tool-kit.

Although the Kabazi V, sub-unit III/3 artefacts are clearly of WCM origin, it is nevertheless difficult to overlook some evident differences between these and most of the already known WCM assemblages. Aside from the already noted absence of Levallois Tortoise and parallel volumetric methods in core reduction processes at Kabazi V, its debitage, including tool blanks, has some clear distinctions. While the blade index (23.1%) for Kabazi V, sub-unit III/3 correlates well with all other WCM debitage assemblages (see Chabai 2000: Table 6 on p. 202; Chabai 2004c: Table II-4 on p. 56), its faceting indices are very distinct, they being characterised by very low values – IFl = 47.3% and IFstr = 19.9%, which are 1.5 times lower for large faceting, and in excess of twice as low for strict faceting.

What could be the reasons behind these technological differences? Of course, the first explanation that comes to mind is a possible admixture of Crimean Micoquian influence as evidenced through reduced faceting indices. However, this hypothesis does not seem very realistic. In general, it is difficult to distinguish one industrial component from another for any mixed debitage sample. On the other hand, the debitage from Kabazi V, sub-unit III/3 does not have sufficient enough Micoquian admixture within the WCM debitage. Let us not forget that no one bifacial reduction blade was identified among the analysed debitage, and only seven bifacial reduction flakes were observed. At the same time, the blade sample has yielded a few Levallois blades and numerous *débordante*/crested pieces, also observed in the flake sample. Therefore, it is a valid conclusion that the debitage from sub-unit III/3 levels at Kabazi V attest to the early WCM character of this assemblage, with a very minor Micoquian admixture. Moreover, at 23.1%, the Kabazi V, sub-unit III/3 blade index is typical of the early WCM. However, were there a significant Micoquian flake component here, we would expect a much reduced blade index, which is not the case.

One might also compare the Kabazi V, sub-unit III/3 blade and faceting indices with respective indices from other Crimean sites with mixed Micoquian and WCM flints (see Chabai 2004c: Table II-6 on p. 73). Chabai's study of ten mixed assemblages resulted in the distinction of a total of five groups of blade and faceting indices, all of which contain in various proportions Micoquian (e.g. bifacial) tool types. The first group is characterised by low blade indices (ca. 5 – 10%) and rather high faceting indices – IFl = ca. 40 – 50% and IFstr = 25 – 30% with also either a high (20 – 30%) or medium (10%) ratio of bifacial tools, e.g. Zaskalnaya V, layers II and III; Zaskalnaya VI, layer II and IV, Aleshin Grotto, layer 2. A second group displays about the same blade and faceting indices as known from the first group, but with a lower number of bifacial tools (less than 5%), e.g. GABO, upper layer. The third group resembles the second in its few bifacial tools (less than 5%) and high large faceting (50%), however, strict faceting is low (18%), and the blade index is higher (12%), e.g. Bakhchisaraiskaya. The forth group is characterised by a moderate number of blades (10%) and low faceting indices (IFl = 27% and IFstr = 12%), and again only few bifacial tools (less than 5%), e.g. Kabazi I. Finally, the fifth group closely resembles the Kabazi V, sub-unit III/3 levels. It is characterised by blade indices of between ca. 19 and 21%, but with varying faceting indices: high ones for Shaitan-Koba, slope finds (IFl = 51.9% and IFstr = 33.9%) and moderate ones for Kholodnaya Balka (IFl = 37.7% and IFstr = 14.2%). A few bifacial tools also occur. Thus, the mixing of Micoquian and WCM finds and traditions takes on many different forms and structures. Accordingly, a number of hypotheses can be put forward to explain the development of such assemblages.

The first group is composed of assemblages with mostly Micoquian finds, as indicated by the high percentage of bifacial tools (10 – 30%), that in turn explain the moderate faceting indices (bifacial reduction debitage often features prepared butts) and low blade indices for these sites, which are situated in close proximity to flint outcrops. Core reduction at these sites also displays some true Micoquian techniques. Respectively, a few possible WCM occupations with only a small number of artefacts incorporated within these thick and artefact-rich layers at Zaskalnaya V did not actually change Micoquian technical indices. There is also a peculiar collection from the Aleshin Grotto, where cultural bearing sediments from Zaskalnaya V were washed down the slope and became deposited (Chabai 2004c, pp. 76-79). Therefore, the identification of the WCM component there was realised on strictly typological grounds, i.e. through the presence of some specific WCM artefacts: Levallois Tortoise and parallel bi-directional Biache cores, Levallois flakes and atypical points, as well as distal and lateral points. The second assemblage group is characterised by finds from the redeposited GABO site, where a dominance of WCM technological elements is reflected by respective cores and high faceting indices. The low number of bifacial tools there might be explained by a small Micoquian component, while the low blade index perhaps reflects a WCM workshop situation, seeing as the site itself is situated at a flint source. The third assemblage group is represented by the site Bakhchisaraiskaya. Here it is highly likely that in the course of old excavations (1930s and 1950s) archaeological levels were excavated which contained more or less equal proportions of Micoquian and WCM flint artefacts. On the one hand, this hypothesis is based on the occurrence of only a small number of bifacial tools, a situation also comparable to the nearby site of Starosele, level 1 (both these sites are situated at a quite substantial distance from high quality flint outcrops), and the low strict faceting index, i.e. Micoquian features. On the other hand, the high faceting index is indicative of WCM traditions. Further, the equal mixture of these two industrial components is also suggested by the medium blade index and the low strict faceting index. The fourth assemblage type, as attested at Kabazi I, excavated in 1950s, can be similarly explained as was the case for the third group, but in light of the lower blade index and much lower faceting indices, it may be argued that the Micoquian Staroselian (?) industrial component prevails over that from the WCM one here. The latter industrial component was identified here again on a purely typological basis (Chabai 2004c, pp. 78-79). The fifth assemblages vary. On the one hand, the Shaitan-Koba slope finds (redeposited following the cleaning of the upper cultural bearing sediments from the rock shelter in Medieval times) which are characterised by typical early WCM technical indices, contains just a minor number of Micoquian artefacts which did not alter the overall WCM character. However, we cannot compare directly the Shaitan-Koba assemblage with the ones from Kabazi V, sub-unit III/3, as the former does not stem from cultural bearing deposits. On the other hand, the Kholodnaya Balka assemblage, with its ca. 19% of blades and moderate faceting indices (IFl = 37.7% and IFstr = 14.2%), is very close to the blade index from Kabazi V, sub-unit III/3, while faceting indices are lower at the former than at Kabazi V.

All in all, with exception of the finds from Shaitan-Koba, no single Crimean Middle Palaeolithic assemblage with attested mixed Micoquian and WCM flints does mirror debitage technical indices observed at Kabazi V, sub-unit III/3. Does this mean that we are faced with one more mixing variant, or is it a technical variation of the early WCM industry? Most likely, it is a combination of both these factors, but with a clear prevalence of the latter. Of course, there is a minor Micoquian component within the Kabazi V, sub-unit III/3 archaeological sequence that is seen through a few bifacial reduction flakes and "trapezoidal" scrapers and points, but no bifacial tools. Clearly, the most evident admixture was recognised in the uppermost and the lowermost archaeological levels. At the same time, the minimal Micoquian admixture was not sufficient to seriously influence and cause change to technical indices. And it did not happen for the blade index and only would relate to the faceting indices. Thus, it is perhaps more appropriate to suppose some special characteristics of the Kabazi V, sub-unit III/3 flint assemblage within the WCM industry, as suggested, for example, by:

– the dominance of primary flaking processes linked to the Biache method in its uni-polar variant, while the Biache method in its bi-polar variant and ca. 22% of bi-directional debitage are characteristic for the etalon-like early WCM materials from levels II/7 – II/8C at Kabazi II (see Chabai 2000: Table 6 on p. 202; Chabai 2004c: Table II-3 on p. 52);

– the absence in primary flaking processes of Levallois Tortoise and parallel volumetric methods, which are well represented in the etalon-like early WCM materials from levels II/7 – II/8C at Kabazi II;

– the relative paucity of points in Kabazi V in comparison to other early WCM assemblages.

In light of these peculiarities, it may be assumed that due to obvious technological differences in the assemblage, faceting indices for the Kabazi V, sub-unit III/3 debitage are low. There is no Levallois Tortoise core method that certainly would have led to higher indices, as would have the systematic application of the Parallel Biache method in its bi-polar variant. Finally, the observed infrequency of true retouched points, which are usually produced on "well made blanks" with prepared butts, also resulted in lower indices.

Now, after having established the special status of the Kabazi V materials within the WCM techno-typological ranges, we should turn to the functional variability system of WCM sites, and compare this to the WCM assemblages from Kabazi V.

We should not forget that when comparing the Kabazi V, sub-unit III/3 WCM assemblage with those from other WCM sites we are, in fact, dealing with functionally variable sites. Thus, whereas the Western Crimean, early WCM levels at Kabazi II have been defined as *"primary butchering stations, type A "* (Chabai 2004c, pp. 213- 216), layers II/2 and III at Karabi Tamchin site in the Eastern Crimea are termed *"short term camps, type B"* (Chabai 2004c, pp. 218- 221). At the same time, Shaitan-Koba site upper layer (Western Crimea) is associated with *"short term camps, type A"* (Chabai 2004c, pp. 217- 218). Considering the absence of primary butchering activity at Kabazi V site and its location near the Mylnaya mountain flint outcrop, and prior to the report on the archeozoological data, we might compare Kabazi V, sub-unit III/3 assemblages with those from the upper layers of Shaitan-Koba. These Shaitan-Koba materials are characterised by the following on-site flint exploitation data:

tools – 12.4%;
debitage : core-like pieces – 29.8 : 1;
tools : core-like pieces – 3.8 : 1;
density of artefacts per cubic metre – 313.3 (Chabai 2004c: Table VI-3 on p. 218).

The respective Kabazi V, sub-unit III/3 data are as follows:

tools – 19.4%;
debitage: core-like pieces – 24.2 : 1;
tools : core-like pieces – 6.1 : 1;
average density of artefacts is 1,479.1 items per cubic metre.

So, although not identical, the data from Kabazi V are similar, with the greatest correlation evident between this material and that from levels II/7 – II/8C at Kabazi II, and layers II/2 and III at Karabi Tamchin. The Karabi Tamchin flint exploitation data are the most distinct within the WCM, and the site's location, far removed from flint sources, with the supposed import of mainly finished tools to the site, and its proposed function as a secondary butchering station (see Chabai 2004c, p. 221), explains this fact. On the other hand, the Shaitan-Koba, Kabazi V and Kabazi II data do not vary greatly; this can perhaps be explained by the close proximity of these three sites to flint outcrops. However, some very obvious differences should not be overlooked. For example, only two levels from Kabazi II (II/7D and II/7C) even approach the tool ratio noted for the Shaitan-Koba and Kabazi V assemblages – 12.4 and 14.1%, respectively, while four other levels are characterised by much lower ratios: 5.1 – 11.8%. The ratio of debitage to core-like pieces, tools to core-like pieces, and the indices for artefact density are always lower for the Kabazi II assemblages. Therefore, there exist greater similarities between the WCM materials from Shaitan-Koba and Kabazi V materials than between the Kabazi II and Karabi Tamchin data. At the same time, there is a methodological problem to our comparisons that should also be mentioned. In these comparisons, we have always compared the overall assemblage data from Kabazi V, and not the respective data from each of the individual affiliated levels. This is because the Shaitan-Koba site is characterised by a very slow sedimentation rate for its cultural bearing deposits and, with certainty, the so-called upper layer is composed of a number of human occupations, while the six levels of Kabazi V, sub-unit III/3 accumulated at much greater rates, and can be considered as traces of 1 to 3 (presumably) human occupations per level. Accordingly, the Kabazi V, sub-unit III/3 data were artificially lumped together for the corresponding comparisons with the Shaitan-Koba data. Nevertheless, the levels from Kabazi V, sub-unit III/3 are characterised by the following data:

tools – 12.0 – 24.2%;
debitage : core-like pieces ratio – 14.3 – 55.8 : 1;
tools : core-like pieces ratio – 2.1 – 12.0 : 1;
density of artefacts per cubic metre – 926.1 – 2,230.4 (see Table 9-1).

At Kabazi V, sub-unit III/3, assemblages can be subdivided into six levels according to the ratios of debitage to core-like pieces and of tools to core-like pieces. The two levels III/3-1 and III/3-1A fall within the ranges for the early WCM as observed at Kabazi II:

debitage : core-like pieces ratio – 14.3 – 15.5 : 1;
tools : core-like pieces ratio – 2.1 – 4.5 : 1,

while the respective data for the remaining 4 levels from Kabazi V are much different. For these reasons, it may be assumed that this picture is indicative of significant variability among human occupations within Kabazi V, sub-unit III/3. Whereas 2 levels are similar to the Kabazi II, II, the 4 other levels are more comparable to the Shaitan-Koba data.

All in all, in line with the human occupation data expected for short-term camps of type A, established by V. P. Chabai (2004c, pp. 218), we see four basic characteristics: transportation of parts of ungulate carcasses of to the site; a fireplace construction; primary and secondary flint treatment processes on material from nearby flint sources; se-condary processing of ungulates at the site. In contrast to Kabazi II site levels which are interpreted as primary butchering stations, camps of type A are characterised by ungulate hunting activities; transportation of the killed ungulates and of flint objects from the nearby flint outcrop; primary processing of ungulates; transportation of some the best meat-bearing parts of animals to other locations. Thus, in the light of the comparison between Shaitan-Koba and Kabazi V assemblage data, and in consideration of the basic human occupation data, as well as the close proximity of Kabazi II to Kabazi V, we can presume that from (killing – butchering) sites such as Kabazi II, WCM human groups were carrying ungulate parts to short-term sites like Kabazi V. Here, there followed a secondary processing of the carcasses and intensive flint treatment processes. Further, we cannot exclude that the relative paucity of true retouched points (8 classifiable and 4 unclassifiable fragments) within Kabazi V, sub-unit III/3 tool-kits is connected to the export of these pieces from the site. Namely, points might be considered so-called curated tools in the WCM.

Abstract

КАБАЗИ V: ЗАПАДНОКРЫМСКИЕ ИНДУСТРИИ ПАЧКИ ГОРИЗОНТОВ III/3

Ю.Э. ДЕМИДЕНКО

Стратиграфически пачка археологических горизонтов III/3 залегает между пачками горизонтов III/2 и III/4, которые характеризуются доминированием микокских артефактов. Соответственно, в пачке горизонтов III/3 не исключена микокская примесь и это притом, что в ходе раскопок данного культурно-хронологического подразделения стоянки была определена его индустриальная составляющая в виде западнокрымского мустье. Поэтому под углом зрения наличия в этой части отложений памятника двух данных среднепалеолитических индустриальных компонентов были проанализированы обнаруженные находки.

Раскопками 2002 года в пачке горизонтов III/3 найдено 10755 кремневых артефактов, 2 каменных и 5 костяных ретушеров. Общий список кремней: преформы 3 экз. / 0,1%; нуклевидные изделия – 44 экз. / 0,4%; отщепы – 810 экз. / 7,5%; пластины – 254 экз. / 2,4%; орудия – 267 экз. / 2,5%; обломки – 177 экз. / 1,6%; чешуйки – 9200 экз. / 85,5%. В отдельности 6 горизонтов характеризуются следующими количественно вариабельными коллекциями кремней: III/3-1 – 1556 экз., III/3-1А – 1462 экз., III/3-2 – 1656 экз., III/3-2А – 605 экз., III/3-3 – 2218 экз. и III/3-3А – 3258 экз. Детальный технико-типологический анализ кремней показал абсолютное доминирование в каждом из горизонтов артефактов западнокрымского мустье. Одновременно микокский компонент представлен среди дебитажа только 7 отщепами обработки двусторонних орудий, а среди односторонних орудий к микокским отнесены 2 полу-трапециевидных остроконечника, 1 полу-трапециевидное скребло, 2 под-трапециевидных скребла и 1 трапециевидное скребло. Двусторонние орудия в пачке горизонтов III/3 зафиксированы не были. В то же время западнокрымское мустье типологически проявляется в следующих признаках: серийности продольных и бипродольных нуклеусов со вспомогательными ударными площадками параллельного метода первичного расщепления Биаш; многочисленных реберчатых и débordantes сколах; многочисленных пластинах; присутствии леваллуазских сколов и леваллуазских атипичных

острий; доминировании простых скребел и специфических типах остроконечников.

Обобщающие технические и типологические индексы кремней пачки горизонтов III/3 следующие. Индекс пластин (ILam) составляет 23,1. Фасетаж ударных площадок сколов и сколов-заготовок орудий: IFl = 47,3, IFs = 19,9. Усредненные параметры отщепов: длина – 3,56 см; ширина – 3,32 см; толщина – 0,83 см. Усредненные параметры пластин: длина – 4,79 см; ширина – 1,90 см; толщина – 0,61 см. Причем четко определена тенденция отбора для орудий сколов с большей длиной и шириной. В инструментарии доминируют сколы с ретушью (110 экз. / 41,2%) и многочисленны неопределимые (значительно фрагментированные) орудия (50 экз. / 18,7%). Среди типологически индикативных орудий (101 экз.), без учета 6 микокских изделий, выделены такие классы: скребла – 69 экз. / 68,3%; остроконечники – 15 экз. / 14,8%; зубчатые – 10 экз. / 9,9%; выемчатые – 3 экз. / 3,0%; скребки, резцы, тронкированные изделия, тронкированно-фасетированные изделия – по 1 экз. каждый / 1,0%.

Анализ индустриальных показателей находок пачки горизонтов III/3 Кабази V в контексте известных комплексов находок западнокрымского мустье показал ряд их отличий – некоторую заниженность индексов фасетажа и остроконечников, отсутствие свидетельств леваллуазского черепаховидного и параллельного объемного методов первичного расщепления. В целом это без сомнений коллекция западнокрымского мустье лишь с очень незначительной микокской примесью и ее некоторая особость может заключаться в специфике жизнедеятельности людей среднего палеолита на стоянке, которая может быть одним из функциональных проявлений кратковременных лагерей по вторичной утилизации частей туш копытных животных.

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter 10

Kabazi V, Sub-Unit III/4: Artefacts

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This chapter presents the analysis of materials from 7 levels assigned to sub-unit III/4 of Kabazi V which were investigated between 2002 and 2003. Results of previous excavations within the same sub-unit between 1993 and 1995 have already been published (Yevtushenko 1998b). However, the material described in Yevtushenko's publication comprises only a small number of artefacts from a limited excavation area measuring just a few square metres. On the other hand, the more recent investigations concentrated on a much larger area, and hence yielded bigger collections of artefacts. As such, these assemblages help to identify in much more detail the characteristics of the sub-unit III/4 occupations. Accordingly, sub-unit III/4 appears to comprise a total of 7 levels, which are separated by "ephemeral" sterile lenses (Chapters 1 and 2, this volume); this contrasts to results from the 1993-1995 field campaigns which suggested that this was just a single level. Whereas levels III/4-2, III/4-3, III/4-4, III/4-5, and III/4-6 were each excavated over an area of 11 m², level III/4-1 was uncovered in 14.5 m², and level III/4-1A in just over 1 m². The densities of artefacts per cubic metre sediment are as follows: III/4-1: 1,080.6 items, III/4-2: 1,005 items, III/4-3: 775 items, III/4-4: 705 items, III/4-5: 852.8 items, and III/4-6: 622.2 items. Objects from sub-unit III/4 that are connected with human activity comprise, 1) ashy clusters, and 2) a pit with flint artefacts in level III/4-2 (Chapters 2 and 16, this volume).

The description of artefacts adheres to a classification system after Gladilin (1976) which was adopted for Crimean Middle Palaeolithic studies by Chabai and Demidenko (1998). Based on the results from typological and technological analyses, all levels are palimpsests which feature both Levallois-Mousterian and Crimean Micoquian characteristics.

Structure of Artefact Assemblages

The archaeological levels assigned to sub-unit III/4 are very thin, each not thicker than a single bone or artefact. The total amount of artefacts from sub-unit III/4 numbers 50,514 items (Table 10-1) which can be subdivided into three main groups.

The first group comprises 50,469 flint items, which again can be subdivided into seven artefact categories, these being chips, flakes, tools, blades, chunks, cores, and preforms (Table 10-1). The majority of flint artefacts (97.7 %) comprise chips (flakes less than

3 cm in length or width). The sum of flakes, blades, chunks, and cores constitutes just 2.57 % of the total number of flints. Among the latter, flakes are the most numerous, composing 59.79 % in the essential count (Table 10-1).

In the essential count, tools make up a near quarter (23 %) of all artefacts (Table 10-1). Among tools the most common are unifacial specimens. The bifacial tool index, in relation to all tools, and including retouched and unidentifiable pieces, amounts to 6.8 %; under exclusion of the retouched and unidentifiable pieces, this index lies at 2.4 %. On the whole, values for both indexes are very low, and correspond to mixed collections, as previously attested at such sites as Starosele (4.9 % to 5.4 %); Kabazi I (3.4 %); Holodnaya Balka (1.7 %), excavated by A. A. Formozov in the 1950s; the lower layer of Bakchisaraiskaya (4 %), investigated by D. A. Krainov; and GABO (4.1 %), upper layer (Kolosov *et al.*, 1993; Chabai 2004c, p. 73, Tab. II-6).

Two further groups of archaeological material from sub-unit III/4 include bone tools and pebbles. None of the 31 pebbles shows visible traces of use as a hammerstone or retoucher (Table 10-1). Bone artefacts consist of retouchers, these making up 1.21 % in the essential count (Table 10-1).

Sub-unit III/4 assemblages are characterised by their "intermediate" status between Micoquian and Western Crimean Mousterian (WCM) traditions. For example, whereas the observed percentages of tools are common for Micoquian site-workshops, the percentage of cores, especially in level III/4-1, are more consistent with Western Crimean Mousterian (WCM) assemblages. Further, the presence of preforms of bifacial tools is a Micoquian feature, while their absence, especially in level III/4-1, is a WCM attribute. Finally, the percentages of bifacial tools appear too low for the Micoquian, but too high for the WCM.

Chunks

Chunks are not numerous, but were found in all levels (Table 10-1). About 37 % of all fragments stem from level III/4-1. As a rule, chunks are fragments of bad quality raw material, usually pieces of flint plaquettes. Generally, they do not exceed 5 cm in maximum dimensions. There are only seven fragments larger than 5 cm which were found in the three archaeological levels III/4-1 (4), III/4-2 (2), and III/4-5 (1). The largest chunk is 67.78 mm long, 50.81 mm wide, and 31.11 mm thick, and is from level III/4-1. Five chunks from levels III/4-1 (1), III/4-2 (2) and III/4-5 (2) were tested by either a single or a small number of removals. In fact, these fragments are discarded raw material blocks which became fragmented during a first stage of reduction.

Preforms

Seven preforms originate from levels III/4-2, III/4-3, III/4-5 and III/4-6; all are unfinished bifacial tools. The basic characteristic feature of this artefact category is the absence of pronounced retouched edges, which means that they cannot be assigned to the bifacial tools. The edges of the preforms are wavy in profile, and in plan show denticulated outlines. Three preforms are complete, the longest piece being 82.38 mm, with a maximum width of 72.61 mm. The thickness of these artefacts ranges from 8.36 to 21.06 mm. Flint plaquettes and natural flakes served as blanks for the manufacture of these preforms, which are a common feature in Crimean Micoquian assemblages, especially at on-site workshops, such as at Zaskalnaya V, Zaskalnaya VI, and at Kabazi V, III/1, III/1A and III/2.

Cores

Cores were found in five levels; they were not discovered in levels III/4-1A and III/4-6. The total number of cores for sub-unit III/4 is 27 items, fifteen of which were found in level III/4-1 (Table 10-1). Cores are represented by the following typological classes: radial cores (N=7); a discoid core (N=1); a unidirectional core (N=1); a unidirectional alternate core (N=1); bidirectional cores (N=5); a bi-transverse core (N=1); an orthogonal core (N=1); and eleven cores of unidentifiable type. Radial cores comprise four cores with a rounded flaking surface (Fig. 10-1, *1*) and 3 broken items. Three of the bidirectional cores have a rectangular flaking surface (Fig. 10-1, *2*), while one is sub-cylindrical. The unidirectional rectangular, unidirectional alternate rectangular, orthogonal rectangular (Fig. 10-2, *1*), and bi-transverse rectangular (Fig. 10-1, *3*) cores all occur once each in the sub-unit III/4 core assemblage. All cores from the sub-unit are heavily exhausted; only 6 specimens are larger (in length or width) than 6 cm. The largest core is 66.5 mm long and 44.17 mm wide and stems from level III/4-1. A total of 21 cores are thinner than 20 mm, while only two are thicker than 3 cm. Finally, 15 of the 27 cores are fragmented. All of the above observations are indicative of a high degree of core utilization in sub-unit III/4. In spite of their exhausted conditions, some important core attributes are still

Flint artefacts	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%	ess %
Chunks	17	1	4	4	12	7	2	47	0.09	·
Preforms	·	·	1	2	·	1	3	7	0.01	0.66
Cores	15	·	2	4	3	3	·	27	0.06	2.54
Chips	13,434	530	7,930	5,025	5,717	8,064	5,873	46,573	97.67	·
Flakes	191	6	110	82	79	82	72	622	1.31	58.52
Blades	54	2	33	18	22	10	7	146	0.31	13.73
Tools	70	·	45	43	33	41	29	261	0.55	24.55
Total:	**13,781**	**539**	**8,125**	**5,178**	**5,866**	**8,208**	**5,986**	**47,683**	**100.00**	**100.00**

Pebble & bone artefacts	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:
Pebble fragments	20	·	4	2	3	1	1	31
Bone retouchers	3	·	2	2	1	5	1	14
Total:	**23**	**·**	**6**	**4**	**4**	**6**	**2**	**45**

Table 10-1 Kabazi V, sub-unit III/4: artefact totals.

visible. First, the majority of cores have lateral supplementary platforms, whereby both main and supplementary platforms are usually faceted. Second, the core assemblage comprises mainly bi-, unidirectional and radial core types which are consistent with typological transformation of cores in the WCM assemblages from Kabazi II, Unit II (Chabai 1998b, Usik 2003). This type of core assemblage has never been found in association with a homogeneous Crimean Micoquian tool-kit.

Blank variability

Most blanks are chips (Fig. 10-3), whereby regular chips and chips with a broken butt are most common (90.19 %) (Table 10-2). Further blanks comprise, in descending order, bifacial thinning and rejuvenating chips, flakes, blades, bifacial thinning flakes, and bifacial thinning blades (Table 10-2). Blanks which are thought to document processes involved in bifacial tool production make up 7.89 % of the total amount of blanks. The "bifacial thinning" blanks discovered in the assemblages from sub-unit III/4 are of a non-uniform character. If we disregard chips from the 0.1 to 0.9 mm metric range, the ratio of "bifacial thinning" blanks in such levels as III/4-1, III/4-2, III/4-3, III/4-4 and III/4-6 (Fig. 10-4) are much lower than observed previously in other Micoquian complexes in the Crimea. Moreover, the number of bifacial thinning flakes and blades, without all chips, in archaeological levels III/4-1, III/4-3 and III/4- 4 shows a sharp drop (Fig. 10-5). Indeed, in the Micoquian complexes of Chokurcha I, Unit IV; Buran-Kaya III, level B; and Kabazi V, level III/2 (Chabai 2004c, Demidenko 2004a, Chapter, this volume) "bifacial thinning" flakes and blades are twice as numerous as in the aforementioned assemblages from sub-unit III/4. The low percentage of "bifacial thinning" blanks in levels III/4-1, III/4-3 and III/4-4 clearly demonstrates that flakes and blades resulted mainly from core reduction. The role of bifacial tool production in the fabrication of flakes and blades appears to have been only minor.

Blade ratios also vary in the assemblages from sub-unit III/4. The lowest blade index was noted for levels III/4-3 (14.18), III/4-5 (12.97) and III/4-6 (11.32). Generally, blade indexes such as these are common to homogeneous Micoquian complexes, and also to some WCM assemblages. In other levels (III/4-2, III/4-4 and III/4-1) blade indexes fluctuate between 20 and 20.96, clearly characteristic of a WCM industry.

Although all levels of sub-unit III/4, especially III/4-1 and III/4-4, contain enough blades to be classed WCM industries, they have also produced too much bifacial thinning and rejuvenation blanks for them to be attributed to the Levallois-Mousterian techno-complex. At the same time, very high blade indexes, as well as extremely low ratios of bifacial thinning and rejuvenation blanks means that the assemblages from sub-unit III/4 cannot be identified as Crimean Micoquian. Further, it should be stressed that sub-unit III/4 levels differ from one another with regard to their blade indexes and in the percentages of bifacial thinning blanks. For example, level III/4-6 has yielded the lowest blade index (11.32) but the highest percentage of bifacial thinning blanks (11.32 %), while level III/4-1 has produced the highest blade index (20.96) but the lowest percentage of bifacial thinning blanks (3.55 %).

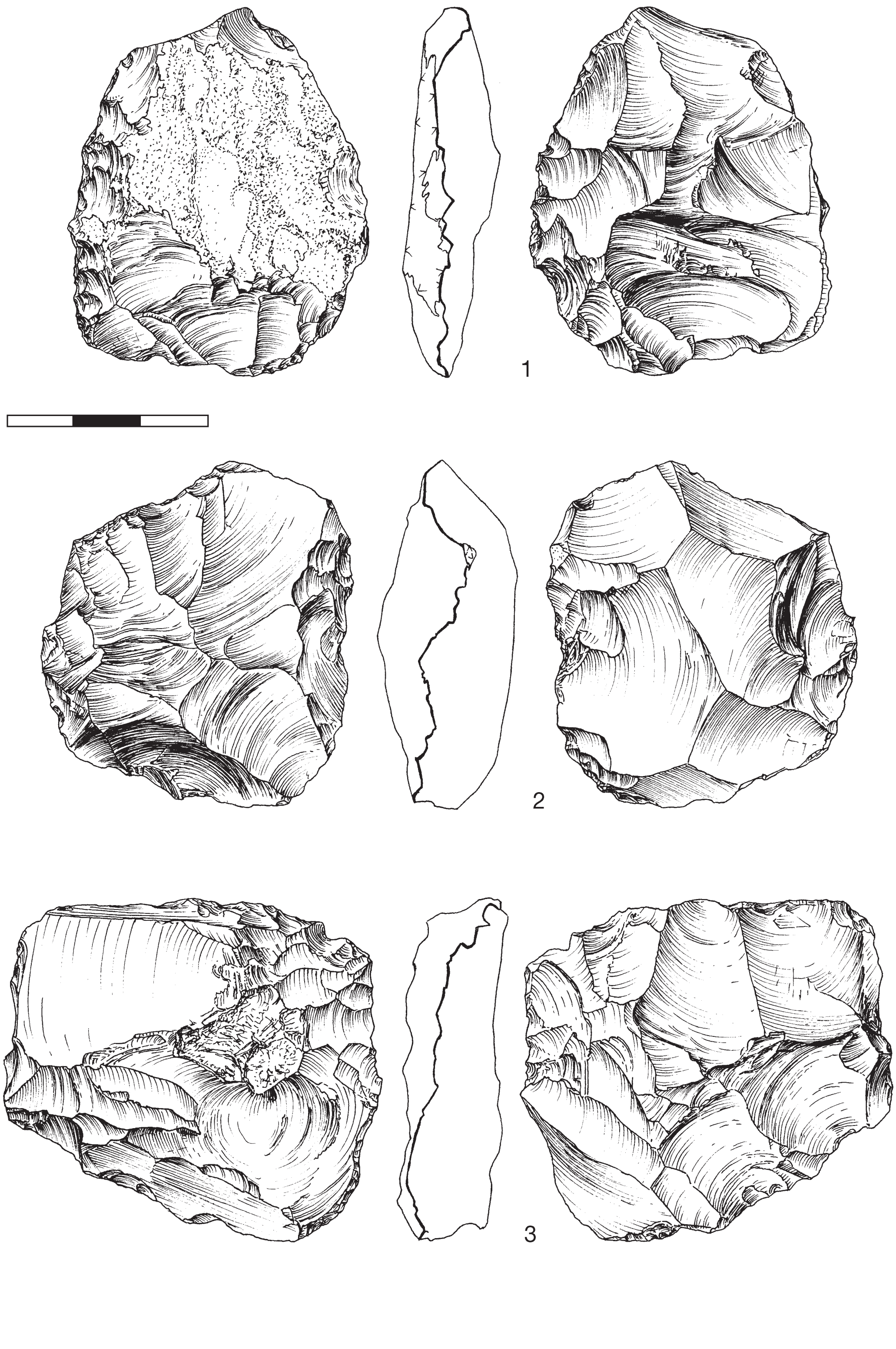

Fig. 10-1 Kabazi V, sub-unit III/4, levels III/4-1 (1), III/4-3 (2), III/4-5 (3). Cores: 1 – radial; 2 – bidirectional; 3 – bi-transverse.

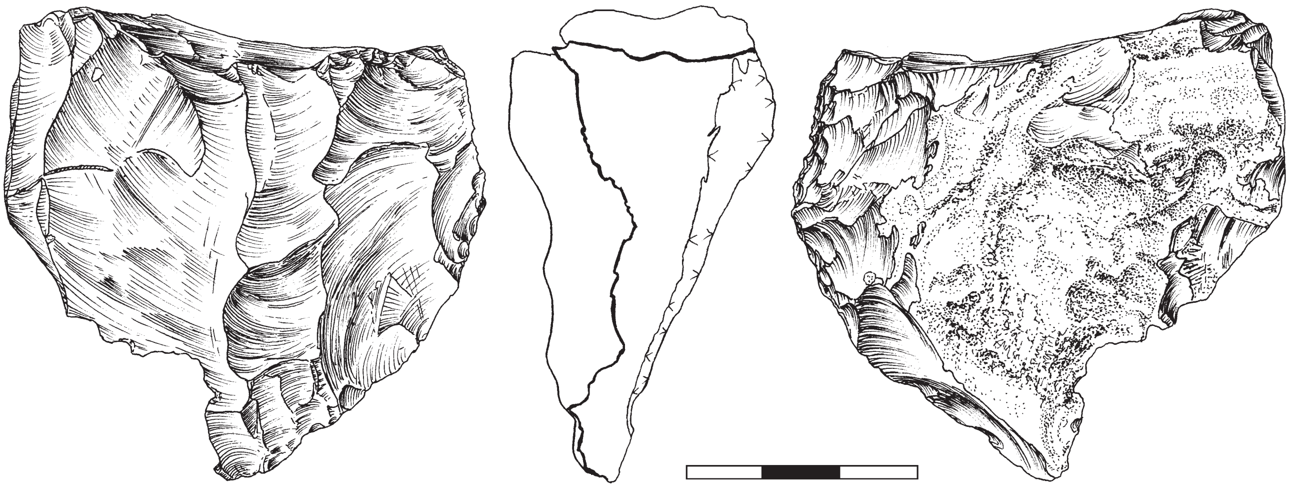

Fig. 10-2 Kabazi V, sub-unit III/4, level III/4-3. Core – orthogonal.

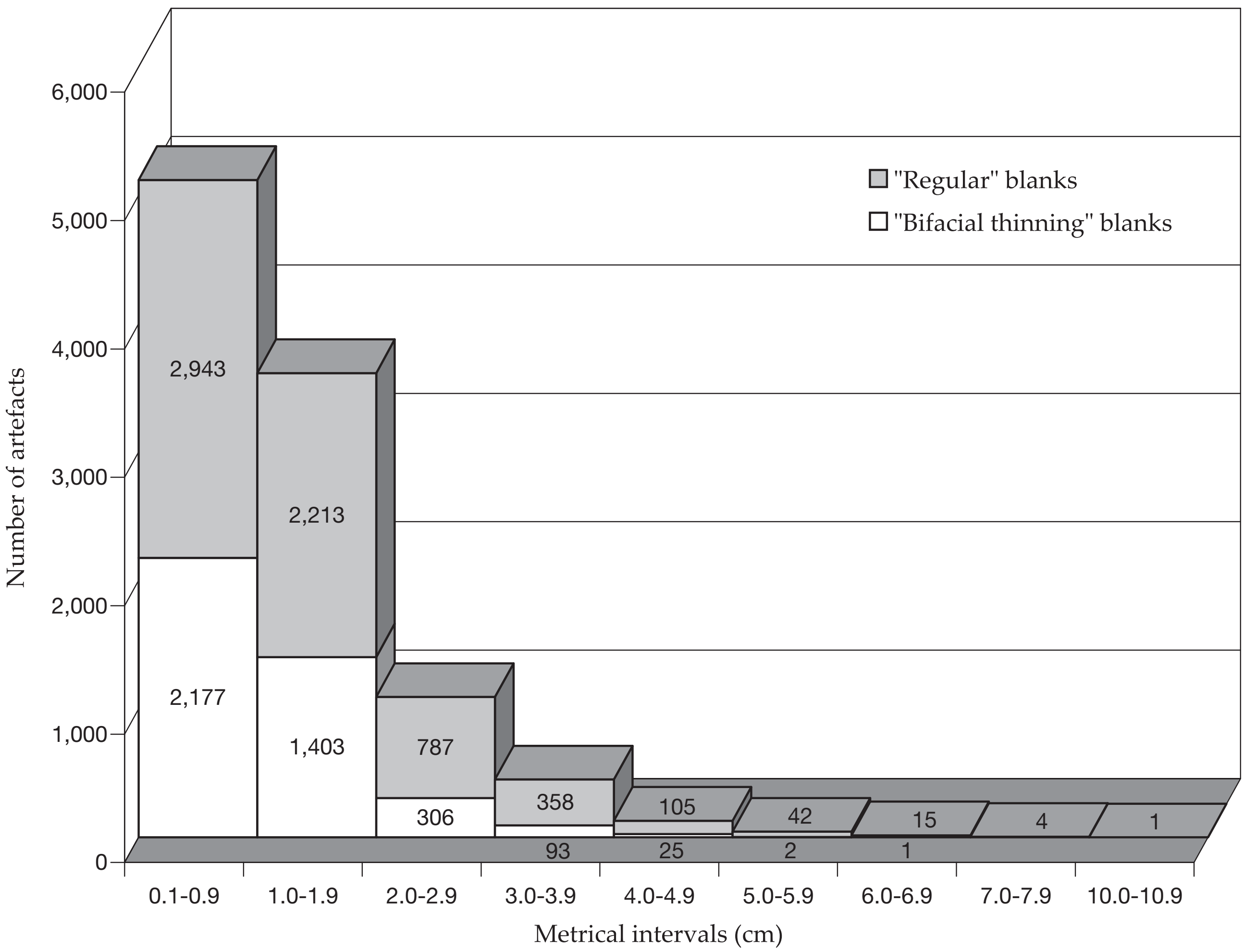

Fig. 10-3 Kabazi V, sub-unit III/4: "regular" and "bifacial thinning" blanks, by metrical intervals.

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Chips * **	12,681	501	7,299	4,670	5,219	7,221	5,311	42,902	90.15
Bifacial thinning ** & rejuvenating chips *	753	29	631	355	499	845	562	3,674	7.73
Flakes **	235	5	127	112	95	100	82	756	1.59
Bifacial thinning flakes **	10	1	21	9	9	14	12	76	0.16
Blades **	64	2	35	19	25	16	12	173	0.36
Bifacial thinning blades **	1	·	2	1	1	1	·	6	0.01
Total:	**13,744**	**538**	**8,115**	**5,166**	**5,848**	**8,197**	**5,979**	**47,587**	**100.00**

* including pieces with broken butts ** including tools

Table 10-2 Kabazi V, sub-unit III/4: blank variability as numbers and percentages of each type.

	cm	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	ess %
Regular	1.0 - 1.9	632	33	404	228	304	342	242	2,185	47.37
	2.0 - 2.9	230	6	113	86	116	130	93	774	16.78
Bifacial	1.0 - 1.9	261	9	206	140	194	330	186	1,326	28.74
	2.0 - 2.9	47	1	46	19	48	68	39	268	5.81
Rejuvenating	0.1 - 0.9	6	·	1	2	·	·	4	13	0.28
	1.0 - 1.9	6	1	12	4	6	3	4	36	0.78
	2.0 - 2.9	1	·	2	·	2	3	3	11	0.24
Broken	1.0 - 1.9	2,264	148	1,455	1,085	1,332	1,955	1,137	9,376	·
	2.0 - 2.9	346	14	251	185	185	282	183	1,446	·
Other chips	0.1 - 0.9	9,641	318	5,440	3,276	3,530	4,951	3,982	31,138	·
	Total:	**13,434**	**530**	**7,930**	**5,025**	**5,717**	**8,064**	**5,873**	**46,573**	**100.00**

Table 10-3 Kabazi V, sub-unit III/4: grouped maximum dimensions for different kinds of chips.

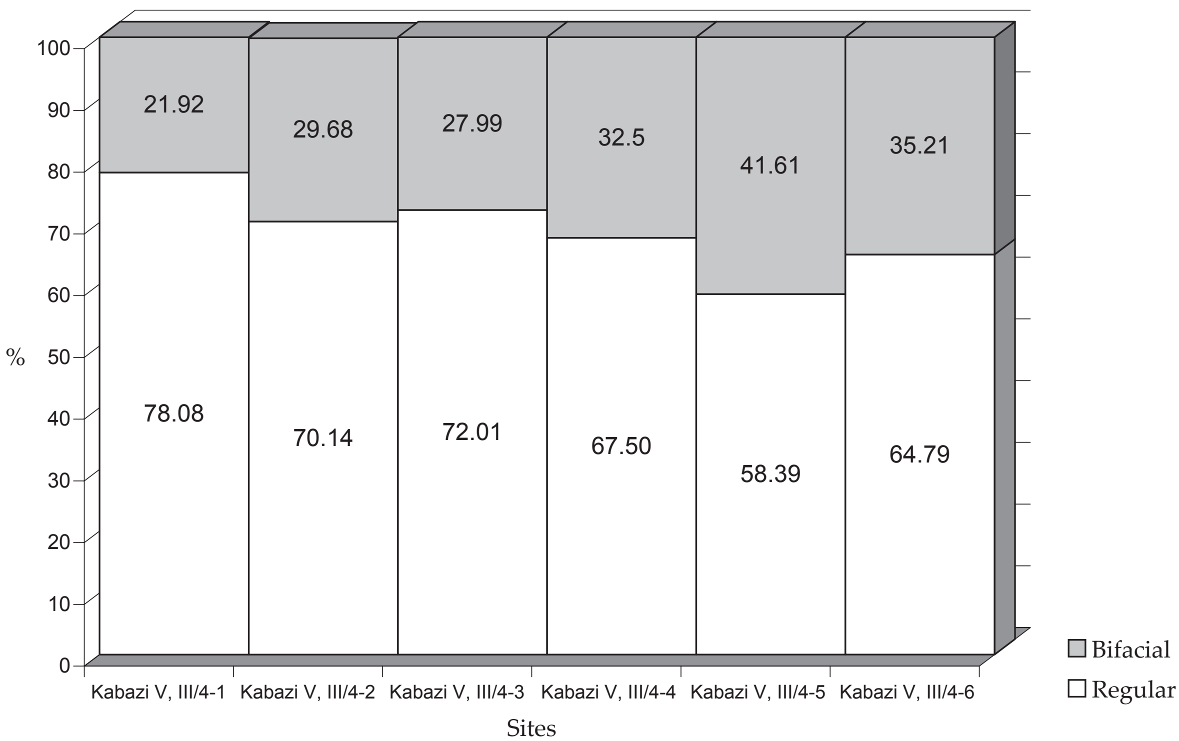

Fig. 10-4 Kabazi V, sub-unit III/4: percentage of "regular" and "bifacial thinning" blanks, with chips (1.0 – 2.9 cm).

Chips

Chips have been subdivided into five groups: "regular", bifacial thinning chips, rejuvenating chips, broken chips, and chips smaller than 10 mm (Table 10-3). Due to the small size of artefacts in the later group, it proved difficult to differentiate between regular items and items from bifacial thinning. At the same time, rejuvenating chips were clearly visible, even in the smallest metrical intervals. All the above listed groups of chips occur in all levels of sub-unit III/4. In fact, chip assemblages from sub-unit III/4 levels can be subdivided into three groups. The first, as defined for level III/4-1, is characterised by the lowest percentage of bifacial thinning and rejuvenating chips (27.13 %). The second group was found in levels III/4-2, III/4-3, and III/4-4. In these levels the amount of bifacial thinning and rejuvenating chips ranges from 34.45 % to 37.31 %. The third group, found in levels III/4-5 and III/4-6, is characterised by the highest amount of bifacial thinning chips (41.33 – 46.12 %) in sub-unit III/4. With the exception of archaeological level III/4-1, the ratio of "bifacial" chips is never less than 34 %, which is characteristic for Micoquian complexes. For example, whereas the ratio of "regular" and "bifacial" chips in level III/2 (Crimean Micoquian) at Kabazi V are 64.15 % and 35.85 %, respectively, in level IV/1 (WCM) at the same site they make up 92.37 % and 7.63 % of chips between 1.0 cm and 2.9 cm. Rejuvenating chips from all metrical intervals comprise only 1.27 % of all chips. It should be noted that rejuvenating chips in this sub-unit consist solely of reshaping chips from bifacial tool tips. Rejuvenating chips comprise 3.72 % of the sum of bifacial thinning and rejuvenating chips.

Flakes and blades

On average, blades comprise 17.7 % (Table 10-2). The blade index ranges from 20.96 in level III/4-1 to 11.32 in level III/4-6. A total of 8.1 % of flakes and blades stems from bifacial tool reduction processes. At the same time, a little over 3 % of blades and flakes in level III/4-1 are linked with bifacial technology. While the bifacial thinning blades and flakes in level III/4-2 make up more than 14.2 %, rejuvenating pieces are observed on neither of these. The available cores suggest some blade production, especially in level III/4-1. On the other hand, the presence of bifacial tools and preforms of bifacial tools in assemblages of sub-unit III/4 is indicative of bifacial flaking.

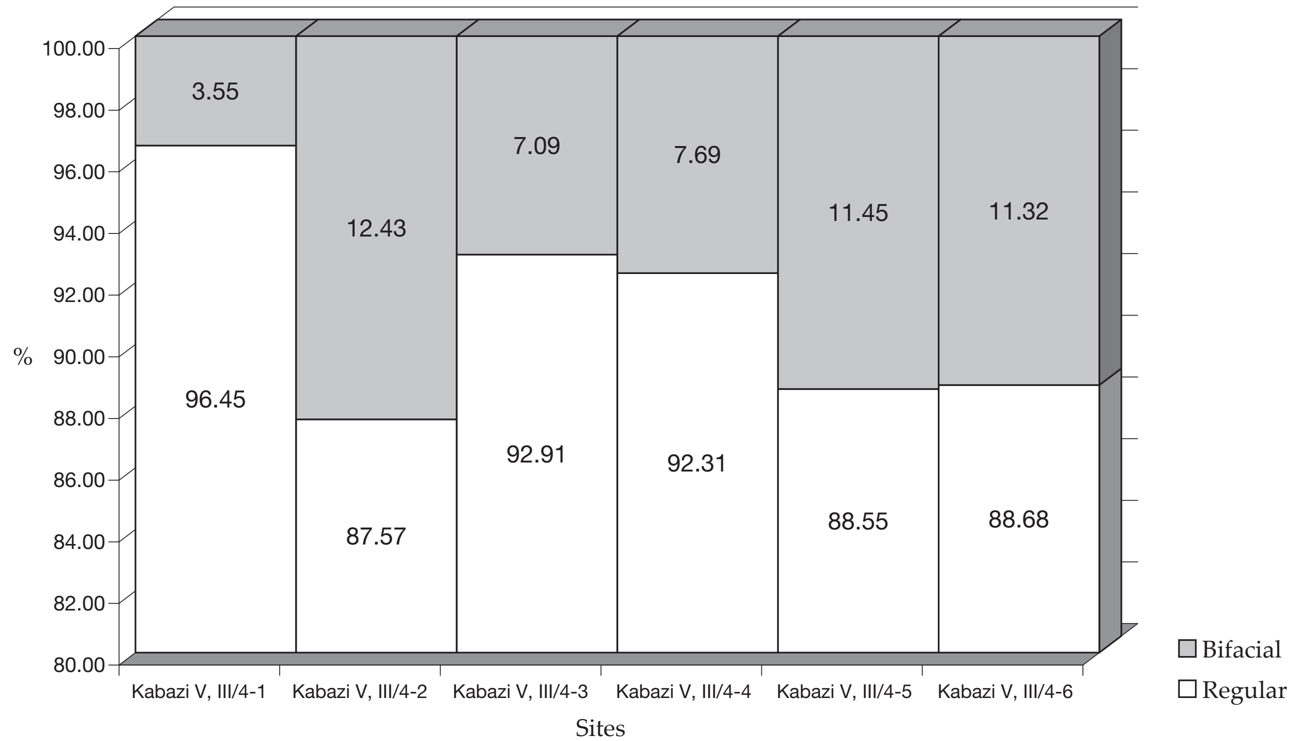

Fig. 10-5 Kabazi V, sub-unit III/4: percentage of "regular" and "bifacial thinning" blanks, with-out chips.

Blank dimensions

A prevalence of length over width was identified as a general trend among blanks, and is observed in four blank assemblages, in levels III/4-1, III/4-2, III/4-3 and III/4-4 (Table 10-4, Fig. 10-6), with the most elongated proportions identified in levels III/4-1, III/4-2, III/4-3. In the blank assemblage from level III/4-5 length and width relations varied only slightly. In level III/4-6 blank dimensions are characterised by mainly transverse proportions. Also, in practically all archaeological levels of sub-unit III/4 blades are clearly longer than flakes, with the exception of level III/4-4 where blades are on average just 1 mm longer. At the same time, flakes from this level are the longest of all flake assemblages in sub-unit III/4. An opposite situation was observed in level III/4-5. Here, blades are the longest recorded, while flakes are the shortest. In all archaeological levels of sub-unit III/4 the blanks chosen for tool production display maximal dimensions of length, width and thickness. The only exception is the tool-kit from level III/4-5, where blanks selected for tool production have the smallest sizes in comparison to blanks without secondary treatment (Table 10-4). Moreover, tool sizes from level III/4-5 are the smallest among all tools from sub-unit III/4. All these observations might suggest that tools from archaeological level III/4-5 were not made on site. The tool-kit of level III/4-5 was probably brought to the site, used, and then discarded. Another possible interpretation could involve a lack of technological links between tool and debitage assemblages in level III/4-5. The tools and debitage assemblages initially originated in different occupations and after, due to the post-depositional transportation, they were mixed in level III/4-5.

Platform dimensions

In all levels of sub-unit III/4 the platforms of "regular" blanks are wider and thicker than those on "bifacial thinning" blanks. Among regular blanks, blade platforms are both considerably more narrow and thinner than platforms on flakes (Table 10-4). This heterogeneity in the dimensions of platforms can be more or less linked with striking platform preparation. As a whole, in archaeological levels III/4-1, III/4-2 and III/4-3, plain platforms and cortex-covered platforms are the smallest (Fig. 10-7), while all types of prepared platforms (dihedral, polyhedral and faceted) are wider and thicker. In archaeological levels III/4-4, III/4-5 and III/4-6 the predominance in the sizes of prepared butts is slightly diluted due to an increase in the amount of plain platforms. This is most clearly expressed in the material from archaeological level III/4-6; among platforms those with faceted butts are not the biggest. However, in archaeological levels III/4-1, III/4-2, III/4-3, III/4-4 and III/4-5 these platform types are available in sufficient number, and form "cluster" zones in the scatterplott (Fig. 10-7). In level III/4-6 the faceted striking platforms are the least numerous among pieces with prepared striking platforms, and show a "dispersed" concentration in the scatterplott. The last type of distribution of faceted platforms is characteristic for all "bifacial thinning" blanks of sub-unit III/4 (Fig. 10-8).

The faceted platforms prevail among all types of prepared butts, especially in archaeological levels III/4-1, III/4-2, III/4-4 and III/4-5. These indicate an intended manufacture of blades and flakes with frequent elongated proportions, as are characteristic for Levallois-Mousterian industries.

Surface cortex

In sub-unit III/4 a total of 61.77 % of blanks have retained some cortex coverage (Table 10-5). Blanks with dorsal cortex include 73.56 % of flakes, 16.72 % of blades, 8.96 % of bifacial thinning flakes, and 0.76 % of bifacial thinning blades. In each of these groups of blanks most pieces display only the minimal percentage of cortex coverage, i.e. no more than a quarter of the dorsal surface. With the exception of flakes, there are similar percentages of blanks without cortex and blanks with <25 % cortex coverage (Table 10-5). Among all types of blanks a dominance of partly corticated blanks is characteristic. The ratio of corticated to non-corticated flakes lies at 1.55; the same ratio for bifacial thinning flakes is 2.04, and for blades and bifacial thinning blades these ratios are 1.74 and 1.68, respectively. Blanks with more than 50 % cortex coverage on their dorsal surface are not numerous, accounting for just 17.46 % of the total amount of blanks. The majority of the latter are primary blanks, and make up 9.58 % of all blanks. High percentages of blanks with cortex coverage are a characteristic feature of all Crimean Middle Palaeolithic industries based on plaquette raw material exploitation.

Dorsal scar patterns

There is an incredible number of varieties of dorsal scar types and patterns in the sub-unit III/4 assemblages. However, three types of dorsal scar pattern appear to dominate among all kinds of flakes and regular blades, these being the converging, unidirectional, and unidirectional-crossed variations (Table 10-6). Particularly numerous are blanks with a converging scar pattern; these make up about half (44.32 %) of all bifacial thinning flakes. The bila-teral, radial and four-directional dorsal scar types are represented by only a few items each. The

	Blank types	III/4-1	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6
Length	flakes including tools	35.81	35.39	32.88	37.22	30.85	33.98
	blades including tools	42.83	42.72	40.66	38.30	47.94	41.52
	blanks (flakes & blades)	35.35	35.07	33.00	34.81	29.94	32.19
	tools	43.45	46.95	38.83	46.85	35.00	42.56
Width	flakes including tools	32.08	29.09	31.05	33.44	31.06	35.63
	blades including tools	17.26	17.86	17.33	17.00	17.68	17.96
	blanks (flakes & blades)	29.09	26.04	26.67	28.75	29.68	33.36
	tools	33.24	31.01	34.96	31.75	27.55	35.59
Thickness	flakes including tools	7.55	6.56	7.15	7.64	6.65	7.23
	blades including tools	5.08	6.38	5.56	6.02	5.91	6.96
	blanks (flakes & blades)	6.88	6.11	6.49	6.73	6.80	6.65
	tools	8.56	8.80	8.13	9.06	5.81	8.91
Platform width	flakes including tools	17.29	17.94	19.34	15.97	15.74	17.41
	blades including tools	10.74	10.42	8.36	9.17	11.73	9.71
	blanks (flakes & blades)	15.74	16.29	17.79	14.75	15.40	17.11
	tools	16.78	17.95	18.13	15.57	14.63	17.33
Platform thickness	flakes including tools	5.10	4.77	5.21	4.76	4.48	4.43
	blades including tools	4.16	3.79	3.67	3.94	3.56	4.35
	blanks (flakes & blades)	4.68	4.39	4.96	4.55	4.35	4.23
	tools	5.97	6.10	5.13	4.94	4.40	5.74

Table 10-4 Kabazi V, sub-unit III/4: average of size of debitage (mm).

four-directional scar pattern is characteristic for regular blades only. Blanks with a radial type of dorsal scar pattern are the most representative among bifacial thinning flakes. Cortex, lateral, bidirectional and crested types of scar patterns are not numerous, but occur in all groups of blanks, with the exception of bifacial thinning blades. The cortex and bidirectional types of scar patterns are the most representative among flakes. The lateral and crested types are mostly characteristic for blades. However, in each group of blanks these types do not exceed 9 %. Due to the small number of bifacial thinning blades in sub-unit III/4 it is difficult to evaluate objectively the preferences in relation to dorsal scar pattern types. However, five of eight bifacial thinning blades display converging scar patterns. The unidirectional, unidirectional-crossed and bidirectional-crossed types are recorded for three bifacial thinning blades.

Axes

On-axis blanks are the most common variant at 72.3 % (Table 10-7). Among the off-axis blanks the bifacial thinning flakes dominate (64.77 %).

Shapes

The most frequent shapes observed for artefacts from sub-unit III/4 are rectangular, crescent and trapezoidal. These make up from 11.46 % up to 16.71 % of all blanks (Table 10-8). Triangular and irregular types are not numerous, they constituting 9.77 % and 6.76 %, respectively. No more than 2 % of all blanks are leaf shaped, a ratio also observed for trapezoidal elongated and ovoid shaped pieces. However, it should be noted that this above structure is characteristic for "regular" flakes only. Among bifacial thinning flakes the most frequently observed pieces are trapezoidal (25 %) or crescent shaped (22.73 %) (Table 10-8). All remaining identified shapes prove less significant, although among these the irregular shapes appear more or less important (14.77 % of all blanks). The rectangular shape, so frequent among "regular" flakes, is of little significance among bifacial thinning flakes (10.23 %). Ovoid and leaf shaped pieces are the least commonly encountered. Most "regular" blades are either rectangular (26.59 %) or crescent shaped (20.81 %), with other shapes not exceeding 7.5 % of

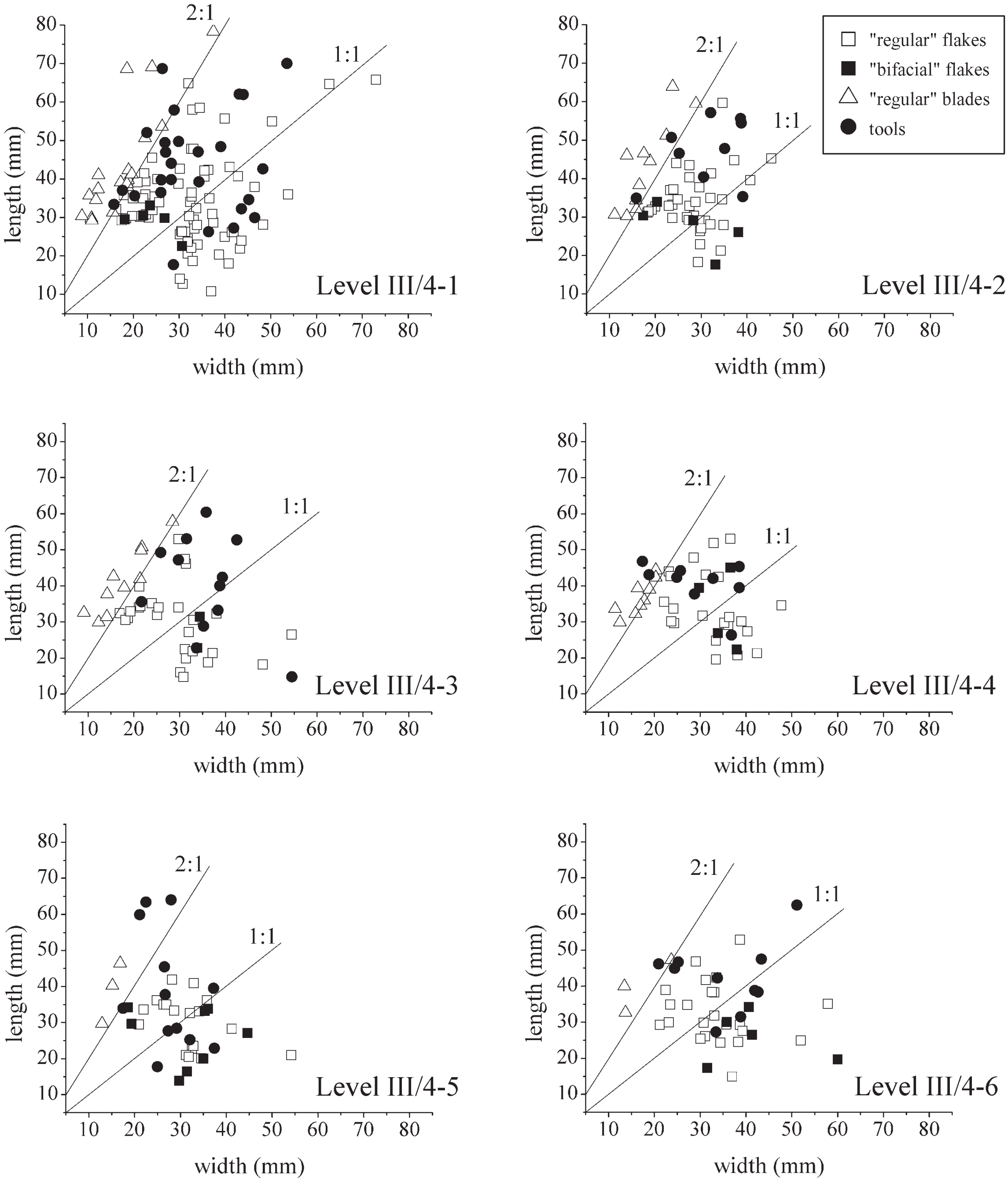

Fig. 10-6 Kabazi V, sub-unit III/4: length/width scatterplot for "regular" and "bifacial thinning" blanks and unifacial tools, by levels.

their total (Table 10-8). Further, the highest percentage of leaf shaped pieces (5.78 %) was found among regular blades. Ovoid and trapezoidal shapes are completely absent. There are only a few trapezoidal elongated shaped pieces. In shape, bifacial thinning blades closely resemble "regular" blades (Table 10-8), but this conclusion remains hypothetical due to the statistical incompleteness of the former.

Lateral profiles

The "general" structure of types of lateral profiles of all blanks coincides with structure for "regular" flakes. Among other blank types a number of differences can be observed (Table 10-9). For the most part, "regular" flakes include blanks with an incurvate medial profile (41.71 %), followed by blanks with twisted (21.11 %), flat (11.68 %), incurvate

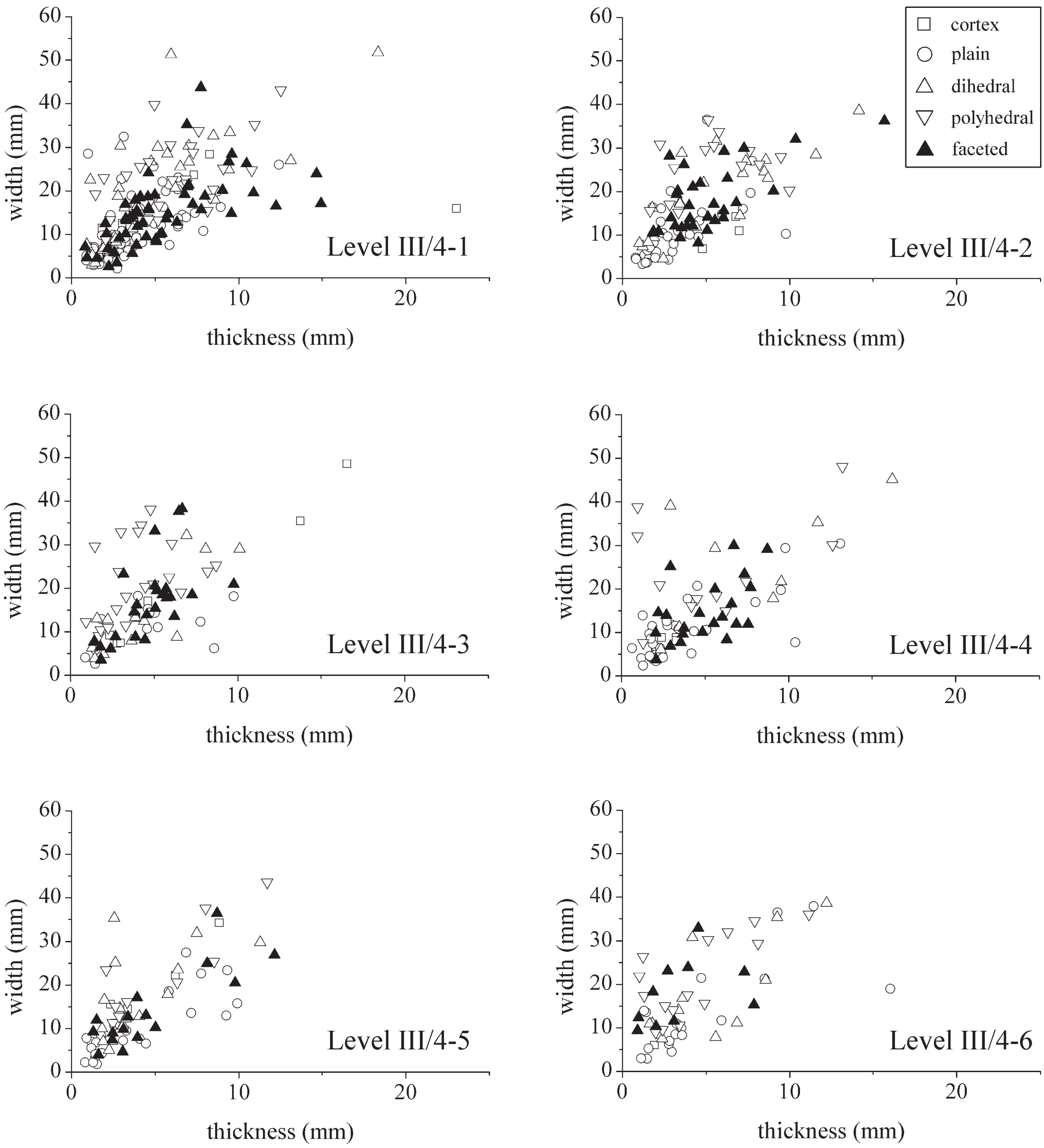

Fig. 10-7 Kabazi V, sub-unit III/4: width/thickness scatterplot for blanks, after platform types and by levels.

distal (9.55 %), and convex (5.53 %) profiles. It should be noted, however, that pieces with a convex profile are characteristic for "regular" flakes only. Among bifacial thinning flakes, as well as "regular" flakes, the highest ratio of blanks (50 %) displays an incurvate medial lateral profile. Bifacial thinning flakes with incurvate distal lateral profile are also numerous and make up 30.68 %. Twisted and flat lateral profiles are less representative, at 12.5 % and 5.68 %, respectively (Table 10-9). Among "regular" blades those with a twisted lateral profile are most numerous; blades of this type make up 53.18 %, followed by pieces with incurvate medial profile (31.79 %). Poorly represented among flakes are blanks with a flat lateral profile, although this type is well represented among "regular" blades (11.56 %). Less than

2 % of blades have an incurvate distal lateral profile. Bifacial thinning blades comprise – practically in equal proportions – blanks with incurvate medial and twisted profiles (Table 10-9).

Distal profiles

The feathering distal profile is the most commonly encountered type of end termination among all blanks from sub-unit III/4 (Table 10-10); in the case of bifacial thinning flakes, this type occurs on 46.59 % of pieces, while among flakes it is found on 30.4 % of artefacts. Blanks with hinged terminations are also numerous, varying from between 16.18 % and 28.41 %, the former value being characteristic for blades. Both flakes and blades show a very low maintenance of blanks with blunt and overpassed end terminations. In total, overpassed and blunt types do not exceed 4 %. Blanks with an overpassed distal profile are rare, not exceeding 1.1 % among "regular" flakes and blades, but 2.27 % among bifacial thinning flakes (Table 10-10).

Cross-sections at midpoint

For flakes and blades the most frequently noted midpoint cross-sections are triangular and trapezoidal. However, it should also be noted that whereas triangular cross-sections dominate among "regular" blanks, "bifacial thinning" blanks display mostly trapezoidal cross-sections (Table 10-11). Triangular cross-sections are more characteristic for "regular" blades (57.23 %), whereas trapezoidal cross-sections are more common among bifacial thinning flakes (42.05 %). Less representative types of midpoint cross-sections for "regular" flakes are convex, lateral steep, polyhedral, and flat types; this observation also applies to bifacial thinning flakes. A distinctive feature of bifacial thinning flakes is a dominance of polyhedral cross-sections over lateral steep cross-sections. Flat midpoint cross-sections are characteristic for flakes only (Table 10-11). Blades are characterised by triangular and trapezoidal midpoint cross-sections, followed in descending order by lateral steep, convex, and polyhedral types (Table 10-11).

Platform preparation

Practically in all archaeological levels of sub-unit III/4 cortex platforms are the most seldomly observed (Table 10-12), that is with the exception of the flake assemblage from level III/4-3 in which cortex platforms make up 18.18 % of all identifiable types, and even prevail above plain and dihedral types. Plain platforms constitute 31.84 % of all identifiable platforms; they dominate exclusively among "bifacial thinning" flakes. As a whole, in all archaeological levels of sub-unit III/4 prepared platforms are the most widespread type (60.8 %). Among "regular" flakes and blades there are various degrees of butt preparation (Table 10-13). For example, "regular" flakes from archaeological levels III/4-5 (Ifs=18.75) and III/4-6 (Ifs=17.77) are characterised by the lowest Ifs indexes, but at the same time have also yielded the highest Ifs index for "regular" blades (62.5 and 100 respectively). Besides in archaeological levels III/4-1 and III/4-5 the blades with facetted platforms prevail above the blades with dihedral and polyhedral butts, making not less than 40 % among the whole blades. Only in the two levels III/4-2 and III/4-3 does the sum of dihedral and polyhedral platforms exceed the quantity of facetted butts. As a whole, in all levels of sub-unit III/4 the Ifs for blades (III/4-1 Ifs= 41.02,

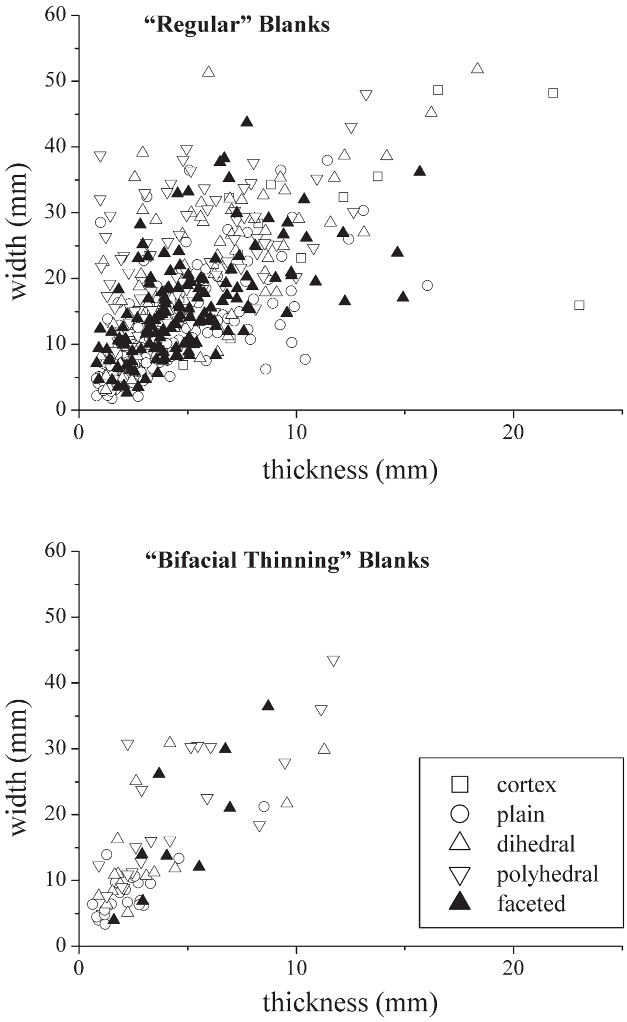

Fig. 10-8 Kabazi V, sub-unit III/4: width/thickness scatterplot for all "regular" and "bifacial thinning" blanks, after platform types.

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
0 %	102	1	47	48	36	38	31	303	29.96
1-25 %	75	2	33	32	34	31	24	231	22.85
26-50 %	22	·	20	17	10	14	14	97	9.59
51-75 %	14	2	11	7	7	6	7	54	5.34
76-100 %	24	·	16	8	10	9	9	76	7.52
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.27**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
0 %	1	·	8	4	3	9	3	28	2.77
1-25 %	4	1	5	3	2	2	3	20	1.98
26-50 %	1	·	4	2	1	·	1	9	0.89
51-75 %	1	·	2	·	1	2	2	8	0.79
76-100 %	2	·	2	·	2	2	3	11	1.09
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
0 %	23	1	15	9	7	5	2	62	6.13
1-25 %	21	1	10	6	11	4	1	54	5.34
26-50 %	9	·	7	3	5	3	2	29	2.87
51-75 %	7	·	·	1	1	2	2	13	1.29
76-100 %	4	·	3	·	1	2	1	11	1.09
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
0 %	·	·	·	1	1	1	·	3	0.30
1-25 %	·	·	2	·	·	·	·	2	0.20
26-50 %	·	·	·	·	·	·	·	·	·
51-75 %	·	·	·	·	·	·	·	·	·
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.49**

Table 10-5 Kabazi V, sub-unit III/4: flakes and blades – percentage of dorsal cortex.

III/4-2 Ifs=40, III/4-3 Ifs=30, III/4-4 Ifs=27.27, III/4-5 Ifs=62.5) are higher than for blades from Kabazi V, III/2 (Ifs=7.69). With exception of level III/4-6 (Ifs=100), these also lie below values observed for Kabazi V, IV/1 (Ifs=64.47). These high Ifs indexes for the majority of levels from sub-unit III/4 suggest the presence of blade production. Blade production most certainly took place in archaeological levels III/4-1, III/4-2 and III/4-5. In each of the archaeological levels III/4-1, III/4-3, III/4-5 and III/4-6 more than 40 % of tools with identifiable striking platforms have faceted platforms (41.93 %, 47.36 %, 44.44 % and 42.85 %, respectively). The lowest ratio of tools with faceted platforms is noted in level III/4-2 (25 %); in level III/4-3 they make up 35.29 % of tools with identifiable platforms.

Platform lipping

A total of 69.73 % of all identifiable blanks have unlipped platforms (Table 10-14), although unlipped platforms prevail among "regular" blanks only, semi-lipped and lipped platforms being less common. The semi-lipped and lipped platforms occur in more or less equal proportions. The sum of semi-lipped and lipped types constitutes 30.27 % of all identifiable platforms. There are no lipped platforms among "regular" blades. On the other hand, the overwhelming majority of "bifacial thinning" flakes and blades are – as to be expected – characterised by lipped platforms.

Platform angles

Whereas 65.97 % of identifiable flakes display

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
Cortex	19	·	14	7	8	4	5	57	5.64
Lateral	14	·	6	5	6	4	4	39	3.86
Bilateral	2	·	1	·	1	2	·	6	0.59
Radial	2	·	3	2	1	2	·	10	0.99
Converging	64	·	40	27	25	34	29	219	21.66
Unidirectional	40	3	28	20	20	16	17	144	14.24
Unidirect.-crossed	40	·	11	17	14	13	8	103	10.19
Bidirectional	22	·	5	17	7	12	4	67	6.63
Bidirect.-crossed	15	1	6	5	5	5	4	41	4.06
Crested	4	1	1	2	5	1	3	17	1.68
Unidentifiable	15	·	12	10	5	5	11	58	5.74
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.26**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
Cortex	1	·	1	·	·	·	1	3	0.30
Lateral	·	·	1	1	·	·	·	2	0.20
Bilateral	·	·	·	·	1	·	·	1	0.10
Radial	·	·	1	2		1	1	5	0.49
Converging	5	1	11	3	3	6	2	31	3.07
Unidirectional	3	·	1	·	1	2	2	9	0.89
Unidirect.-crossed	·	·	6	·	1	4	3	14	1.38
Bidirectional	·	·	·	1	2	1	2	6	0.59
Bidirect.-crossed	·	·	·	2	1	1	·	4	0.40
Crested	·	·	·	·	·	·	1	1	0.10
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
Cortex	3	·	2	·	·	1	1	7	0.69
Lateral	2	·	4	1	1	1	1	10	0.99
Bilateral	·	1	1	·	·	·	·	2	0.20
Radial	·	·	·	1	·	·	·	1	0.10
Converging	20	1	12	5	8	9	4	59	5.84
Unidirectional	16	·	4	5	12	2	2	41	4.06
Unidirect.-crossed	10	·	2	2	2	1	·	17	1.68
Bidirectional	4	·	4	1	·	·	·	9	0.89
Bidirect.-crossed	4	·	1	3	2	2	·	12	1.19
Fourdirectional	1	·	·	·	·	·	·	1	0.10
Crested	2	·	5	1	·	·	·	8	0.79
Unidentifiable	2	·	·	·	·	·	·	2	0.20
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
Converging	·	·	1	·	1	1	·	3	0.30
Unidirectional	·	·	·	1	·	·	·	1	0.10
Unidirect.-crossed	·	·	1	·	·	·	·	1	0.10
Bidirect.-crossed	·	·	·	·	·	·	·	·	·
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.49**

Table 10-6 Kabazi V, sub-unit III/4: flakes and blades – dorsal scar patterns.

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
On-axis	115	4	65	53	44	54	34	369	36.50
Off-axis	68	1	33	36	32	25	28	223	22.06
Unidentifiable	54	·	29	23	21	19	23	169	16.72
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.27**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
On-axis	4	·	10	1	3	3	3	24	2.37
Off-axis	5	1	10	7	6	11	8	48	4.75
Unidentifiable	·	·	1	1	·	1	1	4	0.40
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
On-axis	64	1	34	18	25	16	8	166	16.42
Off-axis	·	1	1	1	·	·	·	3	0.30
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
On-axis	·	·	2	1	1	1	·	5	0.49
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.49**

Table 10-7 Kabazi V, sub-unit III/4: flakes and blades – axes.

obtuse platforms, a right angle platform is found on 34.03 % of flakes (Table 10-15). More than half of blades (52.08 %) display a right angle platform or something close to it. In archaeological levels III/4-1 and III/4-3 flakes with right angle and obtuse platforms occur in roughly equal numbers, while in archaeological levels III/4-5 and III/4-6 the latter are twice as frequently observed. A common feature of "bifacial thinning" flakes and blades are the dominant role of obtuse platforms, one of the main attributes of this kind of blank.

Tools

Tools were found in all archaeological levels of sub-unit III/4, but level III/4-1A (Table 10-1). A total of 77.78 % of tools were made on flakes (Table 10-16); blades served as blanks for 11.49 % of tools, with only 0.77 % of tools made on chips. Tools on "bifacial thinning" blanks make up 1.91 % of the total, and in 1.92 % of the cases tools were made on natural flakes. One notched tool was made on an unidirectional residual core (level III/4-4). In sub-unit III/4 the sizes of unifacial tools correspond with the sizes of the largest unretouched blanks (Fig. 10-6). The largest unretouched blanks are often characterised by faceted platforms (Fig. 10-9). In layers III/4-1, III/4-3, III/4-5 and III/4-6 tools on blanks with faceted platforms account for more than 40 %. Tools on blanks with maximum dimension below 3 cm are not numerous and include just a few items from levels III/4-4 and III/4-5 (Table 10-17). On average, unifacial tools in all levels of sub-unit III/4 are characterised by a prevalence of length over width (Table 10-4). These unifacial tools proportions are most obvious in levels III/4-1, III/4-2, III/4-3 and III/4-5 (Fig. 10-6). For bifacial tools the average values are as follows: length – 44.52 mm, and width – 38.39 mm. The one complete bifacial tool from layer III/4-3 is 39.19 mm long, 32.03 mm wide, and 15.93 mm thick.

There are ten classes of tools: points, scrapers, denticulates, notches, bifacial points, bifacial scrapers, retouched pieces, thinned pieces, burins, and unidentifiable retouched fragments. The most numerous are scrapers (74.4 % in the essential count) (Table 10-17). Whereas points comprise 12 % of tools in the essential count, other types of unifacial tools do not exceed values of 4 % (Table 10-17). Bifacial tools are represented by points and scrapers, typical for the Crimean Micoquian; in sum, this accounts for just 2.4 % of all identifiable tools, not including retouched and thinned pieces.

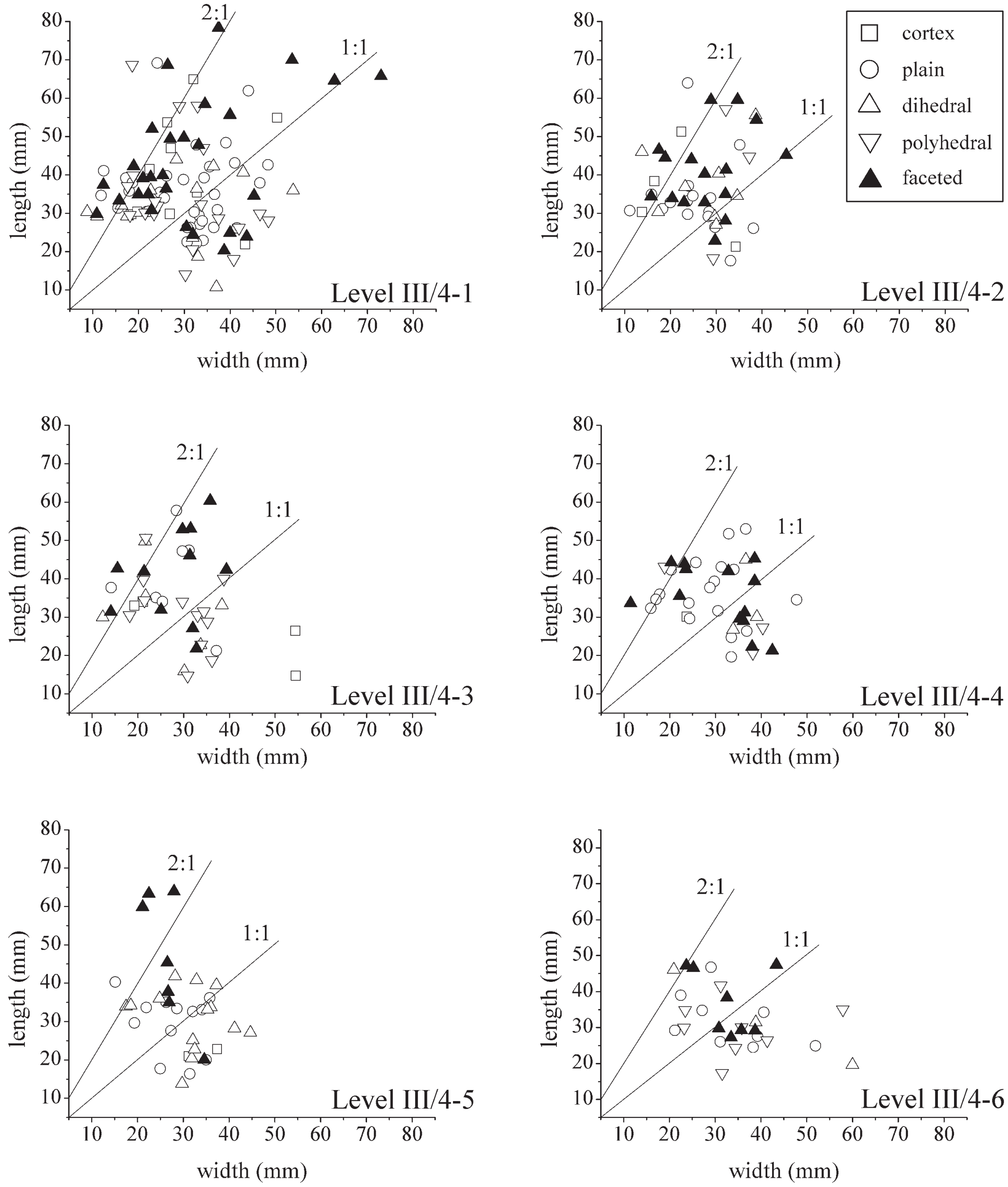

Fig. 10-9 Kabazi V, sub-unit III/4: length/width scatterplot for blanks, after platform types.

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
Rectangular	45	1	15	13	11	17	11	113	11.18
Triangular	27	·	16	13	11	5	8	80	7.91
Trapezoidal	27	1	12	11	12	16	13	92	9.10
Trapezoidal elongated	4	·	2	3	3	3	·	15	1.48
Ovoid	7	·	5	3	·	2	1	18	1.78
Leaf shaped	5	·	2	3	·	1	·	11	1.09
Crescent	23	1	18	6	16	16	15	95	9.40
Irregular	9	2	4	12	8	5	6	46	4.55
Unidentifiable	90	·	53	48	36	33	31	291	28.78
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.27**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
Rectangular	1	·	1	1	2	2	1	8	0.79
Triangular	3	·	4	1	1	·	·	9	0.89
Trapezoidal	1	·	1	3	4	5	2	16	1.58
Trapezoidal elongated	·	·	1	·	·	·	1	2	0.20
Ovoid	·	·	1	·	·	·	·	1	0.10
Leaf shaped	·	·	1	·	·	·	·	1	0.10
Crescent	2	·	4	2	1	6	4	19	1.88
Irregular	·	·	5	1	1	·	2	9	0.89
Unidentifiable	2	1	3	1	·	2	2	11	1.09
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
Rectangular	17	·	5	3	10	6	3	44	4.35
Triangular	4	1	2	2	1	2	1	13	1.29
Trapezoidal elongated	·	·	1	·	·	·	·	1	0.10
Leaf shaped	6	1	1	·	1	1	·	10	0.99
Crescent	15	·	8	4	2	2	3	34	3.36
Irregular	2	·	2	·	3	1	·	8	0.79
Unidentifiable	20	·	16	10	8	4	1	59	5.84
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
Rectangular	·	·	1	·	·	1	·	2	0.20
Crescent	·	·	1	1	1	·	·	3	0.30
Irregular	·	·	·	·	·	·	·	·	·
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.49**

Table 10-8 Kabazi V, sub-unit III/4: flakes and blades – shapes.

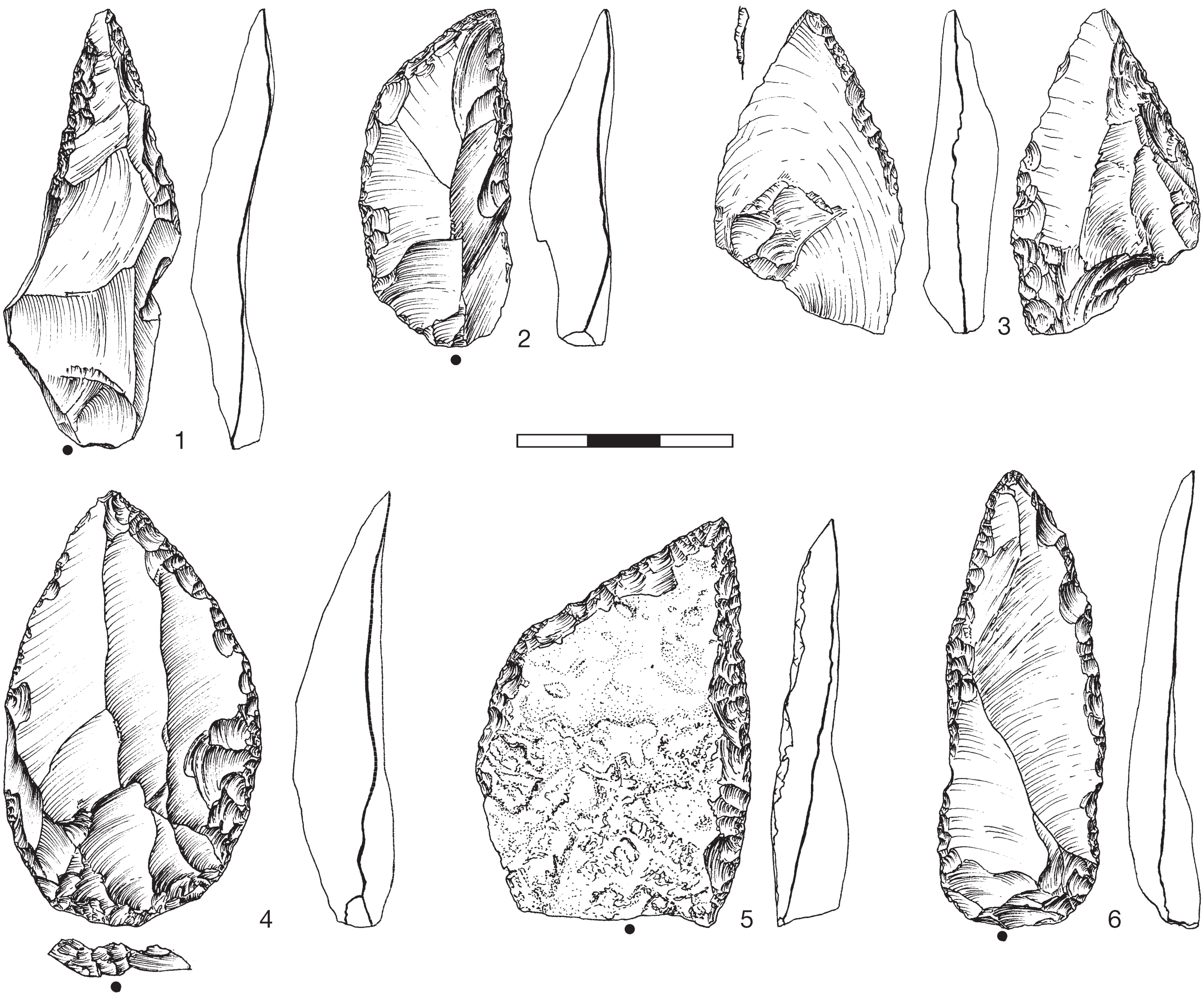

Fig. 10-10 Kabazi V, sub-unit III/4, levels III/4-2 (3, 5), III/4-3 (4, 7), III/4-5 (1, 6), III/4-6 (2). Points: 1 – distal; 2, 5 – semi-crescent; 3 – sub-leaf alternative; 4 – sub-leaf; 6 – sub-triangular elongated; cores: 7 – orthogonal.

Points

Points were found in five of the seven levels of sub-unit III/4 (Table 10-17), although about half of all points (46.67 %) stem from level III/4-3. Points were made on both flakes (13 items) and blades (2 items). Those blanks chosen for point production are relatively large, ranging from 45 to 63.3 mm in length, and were removed mainly on-axis. Off-axis blanks were used for only 3 points, while 8 points were made on on-axis blanks; the axes of four further pieces could not be identified. The points from sub-unit III/4 comprise approximately equal ratios of semi -crescent (Fig. 10-10, *2, 5*) and sub-leaf (Fig. 10-10, *3, 4*) pieces. Lateral, distal (Fig. 10-10, *1*), sub-triangular elongated (Fig. 10-10, *6*) and semi-trapezoidal points are also recorded with one point each. Whereas three points have an alternative retouch, all others display a dorsal retouch. Points were produced using combinations of non-invasive, scalar, flat and / or semi-steep retouch. In sum, the point assemblage comprises artefacts and technological elements which are characteristic of both the WCM (distal and lateral points on blades, the absence of invasive retouch) and Micoquian (semi-crescent and semi-trapezoidal shapes) traditions.

Scrapers

Scrapers were found in six of the seven levels of sub-unit III/4 (Table 10-17), with the highest number

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
Flat	36	·	13	12	12	10	9	92	9.10
Incurvate medial	107	4	45	51	40	40	27	314	31.06
Incurvate distal	24	·	11	11	9	6	14	75	7.42
Twisted	36	1	27	14	26	31	20	155	15.33
Convex	11	·	9	8	5	3	7	43	4.25
Unidentifiable	23	·	22	16	5	8	8	82	8.11
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.27**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
Flat	·	·	2	1	·	1	·	4	0.40
Incurvate medial	6	1	8	3	5	8	7	38	3.76
Incurvate distal	2	·	6	4	2	5	3	22	2.18
Twisted	1	·	5	·	2	1	2	11	1.09
Unidentifiable	·	·	·	1	·	·	·	1	0.10
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
Flat	10	·	6	·	3	1	·	20	1.98
Incurvate medial	16	·	10	10	9	7	1	53	5.24
Incurvate distal	1	·	·	1	·	·	1	3	0.30
Twisted	35	2	19	7	13	8	6	90	8.90
Unidentifiable	2	·	·	1	·	·	·	3	0.30
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
Incurvate medial	·	·	1	·	1	·	·	2	0.20
Twisted	·	·	1	1	·	1	·	3	0.30
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.49**

Table 10-9 Kabazi V, sub-unit III/4: flakes and blades – lateral profiles.

recovered from level III/4-1, and the lowest from level III/4-6. Scrapers have been subdivided into 44 types, assigned to four basic morphological groups: transverse and diagonal (N=14), simple (N=41), double (N=13), and convergent (N=25). A total of 59.14 % of scrapers have one retouched edge, 13.98 % are bilateral scrapers, and 26,88 % are converging scrapers. In 87.1 % of cases, scrapers were made on flakes; only 10.75 % were made on blades, and just 2.15 % on natural flakes. On-axis blanks were preferred, and account for 74.07 % of all identifiable blanks. There are 35 unbroken scrapers, twenty of which are larger than 4 cm. Scrapers were produced using different combinations of scalar, flat and/or semi-steep, and sometime invasive, retouch. Ventral thinning was observed on 16.13 % of scrapers.

Transverse and diagonal scrapers

Transverse and diagonal scrapers were found in five of the seven levels of sub-unit III/4 (Table 10-17). Most characteristic for transverse scrapers are tools with a straight working edge. Diagonal scrapers are represented in more or less equal ratios by tools with convex and concave working edges. Transverse scrapers are subdivided into the following types: transverse-straight, transverse-convex, transverse-convex, thinned base, and transverse-concave. On the other hand, diagonal scrapers are represented by just two types of scrapers: diagonal-convex (Fig. 10-11, *2*) and diagonal-concave (Fig. 10-11, *1*). All transverse and diagonal scrapers were produced on flakes. Of 12 identifiable blanks 11 were made on off-axis flakes.

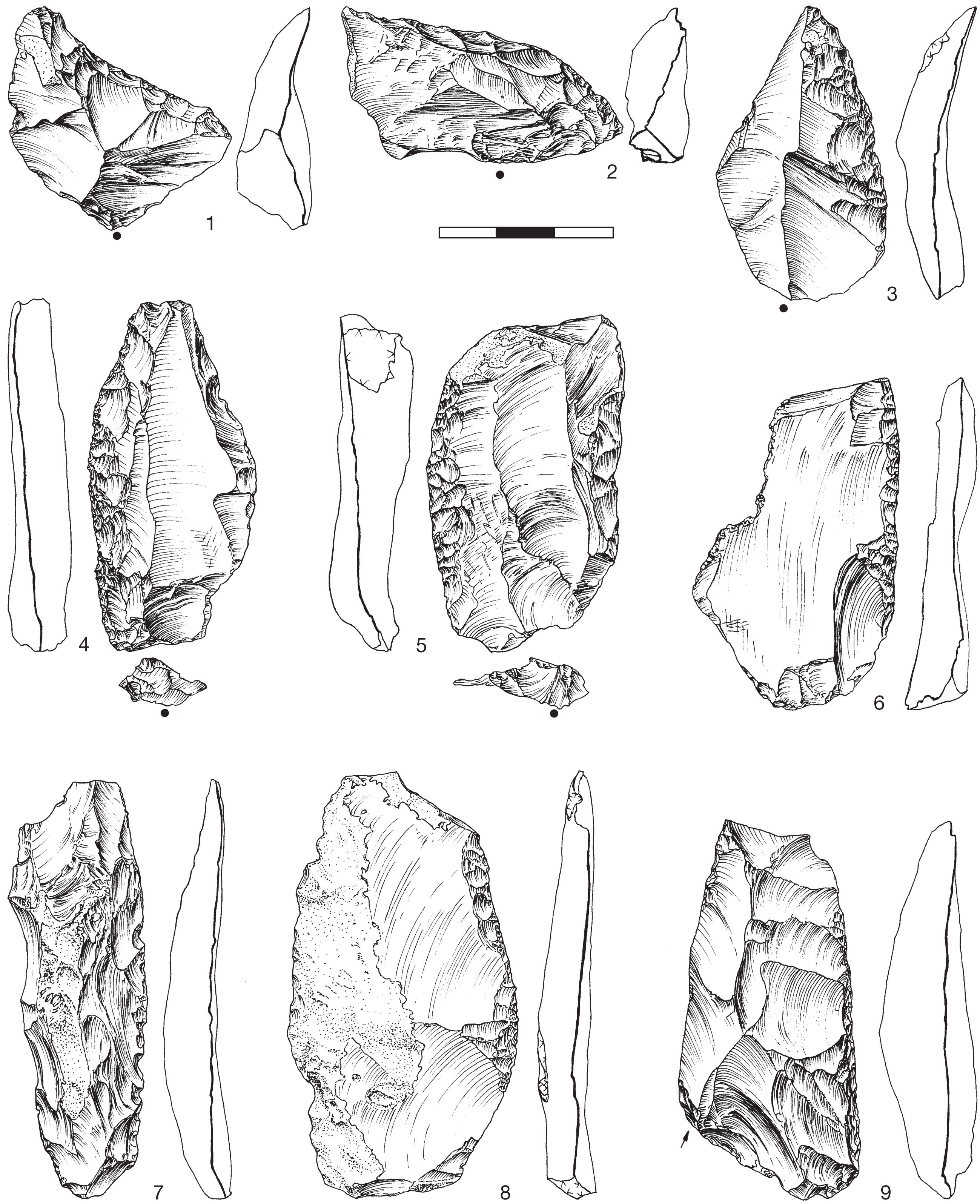

Fig. 10-11 Kabazi V, sub-unit III/4, levels III/4-1 (4, 6, 7, 8), III/4-3 (1, 3, 5), III/4-4 (2). Scrapers: 1 – diagonal concave; 2 – diagonal convex; 3, 4, 5, 7, 8 – simple convex; 6, 9 – simple straight.

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
Feathering	79	2	36	31	31	32	21	242	22.72
Hinged	64	3	29	29	22	26	24	213	20.00
Overpassed	4	·	·	1	2	·	1	9	0.85
Blunt	10	·	7	2	4	3	2	28	2.63
Retouched	20	·	15	17	14	9	14	90	8.45
Missing	60	·	40	32	24	28	23	214	20.09
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**796**	**74.74**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
Feathering	5	·	10	3	6	8	5	37	3.66
Hinged	2	·	3	2	2	4	2	15	1.48
Overpassed	·	·	·	1	·	·	1	2	0.20
Blunt	·	·	1	1	·	·	·	2	0.20
Retouched	·	·	·	·	·	1	1	2	0.20
Missing	2	1	7	2	1	2	3	18	1.78
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
Feathering	25	1	11	8	11	5	2	63	6.23
Hinged	7	·	5	3	5	4	2	26	2.57
Overpassed	1	·	1	·	·	·	·	2	0.20
Blunt	1	·	3	1	1	·	1	7	0.69
Retouched	2	·	1	·	·	2	1	6	0.59
Missing	28	1	14	7	8	5	2	65	6.44
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
Feathering	·	·	·	1	·	1	·	2	0.20
Hinged	·	·	1	·	·	·	·	1	0.10
Missing	·	·	1	·	1	·	·	2	0.20
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.49**

Table 10-10 Kabazi V, sub-unit III/4: flakes and blades – distal profiles.

Simple scrapers

Simple scrapers were found in six of the seven levels from sub-unit III/4 (Table 10-17). These scrapers are most numerous in levels III/4-1 and III/4-5. Deficits of such scrapers are observed in levels III/4-4 and III/4-6. In accordance with the shape of their working edge, simple scrapers are subdivided into different types. There are pieces with straight working edges (N=9) (Fig. 10-9, *6, 9*), with convex edges (N=28) (Fig. 10-11, *3, 4, 5, 7, 8*), with concave edges (N=3), and with wavy edges (N=1). Most scrapers display a dorsal retouch; only one simple convex scraper from level III/4-3 has a ventral retouch (Table 10-17). Ventral thinning is not characteristic among simple scrapers, with only four tools (all convex scrapers) showing signs of this feature; one piece was bi-terminally thinned, two items display a thinned base, and one scraper has a truncated-faceted distal end (Table 10-17). Two backed (Fig. 10-12, *1, 2, 5*) and

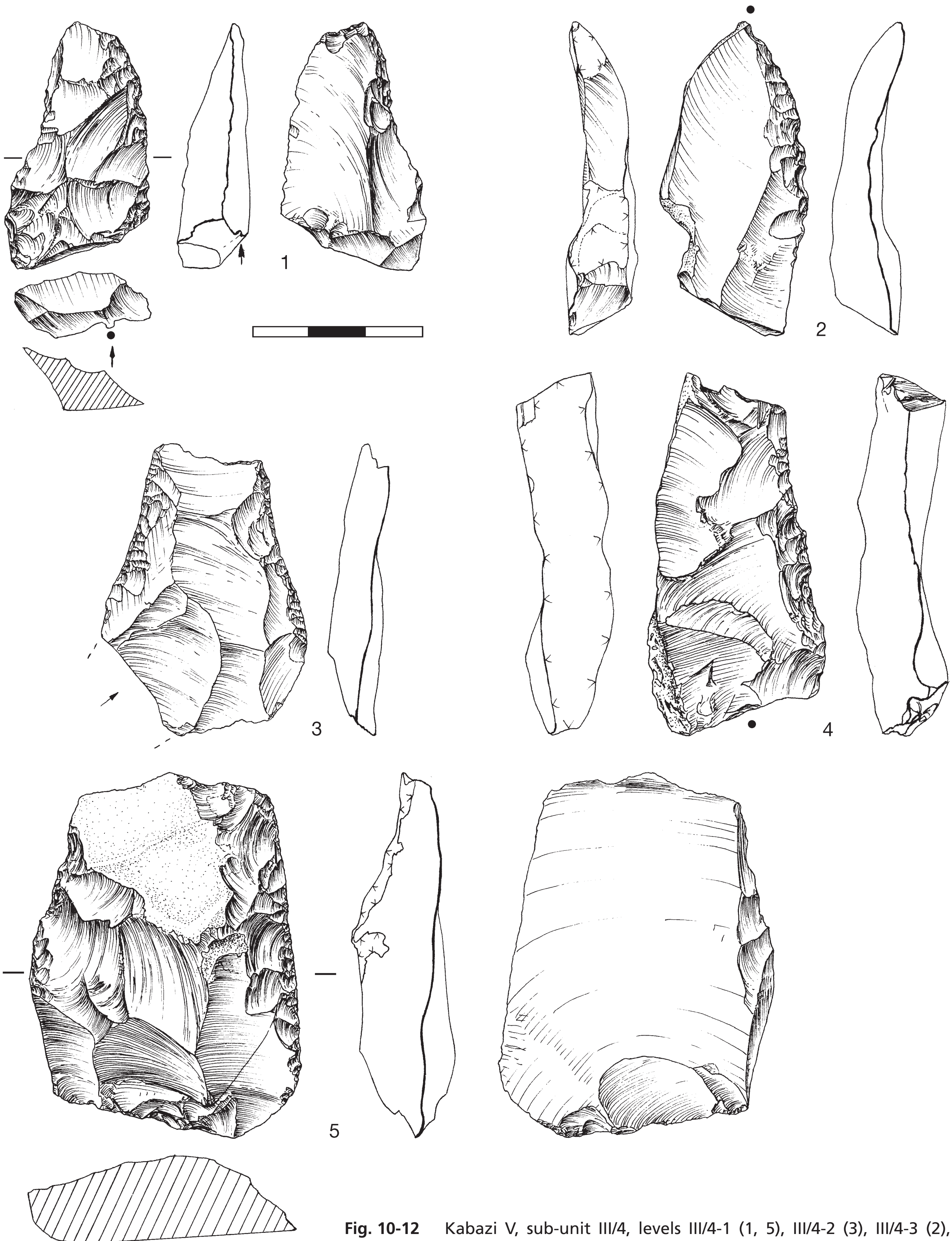

Fig. 10-12 Kabazi V, sub-unit III/4, levels III/4-1 (1, 5), III/4-2 (3), III/4-3 (2), III/4-5 (4). Scrapers: 1 – simple convex, backed, thinned base; 2 – simple convex, backed; 3 – double con-cave; 4 – simple concave, naturally backed; 5 – simple straight, backed, thinned base.

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
Flat	1	·	1	2	2	4	·	10	0.99
Triangular	73	2	47	38	33	47	28	268	26.51
Lateral steep	22	·	16	6	8	4	9	65	6.43
Trapezoidal	82	3	27	30	33	24	24	223	22.06
Polyhedral	8	·	2	3	1	2	7	23	2.27
Convex	18	·	12	9	12	7	4	62	6.13
Unidentifiable	33	·	22	24	8	10	13	110	10.88
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.27**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
Flat	·	·	·	·	·	·	·	·	·
Triangular	4	·	12	4	1	6	2	29	2.87
Lateral steep	·	·	·	2	·	·	·	2	0.20
Trapezoidal	3	·	5	3	6	6	6	29	2.87
Polyhedral	·	1	1	·	1	1	2	6	0.59
Convex	2	·	2	·	1	2	2	9	0.89
Unidentifiable	·	·	1	·	·	·	·	1	0.10
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
Triangular	36	1	21	9	15	10	4	96	9.50
Lateral steep	6	·	4	1	·	1	·	12	1.19
Trapezoidal	19	1	8	8	9	4	3	52	5.14
Polyhedral	2	·	·	·	·	·	·	2	0.20
Convex	1	·	2	·	1	1	1	6	0.59
Unidentifiable	·	·	·	1	·	·	·	1	0.10
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
Triangular	·	·	·	·	1	·	·	1	0.10
Lateral steep	·	·	·	1	·	·	·	1	0.10
Trapezoidal	·	·	2	·	·	1	·	3	0.30
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.49**

Table 10-11 Kabazi V, sub-unit III/4: flakes and blades – cross-sections.

four naturally backed (Fig. 10-12, *4*) simple scrapers were recovered from levels III/4-1, III/4-3 and III/4-5.

Whereas 85.37 % of simple scrapers were made on flakes, 12.2 % were made on blades, and 2.44 % on natural flakes. Seven scrapers were made on off-axis blanks, the rest on on-axis blanks. Simple scrapers are, on average, 51.57 mm long and 34.43 mm wide.

Double scrapers

Double scrapers were discovered in six levels (Table 10-17), the most common type being the double-convex scraper (N=4). Further, there are two examples of double-convex distally thinned scrapers (Fig. 10-13, *1, 4*). All other types of double scrapers are

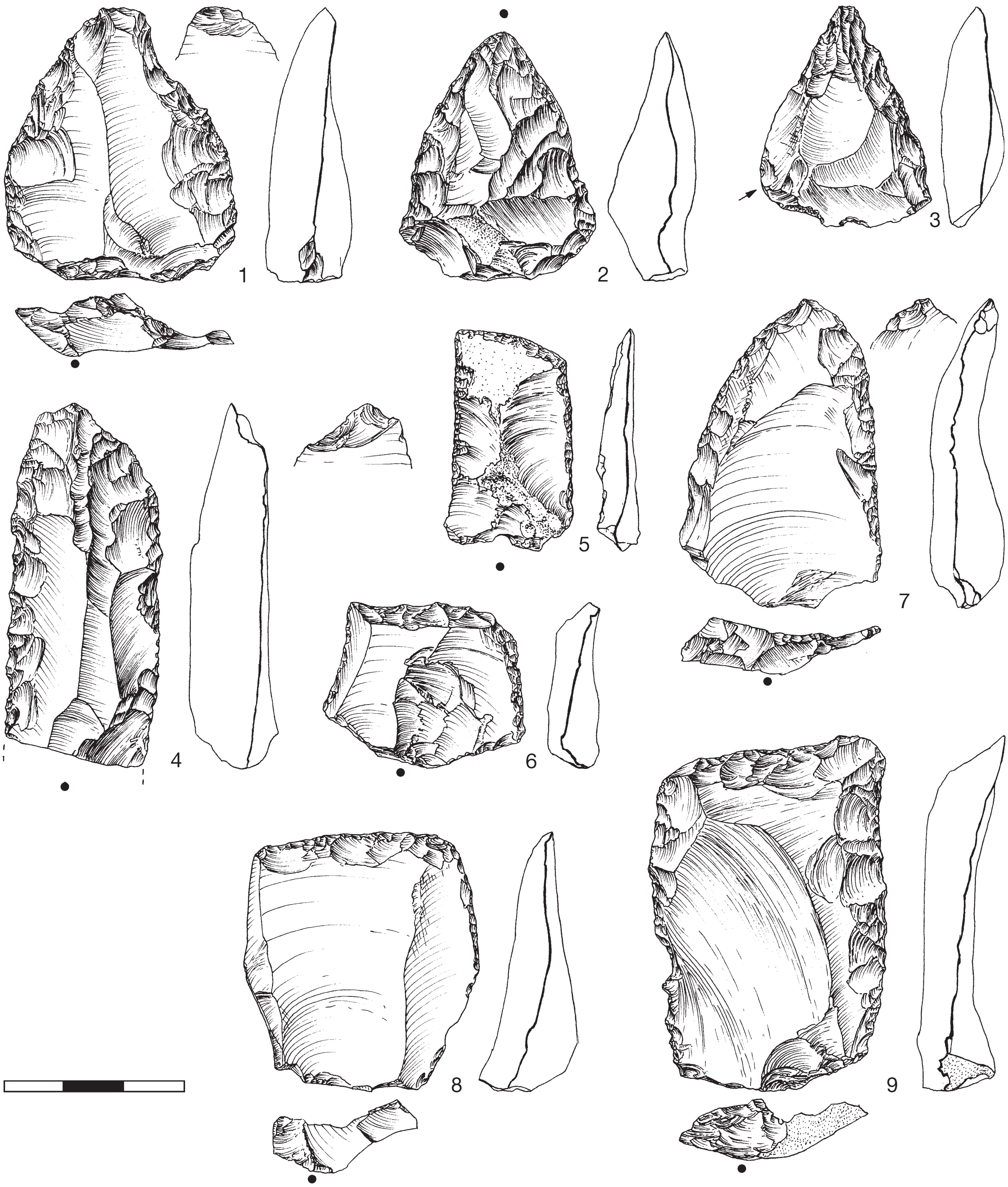

Fig. 10-13 Kabazi V, sub-unit III/4, levels III/4-1 (3, 5, 7), III/4-2 (9), III/4-3 (8), III/4-4 (1), III/4-6 (2, 4, 6). Scrapers: 1, 4 – double convex, terminally thinned; 2, 3 – semi-leaf; 5, 9 – sub-rectangular; 6, 8 – semi-rectangular; 7 – semi-leaf, terminally thinned.

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
Cortex	12	·	2	12	3	5	2	36	3.56
Plain	50	·	16	11	25	19	15	136	13.45
Dihedral	24	2	14	8	6	10	8	72	7.12
Polyhedral	23	·	10	14	8	5	12	72	7.12
Facetted	38	2	19	21	16	9	8	113	11.18
Crushed	18	·	10	9	4	15	7	63	6.23
Missing by retouch	3	·	3	1	1	2	6	16	1.58
Missing	69	1	53	36	34	33	27	253	25.02
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.27**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
Cortex	1	·	·	·	·	·	·	1	0.10
Plain	4	1	9	·	3	4	4	25	2.47
Dihedral	1	·	5	1	2	3	3	15	1.48
Polyhedral	2	·	3	5	2	5	3	20	1.98
Facetted	1	·	4	·	2	3	1	11	1.09
Crushed	·	·	·	1	·	·	·	1	0.10
Missing	·	·	·	2	·	·	1	3	0.30
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
Cortex	1	·	3	·	2	·	·	6	0.59
Plain	11	1	7	3	5	1	·	28	2.77
Dihedral	7	·	1	3	·	2	·	13	1.29
Polyhedral	4	·	·	1	1	·	·	6	0.59
Facetted	16	·	7	3	3	5	1	35	3.46
Crushed	6	1	1	3	7	2	2	22	2.18
Missing by retouch	·	·	·	1	·	·	·	1	0.10
Missing	19	·	16	5	7	6	5	58	5.74
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
Plain	·	·	1	·	·	·	·	1	0.10
Dihedral	·	·	·	1	·	1	·	2	0.20
Polyhedral	·	·	·	·	·	·	·	·	0.00
Facetted	·	·	1	·	1	·	·	2	0.20
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.49**

Table 10-12 Kabazi V, sub-unit III/4: flakes and blades – platform types.

		III/4-1	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6
Regular flakes	Ifs	25.85	28.05	31.81	27.58	18.75	17.77
	Ifl	57.82	67.07	65.15	51.72	50.00	62.22
Regular blades	Ifs	41.02	40.00	30.00	27.27	62.50	100.00
	Ifl	69.23	45.00	70.00	36.36	87.50	100.00

Table 10-13 Kabazi V, sub-unit III/4: faceting indexes for regular flakes and blades.

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
Unlipped	138	2	46	54	41	37	35	353	34.92
Semi-lipped	8	1	15	8	15	11	9	67	6.63
Lipped	1	1	·	2	1	·	·	5	0.49
Unknown	90	1	66	48	40	50	41	336	33.23
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.27**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
Semi-lipped	·	·	2	·	·	3	·	5	0.49
Lipped	9	1	19	6	9	12	11	67	6.63
Unknown	·	·	·	3	·	·	1	4	0.40
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
Unlipped	31	·	18	7	10	8	1	75	7.42
Semi-lipped	7	1	·	3	1	·	·	12	1.19
Unknown	26	1	17	9	14	8	7	82	8.11
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
Lipped	·	·	2	1	1	1	·	5	0.49
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.75**

Table 10-14 Kabazi V, sub-unit III/4: flakes and blades – platform lipping.

represented by one example each in the sub-unit III/4 assemblage: double-straight; double-convex, distally truncated-faceted; convex-wavy; convex-wavy, distally truncated-faceted; convex-concave, bi-terminally thinned; double-concave (Fig. 10-12, 3), and double-wavy. With the exception of one double convex-wavy tool which is alternatively retouched, all other double-edge scrapers are characterised by dorsal retouch. Three of the 13 double scrapers have ventral thinning: two distally thinned pieces and one bi-terminally thinned piece. Two more double scrapers have truncated-faceted distal ends. Nine of the thirteen double scrapers were produced on flakes, all others on blades. Most blanks (N=9) were on-axis removals.

Convergent scrapers

Convergent scrapers are the second most numerous of the four different morphological scraper groups, being found in five of seven levels of sub-unit III/4 (Table 10-17). Based on the morphology of their retouched edges, convergent scrapers are subdivided into six main shapes; there are three leaf-shaped convergent

	III/4-1	III/4-1A	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Flakes & tools on flake									
Right, 90°	71	2	24	31	24	11	14	177	17.51
Obtuse, > 110°	76	2	37	33	33	37	30	248	24.53
Unknown	90	1	66	48	40	50	41	336	33.23
Total:	**237**	**5**	**127**	**112**	**97**	**98**	**85**	**761**	**75.27**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake									
Obtuse, > 110°	9	1	21	6	9	15	11	72	7.12
Unknown	·	·	·	3	·	·	1	4	0.40
Total:	**9**	**1**	**21**	**9**	**9**	**15**	**12**	**76**	**7.52**
Blades & tools on blade									
Right, 90°	19	1	13	6	7	4	·	50	4.95
Obtuse, > 110°	20	·	5	4	4	4	1	38	3.76
Unknown	25	1	17	9	14	8	7	81	8.01
Total:	**64**	**2**	**35**	**19**	**25**	**16**	**8**	**169**	**16.72**
Bifacial thinning blades & tools on bifacial thinning blade									
Obtuse, > 110°	·	·	2	1	1	1	·	5	0.49
Total:	**·**	**·**	**2**	**1**	**1**	**1**	**·**	**5**	**0.75**

Table 10-15 Kabazi V, sub-unit III/4: flakes and blades – platform angles.

scrapers, three are triangular, four are trapezoidal, five are rectangular, five are crescent-shaped, and one is hook-like. Due to fragmentation, four tools could not be assigned to a morphological group. Leaf-shaped scrapers comprise semi-leaf dorsal types (Fig. 10-13, *2, 3*), one of which displays a distal thinning (Fig. 10-13, *7*). Of the three triangular scrapers only one is really triangular, a tool with a thinned base and back, while the other two are sub-triangular dorsal and are alternatively retouched. Trapezoids are subdivided into semi-trapezoidal elongated dorsal (N=1), semi-trapezoidal inversely retouched (N=1), semi-trapezoidal dorsal distally thinned (N=1; Fig. 10-14, *2*) and sub-trapezoidal dorsal (N=1) types. The convergent scrapers with rectangular edges comprise two semi-rectangular (Fig. 10-13, *6, 8*) and three sub-rectangular (Fig. 10-13, *5, 9*) pieces. Crescent-shaped scrapers include pieces which can be assigned to four different sub-types: semi-crescent dorsal (N=2), semi-crescent alternative (N=1; Fig. 10-14, *4*), semi-crescent dorsal, thinned back (N=1; Fig. 10-14, *1*), and sub-crescent dorsal (N=1; Fig. 10-14, *3*). There is only one hook-like scraper. All tools were made on blanks with maximum dimension in excess of 3 cm. The overwhelming majority of blanks were made on on-axis flakes.

Burins

Upper Palaeolithic tool types are represented by burins (Table 10-17). Burins were found in levels III/4-1, III/4-2, III/4-3 and III/4-4. They are subdivided into the following types: angle burin, double angle burin, dihedral burin, and burin on a concave truncation (Fig. 10-15, 3). All burins are fragmented.

Denticulates

Denticulates were found in levels III/4-1, III/4-3, III/4-5 and III/4-6 (Table 10-17). All were made on flakes, including one natural flake. Denticulates are represented by the following types: straight dorsal (N=2), convex dorsal (N=2), and one alternatively retouched fragment.

Notches

Notched tools were found in three levels (Table 10-17). Four notches were made on flakes, and one from level III/4-4 on a residual core. Three types of notches were distinguished: lateral (N=2); transverse (N=2); and lateral-transverse (N=1).

	III/4-1	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%
Tool on natural flake	·	2	2	·	·	1	5	1.92
Tool on core	·	·	·	1	·	·	1	0.38
Tool on chip	·	·	·	1	1	·	2	0.77
Tool on flake	53	39	37	25	29	20	203	77.78
Tool on blade	10	3	2	4	7	4	30	11.49
Tool on bifacial thinning chip	·	·	·	·	1	·	1	0.38
Tool on bifacial thinning flake	2	·	·	·	·	1	3	1.15
Tool on bifacial thinning blade	·	1	·	·	·	·	1	0.38
Unidentifiable	5	·	2	2	3	3	15	5.75
Total:	**70**	**45**	**43**	**33**	**41**	**29**	**261**	**100.00**

Table 10-16 Kabazi V, sub-unit III/4: blank types used for tool production.

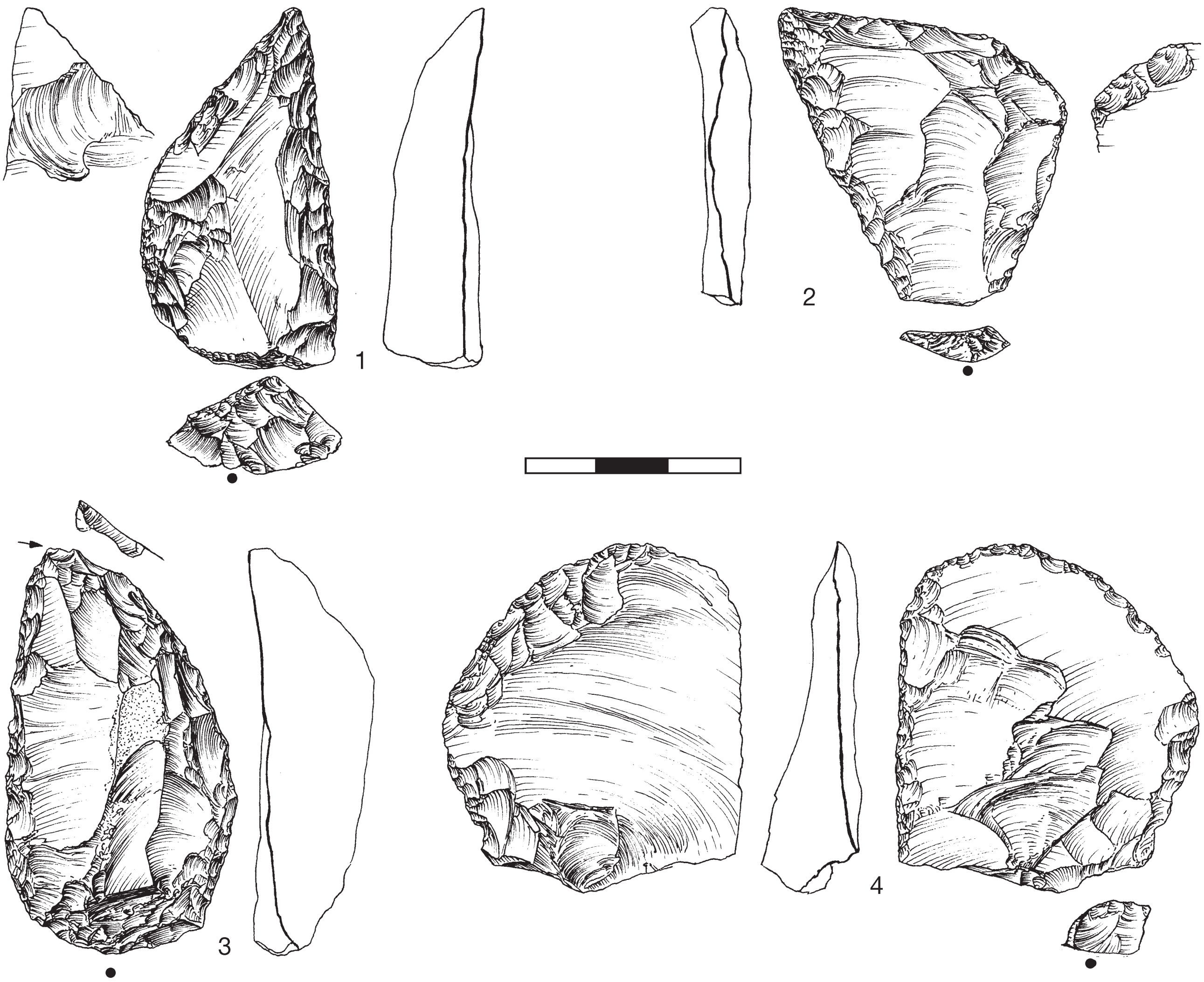

Fig. 10-14 Kabazi V, sub-unit III/4, levels III/4-1 (1), III/4-2 (3), III/4-4 (2), III/4-6 (4). Scrapers: 1 – semi-crescent, thinned back; 2 – semi-trapezoidal, terminally thinned; 3 – sub-crescent; 4 – semi-crescent, alternative.

Bifacial tools

Bifacial tools (Table 10-17) were found in levels III/4-2 and III/4-3. One of the bifacials is the distal part of a point. Two other bifacials are hook-like scrapers. Only one scraper from level III/4-3 is complete; this piece is 39.19 mm long, 32.03 mm wide, and 15.93 mm thick. Its edges were treated using a denticulate retouch.

Retouched pieces and thinned pieces

Retouched pieces were found in six levels of sub-unit III/4 (Table 10-17) where they make up 29.89 % of the total number of tools (Fig. 10-15, *1, 2, 4, 5*). Most retouched pieces were made on flakes (78.21 %), with blades serving as blanks for 20.51 % of retouched pieces; only one chip blank was identified among the retouched pieces. The most common type of retouched pieces is a flake or blade with one dorsally retouched lateral edge, followed by flakes with a dorsally retouched transverse edge. The remaining 28.03 % of retouched pieces fall into one of twelve further types (Table 10-17). Two retouched pieces have a distal thinning (Fig. 10-15, *1*), and one is a distally truncated faceted piece. Four truncated-faceted pieces were discovered in three levels (Table 10-17); all are distally truncated-faceted flakes on a ventral surface.

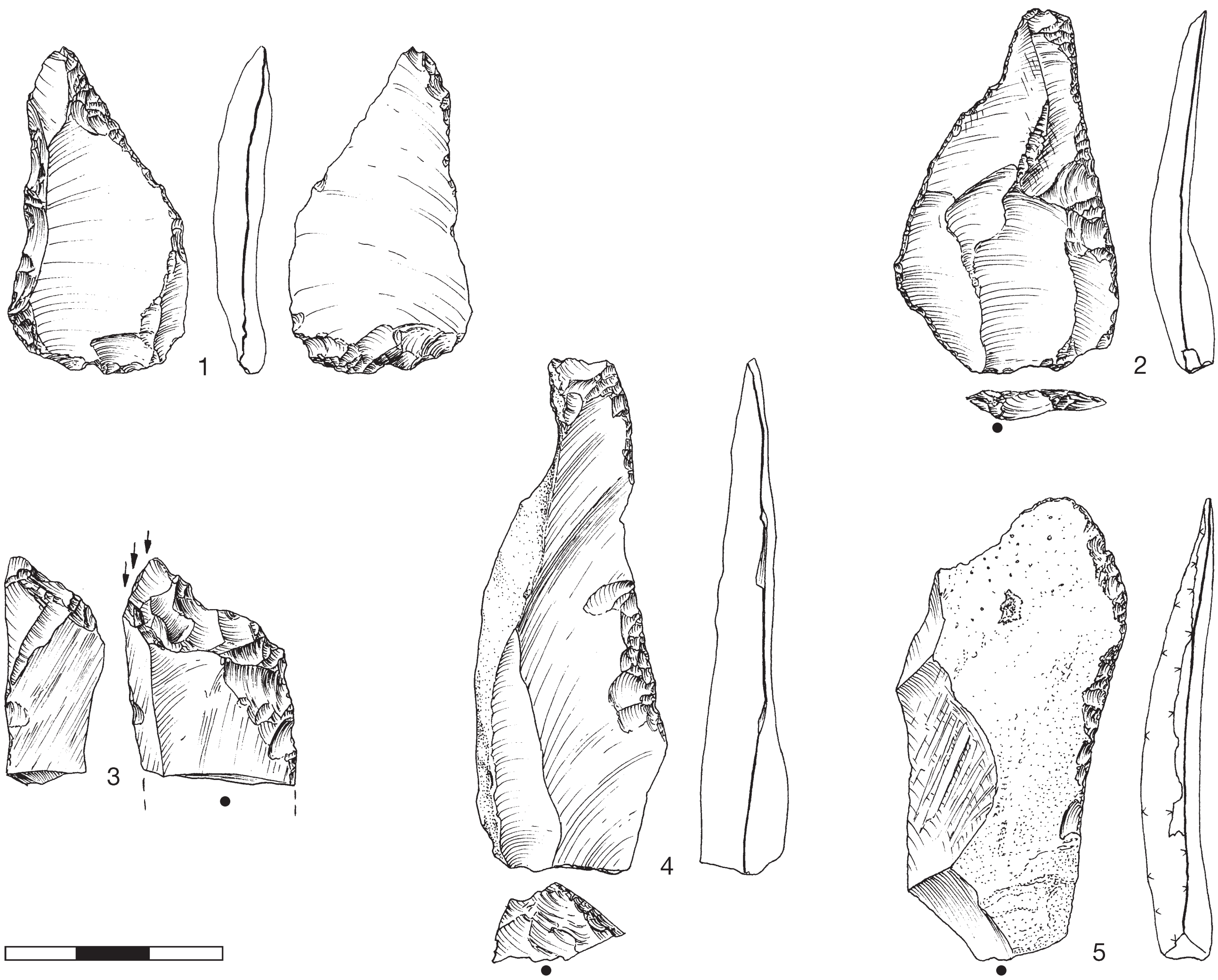

Fig. 10-15 Kabazi V, sub-unit III/4, levels III/4-1 (1, 3, 5), III/4-5 (2), III/4-6 (4). Retouched pieces: 1 – flake with retouch, bi-terminally thinned; 2 – flake with retouch; 3 – burin on the concave truncation; 4, 5 – blade with retouch.

	III/4-1	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%	esse %
Points									*12.0*
Lateral, dorsal	·	·	1	·	·	·	1	0.38	0.8
Distal, dorsal	·	·	·	·	1	·	1	0.38	0.8
Sub-leaf, dorsal	·	·	1	·	·	·	1	0.38	0.8
Sub-leaf, alternate	·	1	·	·	·	·	1	0.38	0.8
Semi-trapezoidal, alternate	·	·	·	·	·	1	1	0.38	0.8
Sub-triangular, dorsal	1	·	1	·	·	·	2	0.77	1.6
Sub-triangular, dorsal, elongated	·	·	·	·	1	·	1	0.38	0.8
Semi-crescent, dorsal	·	1	·	·	·	1	2	0.77	1.6
Sub-crescent, dorsal, thinned back	1	·	·	·	·	·	1	0.38	0.8
Unidentifiable, dorsal	·	·	3	·	·	·	3	1.15	2.4
Unidentifiable, alternate	·	·	1	·	·	·	1	0.38	0.8
Scrapers									*74.4*
Transverse-straight, dorsal	·	2	2	1	·	·	5	1.92	4.0
Transverse-convex, dorsal	·	·	1	·	1	·	2	0.77	1.6
Transverse-convex, dorsal, thinned base	·	·	·	1	·	·	1	0.38	0.8
Transverse-concave, dorsal	·	·	·	·	1	·	1	0.38	0.8
Diagonal convex, dorsal	·	·	·	1	1	·	2	0.77	1.6
Diagonal concave, dorsal	1	·	1	·	1	·	3	1.15	2.4
Straight, dorsal	5	·	1	1	1	·	8	3.07	6.4
Straight, dorsal, naturally backed	·	·	·	·	1	·	1	0.38	0.8
Convex, dorsal	6	4	3	2	6	·	21	8.05	16.8
Convex, ventral	·	·	1	·	·	·	1	0.38	0.8
Convex, dorsal, backed, thinned base	1	·	1	·	·	·	2	0.77	1.6
Convex, dorsal, distally truncated-faceted	·	·	·	·	1	·	1	0.38	0.8
Convex, dorsal, bi-terminally thinned	·	1	·	·	·	·	1	0.38	0.8
Convex, dorsal, naturally backed	·	·	1	·	·	·	1	0.38	0.8
Convex, dorsal, naturally backed, distally thinned	1	·	·	·	·	·	1	0.38	0.8
Concave, dorsal	1	1	·	·	·	·	2	0.77	1.6
Concave, dorsal, naturally backed	·	·	·	·	1	·	1	0.38	0.8
Wavy, dorsal	·	·	·	·	·	1	1	0.38	0.8
Double straight, dorsal	1	·	·	·	·	·	1	0.38	0.8
Double convex, dorsal	2	·	1	·	1	·	4	1.53	3.2
Double convex, dorsal, distally thinned	·	·	·	1	·	1	2	0.77	1.6
Double convex, dorsal, distally truncated-faceted	1	·	·	·	·	·	1	0.38	0.8
Double convex-wavy, alternative	·	·	·	1	·	·	1	0.38	0.8
Double convex-wavy, dorsal, distally truncated-faceted	·	·	·	1	·	·	1	0.38	0.8
Double convex-concave, dorsal, bi-terminally thinned	·	1	·	·	·	·	1	0.38	0.8
Double concave, dorsal	·	1	·	·	·	·	1	0.38	0.8
Double wavy, dorsal	·	1	·	·	·	·	1	0.38	0.8
Semi-leaf, dorsal	1	·	·	·	·	1	2	0.77	1.6
Semi-leaf, dorsal, distally thinned	1	·	·	·	·	·	1	0.38	0.8
Triangular, dorsal, thinned base & back	·	·	·	·	·	1	1	0.38	0.8
Sub-triangular, dorsal	·	·	1	·	·	·	1	0.38	0.8
Sub-triangular, alternate	·	·	1	·	·	·	1	0.38	0.8
Semi-trapezoidal, dorsal, elongated	1	·	·	·	·	·	1	0.38	0.8
Semi-trapezoidal, ventral	·	·	·	1	·	·	1	0.38	0.8
Semi-trapezoidal, dorsal, distally thinned	·	·	·	1	·	·	1	0.38	0.8
Sub-trapezoidal, dorsal	·	1	·	·	·	·	1	0.38	0.8
Semi-rectangular, dorsal	·	·	1	·	·	·	1	0.38	0.8
Sub-rectangular, dorsal	2	1	·	·	·	·	3	1.15	2.4
Semi-crescent, dorsal	·	·	·	1	·	2	3	1.15	2.4
Semi-crescent, alternate	·	·	·	·	·	1	1	0.38	0.8
Semi-crescent, dorsal, thinned back	1	·	·	·	·	·	1	0.38	0.8
Sub-crescent, dorsal	·	1	·	·	·	·	1	0.38	0.8
Hook-like, dorsal	1	·	·	·	·	·	1	0.38	0.8
Convergent, dorsal, unidentifiable	·	2	1	·	·	1	4	1.53	3.2

Table 10-17 Kabazi V, sub-unit III/4: tools.

	III/4-1	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6	Total:	%	esse %
Upper Paleolithic types									*3.2*
Burins	1	1	1	1	·	·	4	1.53	3.2
Denticulates									*4.0*
Straight, dorsal	·	·	2	·	·	·	2	0.77	1.6
Convex, dorsal	·	·	·	·	1	1	2	0.77	1.6
Unidentifiable, alternate	1	·	·	·	·	·	1	0.38	0.8
Notches									*4.0*
Lateral, dorsal	·	·	·	1	·	·	1	0.38	0.8
Lateral, ventral	·	·	·	1	·	·	1	0.38	0.8
Transverse, dorsal	·	·	·	·	1	·	1	0.38	0.8
Transverse, ventral	·	·	·	·	·	1	1	0.38	0.8
Lateral-transverse, dorsal	·	·	·	·	1	·	1	0.38	0.8
Bifacial points									*0.8*
Unidentifiable	·	1	·	·	·	·	1	0.38	0.8
Bifacial scrapers									*1.6*
Hook-like	·	1	1	·	·	·	2	0.77	1.6
Retouched pieces									
On chip, lateral, dorsal	·	·	·	1	·	·	1	0.38	·
On flake, lateral, dorsal	10	3	6	6	4	5	34	13.03	·
On flake, lateral, dorsal, bi-terminally thinned	·	·	·	·	·	1	1	0.38	·
On flake, lateral, ventral	·	1	·	·	1	·	2	0.77	·
On flake, lateral, alternative	·	·	1	·	1	·	2	0.77	·
On flake, lateral-transverse, dorsal	·	·	·	·	1	·	1	0.38	·
On flake, bilateral, dorsal	1	2	·	·	·	·	3	1.15	·
On flake, bilateral, alternative	·	·	·	·	1	·	1	0.38	·
On flake, bilateral, dorsal, terminally truncated-faceted	·	·	·	1	·	·	1	0.38	·
On flake, bilateral-transverse, dorsal	·	1	·	1	·	·	2	0.77	·
On flake, transverse, dorsal	5	1	2	1	3	·	12	4.60	·
On flake, transverse, alternative	·	·	·	1	·	·	1	0.38	·
On flake, transverse, dorsal, thinned base	1	·	·	·	·	·	1	0.38	·
On blade, lateral, dorsal	3	4	1	4	1	1	14	5.36	·
On blade, bilateral, dorsal	1	·	·	·	1	·	2	0.77	·
Truncated-faceted pieces									
Truncated-faceted	1	·	·	·	1	2	4	1.53	·
Unidentifiable									
Unifacial tools fragments	13	11	5	1	4	5	39	14.94	·
Bifacial tools fragments	5	1	1	2	3	3	15	5.75	·
Total:	**70**	**45**	**43**	**33**	**41**	**29**	**261**	**100.00**	**100.0**

Table 10-17 Continued.

Unidentifiable tools

All tiny tools fragments were attributed to unidentifiable tools. These tool fragments are encountered in six levels from sub-unit III/4. Unifacial unidentifiable tools comprise 14.94 % of the entire tool assemblage. Fragments of bifacial tools comprise 5.75 %.

Bone retouchers

Bone retouchers were discovered in six levels of sub-unit III/4 (Table 10-1) and belong to two different types: there are nine simple bone retouchers, and five double retouchers. For a more detailed description of the retouchers, see Chapter 15 , by A. Veselsky.

Pebbles and tools on pebbles

A total of 31 pebbles stem from six levels of sub-unit III/4, with most pebbles found in level III/4-1 (Table 10-1). Most are fragmented and show no traces of use. Only two pebbles are complete; these have an average length of 39.68 mm, an average width of 27.03 mm, and an average thickness of 6.89 mm.

This is the most comfortable size for pebbles used as stone retouchers. While the majority of pebbles are of sandstone (N=23), six are of a specific type of limestone usually encountered on the banks of the Alma river, one is of a rare quartzite, and one is of either tufa or travertine.

Artefacts from the Pit, Level III/4-2, Square 9AA

The artefact assemblage from the pit comprises 2,786 items. Refits of flint blanks discovered in the pit show that all these artefacts stem from the production of just one bifacial tool (see Chapters 2 and 16 for detailed description of the pit and refits). All blanks larger than 3 cm were refitted. Further, 22 flakes and blades were conjoined from its fragments. A cast of the missing bifacial preform was made by filling the empty corpus of the refitted nodule with a paraffin based wax. This "reconstructed" bifacial preform is 14.23 cm long, 6.11 cm wide, and 1.78 cm thick. It should also be noted that only artefacts from the pit could be refitted, i.e. neither artefacts from the neighbouring squares nor from archaeological level III/4-2 as a whole could be refitted.

More than 50 % of the chips have "lips". The flake assemblage from the pit is characterised by a dominance of items with transverse proportions (Fig. 10-16, *1*). Blades are rare, and blades with faceted platforms are absent (Fig. 10-16, *2*). Both the converging and unidirectional scar patterns are dominant among both flakes and blades. More than 80 % of blanks retain some cortex on their dorsal surfaces. Prepared platforms are mainly of dihedral and polyhedral types. Blanks with faceted platforms are rare. The widths of striking platforms rarely exceed 20 mm, and maximum thickness is rarely in excess of 5 mm (Fig. 10-16, *3*). As a whole, the flint complex from the pit is characterised purely by blanks from bifacial tool production. On the other hand, there is a significant difference between the typological and statistical attributes between the blank assemblage from pit and that from level III/4-2; in the latter core treatment was dominant.

The artefact cache from the pit is only the third time that such a situation has been recorded for the Crimean Middle Palaeolithic. In layer III of Zaskalnaya V, a small pit 18 cm in diameter and 3 cm deep yielded 84 unretouched blanks *"produced from one nodule of a yellow colour"* (Kolosov 1983, p. 46-47). In layer III of Zaskalnaya VI, a pit with a "cache" of 8 bifacial tools was discovered (Kolosov, 1986, p. 19; fig. 4, p. 20-21).

Discussion: Characteristic Features of Sub-Unit III/4 Artefact assemblages

Archaeological complexes from sub-unit III/4 have each produced evidences of two technological processes, firstly, the production of bifacial tools, and secondly, core reduction. Developed core technologies are characteristic of Western Crimean Mousterian (WCM) industries, which themselves are a variant of the Eastern European Levallois-Mousterian. The predominant method of flaking in Eastern Micoquian industries can be termed plano-convex bifacial. In the Kabazi V sequence, more or less homogeneous assemblages belonging to these techno-complexes have been identified in levels III/1, III/1A, III/2, and IV/1.

The presence of bifacial technology in levels III/4-2, III/4-3, III/4-5, and III/4-6 is evidenced by bifacial tool preforms (Table 10-1). These are a common feature of Crimean Micoquian assemblages, especially for site-workshops, as at Zaskalnaya V, Zaskalnaya VI, Kabazi V, III/1, III/1A and III/2. Products of this type are completely absent in levels III/4-1, III/4-1A and III/4-4.

Cores were identified in all levels, except in III/4-1A and III/4-6 (Table 10-1). More than a half of all cores stem from level III/4-1. A distinctive feature for the majority of cores is the occurrence of lateral supplementary platforms (fig. 10-1, *1, 2, 3*; 10-2, *1*). Also, both main and supplementary platforms are usually faceted. The typological structure of cores, which are represented mainly by bi-directional, unidirectional, and radial types, is consistent with typological transformation processes studied in WCM assemblages from Kabazi II, Unit II (Chabai 1998b, Usik 2003). Such core assemblages have never been found in association with a homogeneous Crimean Micoquian tool-kit.

The ratio of different blank types varies from level to level in sub-unit III/4. In most levels the percentage of "bifacial thinning" chips does not correlate with that in Crimean Micoquian assemblages, such as Kabazi V, levels III/1A, III/2, but is higher than that in level III/1 of the same site (Table 10-18). The highest percentages of "bifacial thinning chips" (in excess of 40 %) are found to be characteristic for levels III/4-5 and III/4-6. Archaeological level III/4-1 is characterised by the lowest percentage of "bifacial thinning chips" (26.76 %).

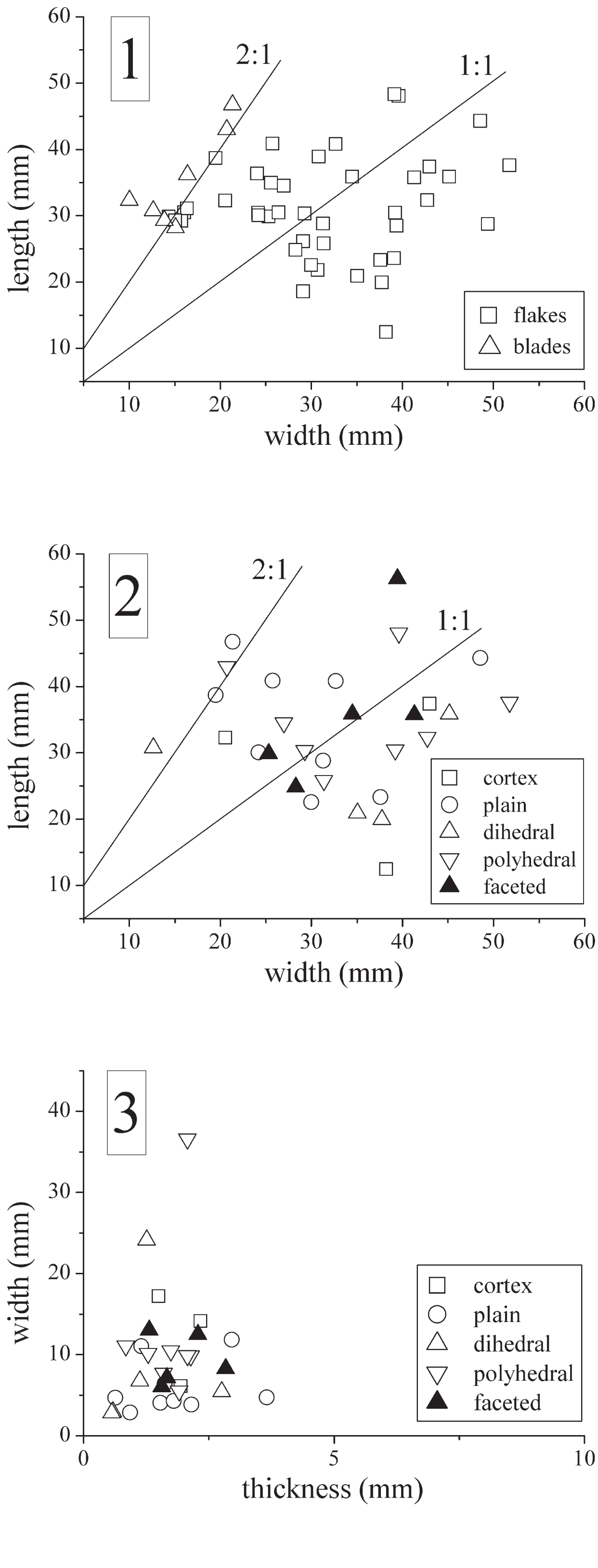

Fig. 10-16 Kabazi V, level III/4-2, pit on square 9AA. 1 – length/width scatterplot for all blanks; 2 – length/width scatterplot for blanks, after platform types; 3 – width/thickness scatterplot for blanks, after platform types.

In this case, the percentage of "bifacial thinning" chips is much lower than observed in homogeneous Crimean Micoquian assemblages, but, at the same time, still exceeds quite considerably parameters noted for WCM industries (Kabazi V, IV/1).

In levels III/4-1, III/4-3 and III/4-4 "bifacial thinning" flakes and blades are relatively rare (Fig. 10-6). Moreover, in levels III/4-3 and III/4-4 percentages of "bifacial thinning" flakes and blades are twice higher than noted for level III/4-1. In levels III/4-2 and III/4-5 the percentages of "bifacial thinning" blanks are the same as those in Kabazi V, levels III/1, III/1A, but lower than in Kabazi V, level III/2 (Table 10-18).

Whereas sub-unit III/4, and especially levels III/4-1, III/4-2 and III/4-4 assemblages, contain sufficient numbers blades to be identified as WCM, they still comprise too many "bifacial thinning and rejuvenation" blanks to be considered part of a Levallois-Mousterian techno-complex. Further, some levels of sub-unit III/4 differ in their blade indexes, and in their ratios of "bifacial thinning blanks". Level III/4-6 yielded the lowest blade index (11.32), but one of the highest ratios of bifacial thinning flakes (12.77 %). On the other hand, level III/4-1 produced the highest blade index (20.96), with the lowest percentage of bifacial thinning blanks (5.62 %)(Table 10-18).

In sum, the strict faceting index for blades in all levels of sub-unit III/4 exceeds considerably values noted for Kabazi V, III/2. At the same time, the same index is lower in all levels of sub-unit III/4 than in level IV/1, the only exceptions being levels III/4-5 and III/4-6 (Table 10-18). Moreover, in levels III/4-1, III/4-3, III/4-5 and III/4-6 the percentages of tools with faceted platforms accounts for more than 40 % of tools with identifiable striking platforms. The lowest percentage of tools with faceted platforms (25 %) is observed in level III/4-2. A high percentage of tools on blanks with faceted platforms indicates that these blanks stem from Levallois-Mousterian cores.

Unifacial tools are dominant in the tool-kits from sub-unit III/4. The most common tool is the simple scraper (Table 10-18). Points are characteristic for both the WCM (distal and lateral types on blades, the absence of invasive retouch) and Micoquian (semi-crescent and semi-trapezoidal shapes) traditions. Truncated-faceted tools, found in archaeological levels III/4-1 and III/4-5, are also considered characteristic of the WCM industry. In all levels of sub-unit III/4 bifacial tools occur mainly as fragments. Complete bifacials were found only in levels III/4-2 and III/4-3. Complete bifacial tools, together with fragments thereof, make up only 6.9 % of all tools in sub-unit III/4. The ratio of bifacial tools to unifacial scrapers and points lies at 2.7 %.

		III/1	III/1A	III/2	III/4-1	III/4-2	III/4-3	III/4-4	III/4-5	III/4-6
"bifacial thinning" chips, 1.0-1.9 cm *		13.86	21.78	27.00	23.37	26.31	29.35	28.96	37.67	32.80
"bifacial thinning" chips, 2.0-2.9 cm *		2.91	5.85	7.11	4.21	5.87	3.98	7.16	7.76	6.88
"bifacial rejuvenating" chips, 1.0-1.9 cm *		1.22	1.08	1.28	0.54	1.53	0.84	0.90	0.34	0.71
"bifacial rejuvenating" chips, 2.0-2.9 cm *		0.30	0.43	0.49	0.09	0.26	·	0.30	0.34	0.53
"bifacial thinning" flakes (%)		5.66	6.75	18.41	4.08	14.19	7.44	8.65	12.28	12.77
"bifacial thinning" blades (%)		4.98	7.01	15.38	1.54	5.41	5.00	3.85	5.88	·
indices of blades		11.22	11.44	9.91	20.96	20.00	14.18	20.00	12.97	11.32
indices of facetting	Ifs	23.52	43.85	14.65	28.20	31.63	28.91	27.84	23.61	17.54
	Ifl	66.24	72.81	52.27	59.48	65.31	68.67	51.89	47.22	63.15
percentage of bifacial tools		21.53	17.20	27.90	2.70					
ratio cores: tools		1 : 54	1 : 19	1 : 70	1 : 4.67	1 : 22.5	1 : 10.75	1 : 11	1 : 13.67	·

* the percentage of the total number of identifiable chips

Table 10-18 Kabazi V. Lithic variability, by level.

To conclude, the technological and typological characteristics of sub-unit III/4 assemblages demonstrate features characteristic for both Levallois-Mousterian and Micoquian techno-complexes. In level III/4-1 the Micoquian influence is reflected to a lesser degree, as is the Levallois-Mousterian component in level III/4-6. In other levels of sub-unit III/4 the Levallois-Mousterian and Micoquian components are represented in approximately equal proportions. The heterogeneous character of the assemblages is most probably a reflection of the geomorphologic situation; the sediments of sub-unit III/4 form a slope (9° to 19.5°), a clear indicator that archaeological material became transported following deposition. The only unaffected (closed) complex is the assemblage of flint artefacts from pit in level III/4-2. Artefacts from this feature bear witness to bifacial tool production, a common activity during the Crimean Micoquian.

Abstract

КАБАЗИ V, ПАЧКА ГОРИЗОНТОВ III/4: АРТЕФАКТЫ

ВЕСЕЛЬСКИЙ А.П.

В пачке горизонтов III/4 обнаружено 7 археологических горизонтов – III/4-1, III/4-1A, III/4-2, III/4-3, III/4-4, III/4-5 и III/4-6, – которые были разделены стерильными прослойками минимальной толщины.

Общее количество находок из пачки горизонтов III/4 составляет 50514 предметов, составляющих 3 основные группы артефактов. Первая группа представлена 50469 кремневыми изделиями и подразделяется на семь категорий артефактов: обломки (47 экз.), чешуйки (49308 экз.), отщепы (673 экз.), пластины (146 экз.), нуклеусы (27 экз.), преформы (7 экз.) и орудия (261 экз.). Вторую и третью группы археологического материала составляют костяные ретушеры (14 экз.) и речные гальки без следов использования (31 экз.).

Главной особенностью структуры археологических артефактов в пачке горизонтов III/4 является наличие признаков, характерных как для микока, так и для леваллуа-мустьерских – западнокрымских индустрий: процент орудий характерен для микокских стоянок-мастерских; процент нуклеусов, особенно в горизонте III/4-1, соответствует западнокрымским леваллуа-мустьерским коллекциям; наличие преформ двусторонних орудий является характерной особенностью микокских индустрий, тогда как их полное отсутствие, в частности в горизонте III/4-1, отличительная черта западнокрымских коллекций; и последнее, процент двусторонних орудий является слишком низким для микока, но в тоже время абсолютно не характерен для гомогенных леваллуа-мустьерских индустрий Крыма.

Орудийный набор в пачке горизонтов III/4 представлен 10 классами: остроконечники, скребла, зубчатые, выемчатые, двусторонние острия, двусторонние скребла, сколы с ретушью, truncated-faceted и неопределимые фрагменты односторонних и двусторонних орудий. Без учета обломков кремня и чешуек орудия составляют практически четверть всех артефактов – 23%. Среди орудий преобладают односторонние изделия. Наиболее представительную группу составляют скребла – 74,4%. По количеству рабочих участков односторонние скребла подразделяются на поперечные/диагональные (14 экз.), продольные (55 экз.), двойные (13 экз.) и конвергентные (25 экз.). Для поперечных/диагональных, продольных и двойных скребел характерны орудия с выпуклым рабочим лезвием. Конвергентные скребла представлены следующими морфологическими группами: полу-листовидные (3 экз.), треугольные и под-треугольные (3 экз.), полу- и под-трапециевидные (4 экз.), полу- и под-прямоугольные (4 экз.), полу- и под-сегментовидные (6 экз.), клювовидные (1 экз.) и неопределимые фрагменты конвергентных орудий (4 экз.).

Остроконечники насчитывают 15 экземпляров и составляют 12% всего орудийного набора. Среди них различаются дистальные (1 экз.), латеральные (1 экз.), под-листовидные (2 экз.), полу-трапециевидные (1 экз.), под-треугольные (3 экз.), полу- и под-сегментовидные (3 экз.), а также неопределимые на уровне отдела фрагменты остроконечников (4 экз.). Остальные типы односторонних орудий в общей сложности не превышают 4%.

Двусторонние орудия представлены острием и скреблом, типичными для крымского микока. В целом они составляют только 2,4% среди определимых орудий. Столь низкий процент двусторонних форм в среднем палеолите Крыма характерен смешанным микокским и леваллуа-мустьерским коллекциям, например, Кабази I, Холодная Балка, нижний слой Бахчисарайской стоянки, верхний слой ГАБО, Староселье, 1953-1956.

Все горизонты, формирующие пачку III/4, являются палимпсестами, сочетающими как леваллуа-мустьерские, так и микокские черты. Наименьшая степень микокской примеси характерна для горизонта III/4-1. Минимальный леваллуа-мустьерский компонент обнаружен в археологическом слое III/4-6. В других горизонтах леваллуа-мустьерские и микокские компоненты представлены приблизительно в равных пропорциях. Главную роль в смешанном характере коллекций сыграл достаточно большой угол падения (от 9˚ до 19,5˚) отложений, в которых аккумулировались археологические горизонты пачки III/4. Такой угол падения отложений предопределил горизонтальное перемещение артефактов, как в процессе, так и после формирования археологических горизонтов. Единственным гомогенным комплексом является коллекция сколов из ямы в горизонте III/4-2. Данные сколы представляют собой отходы производства преформы двустороннего орудия (Глава 16 в этом томе).

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter 11

Kabazi V, Sub-Unit III/5: The Staroselian Industry

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The materials from sub-unit III/5 were recovered from finer-grained deposits in stratum E3 (lithological layer 12A) which had developed due to weathering of the clay bedrock in the rock-shelter. Nevertheless, in this same layer there is also some evidence of pedogenic processes (Ferring 1998: 274-279; Chapter 1, this volume). It should also be noted that owing to the softness of the fossiliferous Eocene clays (Eb) these deposits would have accumulated relatively rapidly.

The ash-enriched sediments which contained the materials constituting sub-unit III/5 were between 30 cm and 50 cm deep (Table 11-1). During the 2003 excavations this sub-unit was subdivided into seven levels. All of these are representative of living floors, each marked by fireplaces, "carpets" of artefacts, as well as faunal remains. In some parts of the excavated area there are obvious sterile lenses between levels III/5-1A, III/5-1, and III/5-1B. However, in other areas these are almost entirely lacking. Certainly, these three levels were deposited separately from the lower level III/5-2, as is clearly visible in all excavated units. In the same way, level 5-2 is separated from the lower level III/5-3 by sterile deposits. Additionally, in some parts of the excavated area, similar sterile deposits are also evident between horizons III/5-3 and II/5-3B, as well as between horizons III/5-3B and III/5-3B2.

Most likely, the levels comprising sub-unit III/5 form several so-called "palimpsests". Although – and as shown for the Middle Palaeolithic site of Les Cannalettes (France) – even a relatively thin horizon might represent a "palimpsest" of several short-term occupations (Meignen, Brugal 2001).

Methodology of Artefact Descriptions

Artefacts recovered in occupations belonging to sub-unit III/5 at Kabazi V are described according to the typological classification used previously for investigation of Crimean Middle Palaeolithic sites (Chabai 1998c, 1998d, 2004b; Chabai, Demidenko 1998; Demidenko 2004a; Marks, Monigal 1998; Yevtushenko 1998b, 2004), with some modifications.

The flint artefacts have been subdivided into seven categories: cores, preforms, tools, flakes, blades, chunks and chips (Table 11-2). The assemblages of Kabazi V, sub-unit III/5 were made on flints of various colours. Most of the artefacts, ca. 90%, are on a grey flint; small numbers of dark brown and yellow flints also occur. The majority of grey flints have a

Levels	*Minimal thickness*	*Maximal thickness*	*Area*	*Artefacts total*	*Density* per sq.m*	*Artifacts essential*	*Density** per cu.m*
III/5-1A	4 cm	4 cm	9 sq.m	8,376	930.7	133	369.4
Sterile	<1 cm	3 cm	·	·	·	·	·
III/5-1	2 cm	2 cm	13 sq.m	10,208	785.2	212	815.4
Sterile	<1 cm	<1 cm	·	·	·	·	·
III/5-1B	2 cm	2 cm	9 sq.m	5,681	631.2	81	450.0
Sterile	3 cm	5 cm	·	·	·	·	·
III/5-2	4 cm	4 cm	13 sq.m	31,150	2,396.2	481	925.0
Sterile	4 cm	4 cm	·	·	·	·	·
III/5-3	1 cm	2 cm	18 sq.m	13,897	772.1	245	907.4
Sterile	<1 cm	4 cm	·	·	·	·	·
III/5-3B	2 cm	2 cm	11 sq.m	17,237	1567.0	258	1,172.7
Sterile	<1 cm	10 cm	·	·	·	·	·
III/5-3B2	2 cm	4 cm	8 sq.m	18,804	2,350.5	272	1,133.3

* average means of all stone artefacts per square meter
** average means of essential artefacts per cubic meter

Table 11-1 Kabazi V, sub-unit III/5: vertical and horizontal distribution of artefacts by levels.

	III/5-1A		**III/5-1**		**III/5-1B**		**III/5-2**	
	N	***ess %***	**N**	***ess %***	**N**	***ess %***	**N**	***ess %***
Cores	2	*1.50*	3	*1.42*	1	*1.23*	5	*1.04*
Preforms	1	*0.75*	1	*0.47*	·	·	6	*1.25*
Tools	43	*32.33*	63	*29.72*	18	*22.22*	129	*26.82*
Flakes	72	*54.14*	129	*60.85*	57	*70.37*	284	*59.04*
Blades	15	*11.28*	16	*7.55*	5	*6.17*	57	*11.85*
Chunks	63	·	135	·	78	·	277	·
Chips	8,180	·	9,861	·	5,522	·	30,392	·
Total:	**8,376**	***100.00***	**10,208**	***100.00***	**5,681**	***100.00***	**31,150**	***100.00***

	III/5-3		**III/5-3B**		**III/5-3B2**		**Total:**	
	N	***ess %***	**N**	***ess %***	**N**	***ess %***	**N**	***ess %***
Cores	7	*2.86*	4	*1.55*	5	*1.84*	27	*1.61*
Preforms	2	*0.82*	1	*0.39*	1	*0.37*	12	*0.71*
Tools	84	*34.29*	90	*34.88*	69	*25.37*	496	*29.49*
Flakes	130	*53.06*	138	*53.49*	169	*62.13*	979	*58.20*
Blades	22	*8.98*	25	*9.69*	28	*10.29*	168	*9.99*
Chunks	159	·	230	·	205	·	1,147	·
Chips	13,493	·	16,749	·	18,327	·	102,524	·
Total:	**13,897**	***100.00***	**17,237**	***100.00***	**18,804**	***100.00***	**105,353**	***100.00***

Table 11-2 Kabazi V, sub-unit III/5: artefact totals by levels.

thin white or bluish patina, which often forms after flints have been exposed by archaeologists.

The flotation of worked sediments and the usage of screens during excavations resulted in the recovery of even the smallest artefacts. As a result, the vast majority of artefacts recovered in each assemblage are chips. Chips are pieces of debitage smaller than 29 mm in their maximum dimensions. Hence, most chips were too small to study their attributes, such as platform characteristics, scar patterns, shapes, etc. The chips in each assemblage have been subdivided according to their maximum dimensions into three metric interval classes: large (with maximum dimension between 29,9 and 20,0 mm), medium (19,9 mm to 10,0 mm), and small (less 10,0 mm). There is no evidence that chips were used as blanks for tool production in any of the assemblages of sub-unit III/5.

Chunks have been subdivided into a several types: broken flint plaquette, amorphous broken pieces, natural blanks (pieces similar to flakes, but without striking platforms and bulbs of percussion) and small broken fragments of unidentifiable debitage. Although chunks are listed under debris, some chunks might have been used as blanks for tool production. Also, some of the largest chunks might have been used as blanks for cores and/or bifacial tools.

The category of cores includes cores and fragments of broken cores. On the basis of the number of working surfaces, these have been subdivided into unifacial and bifacial cores. Further, according to the number and arrangement of striking platforms and scar position on flaking surfaces, these unifacial and bifacial cores have been assigned to several different types. Unifacial cores are represented by the following types: unidirectional, unidirectional transverse, bi-directional, bi-directional transverse, orthogonal crossed, and three-directional crossed. Among bifacial cores, there are unidirectional alternate, bi-directional alternate, orthogonal alternate, multidirectional alternate, and radial alternate (discoid) types.

Preforms include pieces which fail to exhibit continuous edge retouch or a regular core working surface. Typologically, preforms are subdivided into preforms of bifacial tools (pre-tools), preforms of cores (pre-cores) and unidentifiable (broken) pieces.

Blades and flakes with maximal dimensions larger than 29 mm and without traces of secondary treatment are considered as debitage. Blades are blanks with a maximum length of more than twice their maximum width. Flakes are blanks with a maximum length less than twice their maximum width. Additionally, flakes are divided into two types: regular flakes, which are longer than they are wide, and transverse flakes, which are wider than they are long.

An attribute analysis of blanks is undertaken in this chapter. Blanks include debitage lacking traces of secondary treatment, as well as flake tools and blade tools. Blanks have many potential attributes, although the most important are their dimensions, scar pattern, cortex, shape, blank axis, lateral and distal profiles, as well as the characteristics of their striking platforms. Due to the small blade samples, these have been merged with the flakes for the analysis of most attributes. Excluded from blank analyses are bifacial tools, cores, chunks, chips, unidentifiable debitage, and unidentifiable tool fragments.

Tools include regularly retouched unifacial and bifacial implements, irregularly retouched pieces, and broken fragments of tools. Unifacial and bifacial tools have been subdivided into several tool classes, such as points, scrapers, denticulates, notches, end-scrapers, burins, truncated-faceted tools, and perforators. In this chapter, the criteria used in the assignment to the different classes of bifacial and unifacial tools of items with continuous retouch adhere to traditional conventions. However, here it is perhaps necessary to reiterate descriptions of some of the tool classes, i.e. denticulates, notched tools, truncated-faceted tools, and retouched pieces, as these same terms have also been used to refer to quite different items.

Notched tools are characterised by any blank (flake, blade, chunk, etc.) with continuously retouched notches on either one or more more edges.

Denticulate tools are characterised by any blank (flake, blade, chunk, etc.) with a series of retouched notches running down one edge or edges.

Truncated-faceted pieces are characterised by any blanks (flake, blade, chunk, etc.) that exhibit a truncation by method of alternate faceting on one or more edges. Truncated-faceted pieces are defined as a separate tool class unless there are other signs of treatment (retouching, burin blow, etc.). Sometimes, truncated-faceted edges are identified on edges of continuously retouched tools (points, scrapers, denticulates, etc.). In these cases, the truncated-faceted edge or edges are listed only as elements of tool accommodation.

Retouched pieces are characterised by any blank (flake, blade, chunk, etc.) with light marginal, very light marginal (ephemeral), and irregular scalar discontinuous retouch.

According to the number of retouched edges, edge shapes, and edge placement, most tool classes are subdivided into subsets corresponding to overall tool shape. Additional attributes used in the classification of tools are the presence or absence of other typological elements and accommodations, such as backing, thinning, truncation, etc.

For the investigation of the intensity of tool elaboration, several attributes, such as types of retouch, angles of retouch, and retouch extending, were analysed. Taking into account the large numbers of broken and/or uncompleted unifacial tools in all assemblages only complete unifacial points and scrapers were included in these analyses. Each edge of these unifacial tools was studied separately.

The following types of retouch were recognised: scalar, combined (scalar plus sub-parallel) and stepped. Sub-parallel retouch only occurred in combination with scalar retouch. Three ranges of retouch angles were documented: flat (<45º), semi-steep (45º-60º), and steep (>60º).

Based on the extent of retouch, tools have been subdivided into light elaborated (if all working edges have 1-2 retouched rows), medium elaborated (if at least one working edge has multi-row retouch in a strip <5 mm wide), and heavy elaborated (if at least one working edge has multi-row retouch in a strip >5 mm wide).

Most retouched pieces had light marginal or very light marginal (ephemeral) retouch. Only several items from each assemblage display irregular scalar retouch. As retouched pieces exhibit only little modification of their edges, it might be suggested that most of these items were used only briefly and were not resharpened. The typological classification of retouched pieces is shown in separate categories by the position of edge retouch.

Tool fragments were mostly broken tools. These broken tools have different types of retouch but are very small. As such, they provide little typological information and were not useful for assemblage comparisons. These broken tools might be divided into fragments of bifacial and unifacial tools as well as divided into basal fragments, medial fragments, and edge fragments.

Seeing as both cores and bifacial tools are present in assemblages belonging to sub-unit III/5, it follows that blanks (flakes, blades, and chips) can stem either from the exploitation of cores or from bifacial tool shaping/thinning. Also, some debitage samples (mostly chips and small flakes) might come from tool edge modification.

Morphological features for bifacial debitage were documented in several investigations of Middle Palaeolithic assemblages of the Old World (Bordes 1961; Newcamer 1971; Schild, Wendorf 1977; Bradly, Sampson 1986; Demidenko, Usik 1993b; Chabai, Demidenko 1998; Demidenko 2004a, 2004b; Yevtushenko 2003, 2004). It is accepted that blanks that came from bifacial tool shaping/thinning had faceted or plain platforms with lipping, obtuse platform angles, numerous proximally positioned dorsal scars (similar to Upper Palaeolithic "striking platform abrasion"), incurvated or twisted lateral profiles, and expanding/trapezoidal or irregular shapes.

Therefore, tool treatment elements might be distinguished as either by-products of bifacial tool shaping/thinning or as by-products of tool resharpening. For the identification of these two elements, several criteria can be consulted.

The by-products of bifacial tool shaping/thinning need to exhibit: (1) lipped platform, plain or faceted; (2) obtuse platform angle; (3) incurvated or twisted profile; (4) expanding-trapezoidal or irregular shape. It is should be noted that some blanks from obtuse supplementary core platforms might also resemble pieces from bifacial tool shaping/thinning. However, taking into account the absence of cores with supplementary platforms in sub-unit III/5 assemblages, all blanks corresponding to the proposed criteria can be considered as by-products of bifacial shaping.

Elements of tool edge resharpening need to exhibit all aforementioned features of bifacial tool shaping/thinning, plus several further features: (1) few blunt (thick) extremities; (2) generally thin bodies; (3) numerous proximally positioned dorsal scars (similar to Upper Palaeolithic "striking platform abrasion"). In most Middle Palaeolithic studies these blank features have been related only with bifacial thinning. However, this appears questionable, as such resharpening elements might just as equally stem from the thinning of bifacial tools and from the renewal of edges on unifacial tools. Moreover, extensive resharpening of tool edges also took place in industries where bifacial thinning, as well as bifacial tools, are uncommon (Dibble 1988, 1991; Kuhn 1995). In practice, it is often too difficult to separate resharpening elements from bifacial and unifacial tools, if both kinds of tool are present in the tool kit. In fact, only the characteristics of platform preparation, when visible, might provide a relatively clear basis for separating them.

During investigations of Crimean Middle Palaeolithic sites, some specific elements of tool rejuvenation have been recognised among by-products of tool modification (Demidenko 2004a, 2004b; Yevtushenko 2003, 2004). The elements of tool rejuvenation include pointed tips of convergent tools (points and convergent scrapers), basal parts of tools, and parts of tool edges. The clear criteria for identification of rejuvenated tips of bifacial and unifacial points, and convergent scrapers have been proposed by Yu. E. Demidenko (2004a, p.140; 2004b, pp.54-55), and are as follows: (1) small dimensions - as a rule, these are chip-sized elements; (2) expanding or rhomboidal shape, most predominantly transverse; (3) retouched pointed tip, positioned on transversal termination (unifacial tips have retouch only on obverse or inverse tool surfaces, while bifacial tips exhibit elaboration from both surfaces). To these three criteria could be added our fourth criterion: (4) pointed platform at proximal end of the piece that resulted from a side blow, although often the visible platform is absent. It should be noted that tip fragments came not only from tool rejuvenation. They might also stem from the tool production process, i.e. as by-products of unsuccessful tool shaping. In this publication all rejuvenated pointed tips are included in the tool list as unidentifiable unifacial and bifacial points or as unidentifiable unifacial and bifacial convergent scrapers.

Closely related criteria might also be used for the identification of rejuvenated tool bases: (1) expanding, crescent or rhomboidal shape, predominantly transverse; (2) rounded or canted base tip, positioned on transversal termination (unifacial bases have retouch only on obverse or inverse tool surfaces, while bifacial bases exhibit elaboration from both surfaces); (3) pointed platform at proximal end of the piece that resulted from a side blow, although often the visible platform is absent. The dimensions of rejuvenated bases could vary, e.g. from just chip-sized pieces among unifacial and bifacial tools, to relatively massive pieces among bifacial tools. In this publication all rejuvenated bases are included in the tool list as unifacial or bifacial tool fragments.

Rejuvenated working edges might derive from processes connected with cardinal rejuvenation of tool edges. The criteria for the identification of rejuvenated tool edges are as follows: (1) massive wide platform, lipped or semi-lipped, plain or faceted (2) obtuse platform angle; (3) incurvated or twisted lateral profile; (4) expanding-trapezoidal, rectangular or irregular shape; (5) generally thick bodies at proximal end; (6) numerous proximally positioned dorsal scars ("striking platform abrasion"). In this publication all rejuvenated edges are included in the tool list as unifacial and bifacial tool fragments.

Thus, both technological and typological investigations are based on the analysis of core reduction strategies, the attribute analysis of blanks, tool classification, and additional information from the investigation of other artefact categories and/or specific artefact descriptions.

Artefact Assemblages

Assemblages from sub-unit III/5 comprise a total of 105,353 lithic artefacts: 27 cores, 12 preforms, 496 tools, 979 flakes, 168 blades, 1,147 chunks, and 102,524 chips. Although the individual assemblages from different levels vary in size, they exhibit close proportions among the artefact categories (Table 11-2). All seven artefact assemblages exhibited pronounced typological and technological features of the Crimean Micoquian. Nevertheless, there are certain distinctions between artefact categories in these different levels, and these are highlighted below.

Chips

Chips have been subdivided in three groups according to size: small chips (<10 mm), medium chips (19-10 mm), and large chips (29-20 mm). Small chips are predominant in all assemblages of sub-unit III/5, while medium chips make up just around one-quarter of the total. Large chips comprise less than 5% of all chips (Table 11-3). About 30-40% of chips in each assemblage show traces of cortical coverage. No unifacial tools or retouched pieces with chip dimensions were observed in any of the assemblages from sub-unit III/5.

Chunks

Chunks have been subdivided into four types: broken flint plaquette, amorphous broken pieces, natural blanks, and fragments.

Most chunks constitute fragments of unidentifiable debitage and are characteristic for each level assemblage (Table 11-4). Most fragments are represented by small broken pieces (<30 mm maximum dimensions).

Broken flattish flint plaquettes, amorphous pieces, and natural flakes were met in almost all assemblages (with exception of levels III/5-3 and III/5-3B, where natural flakes were absent), though in different proportions. As a rule, these are of medium sizes. The largest plaquette was from level III/5-3 (80 mm length, 69 mm width, 22 mm thick), the largest amorphous chunk from level III/5-3 (66 mm length, 39 mm width, 24 mm thick), and the largest natural piece from level III/5-3B2 (74 mm length, 40 mm width, 21 mm thick). The majority of chunks on amorphous pieces and natural blanks, as well as on flint plaquettes, exhibit cortex coverage. Parts of such chunks might be interpreted as a provision of raw material. Foremost, this applies to plaquette chunks, as in almost every assemblage cores were

	III/5-1A		III/5-1		III/5-1B		III/5-2	
	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Chips 29-20 mm	360	*4.40*	496	*5.03*	260	*4.71*	1,252	*4.12*
Chips 19-10 mm	2,019	*24.68*	2,681	*27.19*	1,446	*26.19*	7,058	*23.22*
Chips <10 mm	5,801	*70.92*	6,684	*67.78*	3,816	*69.11*	22,082	*72.66*
Total:	**8,180**	***100.00***	**9,861**	***100.00***	**5,522**	***100.00***	**30,392**	***100.00***

	III/5-3		III/5-3B		III/5-3B2		Total:	
	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Chips 29-20 mm	517	*3.83*	726	*4.33*	581	*3.17*	4,192	*4.09*
Chips 19-10 mm	3,219	*23.86*	3,872	*23.12*	3,352	*18.29*	23,647	*23.06*
Chips <10 mm	9,757	*72.31*	12,151	*72.55*	14,394	*78.54*	74,685	*72.85*
Total:	**13,493**	***100.00***	**16,749**	***100.00***	**18,327**	***100.00***	**102,524**	***100.00***

Table 11-3 Kabazi V, sub-unit III/5: chip dimensions by levels.

		III/5-1A		III/5-1		III/5-1B		III/5-2	
		N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Types	Plaquettes	1	*0.74*	2	*3.17*	2	*2.56*	5	*1.81*
	Natural flakes	9	*6.67*	1	*1.59*	2	*2.56*	14	*5.05*
	Amorphous	5	*3.70*	1	*1.59*	7	*8.97*	8	*2.89*
	Fragments	120	*88.89*	59	*93.65*	67	*85.90*	250	*90.25*
	Total:	**135**	***100.00***	**63**	***100.00***	**78**	***100.00***	**277**	***100.00***
*Max Dimensions**	<30 mm	4	*26.67*	2	*50.00*	7	*63.64*	8	*29.63*
	30-39 mm	6	*40.00*	1	*25.00*	4	*36.36*	14	*51.85*
	40-49 mm	5	*33.33*	1	*25.00*	·	·	4	*14.81*
	50-59 mm	·	·	·	·	·	·	1	*3.70*
	60-69 mm	·	·	·	·	·	·	·	·
	>70 mm	·	·	·	·	·	·	·	·
	Total:	**15**	***100.00***	**4**	***100.00***	**11**	***100.00***	**27**	***100.00***

		III/5-3		III/5-3B		III/5-3B2		Total:	
		N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Types	Plaquettes	11	*6.92*	9	*3.91*	10	*4.88*	40	*3.49*
	Natural flakes	·	·	·	·	6	*2.93*	32	*2.79*
	Amorphous	14	*8.81*	29	*12.61*	20	*9.76*	84	*7.32*
	Fragments	134	*84.28*	192	*83.48*	169	*82.44*	991	*86.40*
	Total:	**159**	***100.00***	**230**	***100.00***	**205**	***100.00***	**1,147**	***100.00***
*Max Dimensions**	<30 mm	11	*44.00*	14	*36.84*	11	*30.56*	57	*36.54*
	30-39 mm	7	*28.00*	14	*36.84*	15	*41.67*	61	*39.10*
	40-49 mm	4	*16.00*	7	*18.42*	7	*19.44*	28	*17.95*
	50-59 mm	1	*4.00*	3	*7.89*	2	*5.56*	7	*4.49*
	60-69 mm	1	*4.00*	·	·	·	·	1	*0.64*
	>70 mm	1	*4.00*	·	·	1	*2.78*	2	*1.28*
	Total:	**25**	***100.00***	**38**	***100.00***	**36**	***100.00***	**156**	***100.00***

*without fragments

Table 11-4 Kabazi V, sub-unit III/5: chunk types and maximal dimensions*.

observed that had been made on flattish plaquettes.

Although chunks are listed under debris, some chunks might have been used as blanks in the production of tools. There are several unifacial tools made on different types of chunks. These are a lateral convex scraper on a natural flake (level III/5-1A); an atypical end-scraper on a natural flake (level III/5-1); a convergent sub-rectangular scraper on a natural flake, and a notched tool on an amorphous chunk (both from level III/5-3B); and an atypical end-scraper on an amorphous chunk (level III/5B2).

Cores

Cores were found in all levels. There are 19 unifacial and 8 bifacial cores in assemblages from sub-unit III/5 (Table 11-5). All cores are non-volumetric in concept and were used in the production of flake blanks.

Unifacial cores are composed of 3 unidirectional, 5 unidirectional transverse, 2 bi-directional, 1 bi-directional transverse, 1 orthogonal crossed, 2 three-directional crossed and 5 unidentifiable broken cores (Table 11-5).

The *unifacial unidirectional cores* come from levels III/5-1A, III/5-1 and level III/5-2.

The unidirectional core from level III/5-1A was made on a flint plaquette; core dimensions are 46 mm long, 36 mm wide, and 20 mm thick. The faceted striking platform was positioned on the short edge of the piece. The flattened working surface is sub-rectangular shaped with unidirectional parallel scars from removals. The back surface is flat and is covered by cortex. The core was exhausted.

The core from level III/5-1 was made on an amorphous nodule; core dimensions are 48 mm long, 36 mm wide, and 18 mm thick. The dihedral striking platform was positioned on the short edge of the piece. The flattened working surface is sub-rectangular shaped with unidirectional parallel scars from removals. The back surface was flattened and is partly covered with cortex. The core was exhausted.

The unidirectional core from level III/5-2 was made on an amorphous nodule and is 54 mm long, 47 mm wide, and 20 mm thick. The faceted striking platform is situated on the short edge of the piece. The flattened working surface is sub-rectangular shaped with unidirectional parallel scars from removals from the striking platform. The back surface of the core is convex. The core was exhausted.

Unidirectional transverse cores. One core of this type comes from level III/5-1, one stems from level III/5-2, two others from level III/5-3, and one last piece is from the level III/5B assemblage.

The core from level III/5-1 was made on an amorphous nodule; core dimensions are 30 mm long, 51 mm wide, and 18 mm thick. The plane striking platform is situated on one of the longer edges of the core. The flatted working surface is sub-rectangular in shape with unidirectional parallel scars from removals. The back surface is convex and covered with cortex. The core was exhausted.

The core from level III/5-2 was made on a massive sub-rectangular shaped flake, 48 mm long, 28 mm wide, and 25 mm thick. The faceted striking platform was placed on the lateral edge of the flake. The working surface was formed on the flake's inverse side. The working surface features a series of unidirectional parallel scars from removals from the striking platform. The back surface is convex and partly covered with cortex. The core was exhausted.

One of the cores from level III/5-3 was made on an amorphous nodule and is 30 mm long, 52 mm wide, and 22 mm thick. The plane striking platform is situated on the longer edge of the core. The flattened working surface is sub-rectangular in shape. The back surface is convex and partly covered with cortex. The core was exhausted.

Another unidirectional transverse core from level III/5-3 was made on an amorphous nodule, 30 mm long, 40 mm wide, and 16 mm thick. The plane striking platform was placed upon the longer edge of the core. The flattened working surface is of a sub-trapezoidal shape. The back surface is flat and is without cortex. The core was exhausted.

The unidirectional transverse core from level III/5-3B was made on a flint plaquette and exhibits dimensions of 40 mm length, 44 mm width, and 16 mm thickness. The dihedral striking platform is situated on the longer edge of the core. The flattened working surface is sub-triangular shaped. The back surface is convex and covered with cortex. The core was exhausted.

Bi-directional cores came from level III/5-1A and level III/5-3.

The core from level III/5-1A was made on an amorphous nodule. The core is 50 mm long, 39 mm wide, and 21 mm thick, and displays two plane striking platforms that are situated on the opposing shorter edges of the piece. The flattened working surface is multi-angle shaped and exhibits bi-directional parallel scars from removals from the striking platforms. The back surface is convex and is void of cortex. The core was exhausted.

The core from level III/5-3 was made on an amorphous nodule and is 44 mm long, 61 mm wide, and 33 mm thick. It has two plane striking platforms which were positioned on the opposing

	III/5-1A	III/5-1	III/5-1B	III/5-2	III/5-3	III/5-3B	III/5-3B2	Total: N	Total: %
Unifacial cores	*2*	*3*	·	*2*	*5*	*4*	*3*	*19*	*70.40*
Uni-directional	1	1	·	1	·	·	·	3	11.10
Uni-directional transverse	·	1	·	1	2	1	·	5	18.50
Bi-directional	1	·	·	·	1	·	·	2	7.40
Bi-directional transverse	·	1	·	·	·	·	·	1	3.70
Orthogonal crossed	·	·	·	·	·	·	1	1	3.70
Three-directional crossed	·	·	·	·	1	1	·	2	7.40
Unidentifiable (broken)	·	·	·	·	1	2	2	5	18.50
Bifacial cores	·	·	*1*	*3*	*2*	·	*2*	*8*	*29.60*
Uni-directional alternate	·	·	·	·	·	·	1	1	3.70
Bi-directional alternate	·	·	1	2	·	·	·	3	11.10
Orthogonal crossed alternate	·	·	·	1	·	·	·	1	3.70
Radial alternate (discoid)	·	·	·	·	1	·	·	1	3.70
Multi-directional alternate	·	·	·	·	1	·	1	2	7.40
Total:	*2*	*3*	*1*	*5*	*7*	*4*	*5*	*27*	*100.00*

Table 11-5 Kabazi V, sub-unit III/5: cores by types.

shorter edges of the piece. The flattened working surface of the core is sub-trapezoidal shaped and exhibits bi-directional parallel scars from removals from the striking platforms. The back surface is flattened and partly covered with cortex.

The *bi-directional transverse core* was found in level III/5-1. The core, which was made on a flint plaquette, measures 44 mm long, 66 mm wide, and 20 mm thick. The core displays two plane and faceted striking platforms situated on the opposing longer edges of the piece. The flattened working surface is of a sub-rectangular shape and features bi-directional parallel scars from removals from striking platforms. The back surface is flat and covered with cortex. The core is exhausted.

One *orthogonal crossed core* is from level III/5-3B2. This core was made on a massive transverse flake, its dimensions are 42 mm long, 49 mm wide, and 25 mm thick. The core has two plane striking platforms that are found on adjacent edges of the flake. The sub-rectangular shaped working surface was formed on the ventral surface of the flake. The working surface exhibits the crossed scars from removals from striking platforms. The back surface was flattened and is partly covered with cortex.

Three-directional crossed cores stem from levels III/5-3 and III/5-3B. Both cores were exhausted. The core from level III/5-3 was made on an amorphous piece, and is 52 mm long, 51 mm wide, and 10 mm thick. It exhibits three faceted striking platforms that are positioned on different edges. The flattened working surface is sub-triangular shaped with 3-directional crossed scars from removals from striking platforms. The back surface is convex and is partly covered with cortex.

The core from level III/5-3B was made on a flint plaquette. This piece is 46 mm long, 32 mm wide, and 19 mm thick. The core displays 3 faceted striking platforms that were applied to different edges of the plaquette. The flattened working surface is of a sub-rectangular shape and features 3-directional crossed scars from removals from the striking platforms. The back surface was flattened and is partly covered with cortex.

Unidentifiable cores comprise broken items. One such broken core was discovered in level III/5-3, two in level III/5-3B, and two further pieces in level III/5-3B2.

All broken unifacial cores are represented by small parts of cores with pronounced striking platforms. Whereas two of the cores (one from Level III/5B and another from Level III/5B2) exhibit faceted platforms, the three remaining pieces have plane platforms. The shapes of the working surfaces of these broken cores, as well as their systems of elaboration could not be identified.

Bifacial cores are composed of various types, and include 1 unidirectional alternate, 3 bi-directional alternate, 1 orthogonal crossed alternate, 1 radial alternate (discoid), and 2 multi-directional alternate (Table 11-5) pieces.

The *unidirectional alternate core* is from level III/5-3B2. This core was made on a flint plaquette and measures 48 mm long, 36 mm wide, and 25 mm thick. The core has two alternate working surfaces and one plane striking platform that is positioned on the short edge of the plaquette. Both working surfaces are of a sub-rectangular shape. Each surface exhibits unidirectional parallel scars from removals from the single striking platform. There were some traces of cortex on both surfaces.

Bi-directional alternate cores were found in level III/5-1B and level III/5-2. The core from level III/5-1B was made on an amorphous nodule. This piece is 83 mm long, 37 mm wide, and 32 mm thick, and displays two alternate flattened working surfaces and two faceted and dihedral striking platforms that lie on the opposing shorter edges of the piece. Both working surfaces are sub-rectangular shaped and feature unidirectional parallel scars from removals from each of the striking platforms. There are no traces of cortex on this core.

The first of the bi-directional alternate cores from level III/5-2 was made on a flint plaquette and is 48 mm long, 41 mm wide, and 26 mm thick. The core displays two alternate flattened working surfaces and two faceted and plane striking platforms that lie on opposing short edges of the piece. Both working surfaces are multi-angular shaped and exhibit unidirectional scars from removals from striking platforms. Both surfaces of the core still had traces of cortex.

The second bi-directional alternate core from level III/5-2 was partly broken. This piece is 37 mm long, 28 mm wide, and 20 mm thick. The core has two alternate flattened working surfaces and two opposing striking platforms. Both working surfaces feature unidirectional scars from removals from the striking platforms. There were some traces of cortex on both sides of this core. The core was exhausted.

The *orthogonal crossed alternate core* stems from level III/5-2. This core was made on an amorphous nodule, its dimensions being 63 mm long, 40 mm wide, and 17 mm thick. It exhibits two alternate sub-rectangular shaped working surfaces and two striking platforms. One platform is plane and is located on the short edge of piece, while the other is faceted and is found on its longer edge. Both working surfaces feature unidirectional parallel scars from removals from the striking platforms. Both surfaces of the core show some traces of cortex coverage. The core was exhausted.

The *radial alternate (discoid) core* was found in level III/5-3 and measures 41 mm long, 40 mm wide, and 11 mm thick. It has two alternate working surfaces. Both surfaces are characterised by multi-angular shapes with centripetal scar patterns. The obtuse striking platforms were positioned along the edges of the core. One of the surfaces was covered with a little cortex. The core was exhausted.

Multidirectional alternate cores are known from levels III/5-3 and III/5-3B2. The core from level III/5-3 is 53 mm long, 47 mm wide, and 22 mm thick. It has two alternate multi-angular shaped working surfaces and five striking platforms. One working surface displays 3-directional crossed scars from removals from three faceted striking platforms positioned on the edges of the core. The alternate working surface features bi-directional parallel scars from removals from two further faceted striking platforms. There are still some traces of cortex on both surfaces. The core was exhausted.

The multidirectional alternate core from level III/5-3B2 was made on a flint plaquette. The core dimensions are 59 mm long, 42 mm wide, and 22 mm thick. This piece displays two alternate sub-rectangular shaped working surfaces and three obtuse striking platforms. One working surface exhibits crossed scars from removals from two faceted platforms positioned on adjacent edges of the core. The alternate working surface features unidirectional parallel scars from removals from a faceted striking platform. There are some traces of cortex on both surfaces. The core was exhausted.

Preforms

There are a total of twelve preforms in the assemblages belonging to sub-unit III/5-3: one each in levels of III/5-1A, III/5-1, III/5-3b, III/5-3B2, six in layer III/5-2, and two in layer III/5-3.

The preform from level III/5-1A was made on a sub-rectangular shaped flint plaquette. The dimensions of this piece are 45 mm long, 37 mm wide, and 25 mm thick. This preform is broken and features only a dihedral striking platform formed on one edge of piece, and a single short removal from this same platform. Both sides of this artefact are partly covered with cortex. This piece is most likely the preform for a core (pre-core).

The preform from level III/5-1 was made on a nodule and is 40 mm long, 30 mm wide, and 18 mm thick. The preform is elaborated on both sides by a series of flat removals that were placed along its edges. The shape of this item is close to sub-crescent.

Most likely, it is the preform for a bifacial point or convergent scraper (pre-tool).

Typologically different items also occur as preforms in the level III/5-2 assemblage. Three of these are complete, while a further three are represented by broken pieces.

The biggest preform was made on a flint plaquette measuring 68 mm long, 27 mm wide, and 18 mm thick. Primary elaboration on both sides was achieved by a series of flat and wide removals made from one edge of the plaquette, while the opposite edge was backed. Both sides of piece are partly covered by cortex. This piece may be the preform for a backed bifacial scraper (pre-tool).

Another preform made on an amorphous nodule is 48 mm long, 34 mm wide, and 23 mm thick. This artefact exhibits a coarse bifacial elaboration along its entire perimeter and is of a near subcrescent shape. There are no traces of cortex on either side of the piece. Most likely, this is the preform for a bifacial point or convergent scraper (pre-tool).

A third preform was made on a primary transverse flake measuring 32 mm long, 41 mm wide, and 9 mm thick. Whereas its inverse side is completely thinned , its obverse side bears the signs of a coarse elaboration. This item is of a near subcrescent shape. The obverse surface of the flake shows traces of cortex. This piece may be the preform for a bifacial convergent tool (pre-tool).

Additionally, there are three broken preforms from level III/5-2. All these are coarse elaborated basal ends from bifacial tools or parts of broken pre-cores.

Among the preforms from level III/5-3 one was complete and another was broken. The complete preform was made on a primary flake (79 mm long, 45 mm wide, 17 mm thick). This preform exhibits coarse bifacial elaboration along all perimeters of the blank, which is of an ovoid shape. It is likely that this piece represents the preform for a bifacial scraper (pre-tool).

Another broken preform was made on a thin flint plaquette. This preform is the coarse elaborated basal part of either a bifacial tool or a pre-core.

The preform from level III/5-3B was made on a thin flint plaquette, 63 mm long, 32 mm wide, and 16 mm thick. The item was bifacially elaborated by a series of flat wide removals from one edge of the plaquette, while the opposite edge was backed. This piece may represent the preform for a backed bifacial scraper (pre-tool).

The preform from level III/5-3B2 was made on a massive flint plaquette, is 73 mm long, 57 mm wide, and 40 mm thick. A dihedral striking platform was formed on one edge of the piece from which one short removal it was made. This piece is probably the preform for a core (pre-core).

Blanks

The total blank sample from the seven assemblages of sub-unit III/5 numbers 979 flakes, 182 blades, 288 flake tools, and 44 blade tools (Table 11-6). This sum of blanks has produced a relatively low blade index: Ilam=13,5, even though some assemblages do exhibit a slightly larger ratio of blades. Also, it should be noted that about half of all blades in each of the assemblages are off-axis, and therefore might belong to the atypical blades. Further, the sub-unit III/5A assemblage features a relatively large percentage of transverse flakes in its blank sample (Table 11-6).

Among the 1,479 blanks, 500 are broken and are useful only for a subset of observations. The majority of complete blanks stems from levels III/5-1A, III/5-1, III/5-2, III/5-3, III/5-3B, and III/5-3B2. Taking into account the small blank sample from level III/5-1B, the proportional occurrences of many attributes mean little in this assemblage.

Dorsal scar patterns

Among the several identified scar patterns, only unidirectional-crossed and unidirectional types occur with high frequencies in all assemblages of sub-unit III/5 (Table 11-7). Bi-directional, convergent, three-directional and radial types are also noted on a regular basis in all assemblages, but in much lower proportion. Additionally, it should also be noted that flakes with crested and *débordant* scar patterns occur in some assemblages. Most likely, these pieces stem from the elaboration or rejuvenation of bifacial tool edges, particularly as there are no Levallois cores nor features of Levallois technology in any of the assemblages from sub-unit III/5.

Most blanks in the assemblages have some cortical coverage. Here, blanks with <25% cortex dominated among cortical blanks (Table 11-7), while primary blanks (with cortical coverage >75%) are also present in appreciable portions.

Shape characteristics

The majority of blanks are on-axis, although off-axis blanks are also common in all assemblages (Table 11-8).

Several shape attributes have been documented for the blank assemblages, these include blank shape, blank lateral profile, and profile at distal end. All levels show evidence of close shape patterns, i.e. trapezoidal and irregular blank shapes dominate, followed by rectangular and crescent shapes. Other shape types occur sporadically.

	III/5-1A					III/5-1					III/5-1B					III/5-2				
	Unretouched debitage	Retouched pieces	Unifacial tools	Total:	%	Unretouched debitage	Retouched pieces	Unifacial tools	Total:	%	Unretouched debitage	Retouched pieces	Unifacial tools	Total:	%	Unretouched debitage	Retouched pieces	Unifacial tools	Total:	%
Blades	13	·	1	14	*11.60*	10	·	3	13	*6.50*	3	·	·	3	*3.80*	36	1	5	42	*9.60*
Broken blades	2	1	2	5	*4.10*	6	1	·	7	*3.50*	2	·	·	2	*2.50*	21	1	2	24	*5.50*
Regular flakes	32	2	12	46	*38.00*	39	7	9	55	*27.60*	18	2	4	24	*30.00*	98	7	22	127	*29.00*
Transverse flakes	29	3	3	35	*28.90*	52	3	8	63	*31.70*	18	·	1	19	*23.80*	72	4	12	88	*20.10*
Broken flakes	11	4	1	16	*13.20*	38	4	11	53	*26.60*	21	5	5	31	*38.80*	114	12	28	154	*35.20*
Unidentifiable	·	·	5	5	*4.10*	·	·	8	8	*4.00*	·	·	1	1	*1.30*	·	·	3	3	*0.70*
Total:	**87**	**10**	**24**	**121**	***100.00***	**145**	**15**	**39**	**199**	***100.00***	**62**	**7**	**11**	**80**	***100.00***	**341**	**25**	**72**	**438**	***100.00***

	III/5-3					III/5-3B					III/5-3B2					Total				
	Unretouched debitage	Retouched pieces	Unifacial tools	Total:	%	Unretouched debitage	Retouched pieces	Unifacial tools	Total:	%	Unretouched debitage	Retouched pieces	Unifacial tools	Total:	%	Unretouched debitage	Retouched pieces	Unifacial tools	Total:	%
Blades	15	·	5	20	*8.80*	16	2	3	21	*8.70*	17	2	2	21	*8.10*	110	5	19	134	*8.60*
Broken blades	7	2	3	12	*5.30*	9	1	·	10	*4.10*	11	4	1	16	*6.20*	58	10	8	76	*4.90*
Regular flakes	41	10	11	62	*27.40*	54	4	17	75	*31.10*	61	6	11	78	*30.00*	343	38	86	467	*29.80*
Transverse flakes	53	5	5	63	*27.90*	34	5	13	52	*21.60*	48	3	4	55	*21.20*	306	23	46	375	*24.00*
Broken flakes	36	7	17	60	*26.50*	50	5	18	73	*30.30*	60	7	17	84	*32.30*	330	44	97	471	*30.10*
Unidentifiable	·	·	9	9	*4.00*	·	·	10	10	*4.10*	·	·	6	6	*2.30*	·	·	42	42	*2.70*
Total:	**152**	**24**	**50**	**226**	***100.00***	**163**	**17**	**61**	**241**	***100.00***	**197**	**22**	**41**	**260**	***100.00***	**1,147**	**120**	**298**	**1,565**	***100.00***

Table 11-6 Kabazi V, sub-unit III/5: blank types by levels.

Close patterns are true also for lateral profiles: incurvated profiles dominate in all assemblages, followed by twisted and then flat. The convex profile is always the least frequently attested.

Regarding distal profiles, there appears to be some difference between assemblages. Three modes can be differentiated:

1. Hinged ends are more common then feathering and blunted ends; this is the case in levels III/5-1, III/5-1B, and III/5-2;
2. Feathering ends are more common then hinged and blunted ends; this is the case in levels III/5-3, III/5-3B, and III/5B2;
3. Feathering, blunted and hinged distal ends are present in almost equal portions; as in level III/5-1A.

Platform characteristics

Observations made regarding striking platforms have involved the analyses of butt type, butt angle, and butt lipping (Table 11-9).

Unprepared platforms (the sum of plane and cortical types) dominate in all blank assemblages in sub-unit III/5. Multiple faceted butts are common among prepared platform types. In sum, blanks have produced moderate faceting indices: IF large=39,6; IF strict=20,1, although some individual levels do exhibit either slightly higher or lower values.

Concerning platform angles, right butts and obtuse butts are represented in very similar ratios in all assemblages, with the exception of level III/5-3, where right butts are particularly dominant, although obtuse butts still do count for 36,5% of all identifiable platforms.

With regard to platform lipping, unlipped butts are the most dominant, although items with lipped and semi-lipped butts are observed in appreciable portions in each of the assemblages.

Blank dimensions and blank selections

In order to better understand and describe the differences between blank production and blank selection all blanks have been assigned to one of three categories:

	III/5-1A		III/5-1		III/5-1B		III/5-2	
	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Scar Patterns								
Unidirectional	24	*27.91*	37	*29.84*	6	*13.95*	59	*24.18*
Convergent	6	*6.98*	9	*7.26*	6	*13.95*	21	*8.61*
Unidirect.-crossed	27	*31.40*	37	*29.84*	12	*27.91*	75	*30.74*
Bidirectional	9	*10.47*	14	*11.29*	4	*9.30*	26	*10.66*
3-directional	5	*5.81*	11	*8.87*	5	*11.63*	32	*13.11*
Radial	3	*3.49*	2	*1.61*	2	*4.65*	4	*1.64*
Crested	1	*1.16*	2	*1.61*	3	*6.98*	4	*1.64*
Debordant	5	*5.81*	3	*2.42*	·	·	13	*5.33*
Primary	6	*6.98*	9	*7.26*	5	*11.63*	10	*4.10*
Total:	**86**	***100.00***	**124**	***100.00***	**43**	***100.00***	**244**	***100.00***
Cortex								
None	35	*40.70*	50	*40.32*	15	*34.88*	84	*34.43*
<25%	26	*30.23*	36	*29.03*	16	*37.21*	84	*34.43*
26-50%	8	*9.30*	11	*8.87*	5	*11.63*	30	*12.30*
51-75%	8	*9.30*	12	*9.68*	1	*2.33*	25	*10.25*
>75%	9	*10.47*	15	*12.10*	6	*13.95*	21	*8.61*
Total:	**86**	***100.00***	**124**	***100.00***	**43**	***100.00***	**244**	***100.00***

	III/5-3		III/5-3B		III/5-3B2		Total:	
	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Scar Patterns								
Unidirectional	35	*25.74*	41	*31.30*	40	*27.40*	242	*26.59*
Convergent	10	*7.35*	13	*9.92*	16	*10.96*	81	*8.90*
Unidirect.-crossed	37	*27.21*	33	*25.19*	42	*28.77*	263	*28.90*
Bidirectional	19	*13.97*	8	*6.11*	21	*14.38*	101	*11.10*
3-directional	15	*11.03*	23	*17.56*	15	*10.27*	106	*11.65*
Radial	2	*1.47*	5	*3.82*	3	*2.05*	21	*2.31*
Crested	5	*3.68*	3	*2.29*	1	*0.68*	19	*2.09*
Debordant	3	*2.21*	1	*0.76*	1	*0.68*	26	*2.86*
Primary	10	*7.35*	4	*3.05*	7	*4.79*	51	*5.60*
Total:	**136**	***100.00***	**131**	***100.00***	**146**	***100.00***	**910**	***100.00***
Cortex								
None	41	*30.15*	63	*48.09*	45	*30.82*	333	*36.59*
<25%	45	*33.09*	31	*23.66*	54	*36.99*	292	*32.09*
26-50%	16	*11.76*	16	*12.21*	24	*16.44*	110	*12.09*
51-75%	14	*10.29*	14	*10.69*	15	*10.27*	89	*9.78*
>75%	20	*14.71*	7	*5.34*	8	*5.48*	86	*9.45*
Total:	**136**	***100.00***	**131**	***100.00***	**146**	***100.00***	**910**	***100.00***

Table 11-7 Kabazi V, sub-unit III/5: blank dorsal scar patterns and cortical coverage.

	III/5-1A		III/5-1		III/5-1B		III/5-2		III/5-3		III/5-3B		III/5-3B2		Total:	
	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Axis																
On-axis	100	*88.50*	125	*74.40*	39	*61.90*	279	*67.55*	162	*75.00*	134	*66.34*	157	*67.38*	996	*70.74*
Off-axis	13	*11.50*	43	*25.60*	24	*38.10*	134	*32.45*	54	*25.00*	68	*33.66*	76	*32.62*	412	*29.26*
Total:	**113**	***100.00***	**168**	***100.00***	**63**	***100.00***	**413**	***100.00***	**216**	***100.00***	**202**	***100.00***	**233**	***100.00***	**1,408**	***100.00***
Shapes																
Trapezoidal	34	*36.96*	43	*31.85*	20	*39.22*	111	*37.50*	56	*37.33*	57	*37.01*	39	*24.07*	360	*34.62*
Triangular	7	*7.61*	5	*3.70*	2	*3.92*	12	*4.05*	7	*4.67*	9	*5.84*	8	*4.94*	50	*4.81*
Rectangular	13	*14.13*	11	*8.15*	5	*9.80*	35	*11.82*	27	*18.00*	29	*18.83*	23	*14.20*	143	*13.75*
Leaf	2	*2.17*	5	*3.70*	·	·	7	*2.36*	·	·	3	*1.95*	3	*1.85*	20	*1.92*
Crescent	7	*7.61*	5	*3.70*	3	*5.88*	24	*8.11*	11	*7.33*	8	*5.19*	16	*9.88*	74	*7.12*
Ovoid	3	*3.26*	7	*5.19*	3	*5.88*	3	*1.01*	2	*1.33*	5	*3.25*	4	*2.47*	27	*2.60*
Semi-ovoid	·	·	2	*1.48*	2	*3.92*	3	*1.01*	5	*3.33*	·	·	5	*3.09*	17	*1.63*
Irregular	26	*28.26*	57	*42.22*	16	*31.37*	101	*34.12*	42	*28.00*	43	*27.92*	64	*39.51*	349	*33.56*
Total:	**92**	***100.00***	**135**	***100.00***	**51**	***100.00***	**296**	***100.00***	**150**	***100.00***	**154**	***100.00***	**162**	***100.00***	**1,040**	***100.00***
Lateral Profiles																
Incurvate	52	*48.60*	89	*55.63*	38	*57.58*	192	*51.61*	88	*47.83*	110	*55.56*	103	*46.82*	672	*51.42*
Twisted	25	*23.36*	40	*25.00*	15	*22.73*	111	*29.84*	61	*33.15*	55	*27.78*	76	*34.55*	383	*29.30*
Flat	20	*18.69*	21	*13.13*	12	*18.18*	46	*12.37*	25	*13.59*	24	*12.12*	30	*13.64*	178	*13.62*
Convex	10	*9.35*	10	*6.25*	1	*1.52*	23	*6.18*	10	*5.43*	9	*4.55*	11	*5.00*	74	*5.66*
Total:	**107**	***100.00***	**160**	***100.00***	**66**	***100.00***	**372**	***100.00***	**184**	***100.00***	**198**	***100.00***	**220**	***100.00***	**1,307**	***100.00***
Distal Profiles																
Feathering	33	*35.87*	44	*30.34*	17	*26.98*	84	*25.61*	90	*52.33*	81	*52.26*	95	*50.00*	444	*38.78*
Blunt	28	*30.43*	43	*29.66*	16	*25.40*	98	*29.88*	23	*13.37*	28	*18.06*	29	*15.26*	265	*23.14*
Hinged	31	*33.70*	54	*37.24*	29	*46.03*	138	*42.07*	51	*29.65*	45	*29.03*	61	*32.11*	409	*35.72*
Overpassed	·	·	4	*2.76*	1	*1.59*	8	*2.44*	8	*4.65*	1	*0.65*	5	*2.63*	27	*2.36*
Total:	**92**	***100.00***	**145**	***100.00***	**63**	***100.00***	**328**	***100.00***	**172**	***100.00***	**155**	***100.00***	**190**	***100.00***	**1,145**	***100.00***

Table 11-8 Kabazi V, sub-unit III/5: blank shapes and blank profiles.

	III/5-1A		III/5-1		III/5-1B		III/5-2	
	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Platform type								
Cortex	11	*17.74*	13	*11.82*	5	*14.29*	23	*10.80*
Plain	30	*48.39*	48	*43.64*	12	*34.29*	103	*48.36*
Dihedral	7	*11.29*	15	*13.64*	7	*20.00*	33	*15.49*
Polyhedral	5	*8.06*	16	*14.55*	2	*5.71*	17	*7.98*
Multiple faceted	9	*14.52*	18	*16.36*	9	*25.71*	37	*17.37*
Total:	**62**	***100.00***	**110**	***100.00***	**35**	***100.00***	**213**	***100.00***
Facetage indeces								
IF large	33.9		44.6		51.4		40.9	
IF strict	14.5		16.4		25.7		17.4	
Platform angle								
Right	33	*53.23*	57	*51.82*	17	*48.57*	100	*46.95*
Obtuse	29	*46.77*	53	*48.18*	18	*51.43*	113	*53.05*
Total:	**62**	***100.00***	**110**	***100.00***	**35**	***100.00***	**213**	***100.00***
Lipping								
Unlipped	53	*85.48*	82	*74.55*	24	*68.57*	147	*69.01*
Lipped & Semi-lipped	9	*14.52*	28	*25.45*	11	*31.43*	66	*30.99*
Total:	**62**	***100.00***	**110**	***100.00***	**35**	***100.00***	**213**	***100.00***

	III/5-3		III/5-3B		III/5-3B2		Total:	
	N	*ess %*	N	*ess %*	N	*ess %*	N	*ess %*
Platform type								
Cortex	12	*11.54*	9	*7.76*	17	*13.39*	90	*11.73*
Plain	46	*44.23*	58	*50.00*	76	*59.84*	373	*48.63*
Dihedral	11	*10.58*	13	*11.21*	10	*7.87*	96	*12.52*
Polyhedral	4	*3.85*	6	*5.17*	4	*3.15*	54	*7.04*
Multiple faceted	31	*29.81*	30	*25.86*	20	*15.75*	154	*20.08*
Total:	**104**	***100.00***	**116**	***100.00***	**127**	***100.00***	**767**	***100.00***
Facetage indeces								
IF large	44.2		42.2		26.8		39.6	
IF strict	29.8		25.9		15.8		20.1	
Platform angle								
Right	66	*63.46*	57	*49.14*	73	*57.48*	403	*52.54*
Obtuse	38	*36.54*	59	*50.86*	54	*42.52*	364	*47.46*
Total:	**104**	***100.00***	**116**	***100.00***	**127**	***100.00***	**767**	***100.00***
Lipping								
Unlipped	79	*75.96*	83	*71.55*	87	*68.50*	555	*72.36*
Lipped & Semi-lipped	25	*24.04*	33	*28.45*	40	*31.50*	212	*27.64*
Total:	**104**	***100.00***	**116**	***100.00***	**127**	***100.00***	**767**	***100.00***

Table 11-9 Kabazi V, sub-unit III/5: blank platform preparation, platform angle, and platform lipping.

regular flakes, transverse flakes, and blades (Table 11-10). This approach has led to the observation that in each of the assemblages the average dimensions of retouched pieces and unifacial tools in all these blank groups are greater than those of the unretouched debitage sample.

On other hand, morphological differences among blank types did play a secondary role in blank selection. It is obvious that the primary criterion for tool production was blank size. The longest edge of blades and regular flakes was the lateral edge, while for transverse flakes the longest edge was the distal edge. As follows from statistic data (Table 11-11), most blanks fall into the 30-39 mm category, and a little more than a quarter belong to the 40-49 mm group. The pieces larger than 50 mm are represented by less than 10% of all blanks.

Tool selection patterns exhibit the opposite tendency. Tools prevail on blanks with maximum dimensions in excess of 60 mm, and among those blanks with dimensions >70 mm almost all blanks were unifacial tools or/and retouched pieces (Table 11-11).

Thus, the divisions of blanks by their average dimensions as well as by their maximum dimensions show that the bigger blanks were preferred for tool production.

Tools

Assemblages from sub-unit III/5 comprise a total of 496 tools: 23 bifacial tools, 233 unifacial tools, 126 retouched pieces, and 114 tool fragments. Due to the small tool sample sizes from each level, the percentage of different tool classes as well as tool types can only be regarded as indicative of actual trends (Table 11-12).

Bifacial tools

Bifacial tools comprise 14 bifacial points and 9 bifacial scrapers. Among bifacial tools, 4 were made on a flake, 4 on a flint plaquette, 4 on fully bifacial thinned blanks, and 11 are small tip fragments of tools with unidentifiable morphology (Table 11-13). All bifacial tools were made in plano-convex manner; a combination of stepped, scalar and sub-parallel retouch was used in their treatment.

Among bifacial tools, many items were broken, with only very few complete implements. Average dimensions of these pieces bring very limited insights (Table 11-14). In spite of this, bifacial tools exhibit larger dimensions than unifacial tools, retouched pieces, as well as unretouched blanks (Table 11-10, for comparison).

Bifacial points

On the basis of the shapes among bifacial points the following classes are defined: sub-triangular (N=1), elongated leaf-shaped (N=1), leaf-shaped (N=2), sub-crescent (N=2), and unidentifiable (N=8) (Table 11-12).

The *sub-triangular bifacial point* stems from level III/5-1. This partly broken tool was made on an unidentifiable blank and is 51 mm long, 39 mm wide, and 13 mm thick (Fig. 11-1, *1*). Two edges were retouched from the convex side by stepped and scalar retouch. One of the surfaces shows traces of cortex.

The elongated *leaf-shaped point* was discovered in level III/5-3. This tool was made on an unidentifiable flat blank and is relatively large (Fig. 11-3, *1*): 63 mm long, 25 mm wide, and 12 mm thick. This tool displays no traces of cortex on its surfaces. The working edges were retouched from the convex side by stepped and scalar retouch, while the flat side was only slightly retouched. The basal end of the tool had been thinned.

Both *leaf-shaped points* are from level III/5-3. The first of these was made on an unidentifiable bifacially thinned blank and is relatively small: 43 mm length, 16 mm width, and 11 mm thick. One side of this tool exhibits some traces of cortex. The working edges were retouched from the convex side by stepped retouch, while the flat side is unretouched. The second leaf-shaped point was made on a cortical transverse flake and exhibits larger dimensions: 69 mm long, 34 mm wide, and 14 mm thick. The working edges were retouched from its convex side by stepped and scalar retouch, while the flat side was only slightly retouched. Obviously, this was a reutilised unifacial tool.

Sub-crescent points were recovered from levels III/5-3B and III/5-3B2. The point from level III/5-3B was made on a morphologically unidentifiable blank and measures 54 mm long, 25 mm wide, and 11 mm thick (Fig. 11-3, *4*). There were no traces of cortex on this tool. The working edges were retouched from the convex side by stepped and scalar retouch, while the flat side was not retouched. The sub-crescent point from level III/5-3B2 was on a flint plaquette and is relatively large: 82 mm long, 46 mm wide, and 15 mm thick (Fig. 11-2, *1*). Both sides of the tool are covered with cortex. The working edges display an alternate retouch which was applied from both the convex and flat sides by scalar retouch.

Unidentified bifacial points. All unidentifiable bifacial points comprise pointed terminal parts of broken bifacial items. Two of these come from level III/5-1, three from level III/5-2, two from level III/5-3, and one piece from level III/5-3B2. The point from

	III/5-1A			III/5-1			III/5-1B			III/5-2		
	Blades	Flakes	Transversal Flakes	Blades	Flakes	Transversal Flakes	Blades	Flakes	Transversal Flakes	Blades	Flakes	Transversal Flakes
Debitage												
Length (L), mm	39.4	37.9	28.2	47.6	36.4	28.2	40.7	38.6	28.7	41.6	38.4	26.6
Width (W), mm	16.7	26.4	37.5	19.4	25.9	37.4	14.7	29.3	37.0	17.6	27.7	35.7
Thickness (T), mm	7.5	6.6	6.9	6.8	6.3	7.7	4.7	9.1	7.7	6.3	6.1	6.4
L/W	2.4	1.4	0.8	2.5	1.4	0.8	2.8	1.3	0.8	2.4	1.4	0.7
W/L	0.4	0.7	1.3	0.4	0.7	1.3	0.4	0.8	1.3	0.4	0.7	1.3
T/L*100,%	19.0	17.4	24.5	14.3	17.3	27.3	11.5	23.6	26.8	15.1	15.9	24.1
T/W*100,%	44.9	25.0	18.4	35.1	24.3	20.6	32.0	31.1	20.8	35.8	22.0	17.9
Total number:	**13**	**32**	**29**	**10**	**39**	**52**	**3**	**18**	**18**	**36**	**98**	**72**
Retouched pieces												
Length (L), mm	·	41.0	30.3	·	43.0	32.7	·	39.5	·	52.6	37.3	28.5
Width (W), mm	·	26.5	36.3	·	32.4	45.0	·	29.0	·	23.2	28.6	38.8
Thickness (T), mm	·	5.5	4.7	·	7.6	6.7	·	6.0	·	8.2	7.4	5.3
L/W	·	1.5	0.8	·	1.3	0.7	·	1.4	·	2.3	1.3	0.7
W/L	·	0.6	1.2	·	0.8	1.4	·	0.7	·	0.4	0.8	1.4
T/L*100,%	·	13.4	15.5	·	17.7	20.5	·	15.2	·	15.6	19.8	18.6
T/W*100,%	·	20.8	12.9	·	23.5	14.9	·	20.7	·	35.3	25.9	13.7
Total number:	**·**	**2**	**3**	**·**	**7**	**3**	**·**	**2**	**·**	**1**	**7**	**4**
Unifacial tools												
Length (L), mm	44.0	42.2	32.7	45.7	49.9	28.8	·	45.3	34.0	50.0	41.2	32.8
Width (W), mm	19.0	26.5	43.0	21.7	36.8	38.8	·	31.5	72.0	21.5	31.2	44.7
Thickness (T), mm	8.0	8.5	9.0	6.0	10.3	6.0	·	12.3	13.0	7.0	9.2	9.3
L/W	2.3	1.6	0.8	2.1	1.4	0.7	·	1.4	0.5	2.3	1.3	0.7
W/L	0.4	0.6	1.3	0.5	0.7	1.3	·	0.7	2.1	0.4	0.8	1.4
T/L*100,%	18.2	20.1	27.5	13.1	20.6	20.8	·	27.2	38.2	14.0	22.3	28.4
T/W*100,%	42.1	32.1	20.9	27.7	28.0	15.5	·	39.0	18.1	32.6	29.5	20.8
Total number:	**1**	**12**	**3**	**3**	**9**	**8**	**·**	**4**	**1**	**5**	**22**	**12**

Table 11-10 Kabazi V, sub-unit III/5: average dimensions of unretouched debitage, retouched pieces, and unifacial tools by levels*.

level III/5-1 resulted from the tip rejuvenation of a bifacial point and is 14 mm long, 26 mm wide, and 3 mm thick.

Bifacial scrapers

These pieces are subdivided into lateral straight (N=1), lateral convex (N=1), leaf-shaped (N=1), sub-leaf-shaped (N=1), sub-crescent (N=1), sub-trapezoidal and three convergent unidentifiable types (Table 11-12).

The *lateral straight bifacial scraper* was recovered from level III/5-2. This item was made on a massive flake measuring 51 mm long, 32 mm wide, and 10 mm thick. The single straight working edge was retouched from its convex side by stepped and scalar retouch, while its flat side was lacking retouch. The tool might be interpreted as a reutilised unifacial lateral scraper.

The *lateral convex bifacial scraper* stems from level III/5-2. The tool is made on a massive unidentifiable bifacially elaborated blank (74 mm long, 40 mm wide, and 17 mm thick) and displays a single convex working edge that is elaborated by scalar and stepped retouch. The side opposite the retouched edge was modified by a plane backed accommodation.

The *leaf-shaped bifacial scraper* from level III/5-3 was made on a cortical flake. It is 56 mm long, 32 mm wide, and 11 mm thick (Fig. 11-3, 2). The working edges were retouched from the convex side by stepped and scalar retouch. This bifacial item is a reutilised unifacial tool.

The *sub-leaf bifacial scraper* (Fig. 11-1, *2*) from level III/5-2 is made on a flint plaquette and is relatively large (125 mm long, 59 mm wide, and 25 mm thick).

	III/5-3			III/5-3B			III/5-3B2			Total		
	Blades	Flakes	Transversal Flakes	Blades	Flakes	Transversal Flakes	Blades	Flakes	Transversal Flakes	Blades	Flakes	Transversal Flakes
Debitage												
Length (L), mm	41.9	38.9	27.1	38.7	39.3	27.6	45.5	39.2	28.2	42.2	38.4	27.8
Width (W), mm	17.6	29.2	37.6	16.3	29.2	38.8	17.8	27.9	38.9	17.2	27.9	37.6
Thickness (T), mm	6.5	7.2	7.5	6.5	6.8	7.2	5.8	6.6	8.5	6.3	6.9	7.4
L/W	2.4	1.3	0.7	2.4	1.3	0.7	2.6	1.4	0.7	2.5	1.4	0.7
W/L	0.4	0.8	1.4	0.4	0.7	1.4	0.4	0.7	1.4	0.4	0.7	1.4
T/L*100,%	15.5	18.5	27.7	16.8	17.3	26.1	12.7	16.8	30.1	14.9	18.0	26.6
T/W*100,%	36.9	24.7	19.9	39.9	23.3	18.6	32.6	23.7	21.9	36.6	24.7	19.7
Total number:	**15**	**41**	**53**	**16**	**54**	**34**	**17**	**61**	**48**	**110**	**343**	**306**
Retouched pieces												
Length (L), mm	·	42.8	38.0	43.0	42.8	34.5	58.5	43.6	28.5	51.4	41.4	32.1
Width (W), mm	·	29.6	46.4	20.5	28.0	47.5	18.5	34.6	42.0	20.7	29.8	42.7
Thickness (T), mm	·	8.9	9.0	4.5	8.8	6.5	5.0	5.4	8.0	5.9	7.1	6.7
L/W	·	1.4	0.8	2.1	1.5	0.7	3.2	1.3	0.7	2.5	1.4	0.8
W/L	·	0.7	1.2	0.5	0.7	1.4	0.3	0.8	1.5	0.4	0.7	1.3
T/L*100,%	·	20.8	23.7	10.5	20.6	18.8	8.5	12.4	28.1	11.5	17.1	20.9
T/W*100,%	·	30.1	19.4	22.0	31.4	13.7	27.0	15.6	19.0	28.5	23.8	15.7
Total number:	**·**	**10**	**5**	**2**	**4**	**5**	**2**	**6**	**3**	**5**	**38**	**23**
Unifacial tools												
Length (L), mm	68.2	44.4	34.8	57.0	43.9	34.5	53.5	45.6	27.8	53.1	44.6	32.2
Width (W), mm	25.2	31.6	48.8	23.0	31.7	42.4	21.5	32.7	47.0	21.9	31.8	48.1
Thickness (T), mm	10.0	8.5	7.6	7.3	7.9	9.1	7.0	9.2	9.3	7.6	9.4	9.1
L/W	2.7	1.4	0.7	2.5	1.4	0.8	2.5	1.4	0.6	2.4	1.4	0.7
W/L	0.4	0.7	1.4	0.4	0.7	1.2	0.4	0.7	1.7	0.4	0.7	1.5
T/L*100,%	14.7	19.1	21.8	12.8	18.0	26.4	13.1	20.2	33.5	14.3	21.1	28.3
T/W*100,%	39.7	26.9	15.6	31.7	24.9	21.5	32.6	28.1	19.8	34.7	29.6	18.9
Total number:	**5**	**11**	**5**	**3**	**17**	**13**	**2**	**11**	**4**	**19**	**86**	**46**

*complete pieces only

Table 11-10 continued.

The working edges were retouched from the convex side by stepped and scalar retouch, while the flat side was given only a slight retouch. Both obverse and inverse surfaces of the tool were covered with cortex. The basal end of the tool exhibits a natural back accommodation.

The *sub-crescent bifacial scraper* comes from level III/5-3B2. The tool was made on a flint plaquette and is relatively large (98 mm long, 56 mm wide, and 18 mm thick; Fig. 11-2, 2). Both sides of the tool were partly covered with cortex. The working edges were slightly retouched from both the convex and flat side of the piece. This piece represents an unfinished tool.

The *sub-trapezoidal bifacial scraper* is from level III/5-3B. The tool was made on a massive cortical transverse flake (37 mm long, 55 mm wide, and 22 mm thick; Fig. 11-3, *3*). The working edges were retouched from the convex side, using a stepped and scalar retouch, while the flat side was only slightly retouched. This bifacial scraper is a reutilised unifacial tool.

Unidentifiable bifacial convergent scrapers comprise the pointed terminal parts of broken bifacial convergent scrapers. Those were found in levels III/5-1, III/5-2 and III/5-3. The scraper from level III/5-1 is a broken pointed tip fragment (15 mm long, 25 mm wide, and 7 mm thick). There are some traces of cortex on the convex surface of this tool. The item from level III/5-2 was on a flint plaquette (36 mm long, 31 mm wide, and 11 mm thick). The unidentifiable scraper from level III/5-3 is 11 mm long, 18 mm wide, and 3 mm thick.

	III/5-1A					III/5-1					III/5-1B					III/5-2				
	Debitage	Retouched pieces	Unifacial tools	Total:	%	Debitage	Retouched pieces	Unifacial tools	Total:	%	Debitage	Retouched pieces	Unifacial tools	Total:	%	Debitage	Retouched pieces	Unifacial tools	Total:	%
30-39 mm	50	4	3	57	63.30	66	3	11	80	61.10	27	1	2	30	61.20	145	8	11	164	62.80
40-49 mm	15	1	10	26	28.90	29	4	4	37	28.20	10	1	1	12	24.50	40	4	22	66	25.30
50-59 mm	4	·	1	5	5.60	4	3	3	10	7.60	4	·	·	4	8.20	12	3	4	19	7.30
60-69 mm	2	·	·	2	2.20	2	·	·	2	1.50	1	·	1	2	4.10	8	·	2	10	3.80
70-79 mm	·	·	·	·	·	·	·	1	1	0.80	·	·	1	1	2.00	1	1	·	2	0.80
80-89 mm	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·
90-99 mm	·	·	·	·	·	·	·	1	1	0.80	·	·	·	·	·	·	·	·	·	·
Total:	**71**	**5**	**14**	**90**	**100.00**	**101**	**10**	**20**	**131**	**100.00**	**42**	**2**	**5**	**49**	**100.00**	**206**	**16**	**39**	**261**	**100.00**

	III/5-3					III/5-3B					III/5-3B2					Total:				
	Debitage	Retouched pieces	Unifacial tools	Total:	%	Debitage	Retouched pieces	Unifacial tools	Total:	%	Debitage	Retouched pieces	Unifacial tools	Total:	%	Debitage	Retouched pieces	Unifacial tools	Total:	%
30-39 mm	76	7	6	89	61.40	64	4	13	81	54.70	80	3	6	89	57.80	508	30	52	590	60.30
40-49 mm	23	4	7	34	23.40	34	6	12	52	35.10	29	4	4	37	24.00	180	24	60	264	27.00
50-59 mm	9	2	2	13	9.00	4	·	4	8	5.40	11	2	4	17	11.00	48	10	18	76	7.80
60-69 mm	·	2	2	4	2.80	2	·	3	5	3.40	3	2	3	8	5.20	18	4	11	33	3.40
70-79 mm	1	·	2	3	2.10	·	·	1	1	0.70	2	·	·	2	1.30	4	1	5	10	1.00
80-89 mm	·	·	1	1	0.70	·	1	·	1	0.70	1	·	·	1	0.60	1	1	1	3	0.30
90-99 mm	·	·	1	1	0.70	·	·	·	·	·	·	·	·	·	·	·	·	2	2	0.20
Total:	**109**	**15**	**21**	**145**	**100.00**	**104**	**11**	**33**	**148**	**100.00**	**126**	**11**	**17**	**154**	**100.00**	**759**	**70**	**149**	**978**	**100.00**

*complete pieces only

Table 11-11 Kabazi V, sub-unit III/5: blanks grouped by maximum dimensions*.

Unifacial tools

There are a total of 233 unifacial tools. These can be divided typologically into 36 points, 168 scrapers, 7 denticulate tools, 7 notched tools, 8 truncated-faceted tools, 2 end-scrapers, 4 burins, and 1 perforator.

The majority of unifacial tools were made on flakes, while only 25 tools were made on blades, and only 5 are on chunks (Table 11-13). There is no evidence that chips were used as blanks for tool production.

The average dimensions of complete unifacial tools (Table 11-10) were different for tools made on blades, on regular flakes, and on transverse flakes. As mentioned above, unifacial tools exhibited larger dimensions than unretouched blanks for all blank types.

Among 233 unifacial tools, 211 were obversely retouched, 5 were inversely retouched, 9 were alternatingly retouched, 4 were alternately elaborated, and 4 exhibited burin facets.

Although the majority of unifacial tools do not exhibit accommodation elements, most assemblages do feature implements with different types of thinning and/or truncations, while backed items were the most seldom (Table 11-15).

The investigations of tool treatment characteristics (Table 11-16) has shown that among 175 complete unifacial tools (17 points and 158 scrapers) from sub-unit III/5, there are 268 retouched edges. This translates to an average of 1.5 retouched edges per tool. If we examine each assemblage separately, each displays values close to this quotient (from 1.4 to 1.6)

Scalar retouch is dominant, followed by the stepped variant. Combined retouch (sub-parallel plus scalar) occurred much less frequently in the assemblages (Table 11-16).

Table 11-12 Kabazi V, sub-unit III/5: tool classification. ▶

	III/5-1A		III/5-1		III/5-1B		III/5-2		III/5-3		III/5-3B		III/5-3B2		Total:	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Points																
Sub-triangular	·	·	·	·	·	·	2	3.0	·	·	·	·	·	·	2	0.8
Sub-leaf	1	4.4	·	·	1	14.3	·	·	·	·	1	2.0	·	·	3	1.2
Sub-crescent	1	4.4	·	·	·	·	·	·	1	2.2	1	2.0	·	·	3	1.2
Semi-crescent	·	·	·	·	·	·	2	3.0	·	·	·	·	·	·	2	0.8
Sub-trapezoidal	·	·	1	2.8	·	·	1	1.5	1	2.2	·	·	·	·	3	1.2
Semi-trapezoidal	1	4.4	·	·	·	·	2	3.0	·	·	1	2.0	·	·	4	1.6
Tip fragment	1	4.4	1	2.8	1	14.3	5	7.5	4	8.9	5	10.0	2	7.1	19	7.4
Scrapers																
Transverse straight	·	·	·	·	·	·	3	4.5	1	2.2	1	2.0	·	·	5	2.0
Transverse convex	1	4.4	4	11.1	1	14.3	·	·	2	4.4	3	6.0	1	3.6	12	4.7
Transverse concave	·	·	·	·	·	·	·	·	·	·	1	2.0	·	·	1	0.4
Transverse wavy	·	·	·	·	·	·	1	1.5	·	·	·	·	·	·	1	0.4
Transverse-oblique convex	·	·	1	2.8	·	·	2	3.0	2	4.4	1	2.0	1	3.6	7	2.7
Transverse-oblique wavy	·	·	·	·	·	·	3	4.5	·	·	·	·	·	·	3	1.2
Lateral straight	·	·	3	8.3	1	14.3	7	10.4	4	8.9	7	14.0	8	28.6	30	11.7
Lateral convex	6	26.1	3	8.3	1	14.3	6	9.0	7	15.6	7	14.0	3	10.7	33	12.9
Lateral concave	·	·	·	·	·	·	5	7.5	·	·	1	2.0	·	·	6	2.3
Lateral wavy	·	·	1	2.8	·	·	1	1.5	1	2.2	3	6.0	·	·	6	2.3
Double straight	·	·	·	·	·	·	·	·	2	4.4	·	·	·	·	2	0.8
Double convex	1	4.4	·	·	·	·	·	·	2	4.4	·	·	·	·	3	1.2
Double concave	·	·	1	2.8	·	·	·	·	·	·	·	·	·	·	1	0.4
Double straight-convex	2	8.7	1	2.8	·	·	·	·	1	2.2	1	2.0	·	·	5	2.0
Double straight-concave	·	·	·	·	·	·	·	·	1	2.2	·	·	·	·	1	0.4
Double straight-wavy	·	·	1	2.8	·	·	·	·	·	·	·	·	·	·	1	0.4
Convergent sub-triangular	·	·	1	2.8	·	·	1	1.5	·	·	2	4.0	·	·	4	1.6
Convergent sub-leaf	·	·	·	·	·	·	·	·	·	·	·	·	2	7.1	2	0.8
Convergent sub-crescent	·	·	·	·	1	14.3	1	1.5	·	·	1	2.0	1	3.6	4	1.6
Convergent semi-crescent	·	·	·	·	·	·	1	1.5	·	·	1	2.0	2	7.1	4	1.6
Convergent sub-trapezoidal	·	·	1	2.8	·	·	·	·	1	2.2	2	4.0	1	3.6	5	2.0
Convergent semi-trapezoidal	1	4.4	2	5.6	·	·	2	3.0	·	·	3	6.0	·	·	8	3.1
Convergent sub-rectangular	·	·	·	·	·	·	1	1.5	1	2.2	4	8.0	·	·	6	2.3
Convergent semi-rectangular	·	·	·	·	·	·	1	1.5	3	6.7	·	·	1	3.6	5	2.0
Convergent beck-shaped	1	4.4	1	2.8	·	·	·	·	·	·	·	·	·	·	2	0.8
Convergent amorphous	·	·	·	·	·	·	1	1.5	·	·	·	·	·	·	1	0.4
Convergent tip fragment	2	8.7	3	8.3	·	·	3	4.5	·	·	·	·	2	7.1	10	3.9
Denticulates																
Transverse	·	·	·	·	·	·	1	1.5	·	·	·	·	·	·	1	0.4
Lateral	·	·	1	2.8	·	·	3	4.5	1	2.2	-	-	·	·	5	2.0
Double	1	4.4	·	·	·	·	·	·	·	·	·	·	·	·	1	0.4
Notches																
Simple distal	1	4.4	1	2.8	·	·	1	1.5	·	·	·	·	·	·	3	1.2
Simple lateral	·	·	1	2.8	·	·	·	·	1	2.2	1	2.0	·	·	3	1.2
Double lateral	·	·	1	2.8	·	·	·	·	·	·	·	·	·	·	1	0.4
Truncated-faceted tools																
Simple lateral	·	·	·	·	·	·	1	1.5	1	2.2	·	·	·	·	2	0.8
Simple proximal	·	·	·	·	·	·	2	3.0	1	2.2	1	2.0	·	·	4	1.6
Double distal-proximal	·	·	·	·	1	14.3	1	1.5	·	·	·	·	·	·	2	0.8
End-scrapers																
Atypical	·	·	1	2.8	·	·	·	·	·	·	·	·	1	3.6	2	0.8
Burins																
Atypical simple	2	8.7	1	2.8	·	·	·	·	·	·	·	·	·	·	3	1.2
Atypical multifaceted	·	·	1	2.8	·	·	·	·	·	·	·	·	·	·	1	0.4
Perforators																
Sub-triangular	1	4.4	·	·	·	·	·	·	·	·	·	·	·	·	1	0.4
Bifacial Points																
Sub-triangular	·	·	1	2.8	·	·	·	·	·	·	·	·	·	·	1	0.4
Leaf	·	·	·	·	·	·	·	·	2	4.4	·	·	·	·	2	0.8
Leaf elongated	·	·	·	·	·	·	·	·	1	2.2	·	·	·	·	1	0.4
Sub-crescent	·	·	·	·	·	·	·	·	·	·	1	2.0	1	3.6	2	0.8
Tip fragmrnts	·	·	2	5.6	·	·	3	4.5	2	4.4	·	·	1	3.6	8	3.1
Bifacial Scrapers																
Lateral straight	·	·	·	·	·	·	1	1.5	·	·	·	·	·	·	1	0.4
Lateral convex	·	·	·	·	·	·	1	1.5	·	·	·	·	·	·	1	0.4
Convergent leaf	·	·	·	·	·	·	·	·	1	2.2	·	·	·	·	1	0.4
Convergent sub-leaf	·	·	·	·	·	·	1	1.5	·	·	·	·	·	·	1	0.4
Convergent sub-crescent	·	·	·	·	·	·	·	·	·	·	·	·	1	3.6	1	0.4
Convergent sub-trapezoidal	·	·	·	·	·	·	·	·	·	·	1	2.0	·	·	1	0.4
Convergent tip fragments	·	·	1	2.8	·	·	1	1.5	1	2.2	·	·	·	·	3	1.2
Sub-total:	**23**	**100.0**	**36**	**100.0**	**7**	**100.0**	**67**	**100.0**	**45**	**100.0**	**50**	**100.0**	**28**	**100.0**	**256**	**100.0**
Retouched pieces	***10***		***15***		***7***		***29***		***25***		***18***		***22***		***126***	
Lateral	8		15		5		25		19		9		14		95	
Distal	2		·		1		3		4		8		6		24	
Bilateral	·		·		1		1		2		1		2		7	
Tool fragments	***10***		***12***		***4***		***33***		***14***		***22***		***19***		***114***	
Unifacial	7		8		4		24		12		15		17		87	
Bifacial	3		4		·		9		2		7		2		27	
Total:	**43**		**63**		**18**		**129**		**84**		**90**		**69**		**496**	

	III/5-1A					III/5-1					III/5-1B					III/5-2				
	Bifacial tools	Unifacial tools	Retouched pieces	Total:	%	Bifacial tools	Unifacial tools	Retouched pieces	Total:	%	Bifacial tools	Unifacial tools	Retouched pieces	Total:	%	Bifacial tools	Unifacial tools	Retouched pieces	Total:	%
Tool on blade	·	3	1	4	9.30	·	3	1	4	6.30	·	·	·	·	·	·	7	6	13	10.10
Tool on flake	·	21	9	30	69.80	·	28	14	42	66.70	·	10	7	17	94.40	1	62	23	86	66.70
Tool on chunk	·	1	·	1	2.30	·	1	·	1	1.60	·	·	·	·	·	·	·	·	·	·
Tool on plaquette	1	·	·	1	2.30	2	·	·	2	3.20	·	·	·	·	·	3	·	·	3	2.30
Tool on unidentifiable blank	2	5	·	7	16.30	6	8	·	14	22.20	·	1	·	1	5.60	12	15	·	27	20.90
Total:	**3**	**30**	**10**	**43**	***100.00***	**8**	**40**	**15**	**63**	***100.00***	**·**	**11**	**7**	**18**	***100.00***	**16**	**84**	**29**	**129**	***100.00***

	III/5-3					III/5-3B					III/5-3B2					Total:				
	Bifacial tools	Unifacial tools	Retouched pieces	Total:	%	Bifacial tools	Unifacial tools	Retouched pieces	Total:	%	Bifacial tools	Unifacial tools	Retouched pieces	Total:	%	Bifacial tools	Unifacial tools	Retouched pieces	Total:	%
Tool on blade	·	8	2	10	11.90	·	3	3	6	6.70	·	3	6	9	13.00	·	27	19	46	9.30
Tool on flake	2	33	23	58	69.10	1	48	15	64	71.10	·	31	16	47	68.10	4	233	107	344	69.40
Tool on chunk	·	·	·	·	·	·	2	·	2	2.20	·	1	·	1	1.50	·	5	·	5	1.00
Tool on plaquette	1	·	·	1	1.20	4	·	·	4	4.40	2	·	·	2	2.90	13	·	·	13	2.60
Tool on unidentifiable blank	6	9	·	15	17.80	4	10	·	14	15.60	3	7	·	10	14.50	33	55	·	88	17.70
Total:	**9**	**50**	**25**	**84**	***100.00***	**9**	**63**	**18**	**90**	***100.00***	**5**	**42**	**22**	**69**	***100.00***	**50**	**320**	**126**	**496**	***100.00***

Table 11-13 Kabazi V, sub-unit III/5: blank types used for tool production.

	III/5-1A	III/5-1	III/5-1B	III/5-2	III/5-3	III/5-3B	III/5-3B2	Total:
Length (L), mm	·	>51,0	·	83.3	57.8	54.5	90.0	71.4
Width (W), mm	·	39.0	·	43.7	26.8	31.0	51.0	38.3
Thickness (T), mm	·	13.0	·	17.3	11.3	16.5	16.5	14.9
L/W	·	>1.3	·	1.9	2.2	1.8	1.8	1.9
W/L	·	<0.8	·	0.5	0.5	0.6	0.6	0.5
T/L*100,%	·	<25.5	·	20.8	19.6	30.3	18.3	20.9
#	**0**	**1**	**0**	**3**	**4**	**2**	**2**	**12**

*complete pieces only

Table 11-14 Kabazi V, sub-unit III/5: average dimensions of bifacial tools*.

Concerning retouch angle, assemblages do appear to differ somewhat, whereby there were two observable modes:

1. Semi-steep retouch is predominant, while flat retouch and steep retouch are represented by very similar values (levels III/5-1A, III/5-1, III/5-3, III/5-3B);
2. Semi-step, flat and steep types of retouch are represented by almost equal or very close ratios (levels III/5-2 and III/5-3B2) (Table 11-16).

Now turning to the intensity of tool elaboration, heavy retouched tools dominate, followed by medium elaborated pieces. On the other hand, lightly retouched tools are less numerous in each of the levels (Table 11-16).

Points

These comprise sub-triangular (N=2), sub-leaf (N=3), sub-crescent (N=3), semi-crescent (N=2), sub-trapezoidal (N=3), semi-trapezoidal (N=4), and unidentifiable (N=19) types (Table 11-12).

Both *sub-triangular points* were discovered in level III/5-2. One of these points was made on a blade and exhibits medium obverse retouch.

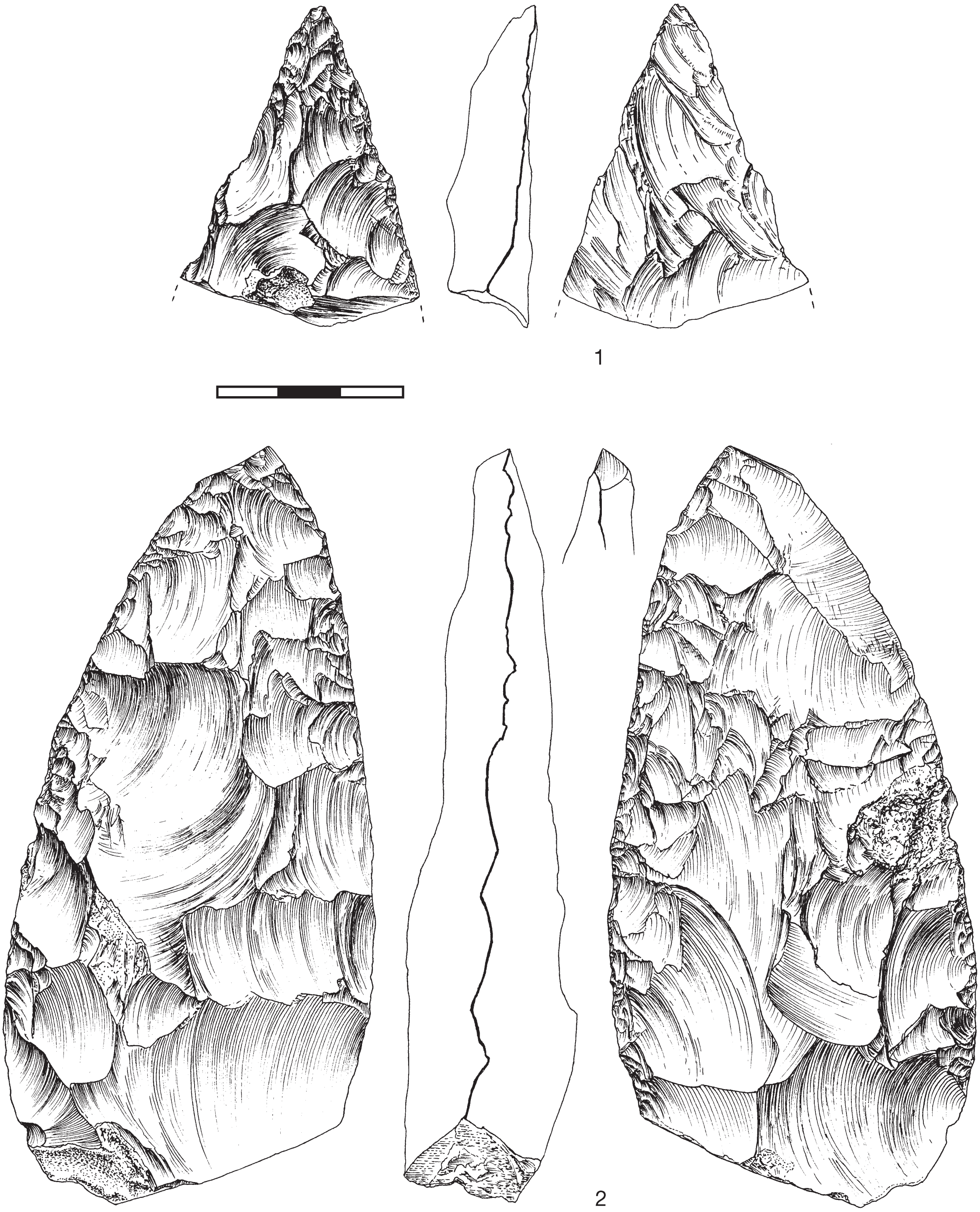

Fig. 11-1 Kabazi V, levels III/5-1 (1) and III/5-2 (2): 1 – bifacial point, sub-triangular; 2 – bifacial scraper, sub-leaf, backed.

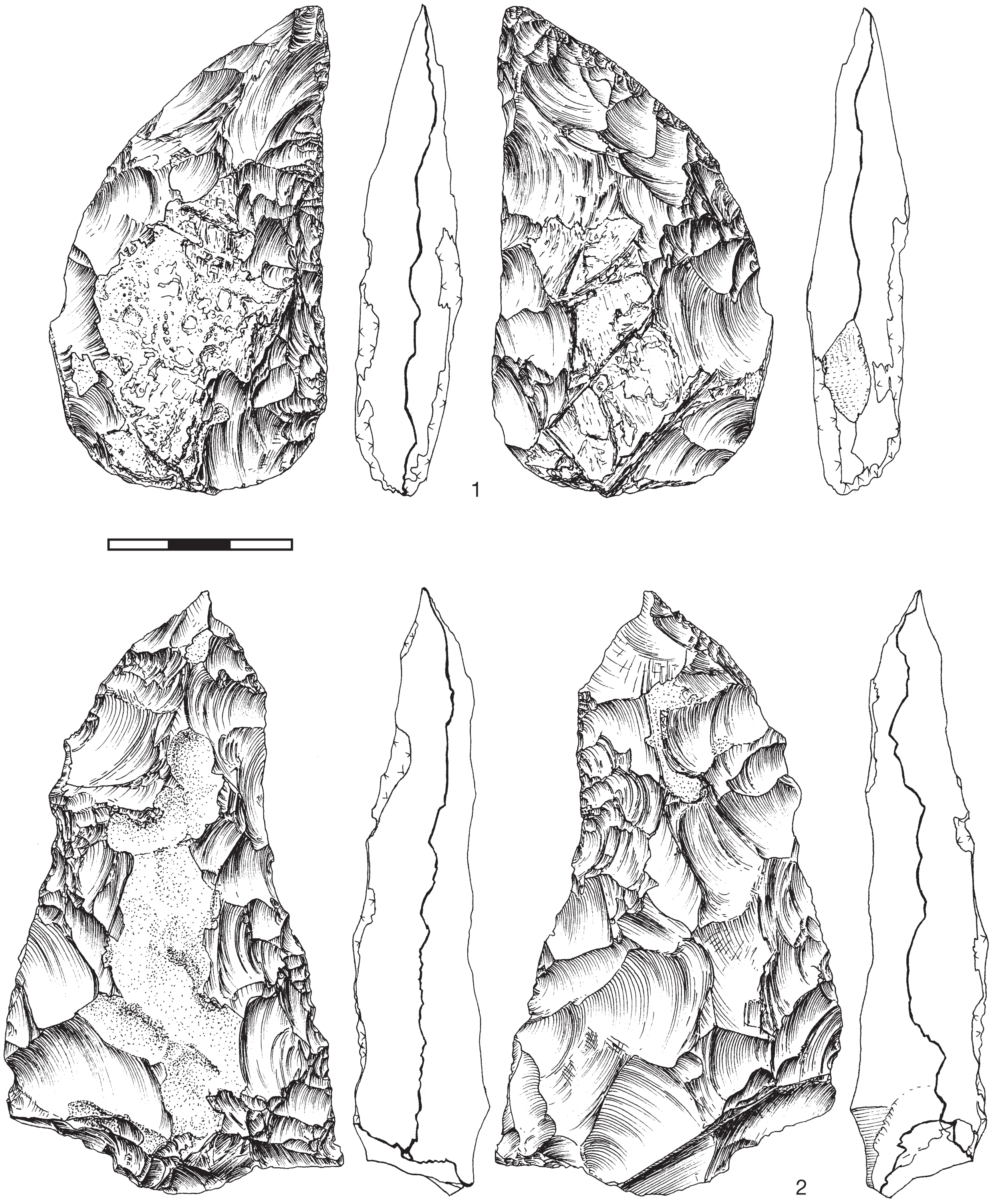

Fig. 11-2 Kabazi V, Level III/5-3B2: 1 – bifacial point, sub-crescent; 2 – bifacial scraper, semi-crescent (unfinished).

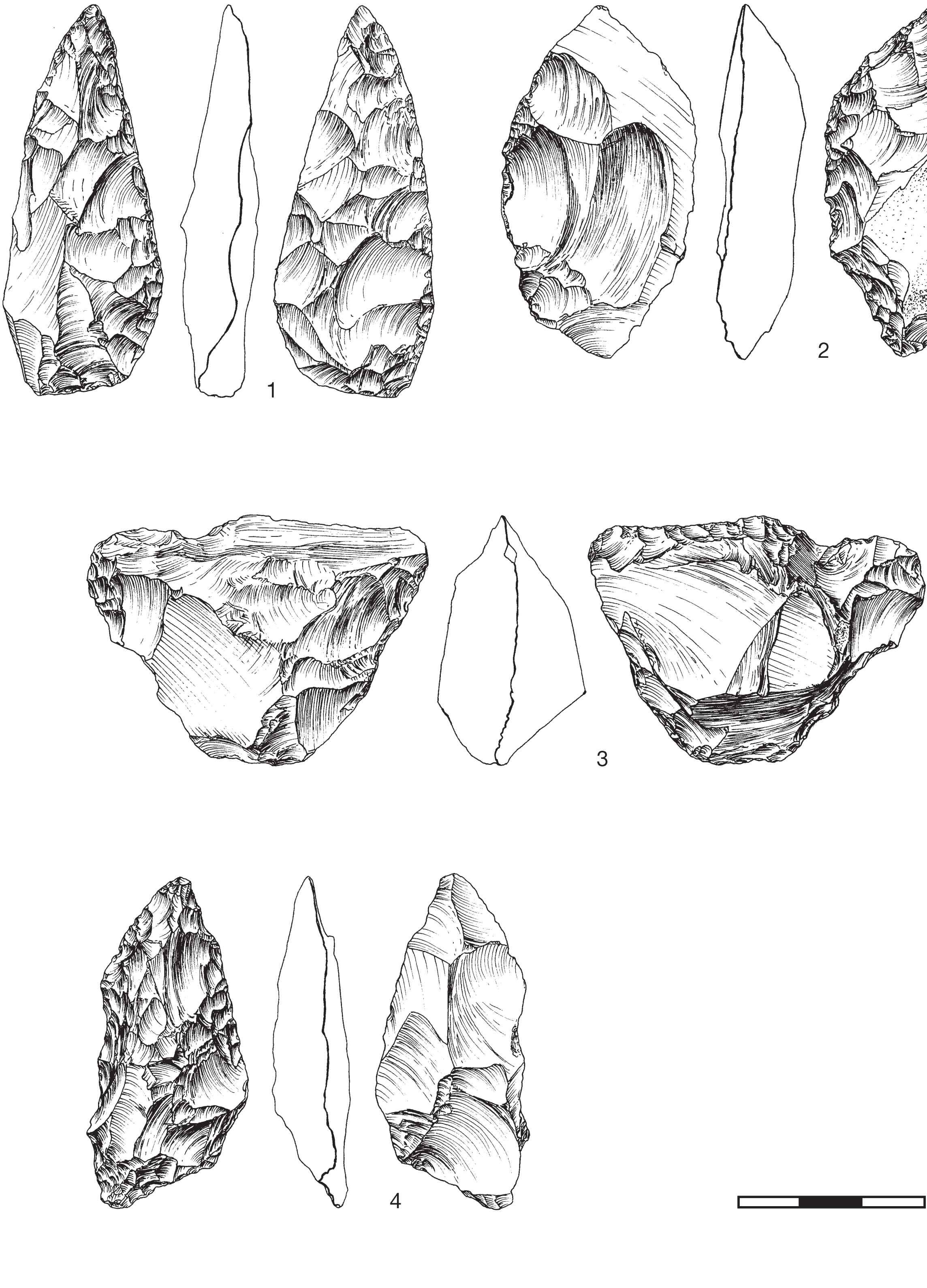

Fig. 11-3 Kabazi V, levels III/5-3 (1, 2), III/5-3B (3, 4): 1 – bifacial point, leaf-shaped, thinned base; 2 – bifacial scraper, leaf-shaped; 3 – bifacial scraper, sub-trapezoidal; 4 – bifacial point, sub-crescent.

	III/5-1A		III/5-1		III/5-1B		III/5-2	
	N	%	N	%	N	%	N	%
None	17	*73.90*	24	*75.00*	5	*71.40*	50	*83.30*
Thinned	3	*13.00*	3	*9.40*	1	*14.30*	5	*8.30*
Backed	·	·	3	*9.40*	·	·	1	*1.70*
Trunckated	3	*13.00*	2	*6.30*	1	*14.30*	4	*6.70*
Total:	**23**	***100.00***	**32**	***100.00***	**7**	***100.00***	**60**	***100.00***

	III/5-3		III/5-3B		III/5-B2		Total:	
	N	%	N	%	N	%	N	%
None	33	*86.80*	37	*77.10*	21	*84.00*	187	*80.30*
Thinned	2	*5.30*	7	*14.60*	4	*16.00*	25	*10.70*
Backed	1	*2.60*	3	*6.30*	·	·	8	*3.40*
Trunckated	2	*5.30*	1	*2.10*	·	·	13	*5.60*
Total:	**38**	***100.00***	**48**	***100.00***	**25**	***100.00***	**233**	***100.00***

* identifiable unifacial tools only

Table 11-15 Kabazi V, sub-unit III/5: tool accomodations*.

The second sub-triangular point was on a regular flake and features a heavy obverse retouch. This tool is a reversal form, i.e. the tip of the point was made on the proximal part of the blank.

Sub-leaf points were found in levels III/5-1A, III/5-1B, and III/5-3B. The sub-leaf point from level III/5-1A was made on a regular flake. This tool shows a heavy obverse retouch and an inverse thinning of its base part. The sub-leaf point from level III/5-1B is on transverse flake and has a heavy obverse retouch (Fig. 11-4, *3*), and also features an inverse thinning of its tip. This tool is of a canted *(déjeté)* form. The sub-leaf point from level III/5-3B was made on a regular flake and has a heavy retouch (Fig. 11-4, *4*).

Sub-crescent points were identified in the assemblages from levels III/5-1A, III/5-3, and III/5-3B. The sub-crescent point from level III/5-1A was made on a regular flake and shows a heavy obverse retouch. This sub-crescent point is a reversal form (Fig. 11-4, *6*). The sub-crescent point from level III/5-3 was made on a blade. This heavily elaborated tool was also terminally thinned (Fig. 11-4, *2*). The sub-crescent point from level III/5-3B was also on a blade. Again, this tool has a heavy retouch (Fig. 11-4, *1*), with inverse thinning of both distal and proximal extremities. The point shows clear impact fractures to its tip.

Both *semi-crescent points* are from level III/5-2. The first of these was made on a blade and has a heavy obverse retouch. The surfaces of the tool exhibit the traces of an ancient yellowish patina and lustrage. This point might be interpreted as a tool made on a reutilised ancient blank. The second semi-crescent point is on a regular flake that belongs to the bifacial shaping/thinning blanks. The tool displays a heavy obverse retouch.

Sub-trapezoidal points stem from levels III/5-1, III/5-2, and III/5-3. The sub-trapezoidal point from level III/5-1 has a near canted *(déjeté)* form (Fig. 11-4, *9*). The tool was made on a transversal flake, which might number among those blanks resulting from bifacial tool shaping. The point shows signs of a heavy obverse retouch and features a clear impact fracture to its tip. The sub-trapezoidal point from level III/5-2 was made on a relatively large regular flake and exhibits a heavy obverse retouch. This tool is also among those belonging to the canted *(déjeté)* type (Fig. 11-4, *8*). The sub-trapezoidal point from level III/5-3 was made on a transverse flake, obviously originating from bifacial shaping/thinning. Again, this tool was heavily retouched and is of a near canted *(déjeté)* form.

Semi trapezoidal points are known from levels III/5-1A, III/5-2, and III/5-3B. The semi-trapezoidal point from level III/5-1A was made on a transverse flake and displays a heavy obverse retouch. This point also approaches a canted *(déjeté)* form (Fig. 11-4, *10*). There are two semi-trapezoidal points in the assemblage of level III/5-2. Typologically, these points also approach the already frequently mentioned canted *(déjeté)* form. The first of these was made on a transverse flake. It exhibits a heavy obverse retouch and basal thinning. The second piece was on a regular flake. This item has a heavy

	III/5-1A		III/5-1		III/5-1B		III/5-2	
	N	%	N	%	N	%	N	%
Types of retouch by tool edges								
Sub-parallel + Scalar	1	*4.20*	3	*8.80*	·	·	10	*16.40*
Scalar	15	*62.50*	23	*67.60*	4	*50.00*	31	*50.80*
Stepped	8	*33.30*	8	*23.50*	4	*50.00*	20	*32.80*
Total:	**24**	***100.00***	**34**	***100.00***	**8**	***100.00***	**61**	***100.00***
Angle of retouch by tool edges								
Flat (<45°)	6	*25.00*	8	*23.50*	1	*12.50*	23	*37.70*
Semi-steep (45°- 60°)	11	*45.80*	18	*52.90*	6	*75.00*	22	*36.10*
Steep (>60°)	7	*29.20*	8	*23.50*	1	*12.50*	16	*26.20*
Total:	**24**	***100.00***	**34**	***100.00***	**8**	***100.00***	**61**	***100.00***
Intensity of tool elaboration								
Light elaborated tools	·	·	3	*14.30*	1	*20.00*	3	*7.00*
Medium elaborated tools	4	*26.70*	7	*33.30*	·	·	7	*16.30*
Heavy elaborated tools	11	*73.30*	11	*52.40*	4	*80.00*	33	*76.70*
Total:	**15**	***100.00***	**21**	***100.00***	**5**	***100.00***	**43**	***100.00***
Retouched edges : tools	1.6		1.6		1.6		1.4	

	III/5-3		III/5-3B		III/5-3B2		Total	
	N	%	N	%	N	%	N	%
Types of retouch by tool edges								
Sub-parallel + Scalar	3	*6.70*	5	*7.60*	4	*13.30*	26	*9.70*
Scalar	26	*57.80*	34	*51.50*	15	*50.00*	148	*55.20*
Stepped	16	*35.60*	27	*40.90*	11	*36.70*	94	*35.10*
Total:	**45**	***100.00***	**66**	***100.00***	**30**	***100.00***	**268**	***100.00***
Angle of retouch by tool edges								
Flat (<45°)	15	*33.30*	21	*31.80*	10	*33.30*	84	*31.30*
Semi-steep (45°- 60°)	25	*55.60*	33	*50.00*	11	*36.70*	126	*47.00*
Steep (>60°)	5	*11.10*	12	*18.20*	9	*30.00*	58	*21.60*
Total:	**45**	***100.00***	**66**	***100.00***	**30**	***100.00***	**268**	***100.00***
Intensity of tool elaboration								
Light elaborated tools	8	*26.70*	9	*22.00*	6	*30.00*	30	*17.10*
Medium elaborated tools	7	*23.30*	7	*17.10*	4	*20.00*	36	*20.60*
Heavy elaborated tools	15	*50.00*	25	*60.90*	10	*50.00*	109	*62.30*
Total:	**30**	***100.00***	**41**	***100.00***	**20**	***100.00***	**175**	***100.00***
Retouched edges : tools	1.5		1.6		1.5		1.5	

*complete unifacial points and scrapers only

Table 11-16 Kabazi V, sub-unit III/5: characteristics of unifacial tool elaboration*.

obverse retouch and was laterally thinned (Fig. 11-4, *7*). The semi-trapezoidal point from level III/5-3B was on a transverse flake and is heavily retouched (Fig. 11-4, *5*). Again, this tool can be assigned to those of a canted (*déjeté*) type.

Unidentifiable points. Of the 19 unidentifiable points, one stem from level III/5-1A, one from level III/5-1, one from level III/5-1B, five from level III/5-2, four from level III/5-3, five from level III/5-3B, and two from level III/5-3B2. All unidentifiable points comprise broken pointed tips. Most pieces belong to regular forms, with two points from levels III/5-1B

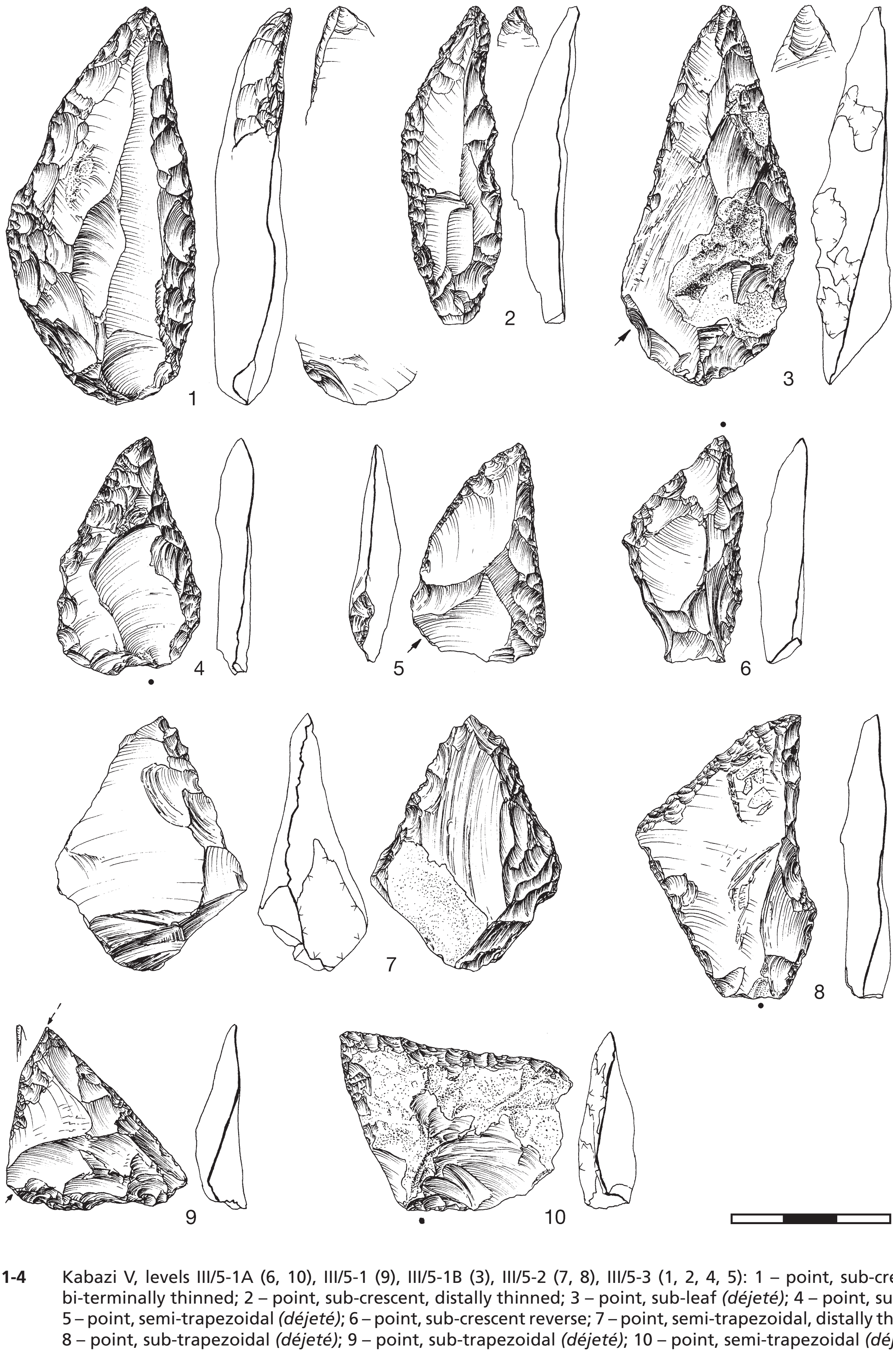

Fig. 11-4 Kabazi V, levels III/5-1A (6, 10), III/5-1 (9), III/5-1B (3), III/5-2 (7, 8), III/5-3 (1, 2, 4, 5): 1 – point, sub-crescent, bi-terminally thinned; 2 – point, sub-crescent, distally thinned; 3 – point, sub-leaf *(déjeté)*; 4 – point, sub-leaf; 5 – point, semi-trapezoidal *(déjeté)*; 6 – point, sub-crescent reverse; 7 – point, semi-trapezoidal, distally thinned; 8 – point, sub-trapezoidal *(déjeté)*; 9 – point, sub-trapezoidal *(déjeté)*; 10 – point, semi-trapezoidal *(déjeté)*.

and III/5-2 approaching clear canted *(déjeté)* forms. In addition, four items from levels III/5-2, III/5-3, III/5-3B, and III/5-3B2 might be assigned to the tip rejuvenated elements.

Scrapers

The joint assemblage from sub-unit III/5 includes 168 scrapers. According to edge placement, these are subdivided into convergent (N=51), double (N=13), lateral (N=75), transverse (N=19), and transverse-oblique (N=10) types.

Convergent scrapers were found in all levels. With reference to their morphological shapes, convergent scrapers can be subdivided into sub-triangular (N=4), sub-leaf (N=2), sub-crescent (N=4), semi-crescent (N=4), sub-trapezoidal (N=5), semi-trapezoidal (N=8), sub-rectangular (N=6), semi-rectangular (N=5), *bec*-shaped (N=2), amorphous shaped (N=1), and unidentifiable (N=10) types (Table 11-12).

Sub-triangular scrapers were observed in levels III/5-1, III/5-2, and III/5-3B. The sub-triangular scraper from level III/5-1 was made on a regular flake. This piece can be descibed as a heavily elaborated obverse retouched tool (Fig. 11-5, *1*). The sub-triangular scraper from level III/5-2 was made on a regular flake and features a heavy obverse retouch. There were two sub-triangular scrapers in level III/5-3B. Both tools were made on transverse flakes and display a heavy obverse retouch. One of these scrapers also has an inversely thinned back side.

Sub-leaf scrapers were discovered in level III/5-3B2. One of these was made on partly broken flake and has a slight obverse retouch. Another was made on a blade and features a heavy obverse retouch (Fig. 11-6, *1*). In spite of its slightly asymmetric shape this tool can be affiliated to those belonging to the *limace* type.

Sub-crescent scrapers are recorded in levels III/5-1B, III/5-2, III/5-B, and III/5-3B2. The sub-crescent scraper from level III/5-1B is made on a regular flake. It is a heavily obverse retouched tool (Fig. 11-5, *3*). The sub-crescent shaped scraper from level III/5-2 was made on a regular flake and also exhibits a heavy obverse retouch. This tool is among those with a reversal form (Fig. 11-5, *6*). The sub-crescent scrapers from levels III/5-3B and III/5-3B2 were made on transverse flakes. These all feature a heavy obverse retouch, and approach clear canted *(déjeté)* forms (Fig. 11-6, *2*). The scraper from level III/5-3B2 exhibits an inversely thinned back (Fig. 11-5, *2*).

Semi-crescent scrapers are observed in levels III/5-2 (N=1), III/5-3B (N=1), and level III/5-3B2 (N=2). The semi-crescent scraper from Level III/5-2 was made on a heavy obverse retouched transverse flake. This tool approaches a canted *(déjeté)* form (Fig. 11-5, *5*). The semi-crescent scraper from level III/5-3B was made on a relatively large flake (67 mm long, 41 mm wide, and 25 mm thick) and has a heavy obverse retouch (Fig. 11-5, *4*). Both semi-crescent scrapers from level III/5-3B2 were on regular flakes and feature a heavy obverse retouch. One of these scrapers exhibits inverse thinning of its terminal tip.

Sub-trapezoidal scrapers were found in levels III/5-1, III/5-3, and III/5-3B2, with one piece, respectively, as well as in level III/5-3B where two items were identified. All sub-trapezoidal scrapers were made on heavy obverse retouched transverse flakes and have been affiliated to the canted *(déjeté)* forms. Also, one scraper from level III/5-3B exhibits an inverse thinning of its basal part (Fig. 11-6, *3*). The scraper from level III/5-3B2 was made on a bifacial shaping/thinning blank (Fig. 11-6, *4*).

Semi-trapezoidal scrapers occur in level III/5-1A (N=1), levels III/5-1 (N=2) and III/5-2 (N=2), and level III/5-3B (N=3). All semi-trapezoidal scrapers have canted *(déjeté)* forms. The scraper from level III/5A was made on a regular flake and has a heavy inverse retouch (Fig. 11-6, *6*). Both semi-trapezoidal scrapers from level III/5-1 feature a heavy obverse retouch. One of these was made on a regular flake. Another scraper was made on a transverse flake and displays an inverse thinning of its basal end. Both semi-trapezoidal scrapers from level III/5-2 are canted *(déjeté)* forms. The first of these was made on a regular flake and has a medium obverse retouch. The second scraper was on a transverse flake and has a heavy obverse retouch. This latter tool exhibits an inverse thinning of both its terminal and basal ends (Fig. 11-6, *5*). The semi-trapezoidal scrapers from level III/5-3B comprise obverse retouched items. The first of these was made on a medium elaborated regular flake, the second on a heavily retouched transverse flake, and the third on a heavily retouched shaping/thinning flake. Also, the scraper made on the transverse flake features an inversely thinned base (Fig. 11-6, *7*).

Sub-rectangular scrapers have been noted in levels III/5-2 (N=1) and III/5-3 (N=1), and with four such pieces from Level III/5-3B. All sub-rectangular scrapers are canted *(déjeté)* forms and display a heavy obverse retouch. The sub-rectangular scraper from level III/5-2 was made on a regular flake. The sub-rectangular scraper from level III/5-3 was made on a transverse flake (Fig. 11-6, *8*). Among the sub-rectangular scrapers from level III/5-3B, two scrapers were made on regular flakes, one scraper was made on a shaping/thinning flake, and one on a chunk. The two tools on regular flakes also exhibit an inverse thinning of their distal ends (Fig. 11-6, *10*).

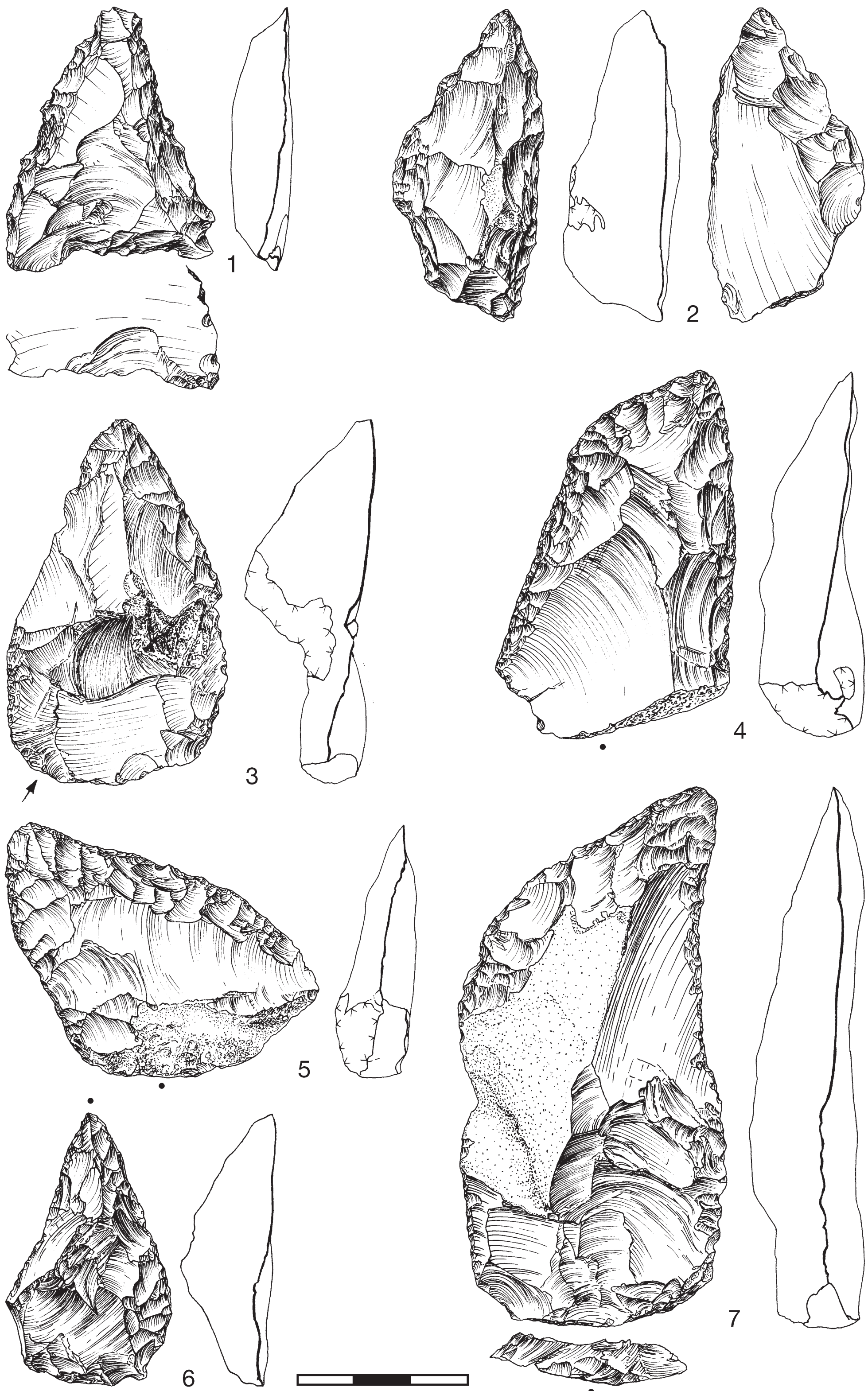

Fig. 11-5 Kabazi V, levels III/5-1 (1, 7), III/5-1B (3), III/5-2 (5, 6), III/5-3B (4), III/5-3B2 (2): 1 – scraper, sub-triangular; 2 – scraper, sub-crescent, thinned back; 3 – scraper, sub-crescent; 4 – scraper, semi-crescent; 5 – scraper, semi-crescent; 6 – scraper, sub-crescent reverse (tool orientation is 180º from the technological orientation of its blank); 7 – scraper, *bec*-shaped *(déjeté)*.

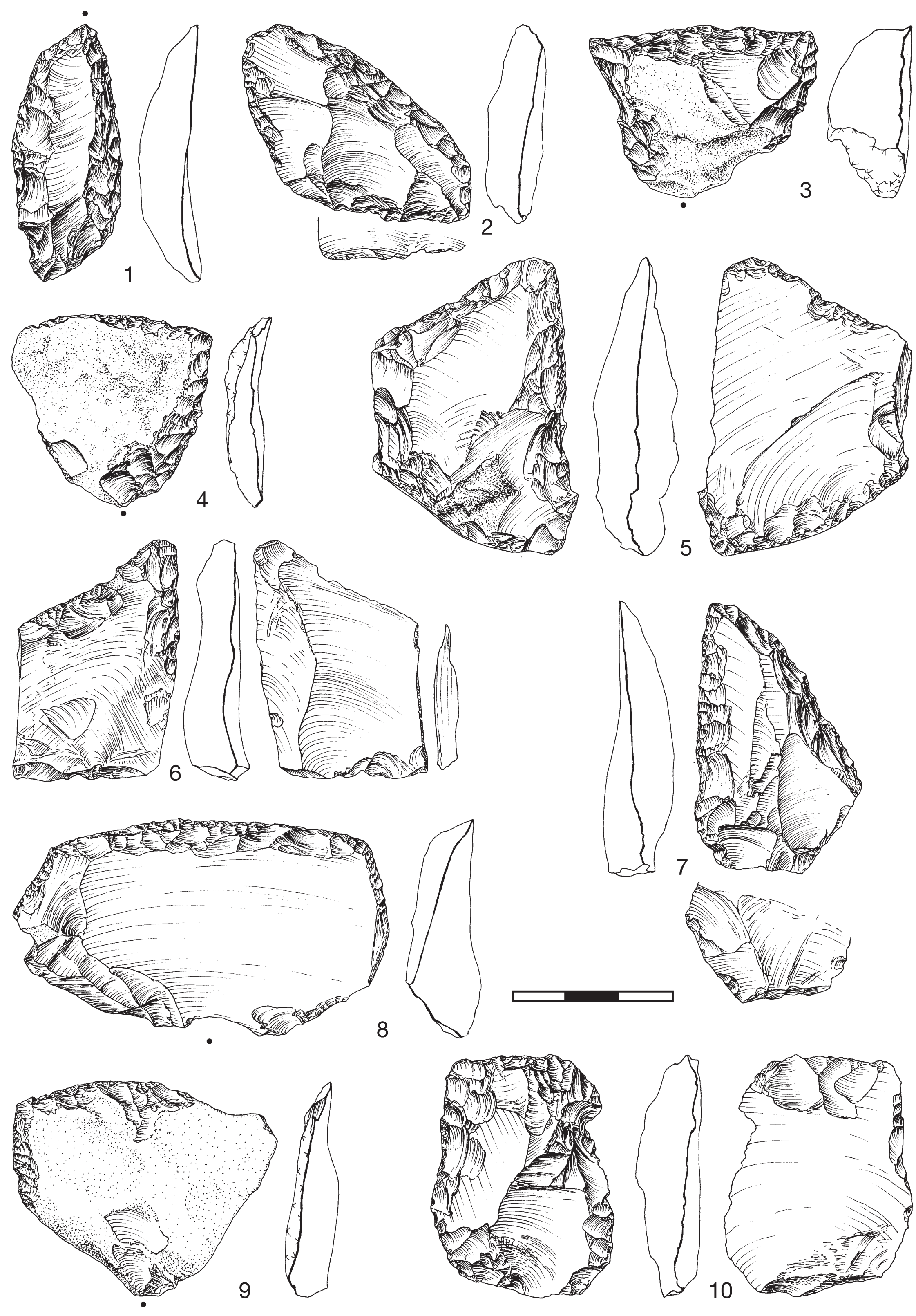

Fig. 11-6 Kabazi V, levels III/5-1A (6), III/5-2 (5, 9), III/5-3 (2, 7, 8), III/5-3B (3, 10), III/5-3B2 (1, 4): 1 – scraper, sub-leaf *"limace"*, reversal; 2 – scraper, sub-crescent *(déjeté)*; 3 – scraper, sub-trapezoidal *(déjeté)*, thinned base; 4 – scraper, sub-trapezoidal *(déjeté)*; 5 – scraper, semi-trapezoidal *(déjeté)*, thinned base; 6 – scraper, semi-trapezoidal *(déjeté)*; 7 – scraper, semi-trapezoidal *(déjeté)*, thinned back; 8 – scraper, sub-rectangular *(déjeté)*; 9 – scraper, semi-rectangular *(déjeté)*; 10 – scraper, sub-rectangular *(déjeté)*, distally thinned.

Semi-rectangular scrapers have been recorded in levels III/5-2 (N=1) and III/5-3B2 (N=1), and level III/5-3 (N=3). Four tools of this group are canted *(déjeté)* scraper forms , and one tool from level III/5-3 is a reversal form. The semi-rectangular scraper from level III/5-2 was made on a transverse flake and has a heavy obverse retouch (Fig. 11-6, *9*). All scrapers from level III/5-3 were made on regular flakes and have a heavy obverse retouch. The semi-rectangular scraper from level III/5-3B2 was made on a regular flake. The base of the scraper was inversely thinned (Fig. 11-7, *1*).

Bec-shaped convergent scrapers are known from levels III/5-1A (N=1) and III/5-1 (N=1). Both these tools show signs of a heavy obverse retouch and are canted *(déjeté)* forms. The scraper from level III/5-1A was made on a regular flake and has a heavy obverse retouch. This piece also exhibits an inverse thinning of both its basal and terminal ends. The *bec*-shaped scraper from level III/5-1 was made on a massive regular flake and has a heavy obverse retouch (Fig. 11-5, *7*).

There is only one example of a *convergent amorphously shaped scraper*. This stems from level III/5-2. It was made on a regular flake and features a heavy obverse retouch.

Unidentifiable convergent tip fragments comprise terminal pointed parts from broken convergent scrapers. All these fragments display an obverse retouched. Of this group, two each come from levels III/5-1A and III/5-3B2, and three each from levels III/5-1 and III/5-2. One of the convergent tip fragments from level III/5-1 is assigned to tool modification elements, while one of the items from level III/5-2, and two from level III/5-3B2, are canted *(déjeté)* forms. The latter piece also exhibits an inversely thinned tip.

Double scrapers, according to their morphology, have been subdivided into double straight (N=2), double convex (N=3), double concave (N=1), straight-convex (N=5), straight-concave (N=1), and straight-wavy (N=1) types (Table 11-12).

Double straight scrapers were found in level III/5-3. One of these was made on regular a flake and was lightly obverse retouched. Another was made on a broken flake and features a heavy obverse retouch.

Double convex scrapers were found in levels III/5-1A and III/5-3. The scraper from level III/5-1A was made on a transverse flake and has a medium obverse retouch. Two double convex scrapers stem from level III/5-3. The first of these was made on a broken regular flake and has a medium obverse retouch. The second was made on a heavily obverse retouched blade (Fig. 11-7, *4*).

The *double concave scraper* was found in level III/5-1. This tool was made on a transverse flake and exhibits an alternate elaboration of its working edges.

Straight-convex scrapers comprise two tools from level III/5-1A, and one tool each in levels III/5-1, III/5-3, and III/5-3B. Both straight-convex scrapers from level III/5-1A show a heavy obverse retouch. One of these was made on a broken regular flake, the other was made on a partly broken blade. The scraper from level III/5-1 was made on a blade and has an alternate retouch. The straight-convex scraper from level III/5-3 was made on a massive obverse retouched blade (Fig. 11-7, *3*). The scraper from level III/5-3B was made on a broken regular flake with obverse retouch.

The *straight-concave scraper* is from level III/5-3. The tool was made on a regular flake and is lightly obverse retouched.

The *straight-wavy scraper* stems from level III/5-1 and was made on a broken, heavily obverse retouched regular flake.

Lateral scrapers number 75 pieces that, on the basis of their edge shapes, have been subdivided into lateral straight (N=30), lateral convex (N=33), lateral concave (N=6), and lateral wavy (N=6) types (Table 11-12).

Lateral straight scrapers are the most numerous group. Among these, three tools stem from level III/5-1, one from level III/5-1B, seven from level III/5-2, four from level III/5-3, seven from level III/5-3B, and eight from level III/5-3B2.

The first of the lateral straight scrapers from level III/5-1 was made on a transverse flake and features a slight obverse retouch. The second tool was made on a regular flake and had been elaborated by means of an obverse medium retouch. The terminal and basal ends of this tool are truncated-faceted (Fig. 11-7, *6*). Finally, the third lateral straight scraper was made on a blade and exhibits faceted back accommodation. The lateral straight scraper from level III/5-B was made on a regular flake and displays a light obverse elaboration.

Among the scrapers from level III/5-2, five tools were made on regular flakes, and two on transverse flakes. All these scrapers are obversely worked by means of a heavy and medium retouch.

Of the straight scrapers from level III/5-3, one was made on a blade (Fig. 11-8, *1*), and three on regular flakes (Fig. 11-8, *6*). All show sign of heavy processing from their obverse sides.

Among the straight scrapers from level III/5-3B, two were on blades, and five were on regular flakes (Fig. 11-7, *10*). Most tools are lightly retouched, only one flake tool features a heavy elaboration. This heavily retouched tool was made on a flake and has

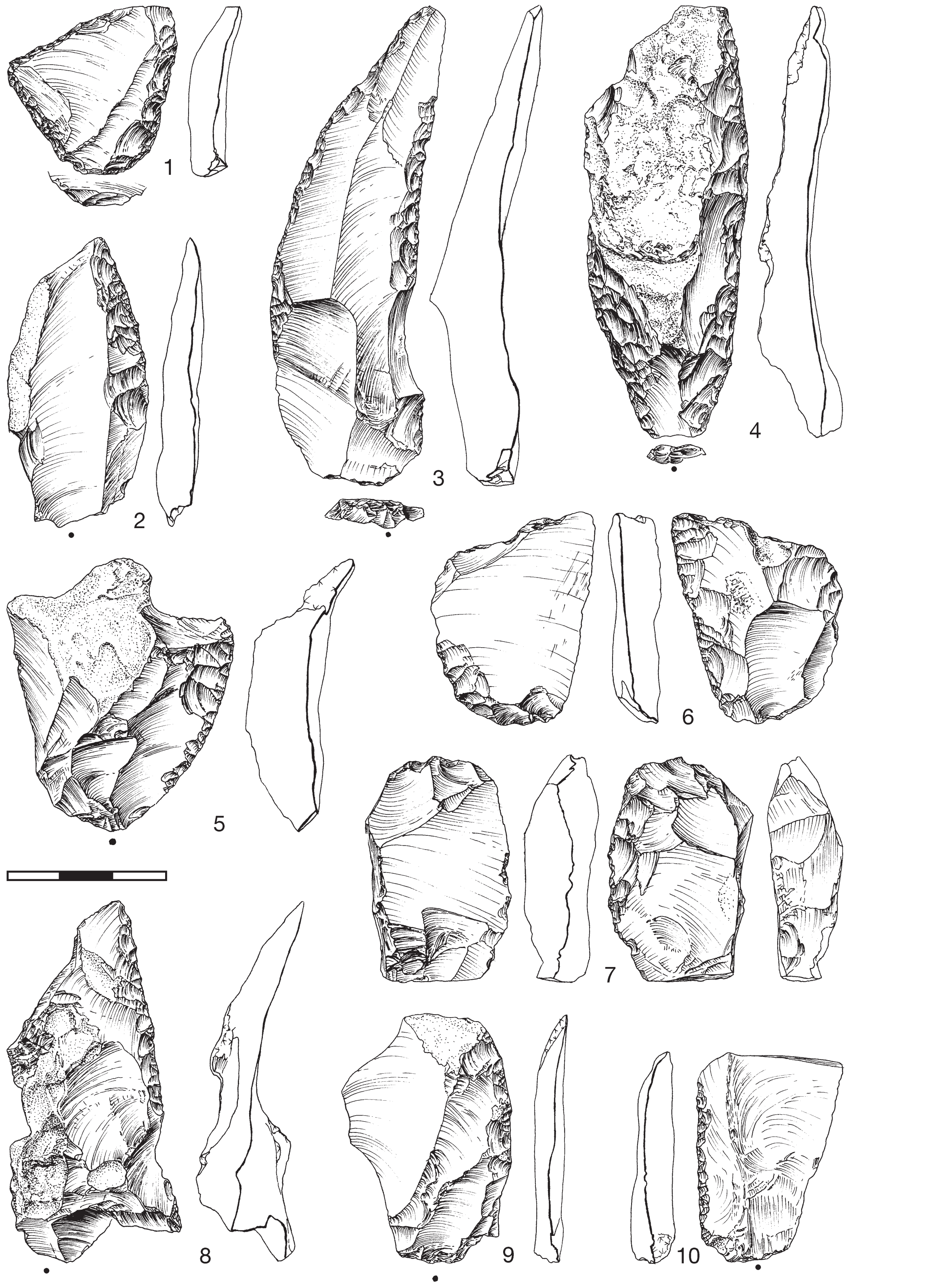

Fig. 11-7 Kabazi V, levels III/ 5-1A (7, 9), III/5-1 (5, 6), III/5-2 (2), III/5-3 (3, 4), III/5-3B (10), III/5-3B2 (1, 8): 1 – scraper, semi-rectangular (canted); 2 – scraper, lateral convex; 3 – scraper, straight-convex; 4 – scraper, double convex; 5 – scraper, lateral convex; 6 – scraper, lateral straight, terminally truncated-faceted; 7 – scraper, lateral convex, terminally truncated-faceted; 8 – scraper, lateral straight; 9 – scraper, lateral convex; 10 – scraper, lateral straight.

a plane back positioned on its blank side, opposite the working edge. One of the lightly retouched flake tools also has natural back accommodation at the same position.

Of the straight scrapers from level III/5-3B2, one was made on a blade, one on a transverse flake, five on regular flakes (Fig. 11-7, *8*), and one on a flake originating from bifacial tool shaping/thinning. Both the tool on the blade and the tool on the transverse flake display a medium retouch. Among the tools on regular flakes, two were heavily and three lightly retouched.

Lateral convex scrapers are the most numerous unifacial tools. Of these, six pieces stem from level III/5-1A, three from level III/5-1, one from level III/5-1B, six from level III/5-2, seven from level III/5-3, seven from level III/5-3B, and three from level III/5-3B2.

Five of the six lateral convex scrapers from level III/5-1A have an obverse retouch, with one piece showing an inverse retouch. Three of the obverse retouched tools were made on a regular flake, one was on a blade, and one was on an amorphous chunk. Among those tools made on regular flakes, two exhibit medium retouch, and one a heavy retouch. One of the scrapers with medium retouch was made on a flake which was a by-product from bifacial shaping/thinning (Fig. 11-7, *9*). The tool on the blade displays a heavy retouched and has a truncated-faceted distal end. The tool made on a chunk has a medium retouch. The inverse retouched scraper was made on a regular flake and features a heavy elaboration (Fig. 11-7, *7*). The distal end of the tool was truncated-faceted.

The lateral convex scraper from level III/5-1B was made on a broken flake and has a heavy obverse retouch.

All lateral convex scrapers from level III/5-1 were made on regular flakes and were worked from their obverse sides: two were lightly retouched, and one was heavily retouched (Fig. 11-7, *5*). Both lightly retouched scrapers were made on blanks which might come from bifacial tool shaping. One of these has a faceted back on the blank side, opposite the working edge.

Among the tools from level III/5-2, two were on blades, and four were on regular flakes. The first of the tools made on a blade has a light obverse retouch, while the other has a heavy obverse retouch (Fig. 11-7, *2*). Two of the scrapers made on regular flakes feature medium obverse retouch, and two have a heavy obverse retouch.

Of the seven convex scrapers from level III/5-3, two were made on blades, three on regular flakes (Fig. 11-8, *2*), and two on flakes which were by-products from bifacial tool shaping/thinning. All of these pieces have an obverse retouch. The tools on blades display a medium elaboration, while tools on trimming-flakes are heavily elaborated. The first of the tools on flakes has a heavy retouch and also exhibits inverse lateral thinning. The second has a natural back which is positioned on its blank side, opposite the medium retouched working edge. Finally, the third of these tools was lightly retouched.

Of the seven convex scrapers from level III/5-3B, two were made on transverse flakes, and five were on regular flakes (Fig. 11-8, *3*). All pieces were obversely retouched. One of the tools made on a transverse flake was heavily retouched, while the other was only lightly worked. One of the tools made on a regular flake exhibits inverse thinning of its base, and another has plane back accommodation that is located on its blank side, opposite its working edge (Fig. 11-8, *5*).

Among the three lateral convex scrapers found in level III/5-3B2, the first was made on a regular flake and has a heavy obverse retouch, the second is on a medium inversely retouched regular flake, and the third is on a flake that is considered a by-product from bifacial tool shaping/thinning. This latter piece shows a light obverse retouch.

In the group of *lateral concave scrapers*, five items are from level III/5-2, and one tool from level III/5-3B. Of the five tools from level III/5-2, three were made on regular flakes, one on a transversal flake, and one on a shaping/thinning flake. The tool on the transversal flake features a heavy obverse retouch and has an inverse thinning of its base. All tools made on regular flakes also exhibit a heavy obverse retouch. On the other hand, the scraper made on the shaping/thinning flake was only lightly worked from its obverse side.

The single lateral concave scraper from level III/5-3B was made on a medium obverse retouched regular flake.

The group of *lateral wavy scrapers* includes one item each from levels III/5-1, III/5-2, and III/5-3, as well as three tools from level III/5-3B. The wavy scraper from level III/5-1 was made on a medium obverse retouched blade. Typologically, this tool can bee assigned to the *raclette* type.

The lateral wavy scraper from level III/5-2 was made on a heavily obverse retouched regular flake.

The lateral wavy scraper from level III/5-3 was made on a partly broken blade and features a light obverse retouch.

Of the three wavy scrapers from level III/5-3B, two have a heavy obverse retouch and were made on regular flakes, and one was made on a transverse flake, a by-product from bifacial shaping/thinning.

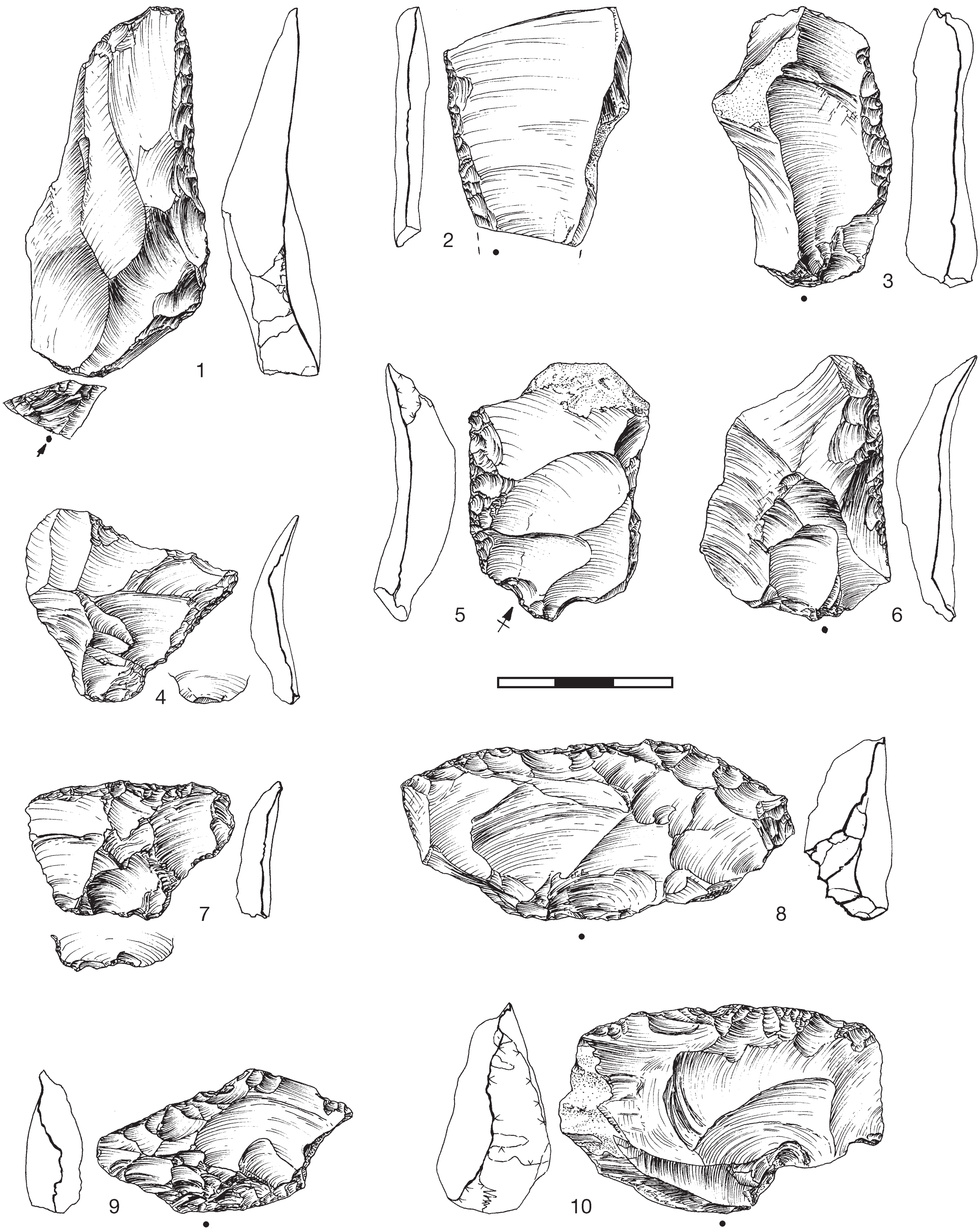

Fig. 11-8 Kabazi V, levels III/5-1 (7), III/5-2 (9), III/5-3 (1, 2, 4, 6), III/5-3B (3, 5, 10), III/5-3B2 (8): 1 – scraper, lateral straight; 2 – scraper, lateral convex; 3 – scraper, lateral convex; 4 – scraper, lateral wavy; 5 – scraper, lateral convex, thinned back; 6 – scraper, lateral straight; 7 – scraper, transversal convex; 8 – scraper, transversal convex; 9 – scraper, transversal straight; 10 – scraper, transversal convex.

The tool has a light obverse retouch (Fig. 11-8, *4*).

Transverse scrapers are subdivided into straight (N=5), convex (N=12), concave (N=1), and wavy (N=1) types (Table 11-12) based on the appearance of their edges.

The group of *transverse straight scrapers* comprises three tools from level III/5-2, and one each from levels III/5-3 and III/5-3B.

All transverse straight scrapers from level III/5-2 were made on transverse flakes, and exhibit a heavy obverse retouch (Fig. 11-8, *9*).

The transverse straight scraper from level III/5-3 was made on a broken flake. This piece has a light obverse retouch. The transverse straight scraper from level III/5-3B was made on a heavily obverse retouched transversal flake.

The group of *transverse convex scrapers* is composed of four tools from level III/5-1, three from level III/5-3B, two from level III/5-3, and one each from levels III/5-1A, III/5-1B and III/5-3B2.

All transverse scrapers from level III/5-1 were elaborated from their obverse sides; three were made on transverse flakes, and one was on a regular flake. The tool made on the regular flake exhibits a truncation of its basal end. Of the tools made on transversal flakes, one features a heavy obverse retouch (Fig. 11-8, *7*), and two have a medium obverse retouch. Both medium worked scrapers exhibit some accommodations: one displays a thinning of it distal and its proximal ends, the other has a faceted back on its lateral edge.

Among the tools from level III/5-3B, one was on a regular flake, and two were on transverse flakes (Fig. 11-8, *10*); all are characterised by a heavy obverse elaboration.

Both scrapers from level III/5-3 were made on transverse flakes, and with a light obverse retouch.

The transverse convex scraper from level III/5-1A was made on a transverse flake. The tool has a heavy obverse retouch, with a thinning of its basal end.

The transverse convex scraper from level III/5-1B was made on a heavily obverse retouched regular flake.

The transverse convex scraper from level III/5-3B2 was made on a transverse flake (Fig. 11-8, *8*) and displays a heavy obverse retouch.

The single *transverse concave scraper* stems from level III/5-3B. The tool was made on a medium obverse retouched transversal flake.

The *single transverse wavy scraper* from level III/5-2 was made on a transverse flake, and has a heavy obverse retouch.

Transverse-oblique scrapers are represented by 10 items; these have been subdivided into convex (N=7) and wavy (N=3) types (Table 11-12).

The group of *transverse-oblique convex scrapers* comprises two tools from level III/5-2, two from level III/5-3, and one each from levels III/5-1, III/5-3B and III/5-3B2.

Both the convex transverse-oblique scrapers from level III/5-2 were made on regular flakes. One of these was worked by means of a heavy obverse retouch (Fig. 11-9, *1*), while the other exhibits a light obverse retouch only.

The first of the transverse-oblique convex scrapers from level III/5-3 was made on a transverse flake, and has a medium obverse retouch (Fig. 11-9, *5*). The second was made on a regular flake, a by-product from bifacial tools shaping / thinning, and exhibits a light obverse retouch.

The transverse-oblique convex scraper from level III/5-1 was made on a regular flake; it exhibits a medium obverse retouch, and has an inversely thinned base.

The transverse-oblique convex scraper from level III/5-3B was made on a transversal flake and has a heavy obverse retouch (Fig. 11-9, *2*).

The transverse-oblique convex scraper from level III/5-3B2 was made on a regular flake and has a heavy retouch from its obverse side (Fig. 11-9, *3*).

All examples of *transverse-oblique wavy scrapers* stem from level III/5-2. Two of these tools, one of which has an inverse thinning of both its basal and terminal ends (Fig. 11-9, *4*), were made on regular flakes and were processed by means of a heavy obverse retouch. The third wavy scraper was made on a regular flake and exhibits a medium obverse retouch.

Denticulate tools

The joint assemblage of sub-unit III/5 features a total of seven denticulate tools. These have been subdivided into transverse (N=1), lateral (N=5), and double (N=1) types (Table 11-12) based on the location of their working edges.

The *transverse denticulate tool* was discovered in level III/5-2. The tool was made on a partly broken transversal flake and has a heavy obverse retouch.

The group of *lateral denticulate tools* comprises three items from level III/5-2, and one each from levels III/5-1 and III/5-3.

The lateral denticulate tool from level III/5-1 was made on a partly broken heavily obverse retouched regular flake.

Among the tools from level III/5-2, one was made on a regular flake, another on a broken blade, and the third on a broken flake. All tools feature a heavy obverse retouch. The tool made on a blade exhibits a faceted lateral back that is located on the

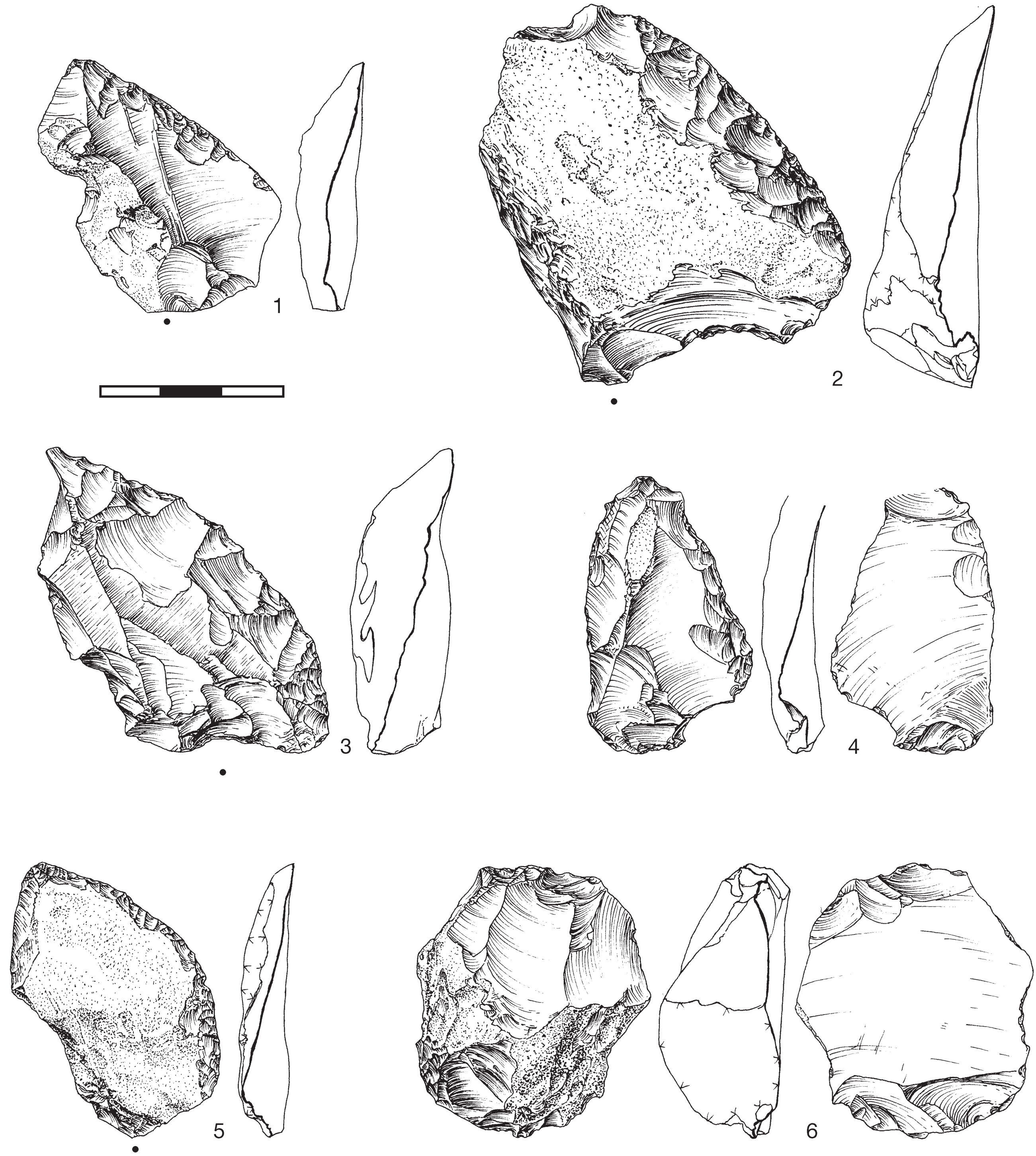

Fig. 11-9 Kabazi V, levels III/5-1B (6), III/5-2 (1, 4), III/5-3 (5), III/5-3B (2), III/5-3B2 (3): 1 – scraper, transversal-oblique convex; 2 – scraper, transversal-oblique convex; 3 – scraper, transversal-oblique convex; 4 – scraper, transversal-oblique wavy, distally thinned; 5 – scraper, transversal-oblique convex; 6 – truncated-faceted tool, terminally and basally elaborated.

blank side, opposite the retouched edge.

The lateral denticulate tool from level III/5-3 that was made on a blade has a medium obverse retouch.

The *double denticulate tool* is from level III/5-1A. This item was made on a broken blade and exhibits alternate elaboration of its lateral working edges. The distal end of this tool blank was truncated-faceted.

Notched tools

The joint assemblage from sub-unit III/5 contains seven notched tools. Based on the location of the retouched notches on these pieces, these items are subdivided into simple distal (N=3), simple lateral (N=3), and double lateral (N=1)types (Table 11-12).

The group of *simple transversal notched tools* comprises one each from levels III/5-1A, III/5-1, and III/5-2.

The notched tool from level III/5-1A was made on a broken flake and has an inversely retouched notch at its distal edge.

The notched tool from Level III/5-1 was made on a transverse flake and also exhibits an obverse retouched notch at its distal edge.

The notched tool from level III/5-2 was made on a transverse flake. The notch with continuous obverse retouch is located at its distal end.

The group of *simple lateral notched tools* is composed of one item each from levels III/5-1, III/5-3, and III/5-3B.

The notched tool from level III/5-1 was made on a partly broken regular flake and exhibits an inversely retouched notch, located at the lateral edge of the blank.

The tool from level III/5-3 was made on a regular flake and exhibits a lightly obverse retouched notch. It is important to note that this notched tool was made on a yellowish flint, of a type different to those otherwise known from this assemblage.

The tool from level III/5-3B was made on a massive chunk; its notch was heavily worked by means of a steeped continuous retouch.

The *double lateral notched tool* (because its two retouched notches are located on opposite lateral sides of the blank) is from level III/5-1. The item was made on a transverse flake and exhibits an alternate elaboration of its notches: one notch has an obverse retouch while the other is characterised by an inverse retouch.

Truncated-faceted tools

The joint assemblage of sub-unit III/5 features a total of eight truncated-faceted tools. According to the position of their truncated edges, these have been subdivided into simple lateral (N=2), simple proximal (N=4), and double distal-proximal (N=2) types (Table 11-12). All truncated-faceted tools exhibit a heavy alternate elaboration.

Simple lateral truncated-faceted tools were recorded in levels III/5-2 (N=1) and III/5-3 (N=1). The tool from level III/5-2 is made on a regular flake, while the tool from level III/5-3 is made on a broken flake.

The group of *simple proximal truncated-faceted tools* is composed of two items from level III/5-2, and one each from levels III/5-3 and III/5-3B.

Whereas the first of the simple proximal truncated-faceted tools from level III/5-2 was made on transverse flake, the other was on a regular flake. The tool from level III/5-3 was made on a regular flake, while the tool from level III/5-3B was on a broken flake.

Double proximal-distal tools were noted in the assemblages from levels III/5-1B (N=1) and III/5-2 (N=1). This type of tools is characterised by the truncation of the blank at its distal and proximal ends by alternate positioned facets. The double proximal-distal tool from level III/5-1B was made on a regular flake (Fig. 11-9, *6*). The tool from level III/5-2 also was made on a regular flake.

End-scrapers

There are two atypical end-scrapers from sub-unit III/5, one stems from level III/5-1, the other from level III/5-3B2 (Table 11-12). Both end-scrapers were made on amorphous chunks and exhibit a heavy obverse stepped retouch on the terminal ends of each of the blanks.

Burins

Four atypical burins have been observed, two each from levels III/5-1A and III/5-1 (Table 11-12). Both burins from Level III/5-1A were made on regular flakes. These burins belong to the type of “simple lateral burin on snap”, i.e. the scar from the burin blow came from the unprepared distal end, and is located along the lateral edge of the blank.

One of the burins from level III/5-1 was made on a broken regular flake. Typologically, this is a “simple lateral burin on break”, i.e. the scar of the burin blow came from the distal break, and was applied along the lateral edge of the blank. Another burin from level III/5-1 was made on a regular flake. This burin is of a type referred to as “multifaceted burin on base”, i.e. the scar series from the burin blows progress from the cant of the blank striking butt, and is located along the lateral edge.

Perforators

There is only one sub-triangular shaped perforator; this stems from level III/5-1A (Table 11-12). It was made on a regular flake and exhibits a heavy obverse retouch.

Retouched pieces

Retouched pieces were found in all levels of sub-unit III/5. Based on the location of their working edges, retouched pieces are subdivided into lateral (N=95), distal (N=24), and bilateral (N=7) types (Table 11-12).

Among the 126 retouched pieces, 107 were made on flakes, while only 19 tools were made on blades (Table 11-13). There is no indication that chunks or chips were used as blanks for retouched pieces.

The average dimensions of complete retouched pieces are different for pieces made on regular flakes, transverse flakes and blades. As a rule, retouched blanks have larger dimensions than unretouched debitage in each assemblage (Table 11-10).

The majority of retouched pieces have an obverse retouch, whereas only six pieces display an inverse retouch; one piece exhibits an alternating retouch.

Regarding retouch pattern, items with a light marginal retouch dominate, followed by pieces with a very light (ephemeral) marginal retouch. Only a few pieces feature a discontinuous irregular scalar retouch (Table 11-17).

Lateral retouched pieces

The group of lateral retouched pieces comprises 8 items from level III/5-1A, 15 items from level III/5-1, 5 items from level III/5-1B, 25 items from level III/5-2, 19 items from level III/5-3, 9 items from level III/5-3B, and 14 items from level III/5-3B2 (Table 11-12).

Among the lateral retouched pieces from level III/5-1A, one item is on a blade, three are on regular flakes, and four are on transverse flakes. All lateral retouched pieces from level III/5-1A exhibit an obverse retouch.

Lateral retouched pieces from level III/5-1 include one item made on a blade, eleven that are on regular flakes, and three on transverse flakes. All lateral retouched pieces from level III/5-1 feature an obverse retouch.

Among the lateral retouched pieces from level III/5-1B, four items are on regular flakes, and one is on a transverse flake. All lateral retouched pieces from level III/5-1B are characterised by an obverse retouch.

Lateral retouched pieces from level III/5-2 number six items made on blades, fourteen on regular flakes, and five on transverse flakes. Only one lateral retouched regular flake has a lightly inverse retouch, all others exhibit an obverse retouch.

Among the lateral retouched pieces from level III/5-3, 2 were made on blades, 13 on regular flakes, and 4 on transverse flakes. Regular flakes with inverse and alternate retouch were observed in only one case each, respectively, while all others display an obverse retouch.

Lateral retouched pieces from level III/5-3B comprise two items on blades, six on regular flakes, and one on a transverse flake. Only two retouched regular flakes feature an inverse elaboration, all others show an obverse retouch.

Among the lateral retouched pieces from level III/5-3B2, four items are on blades, and ten are on regular flakes. Only one lateral retouched blade was inversely retouched, all others are characterised by an obverse retouch.

Distal retouched pieces

The group of distal retouched pieces comprises 2 items from level III/5-1A, 1 item from level III/5-1B, 3 items from level III/5-2, 4 items from level III/5-3, 8 items from level III/5-3B, and 6 items from level III/5-3B2 (Table 11-12).

Of the two distal retouched pieces from level III/5-1A, the first is on a regular flake, and the second is on transverse flake, both have an obverse retouch.

The distal retouched piece from level III/5-1B is a regular flake with an obverse retouch.

The distal retouched pieces from level III/5-2 comprise one item on a regular flake, and two pieces on transverse flakes; all exhibit an obverse retouch.

Among the distal retouched pieces from level III/5-3, two items are on regular flakes, and two are on transverse flakes; all feature an obverse retouch.

Of the distal retouched pieces from level III/5-3B, one item is on a blade, three are on regular flakes, and four are on transverse flakes. Only one transverse flake exhibits an inverse retouch, all others have an obverse retouch.

Among the distal retouched pieces from level III/5-3B2, three items are on regular flakes, and three items are on transverse flakes; all pieces exhibit an obverse retouch.

Bilateral retouched pieces

The group of bilateral retouched pieces comprises one item each from levels III/5-1B, III/5-2, and III/5-3B, and two items each from levels III/5-3 and III/5-3B2 (Table 11-12). All bilateral retouched pieces display a light obverse retouch. Most pieces were made on regular flakes, only two items from level III/5-3B2 were made on blades.

	III/5-1A		III/5-1		III/5-1B		III/5-2	
	N	%	N	%	N	%	N	%
Ephemeral	3	*30.0*	6	*40.0*	·	·	10	*34.5*
Light marginal	5	*50.0*	9	*60.0*	6	*85.7*	17	*58.6*
Irregular scalar	2	*20.0*	·	·	1	*14.3*	2	*6.9*
Total:	**10**	***100.0***	**15**	***100.0***	**7**	***100.0***	**29**	***100.0***

	III/5-3		III/5-3B		III/5-3B2		Total:	
	N	%	N	%	N	%	N	%
Ephemeral	11	*44.0*	9	*50.0*	11	*50.0*	50	*39.7*
Light marginal	14	*56.0*	7	*38.9*	11	*50.0*	69	*54.8*
Irregular scalar	·	·	2	*11.1*	·	·	7	*5.6*
Total:	**25**	***100.0***	**18**	***100.0***	**22**	***100.0***	**126**	***100.0***

Table 11-17 Kabazi V, sub-unit III/5: characteristics of retouched pieces by retouch types.

Tools fragments

There are 27 bifacial and 87 unifacial unidentifiable tools fragments in the sub-unit III/5 assemblage (Table 11-12), the typological characteristics of which cannot be identified due to their small dimensions.

Bifacial tools fragments

These comprise 15 basal parts of tools, 10 medial parts of tools, and 2 fragments of broken edges. The small dimensions of all fragments have meant that a typology of these pieces could not be observed. All bifacial tools fragments are elaborated in the plano-convex manner.

Basal tools fragments. Three basal fragments come from level III/5-1. Apparently, one of these was made on a flint plaquette, while the blank types used for the two remaining pieces could not be identified.

Five basal fragments stem from level III/5-2. The blank types of these basal fragments could not be identified.

One basal fragment is from level III/5-3. Due to the fact that the obverse and inverse surfaces of this item were covered by cortex, the initial tool had obviously been made on a flint plaquette.

Four basal fragments are from level III/5-3B. Owing to their small dimensions, the blank types of most basal fragments could not be identified; only one piece might have been made on a plaquette.

Two basal fragments were recovered from level III/5-3B2. These might be associated with bifacial tool modification elements.

Medial tools fragments. Three medial fragments were discovered in level III/5-1A. Among them, one piece was made on a plaquette, and two others on unidentifiable blanks.

Three medial fragments were recorded in level III/5-2. The first of these was made on a flint plaquette, while the second blank type could not be identified.

One medial fragments stems from level III/5-3. Once again, due to the small dimensions of this fragment, the blank could not be identified.

Three medial fragments are from level III/5-3B. It would appear that all were made on flint plaquettes.

Edge tools fragments. There are two edge fragments from broken bifacial tools, one from level III/5-1, and the other from level III/5-2. The fragment from level III/5-1 was on a flint plaquette. The fragment from level III/5-2 might be assigned to the bifacial tool modification elements.

Unifacial tools fragments

The unifacial elaborated tools fragments comprise 14 basal fragments of tools, 27 fragments of medial parts of tools, 28 fragments of terminal parts, and 18 fragments of broken edges. Due to the small dimensions of all these fragments, their tool typologies, as well as the blank types used in their production, could not be identified. All unifacial tools fragments display an obverse retouch.

Basal tools fragments. These include one item each from levels III/5-1A, III/5-1, III/5-3, three each from levels III/5-3B and III/5-3B2, and five from level III/5-2.

Medial tools fragments. These number two items from level III/5-3B2, three each from levels III/5-1, III/5-1B, III/5-3B, five from level III/5-3, six from level III/5-1A, and seven from level III/5-2.

Terminal tools fragments. These are composed of four items from level III/5-3B, six from level III/5-3, eight from level III/5-3B2, and ten pieces from level III/5-2.

Edge tools fragments. This group comprises one item from level III/5-1B, four from levels III/5-1, III/5-2, III/5-3B2, and five from level III/5-3B.

Tool treatment elements

Elements of tool shaping/thinning and tool edge resharpening

The joint assemblage of sub-unit III/5 contains a total of 639 complete blanks. These provide data not only concerning their striking platforms, but also with regard to their shapes, as well as their lateral and distal profiles.

Of these complete blanks, 94 pieces feature a lipped platform (plain or faceted), an obtuse platform angle, an incurvated or twisted profile, and an expanding or irregular shape. Therefore, all these pieces fulfil the necessary criteria for assignment to *elements from bifacial tool shaping/thinning*. These items comprise 6 blanks from level III/5-1A, 14 blanks from level III/5-1, 7 blanks from level III/5-1B, 27 blanks from level III/5-2, 9 blanks from level III/5-3, 15 blanks from level III/5-3B, and 16 blanks from level III/5-3B2.

In addition, another 34 pieces correspond to criteria characteristic of *elements from tool edge resharpening* and exhibit (in addition to the aforementioned attributes) only few proximal extremities, generally thin blank bodies, and numerous proximally positioned dorsal scars ("striking platform abrasion"). Among these items, 13 pieces (3 from level III/5-1, 3 from level III/5-2, 4 from level III/5-3, and 3 from level III/5-3B2) have faceted butts and might stem from bifacial tool edge resharpening, while 21 pieces (4 from level III/5-1A, 4 from level III/5-1, 5 from level III/5-2, 2 from level III/5-3, 3 from level III/5-3B, and 3 from level III/5-3B2) exhibit plane butts, and might originate from either bifacial or unifacial tool edge resharpening.

Thus, a total of 128 tool treatment elements are connected with bifacial tool shaping and tool edge resharpening, this amounts to 20,0% of the 639 identifiable blanks. Obviously, this percentage reflects only the **minimal portion** of blanks, as the appreciable part of blanks in each assemblage is broken and features of tool treatment elements are no longer visible.

Among the identified tool treatment elements, there are 16 unifacial tools and 10 retouched pieces made on blanks originating from bifacial tool shaping. Three of these are from level III/5-1 (one sub-trapezoidal canted point (Fig. 11-4, *9*), and two lateral convex scraper). Two tools are from level III/5-1A (the lateral convex scraper (Fig. 11-7, *9*), and the lateral retouched piece). One piece stems from level III/5-1B (the lateral retouched piece). Two unifacial tools and two retouched pieces were recorded in level III/5-2 (the semi-crescent point, the lateral concave scraper, and two lateral retouched pieces). Eight tools come from level III/5-3 (one sub-trapezoidal canted point, two lateral convex scrapers, the transverse-oblique convex scraper, three lateral retouched pieces, and one bilateral retouched piece).

Five tools were recovered from level III/5-3B (the sub-rectangular convergent scraper, the semi-trapezoidal convergent scraper, the lateral wavy scraper (Fig. 11-8, *4*), the lateral retouched piece, and the bilateral retouched piece).

Three tools are from level III/5-3B2: the sub-trapezoidal convergent scraper (Fig. 11-6, *4*), the lateral straight scraper, and the lateral convex scraper.

Elements of tool rejuvenation

The sub-unit III/5 assemblage features 29 tip fragments from unifacial convergent tools, and 11 tip fragments from bifacial tools (Table 11-12). However, among these, only two bifacial tip fragments and six unifacial tips fulfil to the criteria for rejuvenated elements.

Bifacial rejuvenated tip fragments are related from levels III/5-1 and III/5-3B2.

The terminal fragment of a bifacial point from level III/5-1 has small dimensions (14 mm long, 26 mm wide, and 3 mm thick), and is of a transverse rhomboidal shape. The pointed tip, which is located on the transversal termination, has a small "pointed" striking butt (<1 mm wide and <1mm height).

The tip fragment from level III/5-3B2 has also been classified as a bifacial unidentifiable point. This is a small piece (26 mm long, 20 mm wide, and 5 mm thick) of rhomboidal shape. The pointed tip is located on the transversal termination. The "pointed' striking platform is only small (<1 mm wide, and <1mm height).

Unifacial rejuvenated tip fragments include one tip from a convergent scraper, and the tips from four points.

The terminal rejuvenated fragment of a unifacial convergent scraper was discovered in level III/5-1. The tip is only small (8 mm long, 18 mm wide, and 4 mm thick), and is of a transverse irregular shape. The pointed tip is located on its transversal termination; it has a small "pointed" striking butt (<1 mm wide, and <1mm high).

Terminal rejuvenated fragments from unifacial points were observed in levels III/5-2, III/5-3, III/5-3B, and III/5-3B2. They number one piece from each of the levels, respectively.

The terminal fragment of a unifacial point from level III/5-2 has only small dimensions (12 mm long, 24 mm wide, and 7 mm thick), and is of a transverse rhomboidal shape. The pointed tip, with a small "pointed" striking butt (<1 mm wide, and <1mm height), is located on its transversal termination.

The tip from level III/5-3 is also small (6 mm long, 21 mm wide, and 3 mm thick). It is of a transverse rhomboidal shape, with a small "pointed" striking butt (<1 mm wide, and <1mm height); the pointed tip is located at the transversal termination.

The unifacial retouched tip from level III/5-3B is irregular in shape and is 28 mm long, 15 mm wide, and 7 mm thick. The butt was broken; the pointed tip is located at the transversal termination.

The tip from level III/5-3B2 is also small (22 mm long, 12 mm wide, and 5 mm thick) and also irregular in shape. The striking butt was broken, and the pointed tip is at the transversal termination of the piece.

Edge resharpening fragments. Only one piece from level III/5-2 corresponds to the identification criteria of a rejuvenated edge. This fragment that is from the edge of a bifacial tool is small (18 mm long, 18 mm wide, and 6 mm thick) and exhibits a massive faceted and obtuse butt (18 mm wide, 6 mm high). It is rectangular in shape and features numerous proximally positioned dorsal scars ("striking platform abrasion").

Base resharpening fragments. Only one bifacially elaborated piece from level III/5-3B2 fulfils the criteria of a rejuvenated base. This fragment from a bifacial tool base is 40 mm long, 16 mm wide, and 15 mm thick). It exhibits a small "pointed" butt (<1 mm wide, <1mm high), is of an irregular shape, and features numerous proximally positioned dorsal scars on both sides.

Inter-Assemblage Comparisons

The essential count (without chips and chunks) reveals close similarities between the structures of assemblages belonging to sub-unit III/5 at Kabazi V (Table 11-2). In all these assemblages unretouched debitage (blades plus flakes) makes up about two-thirds of each essential collection, whereby cores and preforms are few, and tools occur in about the same proportions. The similarity of their essential structures means that these assemblages might have resulted from similar occupation patterns and systems of raw material exploitation.

Although materials from Kabazi V, sub-unit III/5 were described in the previous section, it is useful to again pass review of the similarities and differences observed between the seven assemblages.

Debris

Chips and chunks are listed under debris. Chips are most numerous artefact categories in each of the seven assemblages. All assemblages feature about the same proportions of large, medium and small chips (Table 11-3). It goes without saying that the majority of these pieces are by-products from tool retouching. However, it is impossible to determine exactly which of the chips encountered in each of the metric intervals actually stem from tool retouch and which of these pieces might derive from core reduction. There is no evidence that chips were used as blanks for tool production in any of the assemblages.

Chunks are subdivided into several types: broken flint plaquette, amorphous broken pieces, natural blanks, and small fragments of unidentifiable debitage. Whereas the latter group dominate in all assemblages (Table 11-4), differences can be observed with regard to both the ratios and dimensions of the remaining chunk types (broken flint plaquette, amorphous broken pieces, natural blanks) forming these same assemblages. For instance, the large chunks, with maximal dimensions >50 mm and that might be interpreted as a raw material provisions, are found only in levels III/5-3, III/5-3B, III/5-3B2, and with a few examples in level III/5-2. On the other hand, such pieces are absent in levels III/5-1A, III/5-1, and III/5-1B. Also, natural blanks are only present in small ratios in all assemblages, with the exception of levels III/5-3 and III/5-3B where they are completely absent. At this point, it should be noted that natural blanks are pieces lacking striking platforms and bulbs of percussion, and therefore might stem from the treatment of dried flint raw materials. The presence of natural pieces in assemblages might be indicated by the usage of dried raw materials. This would imply that difficulties may have arisen with regard to fresh raw material access at the site location. Further, this may also suggest that different occupations in sub-unit III are characterised by different raw material collection strategies, or that these occupations may have occurred at different times (seasons) of the year.

Preforms and cores

Preforms and cores make up only small percentages of assemblages . Several large preforms made on flint plaquettes were recovered from levels III/5-2, III/5-3, III/5-3B, and III/5-3B2, while preforms from levels III/5-1 and III/5-1A have relatively small dimensions. These large preforms might be interpreted as provisions of raw material. On the other hand, 10 of 12 preforms might be interpreted as the preforms for bifacial tools (pre-tools), while preforms for cores (pre-cores) are known only from Levels III/5-1A and III/5-3B2.

Unifacial cores dominate in most levels, although bifacial cores are present in appreciable ratios (Table 11-5). A common feature of all core assemblages is the absence of cores with supplementary platforms that might indicate the presence of Levallois technology. Also, blade cores do not occur in any of the assemblages.

In accordance with the quantities and arrangements of striking platforms and scar patterns on core flaking surfaces, complete cores have been subdivided into four groups: (1) unidirectional, unidirectional transverse, and unidirectional alternate cores; (2) bi-directional, bi-directional transverse, and bi-directional alternate cores; (3) orthogonal, three-directional crossed, and orthogonal alternate cores; (4) radial alternate (discoid) and multi-directional alternate cores.

Only cores from groups 1 and/or 2 were identified in all assemblages, while cores from group 3 occur in levels III/5-2, III/5-3, III/5-3B, and III/5-3B2. All multi-platform cores from group 4 were discovered in just two levels, in III/5-3 and III/5-3B2. Thus, cores from all four groups occur only in level III/5-3. It would appear that the occurrences and frequencies of core types could have resulted from clear differences in artefact samples among assemblages.

Potentially, cores from group 1 produced blanks with unidirectional and convergent scar patterns, those from group 2 produced blanks with unidirectional and bi-directional scar patterns, those from group 3 produced blanks with unidirectional and unidirectional/crossed scar patterns, and those from group 4 produced blanks with unidirectional, unidirectional/crossed, convergent, three-directional and radial scar patterns. Thus, according to core occurrences, blanks with unidirectional scar patterns must have dominated, followed by blanks with unidirectional-crossed and bi-directional scar patterns. All other types of scar patterns must occur only sporadically. However, as will be shown below, the investigations of the blanks led to quite different results.

Blanks

The attribute analyses of blanks from all assemblages involved the consideration of several different attributes, including such features as scar pattern, cortex coverage, shape, lateral and distal profiles, dimensions, and the characteristics of striking platforms. Blank assemblages include unretouched debitage (flakes and blades) as well as tools on flakes and tools on blades (Table 11-6). Transverse flakes make up large percentages of each of the assemblages. Also, there are a relatively large number of broken blanks in all samples. Levallois blanks are absent in all assemblages. It should be noted that about half of the blades in each assemblage are off-axis, and therefore might actually be attributed to atypical blades. The relatively low blade indices in each of the levels (Table 11-6), together with the absence of blade cores in all assemblages, might suggest the absence of a purposeful blade technology. Obviously, most of the blades observed in these assemblages are mere by-products resulting from the shaping and thinning of bifacial tools.

Scar patterns

An analysis of the available blank scar patterns indicates that unidirectional and unidirectional/crossed scar patterns are the dominant types in each of the levels (Table 11-7). However, it is evident that the occurrence of scar patterns in blank samples does not correspond to the occurrences of blank scar pattern types suggested from core investigations. An apparent reason for this may lie in the specific features of the assemblages under discussion. As the analyses of tool treatment elements have shown, some blanks (at least 20%) in each of the assemblages might actually stem from bifacial tool shaping/thinning and tool edge resharpening. Thus, many blanks with unidirectional-crossed scar pattern are by-products from bifacial tool treatment.

This conclusion is substantiated by the application of several special technological characteristic (Table 11-18): (1) the ratio of unretouched debitage to cores; (2) the ratio of all blanks to cores; (3) the ratio of tools on blanks to cores; and (4) the ratio of all blanks to cores + bifacial tool + preforms. This last index was chosen because bifacials and preforms (which are in fact pre-cores and/or unfinished bifacial tools) would have been capable of producing blanks. For each assemblage at Kabazi V sub-unit III/5, the ratio of all blanks to cores is fairly high. Although all possible sources for blanks are considered, the ratios of all blanks to cores + bifacial tool + preforms is much lower and no longer appeared to be realistic (Table 11-18). Thus, it is clear that an

	III/5-1A	III/5-1	III/5-1B	III/5-2	III/5-3	III/5-3B	III/5-3B2	Total:
Technological indexes								
IF large	33.9	44.6	51.4	40.9	44.2	42.2	26.8	39.6
IF strict	14.5	16.4	25.7	17.4	29.8	25.9	15.8	20.1
ILam	15.7	10.0	6.3	15.1	14.1	12.8	14.3	13.5
% Levallois blanks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Special indexes								
Percentage of tools	32.3	29.7	22.2	26.8	34.3	34.9	25.4	29.5
Retouched edges : tools[1]	1.6 : 1	1.6 : 1	1.6 : 1	1.4 : 1	1.5 : 1	1.6 : 1	1.5 : 1	1.5 : 1
Unretouched debitage : cores	43.5 : 1	48.3 : 1	62.0 : 1	68.2 : 1	21.7 : 1	40.8 : 1	39.4 : 1	42.5 : 1
Tool on blanks[2] : cores	16.5 : 1	17.0 : 1	14.0 : 1	17.8 : 1	9.0 : 1	16.5 : 1	9.4 : 1	1.3 : 1
All blanks[2] : cores	60.0 : 1	65.3 : 1	76.0 : 1	86.0 : 1	30.7 : 1	57.3 : 1	48.8 : 1	55.8 : 1
All blanks[2] : cores + bifacials[2] + preforms	·	24.5 : 1	·	23.9 : 1	13.4 : 1	32.7 : 1	27.1 : 1	24.3 : 1
Average density per sq m	930.7	785.2	631.2	2,396.2	772.1	1,567.0	2,350.5	1,347.6
Average density per cu m	369.4	815.4	450.0	925.0	907.4	1,172.7	1,133.3	824.7

[1] among complete points and scrapers [2] without tool fragments

Table 11-18 Kabazi V, sub-unit III/5: technological indices and special indices.

appreciable part of blanks in each of the assemblages stems from bifacial tool shaping/thinning and tool resharpening.

Cortex coverage

All blank assemblages exhibit close patterns relating to cortex coverage (Table 11-7). In each Level, the portion of partly cortical blanks is from half to two thirds of all blanks and primary elements are represented in appreciable portions. The blanks with <25% cortex on dorsal surface dominate among cortical blanks. Such plenty of blanks with cortex means that raw material was delivered on site area by large pieces and without or little decortications.

Shape characteristics

Several shape attributes were recognised and analysed in blank assemblages. These were: blank axis, blank shape, blank lateral profile, and profile at distal end (Table 11-8).

In each assemblage, the majority of blanks are on-axis, although a portion of off-axis blanks is also present (Table 11-8). Most off-axis blanks might stem from bifacial tool shaping / thinning and/or tool resharpening.

All assemblages exhibited the same shape pattern: trapezoidal and irregular shapes are dominant, followed by rectangular and crescent shapes. Other shapes occur sporadically. Since many of the blanks produced in each of the assemblage came from bifacial tool shaping / thinning / resharpening, it is to be expected that their shapes are either expanding or irregular, particularly as thinning blanks are normally struck off-axis. Thus, shape patterns also indicate the presence of a bifacial reduction mode.

Also, similarities between assemblages could be observed for lateral profiles: incurvated profiles dominate in all assemblages, followed by twisted and then flat profiles. The convex profile is always the least common. Both incurvated and twisted profiles account for more than two thirds of all profiles in each assemblage, as would be expected when there is an emphasis on bifacial reduction (Marks, Monigal 1998, p.137).

Regarding distal profiles, there are some differences between assemblages. When hinged distal profiles are combined with blunted distal profiles, blank assemblages can be divided into two groups. In the first group (levels III/5-1A, III/5-1, III/5-1B, and III/5-2) the sum of hinged and blunted profiles account for roughly, or more than, two thirds of all profiles, respectively; in the second group (levels III/5-3, III/5-3B, and III/5-3B2) the feathering profiles dominate over the sum of hinged and blunted profiles. As a rule, distal profiles with blunt and hinged extremities resulted from hard hammer flaking, while feathering distal ends might be associated with the soft hammer mode of detachment.

Also, the blunted and hinged distal end could result from the working of dried raw materials (Marks, Monigal 1998). Therefore, it would appear that the differences between these two groups of assemblages might be best explained by the dominance of the soft hammer mode in assemblages with more feathering profiles, and from the working of dried raw materials in assemblages where hinged/blunted profiles are dominant.

Platform characteristics

The dominance of unprepared (plane plus cortical) platforms is extremely common in each of the assemblage from sub-unit III/5 (Table 11-9). Among the identified types of prepared platforms, the multiple faceted and dihedral butts predominate in all assemblages. Evidently, these specific features reflect closely the faceting indices for blanks from all levels. Since many blanks came from bifacial tool shaping / thinning / resharpening the relatively high faceting indices are to be expected.

Concerning platform angles, all assemblages share similar characteristics: right platforms and obtuse platforms are represented in near equal ratios (Table 11-9). In light of the absence of cores with obtuse supplementary platforms, the majority of blanks with obtuse butts might stem from bifacial tool shaping / thinning. Regarding platform lipping, assemblages are also closely related, here unlipped platforms dominate clearly over butts with lipping (Table 11-9). It is of note that platforms with lipping (lipped and semi-lipped) are commonly associated with the soft-hammer mode of detachment, and frequently stem from bifacial tool shaping/thinning, while unlipped butts might rather be connected with the hard hammer mode of core reduction (Marks, Monigal 1998).

Blank dimensions

All assemblages display the same size pattern among blanks: the average dimensions of retouched pieces and unifacial tools are greater among regular flakes, transverse flakes and blades than among the unretouched debitage sample for all blank types (Table 11-10).

The division of blanks according to their maximal dimensions shows that small blanks dominate in all assemblages: the majority of blanks fall into the 30-39 mm category (Table 11-11). The pattern of tool selection also shows a clear tendency, i.e. that larger blanks were used for tool production.

Tools

All assemblages show a similar tool spectrum: each assemblage features bifacial tools, unifacial tools, retouched pieces, and tool fragments (Table 11-12).

Bifacial tools

Bifacial tools make up only a relatively small percentage of the assemblages from each of the levels (Table 11-12). It should be noted that identifiable bifacial tools are absent in levels III/5-1A and III/5-1B, although bifacially elaborated tool fragments (broken bifacial tools) and/or some bifacial tool treatment elements were noted in each of these levels. Therefore, the bifacial technology is nevertheless attested in all assemblages. Both bifacial tools as well as bifacially worked tool fragments were plano-convex; combinations of stepped, scalar, and, rarer, sub-parallel retouch having been used in their treatment. Most of those were made on bifacially thinned blanks or on thin flint plaquettes, although massive flakes were also used for their production (Table 11-13). The bifacial tools exhibit much larger average dimensions than unifacial tools, retouched pieces, as well as unretouched blanks (Table 11-14 and Table 11-10, for comparison). Due to the small samples of bifacial tools, bifacial convergent shaped tools were only attested in the assemblages through tip fragments, and through the occurrence of convergent scrapers. In spite of this, it should be noted that among the definable bifacial tools, the majority comprises convergent shaped implements of foliates and crescent forms, followed by simple-shaped bifacial backed scrapers, while other bifacial forms are relatively seldom. A similar structure of bifacial tool kits is observed for Starosele industries.

Unifacial tools

These predominate in each of the assemblages from sub-unit III/5 and exhibit the closest typological and technological characteristics.

The majority of unifacial tools were made on flakes, although some tools were made on blades, and a few on chunks (Table 11-13). There is no evidence that chips were used as blanks for tool production. In each assemblage, the average dimensions of complete unifacial tools differ for tools made on blades, for tools made on regular flakes, and for tools made on transverse flakes. As could be shown via the comparative data, unifacial tools exhibit larger dimensions than unretouched blanks for all blank types (Table 11-10, for comparison). Most unifacial tools in each collection display an obverse retouch, while alternate retouched tools, as well as tools with inverse retouch and alternating retouch, occur only rarely.

The majority of unifacial tools show no accommodation elements, although inversely thinned, backed and truncated tools are observed (Table 11-15).

Investigations of tool treatment characteristics were carried out under consideration of bases from complete unifacial points and scrapers (Table 11-16). All assemblages exhibit similar ratios of retouched edges per tool, from 1.5 to 1.6, that is indicative of a high intensity of tool elaboration in each level. This suggestion is confirmed by other tool treatment characteristics. Among retouch types, scalar retouch is dominant, followed by stepped retouch. On the other hand, combined (sub-parallel plus scalar) retouch occurs only rarely. Regarding the retouch angle, the sum of semi-steep and steep retouched edges is dominant in all assemblages, although flat retouch edges always occur in appreciable portions. An analysis of the intensity of elaboration among tools has shown that heavy retouched tools dominate each of the assemblages, while lightly elaborated and medium elaborated tools occur in near similar ratios in all of the statistically representative assemblages.

Typologically, unifacial tools have been subdivided into points, scrapers, denticulates, notches, truncated-faceted tools, burins, perforators, and end-scrapers (Table 11-12). Most tool classes (with the exception of burins, perforators, and end-scrapers) were present in all assemblages. In spite of the small tool sample, the ratios of different tool classes as well as tool types are still suggestive.

The most frequent tool in each of the assemblages is the scraper. Among scrapers, those with a single retouched edge (lateral, transverse, and transverse-oblique) are predominant. Most pieces are convex and/or straight shaped, while scrapers with concave and wavy edges occur in only smaller portions (Table 11-12).

Double scrapers were available in small ratios in just four assemblages from levels III/5-1A, III/5-1, III/5-3, and III/5-3B (Table 11-12).

There are a relatively large numbers of convergent scrapers and points in all levels. Due to the distinction between points and convergent scrapers being somewhat arbitrary, these pieces were combined into one morphological category for comparative purposes. A common feature of all assemblages is the significant ratio of points and convergent scrapers of canted *(déjeté)* forms. The convergent scrapers and points exhibit several different shapes, which might be conjoined in accordance to edge shapes and edge arrangement, into seven groups: (1) sub-triangular shaped; (2) foliate shaped (sub-leaf and semi-leaf); (3) crescent shaped (sub-crescent, semi-crescent, and beck-shaped); (4) simple-canted shaped (semi-trapezoidal and semi-rectangular shaped); (5) complex-canted shaped (sub-trapezoidal and sub-rectangular shaped); (6) amorphously shaped; (7) unidentifiably shaped (broken tip fragments). With exception of the sub-triangular shaped, foliate shaped, and amorphously shaped items, tools from all proposed groups are observed in each of the tool kits (Table 11-12). This might underline the significant typological similarity between assemblages.

Denticulate tools, notched tools, and truncated-faceted tools are observed in most levels. Among these tools, a lateral or transverse positioned retouched edge/notch is common.

Two atypical end-scrapers, burins and perforator appear as rather exotic tools in assemblages. End-scrapers are made on chunks and exhibit typologically close implements. The burins comprise atypical simple and atypical multifaceted forms. The perforator is morphologically close to the points.

Retouched pieces

These are observed in all featured assemblages. The majority were made on flakes, although some were made on blades (Table 11-13). There is no evidence that chunks or chips were used as blanks for retouched pieces. In each assemblage, the average dimensions of complete retouched pieces differs for tools made on blades, for tools made on regular flakes, and for tools made on transverse flakes. From comparative data it has been ascertained that retouched pieces exhibit larger dimensions than unretouched blanks for all blank types (Table 11-10, for comparison). The majority of retouched pieces display an obverse retouch, only few pieces have an inverse and alternating retouch, or exhibit alternate elaboration. Regarding retouch types, pieces with a light marginal retouch dominate, followed by pieces with a very light (ephemeral) marginal retouch, while pieces with a discontinuous irregular scalar retouch occur only rarely (Table 11-17).

In all assemblages, retouched pieces exhibit the same typological pattern: laterally retouched pieces dominate, followed by distally transverse retouched, while bilaterally retouched pieces occur only rarely. It should be noted that such sequence of type occurrence among retouched pieces is similar to the pattern among simple types of unifacial scrapers.

Tool fragments

Tool fragments are composed of small parts of broken tools. All assemblages exhibit the same representation of unifacially and bifacially elaborated implements: unifacial broken tools always dominate over bifacial pieces.

The Pattern of Raw Material Exploitation

Inter-assemblage comparisons make it abundantly clear that all assemblages at Kabazi V, sub-unit III/5 are technologically and typologically homogeneous. Therefore, potentially, all discussed assemblages must also display a close pattern of raw material exploitation.

The closest sources of quality flint raw material are situated in close proximity, at a distance of about 1-1.5 km from the Kabazi V site. This large outcrop, known as Belaya (White) Mountain (another local name is Milnaya (Soap) Mountain) has produced flint nodules and plaquettes with the same characteristics as observed among raw material used for flint artefact production in the assemblages from sub-unit III/5 at Kabazi V. Another outcrop to exhibit such flints has been identified in the valley of the Bodrak River, at a distance of some 5-7 km from the site. In any case, both outcrops are good candidates for local raw material sources.

Analyses of the assemblages have shown that the majority of artefacts display cortical coverage. Many cores, preforms, chunks, and bifacially elaborated tools were made on flint plaquettes. Cortical flakes and blades, as well as primary elements, all make up appreciable portions in each of the blank assemblages (Table 11-7). Since there is good evidence of primary flaking in sub-unit III/5 , initial flint raw material reduction probably took place on-site. Obviously, pieces of raw material (plaquette, nodules, and possibly large natural chunks) were transported from sources to the site. It is important to note that primary flint flaking and the production of blanks for tools were based on core exploitation and bifacial tool shaping/thinning. The blanks obtained from both core exploitation and bifacial tool shaping/thinning were used intensively for unifacial tool production, as well in the production of retouched pieces, all of which took place on-site. All assemblages exhibit moderate percentages of tools and relatively high ratios of retouched edges per tool, features which might have resulted from a high intensity of tool usage and tool modification (Table 11-18). There is no clear evidence of tool import from other sites, although it cannot be ruled out that some may have arrived at the site with the group. In any case, a large part of heavily retouched bifacial and unifacial tools in each of the assemblages is in correspondence with the presence of a large number of tool treatment elements, including several bone retouchers (Chapter 15, this volume). Therefore, many such tools were probably reshaped/rejuvenated on-site. Thus, all stages of primary flaking, tool production and tool usage took place on-site.

According to a functional division of sites proposed by V. Chabai, Crimean Middle Palaeolithic occupations can be divided into several types of killing-butchering stations and short-term hunting camps (Chabai, Marks 1998; Chabai et al. 2000; Marks, Chabai 2001; Chabai 2004c; Chabai, Uthmeier 2006). By definition, killing-butchering sites are characterised by primary butchering of hunted animals, a limited core reduction activity, signatures of fire use, and off-site and/or on-site tool production. On the other hand, short-term hunting camps exhibit evidence for the presence of hearths or other kinds of fire-places, and are characterised by more varied activities than are encountered at killing-butchering sites. Further, they display a higher density of artefacts and faunal remains. There should also be evidence of primary and secondary butchering of hunted animals (represented by a several species), and a diversified tool production/use/discard.

All occupations of Kabazi V, sub-unit III/5 have revealed evidence of hearths and/or fire-places (Chapter 2, this volume), and for the occurrence of varied activities conducted on site. The relatively high density of artefacts per square metre, as well as per cubic metre, in each level of sub-unit III/5 reflects a high density of site occupations (Table 11-18). Thus, all levels appear to represent long-term occupations or series of short occupations (palimpsests). On the other hand, the majority of artefacts are represented by debris (in mean of artefacts per square metre) or unretouched debitage (in mean of artefacts per cubic metre), while each occupation left relatively small numbers of tools and cores. Also, all assemblages are characterised by small ratios of tools on blanks per cores + bifacials + preforms (Table 11-18). These features might be suggestive of the presence of small human groups and/or tool exportation.

The faunal remains do not conflict with the archaeological data (Chapter 6, this volume). Among the faunal remains, the frequency of burned pieces indicates the presence of hearths or fireplaces during all occupations. The fauna from the Kabazi V, sub-unit III/5 occupations includes very small numbers of individuals, usually of steppe (horse, saiga) species. In all occupations there is evidence of intensive bone processing, reflective of several short occupations during probably different seasons.

Obviously, these assemblages were left by small human groups over relatively short periods. Thus, both the archaeological and faunal data indicate that these occupations were seasonal hunting camps, oriented to the selective, possibly encounter-based hunting.

Kabazi V, Sub-Unit III/5 in the Context of the Crimean Micoquian

Essentially, assemblages from sub-unit III/5 at Kabazi V are identical in all ways and, thus, can be attributed to the same industry. Features which include the presence of bifacial tools elaborated in a specific plano-convex manner, by-products from bifacial tool shaping/thinning, an absence of cores with supplementary striking platforms, and a lack of Levallois blanks clearly indicate that all assemblages are characteristic of Crimean Micoquian industries.

The typological variability within the Crimean Micoquian is expressed by the differentiation of three facies: the Staroselian, the Kiik-Koba, and the Ak-Kaya. Whereas all feature the same bifacial technology and similar tool-kits, they do differ in the proportional occurrences of different tool classes (Chabai, Marks 1998, pp.366-367). Further, on the morphological level, there are larger distinctions among the proportional occurrences of bifacial tools, convergent tools, and simple tools. Nevertheless, even these represent continua rather than sharp breaks (Chabai et al. 2000; Chabai 2004c).

In a comparison of assemblages from sub-unit III/5 at Kabazi V with other Crimean Micoquian assemblages, several occupations were selected that are representative of all known facies (Tables 11-19 and 11-20): Staroselian (Starosele, level 1 and Kabazi V, complex C); Ak-Kaya (Zaskalnaya V, level III and Zaskalnaya VI, level III); and Kiik-Koba (Kiik-Koba, upper level and Buran Kaya III, level B).

From a typological perspective, the joint assemblage from sub-unit III/5 exhibits a relatively moderate percentage of points (14.1%) and a high percentage of scrapers (65.6%) with a low percentage of bifacial tools (9.0%). This might be more characteristic for the Staroselian (Table 11-19). On the other hand, the assemblage of Kabazi V, sub-unit III/5 differs clearly from both Ak-Kaya and Kiik-Koba industries in all typological instances.

From a morphological perspective (Table 11-20), the assemblage from sub-unit III/5 at Kabazi V displays a relatively high percentage of simple tools. Whereas this is also characteristic for the Ak-Kaya industry, the sub-unit V assemblages differ from Ak-Kaya in their high percentage of convergent and low percentage of bifacial tools. In fact, the percentage of bifacial tools in sub-unit III/5 is closer to that found in the Staroselian and Kiik-Koba, while the percentage of convergent tools is closer to that of the Staroselian, and much lower than in the Kiik-Koba facies.

Thus, the comparison of the aforementioned facies with the assemblages from sub-unit III/5 at Kabazi V indicates that the typological characteristics and morphological structures of the former are more reminiscent of the Staroselian, than they are of the Ak-Kaya. Further, they are clearly quite different to Kiik-Koba.

Conclusions

Kabazi V, sub-unit III/5 comprises seven occupations which have been attributed to industries belonging to the Crimean Micoquian, and most likely to the Staroselian facies. Preliminary AMS measurements have yielded an age for the occupation in level III/5-3B2 of around 38,780±360 BP (Chapter 3, this volume). All levels exhibit a relatively high density of occupation, intensive inhabitant activity, an on-site mode of primary flaking, as well as on-site tool production and tool use. Both archaeological and faunal investigations show clearly that all occupations in sub-unit III/5 at Kabazi V, were short-term season hunting camps that would have been dependent upon local raw material exploitation, and oriented to selective, possibly encounter-based hunting. On the other hand, each assemblage features only relatively small numbers of regular retouched unifacial and bifacial tools, most of which are heavily elaborated through resharpening and rejuvenation. This might suggest an intensive and relatively long usage of these pieces. Clearly, many such tools were left on-site, and additional tools were made on fresh blanks to replace exhausted ones. Therefore, it is logical that some of these newly made tools were also exported to other hunting stations.

Such a subsistence strategy would have been associated with highly mobile human activities, as demonstrated for the Middle Palaeolithic sites of Les Cannalettes (France) and Borisovskoe Gorge (northwest Caucasus), both situated in mid-altitude mountain regions, and for which the catchment areas for successive occupations would have been limited to a 20/25 km radius (Meignen, Brugal 2001; Hoffecker, Baryshnikov 1998). If this interpretation is also applied to the Crimea, the Kabazi V occupations must have laid at the centre of such a catchment area, particularly as raw material sources are local. Several Middle Palaeolithic sites, such as Starosele, levels 1 and 2, GABO, level 2,

	Points	Scrapers	Bifacials	Others	Industial facies
Zaskalnaya V, layer III	11.0	63.3	21.4	4.3	Ak-Kaya
Zaskalnaya VI, layer III	4.1	73.4	19.2	3.4	
Buran Kaya III, layer B	27.3	53.3	12.0	7.4	Kiik-Koba
Kiik-Koba, upper layer	38.2	35.7	11.8	14.3	
Starosele, level 1	16.9	58.1	10.5	14.5	Staroselian
Kabazi V, complex C	18.3	58.3	13.4	10.0	
Kabazi V, sub-unit III/5	14.1	65.6	9.0	11.3	

Table 11-19 Assemblages from Kabazi V, sub-unit III/5 in the typological context of the Crimean Micoquian. (Chabai 2004c; Demidenko 2004b; Marks and Monigal 1998; Yevtushenko 1998b)

	Bifacial tools[1]	Convergent tools[2]	Simple tools[3]	Facies
Zaskalnaya V, level III	23.6	30.4	46.1	Ak-Kaya
Zaskalnaya VI, level III	20.0	26.1	53.9	
Buran Kaya III, level B	13.0	52.3	34.7	Kiik-Koba
Kiik-Koba, upper level	13.8	59.3	26.9	
Starosele, level 1	12.3	41.5	46.2	Staroselian
Kabazi V, complex C	14.8	37.0	48.2	
Kabazi V, sub-unit III/5	10.1	38.4	51.5	

[1] bifacial points and scrapers [2] unifacial points and convergent scrapers
[3] unifacial lateral, transverse, transverse-oblique and double scrapers

Table 11-20 Assemblages of Kabazi V, sub-unit III/5 in the morphological context of the Crimean Micoquian. (Chabai 2004c; Demidenko 2004b; Marks and Monigal 1998; Yevtushenko 1998b)

Chokurcha I, Unit IV are situated no more than 10 to 15 km from Kabazi V and have been attributed to Crimean Micoquian industries (Marks and Monigal 1998; Chabai, Marks 1998; Chabai 2004b). For instance, the assemblages of Starosele, levels 1 and 2 are typologically, technologically, and structurally similar to those from Kabazi V, sub-unit III/5, and belong to the Staroselian facies. Moreover, a series of recent C^{14} AMS dates (Marks et al. 1998, pp.97-99; Chabai 2004c, pp.14-16) of these assemblages (41,200±1,800; 42,500±3,600) show that their age might be statistically identical to the age of occupations at Kabazi V, level III/5-3B2. As has been demonstrated by A. Marks and K. Monigal, the assemblages from Starosele, levels 1 and 2 suggest a complicated on-site / off-site mode of tool production that would have been dependent upon imported raw material and tool importation (Marks, Monigal 1998). Thus, some part of tools and/or raw materials from Kabazi V, sub-unit III/5 might have been exported to Starosele. Thus, hypothetically, all these sites may represent a contemporaneous chain of Micoquian hunting camps in the Western Crimean Midlands.

Abstract

КАБАЗИ V, ПАЧКА ГОРИЗОНТОВ III/5: СТАРОСЕЛЬСКАЯ ИНДУСТРИЯ

ЕВТУШЕНКО А. И.

Пачка горизонтов III/5, состоящая из семи горизонтов (III/5-1A, III/5-1, III/5-1B, III/5-2, III/5-3, III/5-3B, III/5-3B2), залегает в геологическом стратуме E3 (литологический слой 12A), состоящем из мелкоструктурных отложений скального грота, образовавшегося в окаменевшей глине эоценового (Eb) возраста. Поскольку эоценовая глина, из которой сложены стены грота, подвергалась постоянному воздействию природных факторов, ее разложение происходило интенсивно, что способствовало довольно быстрому погребению культурных остатков палеолитических поселений, располагавшихся в гроте. Культурные горизонты залегали в толще общей мощностью 30 – 50 см тонкими прослойками, насыщенными органическими материалами, толщиной от 1 до 4 см каждая (Табл. 11-1). Характер залегания культурных горизонтов позволяет предполагать, что они образовались за короткий период времени, и, вероятно представляют собой серию палимпсестов, которые получились в результате многократных кратковременных посещений грота людьми эпохи среднего палеолита.

Всего, в семи культурных горизонтах было найдено 105353 кремневых артефактов, которые типологически подразделены на 27 нуклеусов, 12 преформ, 496 орудий, 979 отщепов, 168 пластин, 1147 обломков и 102524 чешуек (Табл. 11-2). Хотя кремневые коллекции культурных горизонтов несколько отличаются друг от друга в количественном отношении, они демонстрируют близкие соотношения основных категорий каменных артефактов и сходные технико-типологические характеристики. Все семь культурных горизонтов имеют явные типологические и технологические особенности крымского микока.

В процессе изучения коллекций находок сравнительному анализу были подвергнуты все категории артефактов. Результаты разнообразных исследований помещены в статистические таблицы: метрические параметры чешуек (Табл. 11-3); типология и параметры обломков (Табл. 11-4); типология нуклеусов (Табл. 11-5); различные параметры сколов-заготовок (Табл. 11-6, 11-7, 11-8, 11-9, 11-10, 11-11);, типология и технологические особенности орудийных наборов (Табл. 11-12, 11-13, 11-14, 11-15, 11-16, 11-17); технико-типологические индексы и объективные показатели интенсивности поселений (Табл. 11-18), в период образования пачки горизонтов III/5.

В целом, индустрии культурных горизонтов пачки III/5 характеризуются преобладанием дебитажа, умеренным процентным выражением орудий (в среднем 29,5%), низким содержанием преформ и нуклеусов, среди которых преобладают односторонние с параллельной и подперекрестной системой расщепления плоскостные необъемные ядрища, без подготовленных вспомогательных площадок. Все нуклеусы специализированы для производства отщепов, нуклеусы для пластин отсутствуют. Нуклеусное расщепление не играло значимой роли при производстве сколов-заготовок, среди которых, как минимум, 20% были получены в процессе изготовления двусторонних орудий. Леваллуазские нуклеусы и сколы полностью отсутствуют в коллекциях всех культурных горизонтов пачки III/5. Средние значения технических показателей сколов характерны для микокских индустрий западного Крыма: IF large=36,9; IF strict=20,1; Ilam=13,5. Модель эксплуатации кремневого сырья ориентирована на местные месторождения кремня, расположенные на удалении от 1,5 до 5 км от стоянки. Кремневое сырье доставлялось к месту стоянки, судя по всему, в виде плитчатых конкреций и крупных кусков. Имеющиеся данные позволяют предполагать,

что на месте проводился полный цикл кремнеобработки от первичного расщепления до изготовления орудий и их переоформления. Вероятно, часть изготовленных орудий была унесена на другие стойбища.

Орудийный набор представлен следующими средними типологическими характеристиками (Табл. 11-19): остроконечники составляют 14,1%, скребла 65,6%, двусторонние изделия 9,0%, прочие орудия 11,3%. Среди остроконечников преобладают сегментовидные и листовидные формы, заметной долей представлены трапециевидные угловатые формы (Табл. 11-12). Среди скребел преобладают простые однолезвийные изделия, хотя конвергентные скребла, представленные теми же формами, что и остроконечники, играют заметную роль в коллекции. Зубчатые и выемчатые изделия составляют в сумме лишь 5,5%, скребки, резцы, транкированно-фасетированные изделия и проколки малочисленны. Подавляющее большинство односторонних скребел и остроконечников имеют дорсальную обработку, выполненную, главным образом, чешуйчатой ретушью, далеко заходящей на спинку заготовки. Довольно много орудий обработаны ступенчатой избыточной ретушью. Двусторонние орудия в основном представлены остроконечниками и конвергентными скреблами различных форм, среди которых листовидные и сегментовидные изделия играют заметную роль. Все двусторонние орудия изготовлены в плоско-выпуклой технике, с использованием чешуйчатой и комбинированной ретуши. В целом, технологически и типологически индустрии пачки горизонтов III/5 демонстрируют полный набор характерных черт микокского технокомплекса.

Морфологические характеристики индустрии, подсчитанные для комплекса односторонних и двусторонних скребел и остроконечников, имеют следующие показатели (Табл. 11-20): двусторонние орудия составляют 10,1%, орудия с конвергентными лезвиями 38,4%, простые орудия составляют 51,5%.

Таким образом, типологические и морфологические показатели индустрии Кабази V, III/5 наиболее близки кругу старосельских комплексов крымского микока.

Судя по характеру культурных остатков и интенсивности хозяйственной деятельности, поселения культурных горизонтов Кабази V, III/5 относятся к типу кратковременных охотничьих лагерей, ориентированных на специализированную охоту на стадных животных (сайгу и гидрунтиновую лошадь) в ближайшем окружении от места стоянки (Patou-Mathis, в этом томе).

Для самого нижнего культурного слоя III/5-3В2 имеется предварительная некалиброванная радиоуглеродная дата, сделанная по образцу угля: 38780±360 BP (Глава 3 в этом томе), которая статистически соответствует датам, полученным для стоянки Староселье, слой 1 (41200±1800; 42500±3600) (Marks et al., 1998, p. 97-99; Chabai 2004c, p. 14-16). Учитывая, что индустрии 1-го и 2-го слоев Староселья по всем типологическим и технологическим показателям практически идентичны комплексам Кабази V, III/5, можно предполагать, что эти памятники составляют звенья одной цепи в системе эксплуатации природных ресурсов Крымских предгорий.

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter 12

Kabazi V, Sub-Unit III/6: Flint Artefacts

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Sub-unit III/6 consists of two occupational levels: III/6-1-2 and III/6-3. Seeing as both these levels are the remnants of eroded living floors (Chapter 1, this volume), a high degree of homogeneity among the archaeological material was not expected.

Artefacts Composition

A total of 9,355 artefacts were recovered from sub-unit III/6, whereby the number of artefacts from level III/6-1-2 is about five times greater than from level III/6-3 (Table 12-1). Each of the artefact categories, with the exception of chips and flakes, is statistically incomplete. As usual, the majority of artefacts comprise chips. In the essential count (without chips and chunks) the most dominant artefacts are flakes. The percentage of tools is relatively high, being close to the upper range defined for the WCM, and the lower / mid range for Crimean Micoquian assemblages. The essential percentage of cores fits both to the lower range of the WCM and upper range of Micoquian artefact composition structures. At the same time, the essential percentage of blades is similar to that identified for the Micoquian. The core to debitage (flakes and blades) ratio is 1 : 35.4, and the core to tools ratio is 1 : 6.6. Both ratios are close to those defined for the WCM. Thus, sub-unit III/6 artefact structure can be described as intermediate between Crimean Micoquian and the WCM.

Chunks

There are 11 chunks in level III/6-1-2 and 8 chunks in level III/6-3. The maximum dimension of all these pieces lies below 5 cm. Thus, the average dimensions for chunks are as follows: length – 28.85 mm; width – 18.66; thickness – 9.74 mm. None of the chunk is thought to represent a raw material reserve.

Preforms

The only preform stems from level III/6-1-2. It is the fragment of a flint plaquette which had been tested by a few blows. The dimensions of the preform fragment are: length – 32.83 mm; width – 38.55 mm; thickness – 13.57 mm. A precise and correct

	Level III/6-1-2			Level III/6-3		
	#	%	esse %	#	%	esse %
Chips, <2.99 cm	7,568	97.46	·	1,538	97.09	·
Chunks	11	0.14	·	8	0.51	·
Preforms	1	0.01	0.54	1	0.06	2.63
Cores	5	0.06	2.69	·	·	·
Flakes	128	1.65	68.82	16	1.01	42.11
Blades	17	0.22	9.14	5	0.32	13.15
Tools	35	0.46	18.81	16	1.01	42.11
Total:	**7,765**	**100.00**	**100.00**	**1,584**	**100.00**	**100.00**
Bone retouchers	6			·		

Table 12-1 Kabazi V, sub-unit III/6: artefact totals.

classification of this piece is difficult, it being unclear whether we are dealing with the preform of a bifacial tool or a core. However, the thickness of this artefact best resembles those of the bifacial tools.

Cores

All five cores were recovered from level III/6-1-2. There are two unidirectional cores (one of which with a narrow flaking surface), one bidirectional core, and two unidentifiable core fragments. The only striking platform on the unidirectional core is small (width: 26.63 mm; thickness: 11.01 mm), is covered by cortex, and is characterised by a ca. 90° angle to the flaking surface. The flaking surface is rectangular, and its dimensions are not particularly impressive: length: 34.62 mm; width: 30.99 mm; thickness: 11.01 mm.

The unidirectional narrow flaking surface core exhibits a rectangular flaking surface and a small obtuse faceted striking platform (width: 24.59; thickness: 10.46). The dimensions of this piece are as follows: length – 50.83 mm; width – 24,08 mm; thickness – 41.78 mm.

The bidirectional core has a rectangular flaking surface with two main obtuse faceted striking platforms (Fig. 12-1, *5*). The main platforms are roughly the same size (width: ca. 40 mm; thickness: ca. 17 mm). There are no supplementary platforms. The two main opposed platforms are situated at an angle of about 60° to each other. The core dimensions are as follows: length – 59.16 mm; width – 57.22 mm; thickness – 24.37 mm.

Two further cores are represented by fragments of striking platforms, which are retouched and plain. The dimensions of the former are: width – 51.79 mm; thickness – 21.47 mm. The fragment of the plain striking platform is much smaller: width – 19.41 mm; thickness – 10.60 mm.

Some features of the core assemblage, such as the faceted platforms and the narrow flaking surface, correspond well with WCM methods of core reduction. At the same time, however, the absence of supplementary striking platforms is a clearly Micoquian attribute.

Debitage Structure

A total of 9,321 pieces of debitage were recovered from sub-unit III/6. The greater part of this material stems from level III/6-1-2 (Table 12-2), whereby chips very clearly dominate (97 %). In levels III/6-1-2 and III/6-3 the debitage from bifacial thinning and rejuvenation processes (chips, flakes and blades) accounts for 24.95 % and 15.39 % of this assemblage, respectively. The blade index for levels III/6-1-2 and III/2 lie at 13.56 and 16.22, accordingly. Both these values, i.e. the ratios of bifacial debitage and blade index values, again suggest an intermediate position between Micoquian and WCM assemblages. Firstly, whereas the blade indexes would be too small to be typically WCM, they would be relatively large in Micoquian terms, and secondly, while the percentages of bifacial debitage would be slightly too large for the WCM, they are somewhat small for the Micoquian.

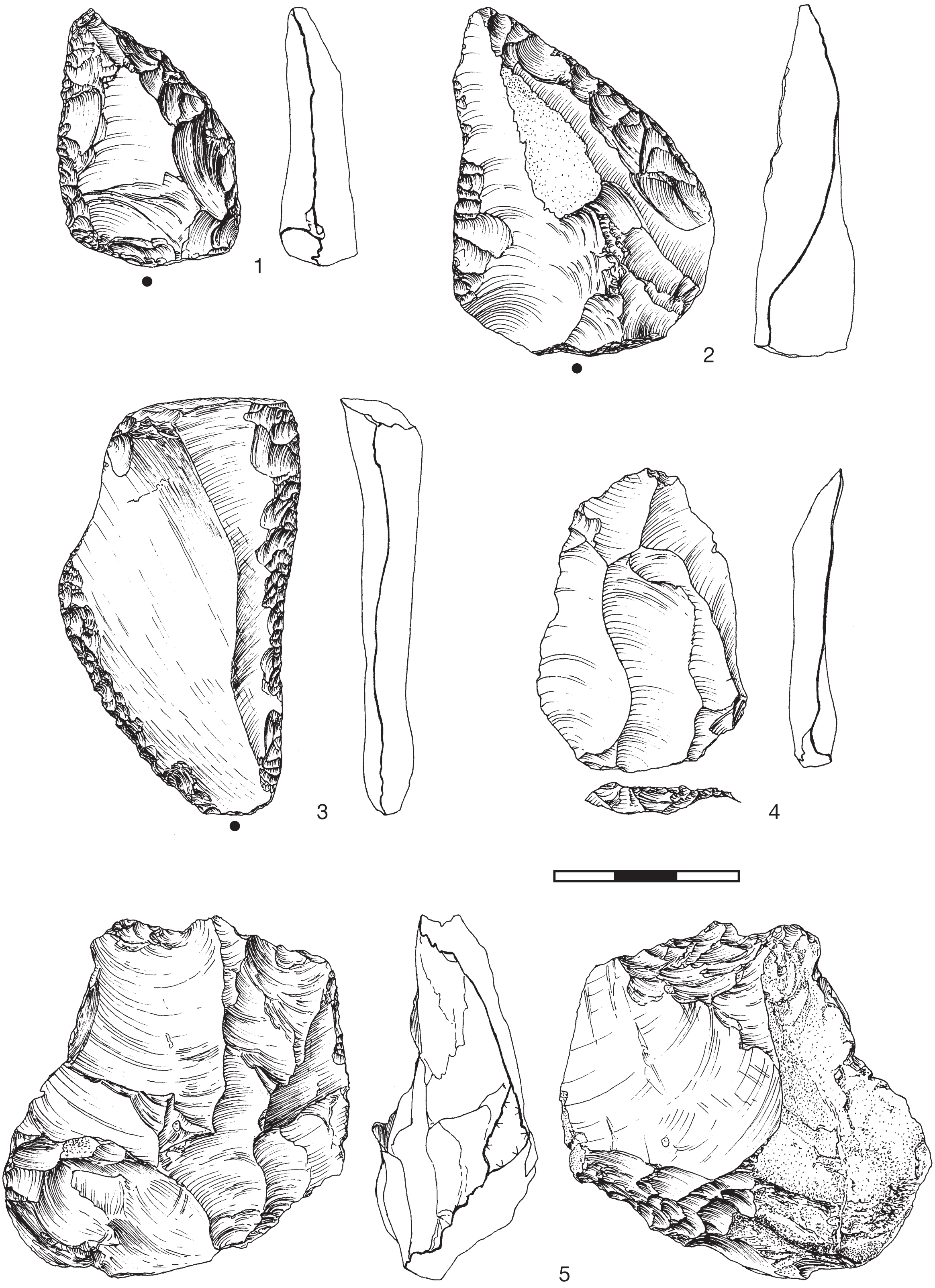

Fig. 12-1 Kabazi V, levels III/6-1-2 (1, 5) and III/6-3 (2, 3, 4). Artefacts: 1 – scraper, semi-crescent; 2 – scraper, convex-concave; 3 – scraper, wavy-convex; 4 – Levallois flake; 5 – core, bidirectional.

		Level III/6-1-2			Level III/6-3		
		#	%	esse %	#	%	esse %
Chips	"regular", 2.0-2.9 cm	158	2.04	14.60	44	2.79	26.04
	"regular", 0.1-1.9 cm	486	6.27	44.92	63	4.00	37.28
	"bifacial thinning", 2.0-2.9 cm	39	0.50	3.60	2	0.13	1.18
	"bifacial thinning", 0.1-1.9 cm	200	2.58	18.48	22	1.39	13.02
	"bifacial rejuvenating", 2.0-2.9 cm	2	0.03	0.19	·	·	·
	"bifacial rejuvenating", 0.1-1.9 cm	20	0.26	1.84	2	0.13	1.18
	unidentifiable	6,663	86.02	·	1,405	89.21	·
Flakes	"regular"	120	1.55	11.09	16	1.02	9.47
	"regular", modified in tools	24	0.31	2.22	14	0.89	8.28
	"bifacial thinning"	7	0.09	0.65	·	·	·
	"bifacial thinning", modified in tools	2	0.03	0.19	·	·	·
	natural	1	0.01	·	·	·	·
	natural, modified in tools	·	·	·	1	0.06	·
Blades	"regular"	17	0.22	1.57	5	0.32	2.96
	"regular", modified in tools	7	0.09	0.65	1	0.06	0.59
	Total:	**7,746**	**100.00**	**100.00**	**1,575**	**100.00**	**100.00**

Table 12-2 Kabazi V, sub-unit III/6: blank assemblage composition.

Chips

Among the identifiable chips, 19.55 % of pieces from level III/6-3 and 28.84 % of pieces from level III/6-1-2 stem from bifacial thinning and rejuvenation. These values are about two times lower than those observed in level III/2, where an intensive production of bifacial tools was identified, but are twice larger than in level IV/1 which is known to have been characterised by intensive on-site core reduction (Chapters 8 and 14, this volume).

Flakes and blades

Whereas 9 bifacial thinning flakes were identified in level III/6-1-2, not a single bifacial thinning blade was discovered (Table 12-2). Also, there are neither bifacial thinning blades nor flakes in level III/6-3. In level III/6-1-2 bifacial thinning flakes make up 5.09 % of all identifiable flakes and blades. In fact, the number of blades is statistically incomplete (Table 12-2). For this reason all considerations regarding the role of blade production in sub-unit III/6 assemblages remain extremely hypothetical. At the same time, the core assemblage from level III/6-1-2 offers an opportunity to consider both on-site blade production and the implication of Levallois technology; one Levallois flake (Fig. 12-1, *4*) was found in level III/6-3, and a *débordante* flake fragment was recovered from level III/6-1-2.

Cortex

In sub-unit III/6 the majority of dorsal surfaces of both flakes and blades exhibit areas covered by cortex (56.04 % of flakes and 55.56 % of blades; Table 12-3), with the majority of blades, as well as flakes, displaying different kinds of lateral cortex (Table 12-4). At the same time, heavily corticated flakes (with >50 % cortex coverage) are twice as numerous as heavily corticated blades.

Dorsal scar pattern

Unidirectional and unidirectional-crossed dorsal scar patterns prevail in both flake and blade assemblages (Table 12-5). Further, flakes with a cortified dorsal surface also constitute a relatively frequently testified group.

Shapes & axes

The flake assemblage is dominated by trapezoidal, rectangular, and triangular shaped pieces. Among

	Flakes		Blades		Total		
	#	%	#	%	#	%	
0 %	72	46.75	7	29.16	79	44.38	**Level III/6-1-2**
1-25 %	30	19.48	6	25.00	36	20.23	
26-50 %	18	11.69	9	37.50	27	15.17	
51-75 %	12	7.79	1	4.17	13	7.30	
>76 %	22	14.29	1	4.17	23	12.92	
Total:	**154**	**100.00**	**24**	**100.00**	**178**	**100.00**	
0 %	11	35.48	3	50.00	14	37.84	**Level III/6-3**
1-25 %	9	29.03	3	50.00	12	32.43	
26-50 %	4	12.91	·	·	4	10.81	
51-75 %	2	6.45	·	·	2	5.41	
>76 %	5	16.13	·	·	5	13.51	
Total:	**31**	**100.00**	**6**	**100.00**	**37**	**100.00**	

Table 12-3 Kabazi V, sub-unit III/6: cortex percentages, by blank types.

	Flakes		Blades		Total		
	#	%	#	%	#	%	
None	72	46.75	7	29.16	79	44.38	**Level III/6-1-2**
Proximal	7	4.55	2	8.33	9	5.06	
Central	5	3.25	·	·	5	2.81	
Lateral	24	15.58	9	37.50	33	18.54	
Bilateral	1	0.65	1	4.17	2	1.12	
Lateral-distal	15	9.74	3	12.50	18	10.11	
Distal	7	4.55	1	4.17	8	4.49	
Distal-Proximal	1	0.65	·	·	1	0.56	
>76 %	22	14.28	1	4.17	23	12.93	
Total:	**154**	**100.00**	**24**	**100.00**	**178**	**100.00**	
None	11	35.47	3	50.00	14	37.84	**Level III/6-3**
Proximal	3	9.68	·	·	3	8.11	
Central	1	3.23	1	16.66	2	5.41	
Lateral	4	12.90	1	16.66	5	13.51	
Bilateral	1	3.23	·	·	1	2.70	
Lateral-distal	1	3.23	1	16.66	2	5.41	
Distal	5	16.13	·	·	5	13.51	
>76 %	5	16.13	·	·	5	13.51	
Total:	**31**	**100.00**	**6**	**100.00**	**37**	**100.00**	

Table 12-4 Kabazi V, sub-unit III/6: cortex placement, by blank types.

	Flakes #	Flakes %	Blades #	Blades %	Total #	Total %	
Cortex	22	14.97	1	4.17	23	13.45	Level III/6-1-2
Lateral	13	8.84	3	12.5	16	9.36	
Bilateral	2	1.36	1	4.17	3	1.75	
Radial	14	9.52	·	·	14	8.19	
Converging	10	6.80	·	·	10	5.85	
Unidirectional	40	27.21	11	45.83	51	29.82	
Unidirectional-crossed	29	19.73	4	16.66	33	19.29	
Bidirectional	8	5.45	3	12.5	11	6.43	
Bidirectional-crossed	7	4.76	1	4.17	8	4.68	
Crested	1	0.68	·	·	1	0.59	
Plain (Yanus flake)	1	0.68	·	·	1	0.59	
Total:	**147**	**100.00**	**24**	**100.00**	**171**	**100.00**	
Unidentifiable	7		·		7		
Cortex	5	17.24	·	·	5	14.29	Level III/6-3
Lateral	2	6.90	·	·	2	5.71	
Bilateral	1	3.45	·	·	1	2.86	
Radial	1	3.45	·	·	1	2.86	
Converging	2	6.90	1	16.67	3	8.57	
Unidirectional	8	27.59	3	50.00	11	31.43	
Unidirectional-crossed	4	13.78	2	33.33	6	17.14	
Bidirectional	2	6.90	·	·	2	5.71	
Bidirectional-crossed	3	10.34	·	·	3	8.57	
Crested	1	3.45	·	·	1	2.86	
Total:	**29**	**100.00**	**6**	**100.00**	**35**	**100.00**	
Unidentifiable	2		·		2		

Table 12-5 Kabazi V, sub-unit III/6: dorsal scar pattern, by blank types.

blades, rectangular shapes are the most characteristic, followed by triangular and trapezoidal elongated (Table 12-6) pieces. The majority of flakes were removed off-axis, while the most part of blades were removed on-axis (Table 12-7).

Blank profiles and cross-sections

There are also some anticipated differences to be observed in flake and blade profiles. Among flakes, flat pieces, with incurvate mid point lateral profiles, and with feathering and / or hinged distal extremities, are the most common (Tables 12-8 and 12-9). Blades tend to be characterised by twisted lateral profiles, and by blunt or feathering distal ends (Tables 12-8 and 12-9). At their mid-point cross-sections the majority of both flakes and blades are either triangular or trapezoidal (Table 12-10).

Platform preparation

The flakes from level III/6-1-2 constitute the largest debitage assemblage with unbroken platforms (Table 12-11). Faceting indexes for flakes from level III/6-1-2 are Ifl=38.88; Ifs=13.33. Taken in total, both flake and blade assemblages from level III/6-1-2 display very similar index values: Ifl=39.0; Ifs=13.0. Such a low rate of faceted platforms is one of the main characteristic features of the Crimean Micoquian. There are slightly more semi-lipped and lipped platforms than unlipped (Table 12-12). Right angle and obtuse angle platforms are practically equal in number (Table 12-13).

Blank dimensions

Table 12-14 shows the average dimensions of debitage assemblages from levels III/6-1-2 and III/6-3.

	Flakes		Blades		Total		
	#	%	#	%	#	%	
Rectangular	15	14.29	10	55.56	25	20.33	Level III/6-1-2
Triangular	11	10.48	2	11.10	13	10.57	
Trapezoidal	47	44.76	·	·	47	38.21	
Trapezoidal elongated	8	7.62	2	11.10	10	8.13	
Ovoid	6	5.71	1	5.56	7	5.69	
Leaf-shaped	5	4.76	1	5.56	6	4.88	
Crescent	5	4.76	1	5.56	6	4.88	
Irregular	8	7.62	1	5.56	9	7.31	
Total:	**105**	**100.00**	**18**	**100.00**	**123**	**100.00**	
Unidentifiable	49		6		55		
Rectangular	4	18.17	3	60.00	7	25.93	Level III/6-3
Triangular	·	·	·	·	·	·	
Trapezoidal	9	40.90	·	·	9	33.33	
Trapezoidal elongated	3	13.63	·	·	3	11.11	
Ovoid	2	9.10	·	·	2	7.41	
Leaf-shaped	·	·	·	·	·	·	
Crescent	2	9.10	2	40.00	4	14.81	
Irregular	2	9.10	·	·	2	7.41	
Total:	**22**	**100.00**	**5**	**100.00**	**27**	**100.00**	
Unidentifiable	9		1		10		

Table 12-6 Kabazi V, sub-unit III/6: shapes, by blank types.

	Flakes		Blades		Total		
	#	%	#	%	#	%	
On-axis	29	27.62	16	80.00	45	36.00	Level III/6-1-2
Off-axis	76	72.38	4	20.00	80	64.00	
Total:	**105**	**100.00**	**20**	**100.00**	**125**	**100.00**	
Unidentifiable	49		4		53		
On-axis	8	34.78	2	40.00	10	35.71	Level III/6-3
Off-axis	15	65.22	3	60.00	18	64.29	
Total:	**23**	**100.00**	**5**	**100.00**	**28**	**100.00**	
Unidentifiable	8		1		9		

Table 12-7 Kabazi V, sub-unit III/6: axes, by blank types.

Level		Flakes #	Flakes %	Blades #	Blades %	Total #	Total %
Level III/6-1-2	Flat	37	26.24	7	29.17	44	26.67
	Incurvate medial	39	27.66	2	8.33	41	24.85
	Incurvate distal	22	15.60	2	8.33	24	14.55
	Twisted	21	14.90	12	50.00	33	20.00
	Convex	22	15.60	1	4.17	23	13.93
	Total:	**141**	**100.00**	**24**	**100.00**	**165**	**100.00**
	Unidentifiable	13		·		13	
Level III/6-3	Flat	5	17.24	1	16.67	6	17.14
	Incurvate medial	3	10.35	·	·	3	8.57
	Incurvate distal	11	37.93	·	·	11	31.43
	Twisted	6	20.69	5	83.33	11	31.43
	Convex	4	13.79	·	·	4	11.43
	Total:	**29**	**100.00**	**6**	**100.00**	**35**	**100.00**
	Unidentifiable	2		·		2	

Table 12-8 Kabazi V, sub-unit III/6: lateral profiles, by blank types.

Level		Flakes #	Flakes %	Blades #	Blades %	Total #	Total %
Level III/6-1-2	Feathering	58	50.00	5	41.67	63	49.22
	Hinged	35	30.17	·	·	35	27.34
	Overpassed	2	1.73	·	·	2	1.56
	Blunt	21	18.1	7	58.33	28	21.88
	Total:	**116**	**100.00**	**12**	**100.00**	**128**	**100.00**
	Retouched	7		4		11	
	Missing	31		8		39	
Level III/6-3	Feathering	5	20.00	·	·	5	17.24
	Hinged	6	24.00	2	50.00	8	27.59
	Overpassed	2	8.00	·	·	2	6.89
	Blunt	12	48.00	2	50.00	14	48.28
	Total:	**25**	**100.00**	**4**	**100.00**	**29**	**100.00**
	Retouched	4		·		4	
	Missing	2		2		4	

Table 12-9 Kabazi V, sub-unit III/6: distal end profiles, by blank types.

Whereas the assemblage from level III/6-1-2 provides some acceptable data, material from level III/6-3 is statistically incomplete. Length, width and thickness parameters of both flakes and blades from level III/6-1-2 are similar to the debitage assemblage from level III/2 (cf. Table 8-15, Chapter 8, this volume), although average dimensions are still much smaller in the former (III/6-1-2) than in the latter (III/2) level. Additionally, all aforementioned debitage dimensions are much smaller than noted, for example, in level IV/1 (cf. Table 14-14, Chapter 14, this volume).

	Flakes		Blades		Total		
	#	%	#	%	#	%	
Flat	2	1.49	·	·	2	1.27	Level III/6-1-2
Triangular	44	32.84	16	66.66	60	37.98	
Lateral steep	17	12.69	1	4.17	18	11.39	
Trapezoidal	38	28.36	6	25.00	44	27.85	
Polyhedral	10	7.46	·	·	10	6.33	
Convex	8	5.97	1	4.17	9	5.69	
Irregular	15	11.19	·	·	15	9.49	
Total:	**134**	**100.00**	**24**	**100.00**	**158**	**100.00**	
Unidentifiable	20				20		
Triangular	9	34.62	3	50.00	12	37.50	Level III/6-3
Lateral steep	7	26.92	·	·	7	21.87	
Trapezoidal	5	19.23	3	50.00	8	25.00	
Polyhedral	3	11.54	·	·	3	9.38	
Irregular	2	7.69	·	·	2	6.25	
Total:	**26**	**100.00**	**6**	**100.00**	**32**	**100.00**	
Unidentifiable	5		·		5		

Table 12-10 Kabazi V, sub-unit III/6: cross-sections, by blank types.

	Flakes		Blades		Total		
	#	%	#	%	#	%	
Cortex	11	12.22	·	·	11	11.00	Level III/6-1-2
Plain	44	48.90	6	60.00	50	50.00	
Dihedral	11	12.22	2	20.00	13	13.00	
Polyhedral	12	13.33	1	10.00	13	13.00	
Faceted straight	7	7.78	·	·	7	7.00	
Faceted convex	4	4.44	1	10.00	5	5.00	
Faceted concave	1	1.11	·	·	1	1.00	
Total:	**90**	**100.00**	**10**	**100.00**	**100**	**100.00**	
	2		·		2		
Crushed	11		4		15		
Missing	51		10		61		
Cortex	4	16.67	·	·	4	14.82	Level III/6-3
Plain	7	29.16	1	33.33	8	29.62	
Dihedral	4	16.67	·	·	4	14.82	
Polyhedral	2	8.33	·	·	2	7.41	
Faceted straight	4	16.67	·	·	4	14.82	
Faceted convex	3	12.50	2	66.67	5	18.51	
Total:	**24**	**100.00**	**3**	**100.00**	**27**	**100.00**	
Crushed	·		1		1		
Missing	7		2		9		

Table 12-11 Kabazi V, sub-unit III/6: platform types, by blank types.

	Flakes #	Flakes %	Blades #	Blades %	Total #	Total %	
Lipped	27	29.35	·	·	27	26.47	Level III/6-1-2
Semi-lipped	25	27.17	6	60.00	31	30.39	
Unlipped	40	43.48	4	40.00	44	43.14	
Total:	**92**	**100.00**	**10**	**100.00**	**102**	**100.00**	
Unidentifiable	62		14		76		
Lipped	3	12.50	·	·	3	11.11	Level III/6-3
Semi-lipped	3	12.50	1	33.33	4	14.82	
Unlipped	18	75.00	2	66.67	20	74.07	
Total:	**24**	**100.00**	**3**	**100.00**	**27**	**100.00**	
Unidentifiable	7		3		10		

Table 12-12 Kabazi V, sub-unit III/6: lipping, by blank types.

	Flakes #	Flakes %	Blades #	Blades %	Total #	Total %	
Acute	1	1.15	·	·	1	1.03	Level III/6-1-2
Obtuse	42	48.28	4	40.00	46	47.42	
Right	44	50.57	6	60.00	50	51.55	
Total:	**87**	**100.00**	**10**	**100.00**	**97**	**100.00**	
Unidentifiable	67		14		81		
Acute	·	·	·	·	·	·	Level III/6-3
Obtuse	5	20.83	·	·	5	18.52	
Right	19	79.17	3	100.00	22	81.48	
Total:	**24**	**100.00**	**3**	**100.00**	**27**	**100.00**	
Unidentifiable	7		3		10		

Table 12-13 Kabazi V, sub-unit III/6: platform angles, by blank types.

Summary of attribute analysis

The studied attributes do not provide sufficient grounds for an exact industrial affiliation of material recovered from sub-unit III/6. For example, although the WCM characteristics among cores might correlate with the presence of blades, Levallois, and *débordante* flakes in the assemblage as a whole, at the same time the observed faceting indexes are certainly not in accord with the identified core faceted striking platforms. Further, although blank dimensions, profiles and shapes more closely resemble features of bifacial tool production encountered in Crimean Micoquian assemblages, debitage ratios from bifacial thinning and rejuvenation processes are too small to be suggestive of on-site bifacial tool production.

	Blank types	III/6-1-2	III/6-3
Length	flakes including tools	30.31	39.02
	blades including tools	41.17	40.34
	blanks (flakes & blades)	30.23	36.67
	tools	37.31	45.64
Width	flakes including tools	31.76	35.08
	blades including tools	17.10	16.88
	blanks (flakes & blades)	29.50	31.65
	tools	29.31	31.38
Thickness	flakes including tools	5.73	6.77
	blades including tools	4.85	3.91
	blanks (flakes & blades)	5.38	6.58
	tools	6.43	5.95
Platform width	flakes including tools	14.37	15.10
	blades including tools	7.32	11.68
	blanks (flakes & blades)	12.45	16.26
	tools	23.48	11.64
Platform thickness	flakes including tools	5.06	5.71
	blades including tools	3.22	3.43
	blanks (flakes & blades)	4.38	5.86
	tools	8.90	4.64

Table 12-14 Kabazi V, sub-unit III/6: debitage average dimensions, in mm.

Tools

The assemblages from sub-unit III/6 comprise a total of 51 tools, the majority of which stem from level III/6-1-2 (Table 12-15). The tool assemblage structure of sub-unit III/6 is represented by the following tool classes: points (N=7), scrapers (N=13), retouched pieces (N=10), thinned pieces (N=1), and unidentifiable items (N=20).

Points

All points were recovered from level III/6-1-2 (Table 12-15). Three of the seven are of the distal type. All points were made on blades, two of which (distal points) were complete. The dimensions of the two complete distal points are as follows: length – 33.48 mm and 49.67 mm; width – 16.20 mm and 17.24 mm; thickness – 3.65 mm and 8.71 mm, respectively. The distal points were made using obverse scalar flat/semi-abrupt retouch. The semi-leaf point is broken, its proximal part being absent. It was probably made on a flake. A combination of scalar/parallel flat/semi-abrupt retouch techniques was used in the production of semi-leaf points. There are three more fragments of point tips. Generally speaking, point typology is characteristic of WCM industries.

Scrapers

The 13 scrapers from sub-unit III/6 are subdivided into three different morphological groups: simple scrapers (N=6), double scrapers (N=4) and convergent scrapers (N=3). Simple scrapers comprise one-edge longitudinal pieces discovered in level III/6-1-2; four of these have a straight edge, one a convex edge, and one scraper has a concave edge (Table 12-15). All were made on flakes. Two straight scrapers were made using obverse scalar flat/semi-abrupt retouch. The straight scraper with a natural back was made using obverse scalar stepped, semi-abrupt retouch. A further straight scraper was elaborated by an inverse scalar flat retouch. The production of convex and concave scrapers involved the application

	III/6-1-2	III/6-3	Total:
Points			
Distal, dorsal	3	·	3
Semi-leaf, dorsal	1	·	1
Unidentifiable, dorsal	3	·	3
Scrapers			
Straight, dorsal	2	·	2
Straight, ventral	1	·	1
Straight, dorsal, thinned base, backed	1	·	1
Convex, dorsal	1	·	1
Concave, dorsal	1	·	1
Double-convex, dorsal	2	·	2
Convex-concave, dorsal	·	1	1
Wavy-convex, dorsal	·	1	1
Semi-trapezoidal, dorsal, bi-terminaly thinnned	1	·	1
Semi-crescent, dorsal	1	·	1
Convergent-amorphous dorsal	1	·	1
Sub-Total:	**18**	**2**	**20**
Retouched Pieces:			
Lateral, dorsal	·	4	4
Lateral-distal, dorsal	1	·	1
Bilateral, dorsal	1	2	3
Lateral, ventral	1	·	1
Distal, dorsal	1	·	1
Thinned Pieces			
Lateral, ventral	·	1	1
Unidentifiable			
Unidentifiable, dorsal	10	7	17
Unidentifiable, alternate	1	·	1
Unidentifiable, bifacial	2	·	2
Total:	**35**	**16**	**51**

Table 12-15 Kabazi V, sub-unit III/6: tools.

of scalar flat and scalar abrupt retouch processes. Longitudinal dimensions of scrapers are as follows: length from 27.82 to 45.89 mm; width from 22.41 to 47.00 mm; and thickness from 3.77 to 14.07 mm.

Double scrapers comprise double-convex, convex-concave and wavy-convex (Table 12-15) types. Whereas the double-convex scrapers were found solely in level III/6-1-2, all others come from level III/6-3. Double-convex scrapers were made on both a blade and on a flake using obverse scalar abrupt and obverse scalar flat retouch, respectively. The dimensions of the double-convex scraper on a blade are as follows: length – 50.86 mm; width – 17.69 mm; thickness – 5.77 mm. The double-convex scraper on a flake displays the following parameters: length – 27.84 mm; width – 38.69 mm; thickness – 4.54 mm. Both convex-concave (Fig. 12-1, *2*) and wavy-convex (Fig. 12-1, *3*) scrapers are made on flakes using combinations of dorsal scalar flat and semi-abrupt retouch. The wavy-convex scraper is the largest tool from the sub-unit III/6 assemblage: length – 68.20 mm; width – 38.54 mm; thickness – 6.50 mm. The convex-concave scraper is slightly smaller: length – 60.05 mm; width – 43.11 mm; thickness – 9.29 mm.

All convergent scrapers were found in level III/6-1-2. Convergent scrapers are represented by semi-trapezoidal, bi-terminally thinned; semi-crescent (Fig. 12-1, *1*); and amorphous examples. All three scraper types were made on flakes using obverse scalar semi-abrupt retouch. The amorphous scraper is broken – the proximal part is missing. The semi-crescent (length – 42.43 mm; width – 20.09 mm; thickness – 8.25 mm) and semi-trapezoidal, bi-terminally thinned (length – 42.72 mm; width – 54.81 mm; thickness – 17.11 mm) convergent scrapers are middle size tools.

Generally speaking, the scraper typology in sub-unit III/6 is more reminiscent of WCM industries, although of course, such forms as the semi-crescent, and especially semi-trapezoidal, bi-terminally thinned scrapers, might be viewed as reprehensive of a Micoquian component.

Retouched pieces

Four retouched pieces originate from level III/6-1-2, with six further pieces from level III/6-3. The main retouch combinations are: obverse irregular flat/semi abrupt scalar/marginal. The typological structure of retouched pieces is presented in Table 12-15. In level III/6-1-2 three retouched pieces were made on flakes and one on a broken blade (bilaterally retouched). The dimensions of the complete retouched pieces are as follows: length – 29.94 – 34.86 mm; width – 18.06 – 57.28 mm; thickness – 3.47 – 14.48 mm.

All retouched pieces from level III/6 were made on flakes. Three pieces were complete: one bilateral and two lateral artefacts. Their sizes range as follows: length from 29.43 to 50.96 mm; width from 25.93 to 35.51 mm; and thickness from 4.01 to 7.73 mm.

	Placement	Type	Angle	III/6-1-2	III/6-3	Total:
Points	obverse	sub-parallel	flat	1	·	1
	obverse	scalar	semi-abrupt	2	·	2
	obverse	scalar	flat	4	·	4
Scrapers	obverse	scalar	abrupt	2	·	2
	obverse	scalar	semi-abrupt	3	·	3
	obverse	scalar	flat	3	2	5
	obverse	stepped	semi-abrupt	2	·	2
	inverse	scalar	flat	1	·	1
Retouched pieces	obverse	scalar	flat	2	4	6
	obverse	scalar	semi-abrupt	·	1	1
	obverse	sub-parallel	semi-abrupt	·	1	1
	inverse	scalar	semi-abrupt	1	·	1
	obverse	marginal	flat	1	·	1
Thinned pieces	inverse	scalar	semi-abrupt	·	1	1
Unidentifiable	obverse	scalar	semi-abrupt	6	4	10
	obverse	scalar	abrupt	1	1	2
	obverse	scalar	flat	5	2	7
	alternate	scalar	semi-abrupt	1	·	1
			Total:	**35**	**16**	**51**

Table 12-16 Kabazi V, sub-unit III/6: tools, retouch characteristics.

Thinned pieces

The only thinned piece stems from level III/6. The lateral side of this flake (length: 45.85 mm; width: 34.70 mm; thickness: 11.03 mm) had been thinned by scalar facets.

Unidentifiable tools

Heavily fragmented tools are represented by 17 pieces of flakes/blades with obverse retouch, and one fragment of a tool on a flake with alternate retouch. Further, there are two fragments (distal and proximal) of bifacial tools. Both were made in the plano-convex manner.

On the whole, the two most frequent combinations of retouch are obverse scalar flat and obverse scalar semi-abrupt (Table 12-16). In 38 of 51 cases these two combinations are attested.

Conclusion

The mixture of WCM and Micoquian attributes in sub-unit III/6 assemblages was caused by depositional processes. Both levels of sub-unit III/6 were located on eroded surfaces at the transition between geological layers 12A and 14A. It is likely that levels III/6-1-2 and III/6-3 are the remnants of a number of eroded Micoquian and WCM occupations.

Abstract

КАБАЗИ V, ПАЧКА ГОРИЗОНТОВ III/6: КРЕМНЕВЫЕ АРТЕФАКТЫ

ЧАБАЙ В.П.

В пачке III/6 было обнаружено два горизонта залегания кремня и фаунистических остатков: III/6-1-2 и III/6-3. Оба горизонта представляют собой остатки эродированных жилых поверхностей (см. Главу 1, в этом томе).

Всего в пачке горизонтов III/6 найдено 9355 артефактов. Большая часть артефактов происходит из горизонта III/6-1-2 (Table 12-1). Коллекция нуклеусов характеризуется преобладанием типов с параллельными огранками рабочих поверхностей и фасетированными ударными площадками (Fig. 12-1, *5*). С таким набором нуклеусов неплохо ассоциируются находки отщепов леваллуа (Fig. 12-1, *4*) и débordantes. С другой стороны, индекс фасетажа ударных площадок сколов (Ifl=39,0; Ifs=13,0 для горизонта III/6-1-2) и индекс пластин (Ilam=13,56 для горизонта III/6-1-2 и Ilam=16,22 для горизонта III/6-3) не соответствуют типологии нуклеусов. Процентное соотношение сколов обработки двусторонних орудий невелико: 24,95 % для горизонта III/6-1-2 и 15,39 % для горизонта III/6-3. Такие процентные показатели сколов обработки двусторонних орудий являются явно недостаточными для микокских комплексов и более чем высокими для леваллуа-мустьерских индустрий. Также следует упомянуть очень незначительные усредненные параметры отщепов и пластин (Table 12-14), которые мало соответствуют результатам нуклеусного расщепления, а более подходят для отходов изготовления двусторонних орудий.

Орудийный набор пачки горизонтов III/6 (Table 12-15) представлен следующими классами изделий: остроконечники (7 экз.), скребла (13 экз.), сколы с ретушью (10 экз.), сколы с утончением (1 экз.), неопределимые на уровне класса фрагменты односторонних (18 экз.) и двусторонних (2 экз.) орудий. Среди остроконечников преобладают дистальные формы (3 экз.), представлены полулистовидный (1 экз.) и неопределимые (3 экз.). Скребла

подразделяются на продольные (6 экз.), двойные (4 экз.) и конвергентные (3 экз.) формы. Среди продольных форм преобладают скребла с прямым лезвием (Table 12-15). Двойные скребла представлены двояковыпуклыми, выпукло-вогнутыми (Fig. 12-1, *2*) и извилисто-выпуклыми типами (Fig. 12-1, *3*). К конвергентным скреблам отнесены полутрапециевидное, полусегментовидное (Fig. 12-1, *1*) и аморфное изделия. Сколы с ретушью представлены, в основном, латерально ретушированными отщепами. Наиболее часто встречающимися комбинациями ретуши для всех классов орудий являются дорсальная чешуйчатая плоская или полукрутая (Table 12-16). Типология орудийного набора более соответствует леваллуа-мустьерскому технокомплексу, хотя полутрапециевидное и полусегментовидное скребла, а также два фрагмента двусторонних орудий составляют ярко выраженный микокский компонент.

В целом, технико-типологические характеристики кремневых комплексов пачки горизонтов III/6 носят смешанный характер. Скорее всего, горизонты III/6-1-2 и III/6-3 являются остатками целого ряда эродированных жилых поверхностей, на которых обитали носители микокского и леваллуа-мустьерского технокомплексов.

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter
14

Kabazi V, Unit IV: Western Crimean Mousterian

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Kabazi V, Unit IV has been subdivided into three different archaeological levels: IV/1, IV/2 and IV/3. Excavations of level IV/1, which concentrated on an area of about 20 m², yielded an artefact density of some 1397.5 items per m³. Levels IV/2 and IV/3 were each excavated in areas of roughly 15 m²; artefact densities in these levels were recorded at 870.8 and 427.8 artefacts per m³, respectively. It is of particular note that these artefact densities are among the highest ever recorded for Western Crimean Mousterian (WCM) occupations.

Artefact Assemblage Structure

The total number of artefacts recovered from Kabazi V, Unit IV lies at 21,563 pieces. The majority of these are chips, which make up 95.5 – 97.5 % of the total number of flint artefacts (Table 14-1). Although none of the Unit IV levels yielded a statistically valuable collection of tools or cores, levels IV/1 and IV/2 have provided a reliable quantity of debitage (flakes and blades). Attribute analyses of these assemblages are presented below.

The structure of the flint artefact assemblage from Kabazi V, Unit IV is characteristic of the so called "site-workshop" model of raw material exploitation (Table 14-1). This model is linked with both on-site core reduction and tool production. Whereas the WCM site-workshop model has been associated, for example, with Kabazi II, Unit II assemblages, WCM levels II/2 and III at Karabi Tamchin have instead been assigned to the so called "tool-users" model (Chabai 2004c). In these latter assemblages, flakes and blades clearly dominate (in essential counts without chunks and chips) over other categories of artefacts, and the percentages of tools and cores are among the lowest recorded in WCM assemblages.

In Kabazi V, levels IV/1, IV/2, IV/3 the tool to core ratios lie at 3.6 : 1; 6.5 : 1; and 9 : 1, respectively. Blank to core ratios are as follows: 39.4 : 1 (level IV/1); 42.5 : 1 (level IV/2); 24.5 : 1 (level IV/3). Such ratios are among the highest noted for WCM assemblages, and closely resemble those from Kabazi II, levels II/1A – II/7, and Kabazi V, sub-unit III/3 (Chabai 1998b; Chapter 9, this volume). The percentages of tools in Kabazi V, Unit IV levels lie within the ranges already observed at Kabazi II, Unit II and at Kabazi V, sub-unit III/3, where they vary from 5% to 14%, and 12% to 24%, respectively. On the other hand, they are much lower than at Karabi Tamchin,

	Level IV/1			Level IV/2			Level IV/3		
	#	%	esse %	#	%	esse %	#	%	esse %
Chips, <2,99 cm	12,402	95.56	·	5,337	96.23	·	2,959	97.50	·
Chunks	44	0.33	·	9	0.16	·	7	0.23	·
Preforms	2	0.02	0.37	·	·	·	·	·	·
Cores	12	0.09	2.25	4	0.07	2.00	2	0.07	2.90
Flakes	357	2.75	66.85	131	2.36	65.50	40	1.32	57.97
Blades	116	0.89	21.72	39	0.71	19.50	9	0.29	13.04
Tools	47	0.36	8.81	26	0.47	13.00	18	0.59	26.09
Total:	**12,980**	**100.00**	**100.00**	**5,546**	**100.00**	**100.00**	**3,035**	**100.00**	**100.00**
Bone retouchers	·			1			1		

Table 14-1 Kabazi V, Unit IV: artefact totals.

layers 2 and 3 (ca. 50 %) (Chabai 1998b; Chapter 9, this volume; Yevtushenko 2004). On the other hand, core ratios from Kabazi V, Unit IV are lower than observed at Kabazi II, Unit II, where they range from between 4.2 % and 7.5 %. In all, the percentage of tools is much lower, and the percentage of cores much higher, than are characteristic of Micoquian assemblages (Chabai 2004c; Chapters, 7, 8, 11, this volume). Thus, generally speaking, the structures of artefact assemblages from Kabazi V, Unit IV are more reminiscent of Kabazi II, Unit II, than of any other Crimean Middle Palaeolithic assemblages. The only important difference is the somewhat lower ratio of cores in the former.

Chunks

The majority of chunks are small pieces of flint lacking any obvious traces of knapping. The average dimensions of chunks are as follows: length – 34.29 mm; width – 22.10 mm; and thickness – 11.97 mm. Only five chunks from level IV/1 are larger than 5 cm. These "big" chunks might be interpreted as raw material supplies; average dimensions of these latter pieces are: length – 51.6 mm; width – 30.18 mm; and thickness – 21.18 mm. It would appear that both "small" and "big" chunks broke off from larger nodules.

Preforms

Two preforms were discovered in level IV/1. The dimensions of these plaquettes, which had been tested by several blows, are: length – 53.02 and 64.85 mm; width – 39.52 and 45.70 mm; and thickness – 25.79 and 17.27 mm, respectively. The longer and wider preform was broken during testing. These are most probably preforms of cores.

Cores

Cores are represented in all levels of Unit IV. The highest number of cores was observed in level IV/1 (12 pieces), four cores were found in level IV/2, and two further cores in level IV/3.

Level IV/1

The core assemblage from level IV/1 comprises one unsystematic core, one discoid core, two radial cores (Fig. 14-1, *7*), one Levallois Tortoise core, two unidirectional core, one bidirectional core (Fig. 14-2, *4*), and 4 unidentifiable core fragments. Only four cores (the discoid core, both radial cores and the bidirectional core) are complete.

All cores exhibit faceted platforms, except the unsystematic core. This latter piece is a multi-platform core of cubic shape. It is 48.22 mm long, 48.22 mm wide, and 40.84 mm thick; all its platforms are plain. Three short flakes (max dimensions <40 mm) were refitted to this core.

The discoid core is ovoid in shape (55.26 mm long; 47.71 mm wide; and 20.22 mm thick). This core exhibits a combination of polyhedral, faceted and plain platforms. The maximum dimensions of the negatives on its flaking surface are: length – 22.67 mm; and width – 31.65 mm.

Both radial cores are relatively large ovoid shaped items. These two cores are 46.51 and 53.30

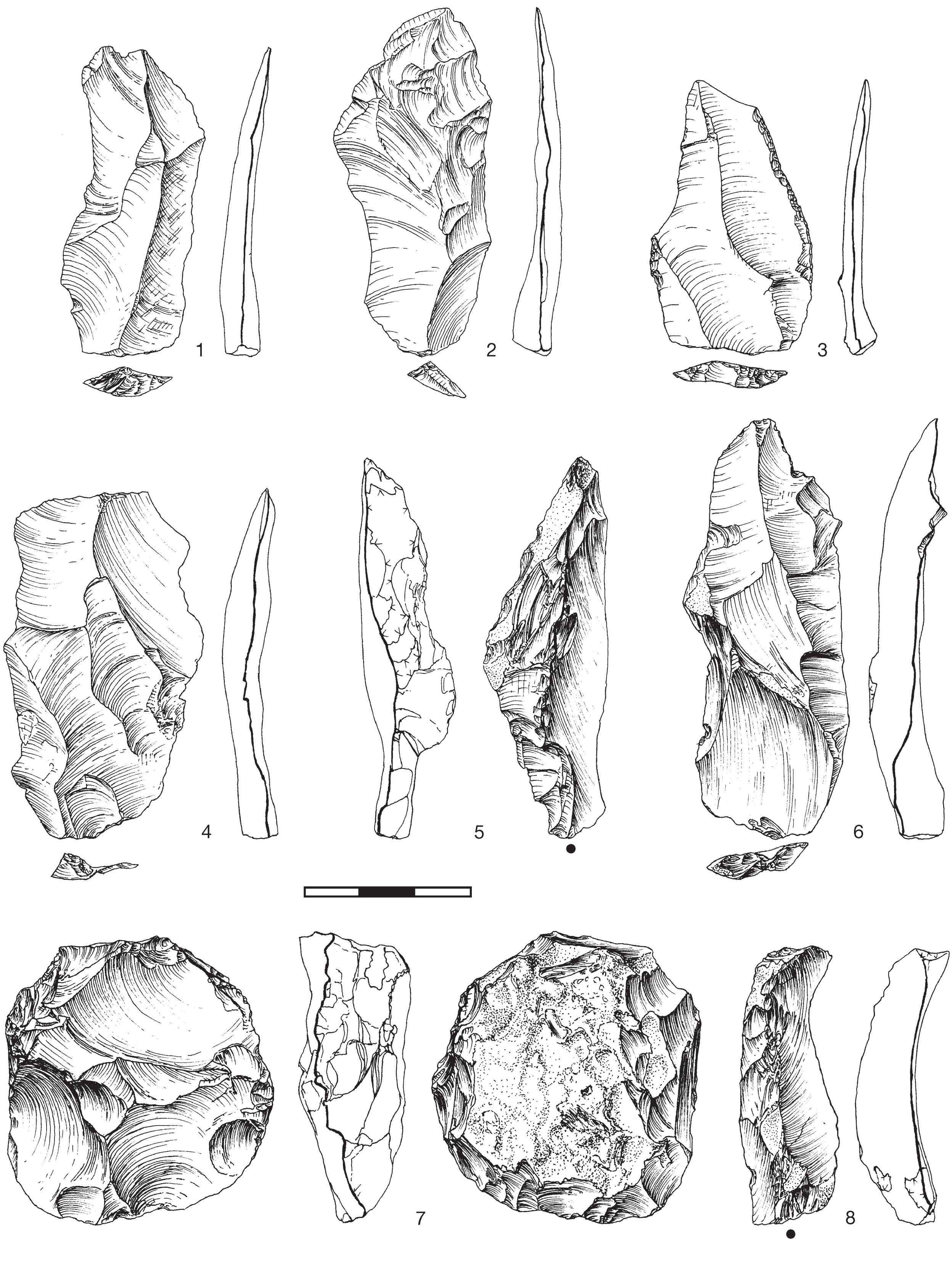


Fig. 14-1 Kabazi V, level IV/1. Debitage: 1 and 6 – Levallois blades; 2 – *enlèvement deux*, on blade; 3 – retouched piece, bilateral, made on flake; 4 – Levallois flake; 5 and 8 – *débordantes*, on blades; 7 – core, radial.

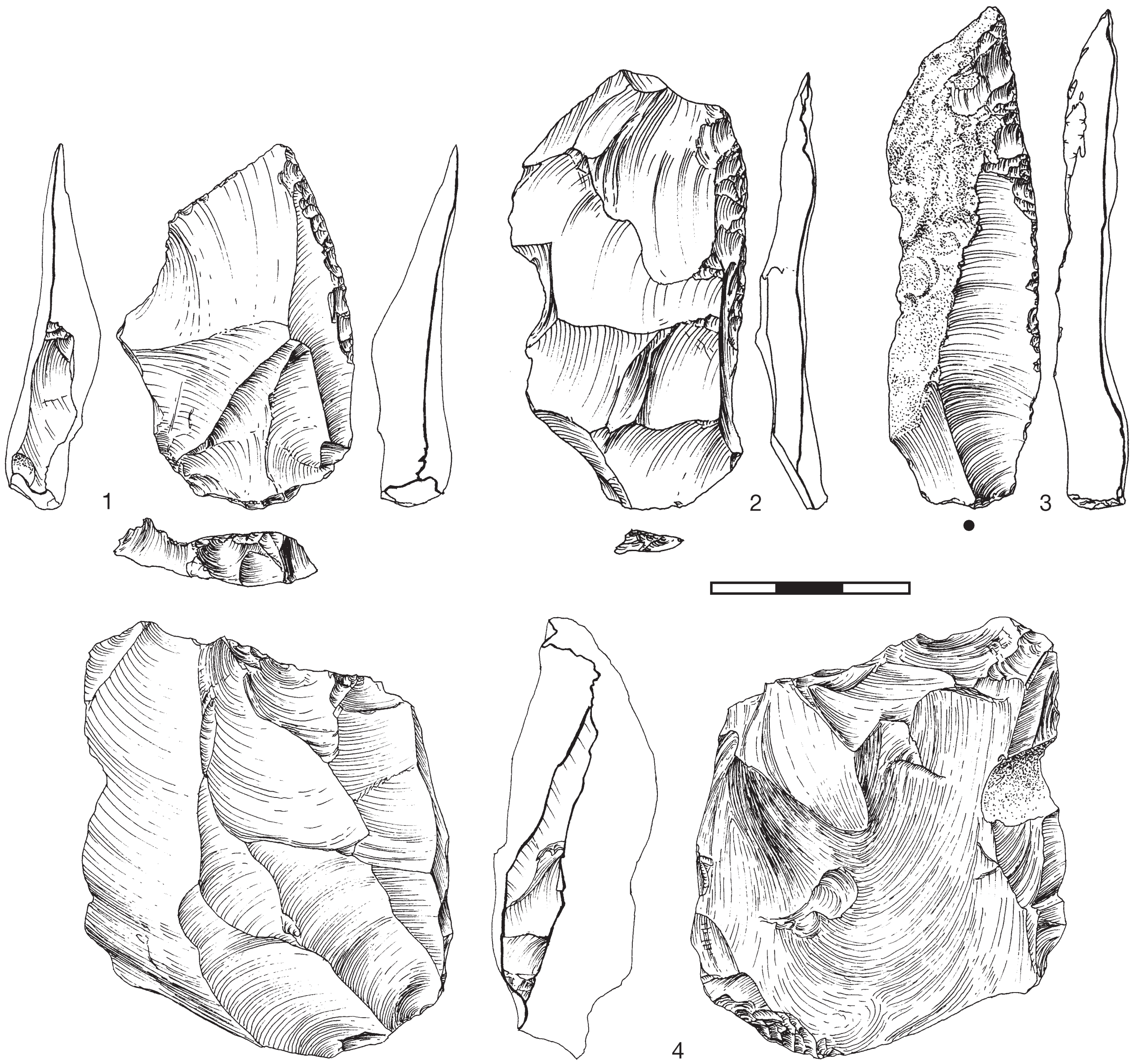


Fig. 14-2 Kabazi V, levels IV/1 (1, 2, 4) and IV/3 (3). Tools: 1 – the retouched piece, lateral, made on *débordantes* flake; 2 – scraper, straight, made on Levallois/*débordantes* flake; 3 – scraper, convex, made on blade; 4 – core, bidirectional.

long, 39.57 and 47.82 wide, and 17.05 and 16.27 mm thick, respectively. They exhibit combinations of faceted, polyhedral and plain platforms (Fig. 14-1, 7); maximum dimensions of negatives found on their flaking surfaces range from 22.77 mm to 40.54 mm.

The Levallois Tortoise core is represented by a relatively large fragment from which not only the distal, but also some lateral parts are missing. It is >59.40 mm long, 54.94 mm wide, and 21.19 mm thick. Both its main striking platform as well as one of its supplementary platforms are faceted. The proximal fragment of a flake (*enlèvement deux*, length: >23.93 mm, width: 33.07 mm) was refitted to the flaking surface of this core. The dimensions of a negative on its flaking surface are: length: >31.22; width: 31.24 mm.

The bidirectional core is a rectangular item (58.64 mm long; 55.40 mm wide; and 18.99 mm thick). Both the main platform and its opposing platform are faceted. The supplementary striking platforms are polyhedral. The two main platforms are situated not strictly opposite each other, but at an angle to one another (Fig. 14-2, *4*). This angle apparently formed an area of convergence for negatives removed from both these platforms. The largest identifiable negative exhibits the following parameters: length: 56.48 mm; and width: 26.99 mm.

There are two broken unidirectional cores. These are >47.29 and >32.94 mm long, 60.13 and >54.52 mm wide, and 19.99 and 11.09 mm thick, respectively. Both cores exhibit faceted main striking platforms and faceted / polyhedral lateral supplementary platforms. The largest existing negative slightly exceeds 40 mm in length.

The unidentifiable cores comprise parts of striking platforms and flaking surfaces. The striking platforms are faceted.

Level IV/2

The cores from this level are represented by four pieces: one discoid core, one unidirectional core, and two unidentifiable fragments of cores.

The discoid core is partly fragmented; the striking platform is only minimally preserved. It is likely that this core was originally ovoid in shape. It is >48.83 mm long, >45.85 mm wide; and 20.26 mm thick. The last flake removed from this core may have had near equal width/length dimensions.

The unidirectional core was made on a flint plaquette. There are two facetted supplementary platforms on both its lateral sides. The main platform is plain and at a right angle to the flaking surface. This core is 36.65 mm long, 40.22 mm wide, and 21.06 mm thick. The last flake removed from this core was clearly smaller then 40 mm.

One of the unidentifiable cores exhibits a faceted striking platform and part of a flaking surface bearing unidirectional negatives. This core is >26.25 mm long, 42.10 mm wide, and 20.83 mm thick. Another unidentifiable core consists of a fragment of a flaking surface (>33.51 mm long; >20.92 mm wide; and >7.94 mm thick).

Level IV/3

There are two cores in this level, a radial core and an unidentifiable core fragment. The radial core is ovoid in shape and exhibits a polyhedral platform. It is 43.38 mm long, 41.87 mm wide, and 15.84 mm thick.

To sum up, there are three main characteristic features of the core assemblage from Kabazi V, Unit IV. First, nearly all cores exhibit faceted and/or polyhedral striking platforms, except for one unsystematic core and one unidirectional core. Second, the Levallois, bidirectional, and unidirectional cores exhibit both main and supplementary striking platforms. Third, all cores are heavily exhausted or broken. The first two features, as well as the typology of the cores, are all characteristic for WCM assemblages from Kabazi II, Unit II, and correspond well with such blanks as Levallois, *débordantes* and *enlèvement deux*, all of which were found among the debitage in level IV/1 (Fig. 14-1, *1, 2, 3, 4, 5, 6, 8*; 14-2, *1, 2*). Finally, the combination of Levallois Tortoise, bi-/unidirectional and radial cores; *débordantes* and *enlèvement deux* blanks, as well as Levallois centripetal flakes and blades all suggest the Biache method of flaking, as previously described for Kabazi II, Unit II assemblage (Chabai 1998b).

Debitage Structure

As might be expected, chips dominate the debitage assemblage (Table 14-2). In contrast to Micoquian assemblages, the percentage of "bifacial thinning" chips are very low, and the same is also true for "bifacial thinning" flakes and blades. Whereas in level III/2 the "bifacial thinning" debitage makes up more than 40 % of the totality of identifiable blanks, in sub-unit IV only 6-10 % of blanks might be connected with bifacial tool production. Further, whereas in Unit IV, bifacial debitage makes up 1.5 - 4.5 % of all flakes and blades, in level III/2 this applies to 20 % of this material. This clearly suggests that on-site bifacial tool production and/or rejuvenation was not carried out within the excavated areas assigned to Unit IV. Another distinctive feature of Unit IV debitage composition is the high blade ratio; blades comprise 21.6 - 26.9 % of the sum of flakes and blades (including tools). In the tool assemblage the blade ratio is even higher, at 30.2 %.

Finally, in contrast to Micoquian assemblages, Levallois blanks (with centripetal dorsal scars), as well as *débordantes* and *enlèvement deux* flakes and blades were also found in Unit IV. In total, two Levallois flakes (Fig. 14-1, *4*) one Levallois/*débordantes* flake (Fig. 14-2, 7), ten *débordantes* flakes (Fig. 14-2, 1), and one *enlèvement deux* on a flake were identified. There are also four Levallois blades (Fig. 14-1, *1, 6*), four *débordantes* blades (Fig. 14-1, *5, 8*), and two *enlèvement deux* on blades (Fig. 14-1, 2). All in all, 24 blanks stem from Levallois flaking. Such a ratio of debitage linked with Levallois technology, i.e. a little more than 3 % of the total number of flakes and blades, was also a common feature among WCM assemblages in Unit II at Kabazi II (Chabai 1998b).

		Level IV/1			Level IV/2		
		#	%	esse %	#	%	esse %
Chips	"regular", 2.0-2.9 cm	337	2.61	23.48	291	5.26	30.73
	"regular", 2.0-2.9 cm, modified into tools	·	·	·	1	0.02	0.11
	"regular", 0.1-1.9 cm	693	5.37	48.29	445	8.04	46.99
	"bifacial thinning", 2.0-2.9 cm	17	0.13	1.19	35	0.63	3.69
	"bifacial thinning", 0.1-1.9 cm	64	0.49	4.46	50	0.90	5.28
	"bifacial rejuvenating", 2.0-2.9 cm	·	·	·	1	0.02	0.11
	"bifacial rejuvenating", 0.1-1.9 cm	4	0.03	0.28	2	0.04	0.21
	unidentifiable	11,287	87.37	·	4,513	81.58	·
Flakes	"regular"	223	1.73	15.54	81	1.46	8.55
	"regular", modified into tools	17	0.13	1.19	12	0.22	1.27
	"bifacial thinning"	4	0.03	0.28	4	0.07	0.42
	unidentifiable	128	0.99	·	46	0.83	·
	unidentifiable, modified into tools	13	0.10	·	9	0.16	·
	natural	2	0.02	·	·	·	·
Blades	"regular"	67	0.52	4.67	23	0.41	2.43
	"regular", modified into tools	8	0.06	0.56	2	0.04	0.21
	"bifacial thinning"	1	0.01	0.06	·	·	·
	unidentifiable	48	0.37	·	16	0.30	·
	unidentifiable, modified into tools	5	0.04	·	1	0.02	·
	Total:	**12,918**	**100.00**	**100.00**	**5,532**	**100.00**	**100.00**

Table 14-2 Kabazi V, Unit IV: composition of blank assemblage.

On the other hand, three bifacial tools, 10 "bifacial thinning" flakes, and two "bifacial thinning" blades were also found in Unit IV. Is this then sufficient evidence to assume an on-site bifacial tool production?

Chips

Chips are subdivided into "regular" chips, "bifacial thinning" chips, as well as items with broken butts (Table 14-2). As mentioned above, "bifacial thinning" chips cannot necessarily be taken as direct evidence for on-site bifacial tool production and/or rejuvenation. It is likely that chips with lips and obtuse platforms originated from supplementary striking platforms during the preparation of flaking surface convexity on Levallois Tortoise, bidirectional, unidirectional and radial cores.

Flakes and blades

Although the relatively high Blade Index (Ilam=21.6-26.9), as well as the occurrence of three bi- and unidirectional cores, are all suggestive of a purposeful production of blades on-site, this assumption finds no direct substantiation in the core typology, i.e. there are no real blade cores. Such a discrepancy between cores and blank assemblages is a characteristic feature of the WCM. The reason for this lies in the transformation of core shapes during the flaking process. Obviously, the initial stages of core utilisation produced relatively high number of blades and/or elongated flakes, while the late stages of core reduction delivered short, often transversal proportions, among blank. Finally, such a high Blade Index is uncommon for Micoquian assemblages.

Level IV/3		
#	%	esse %
84	2.78	18.67
·	·	·
257	8.49	57.11
4	0.13	0.89
37	1.22	8.22
·	·	·
2	0.07	0.44
2,575	85.09	·
37	1.22	8.22
9	0.30	2.00
2	0.07	0.44
·	·	·
·	·	·
1	0.03	·
8	0.27	1.78
9	0.30	2.00
1	0.03	0.23
·	·	·
·	·	·
3,026	**100.00**	**100.00**

Table 14-2 Continued.

	Flakes		Blades		Total		
	#	%	#	%	#	%	
0 %	143	37.14	53	41.08	196	38.13	Level IV/1
1-25 %	110	28.57	36	27.90	146	28.41	
26-50 %	65	16.88	26	20.16	91	17.70	
51-75 %	36	9.36	11	8.53	47	9.14	
>76 %	31	8.05	3	2.33	34	6.62	
Total:	**385**	**100.00**	**129**	**100.00**	**514**	**100.00**	
0 %	57	37.50	19	45.24	76	39.18	Level IV/2
1-25 %	37	24.34	14	33.33	51	26.29	
26-50 %	24	15.79	8	19.05	32	16.49	
51-75 %	18	11.84	·	·	18	9.28	
>76 %	16	10.53	1	2.38	17	8.76	
Total:	**152**	**100.00**	**42**	**100.00**	**194**	**100.00**	
0 %	18	36.74	9	50.00	27	40.29	Level IV/3
1-25 %	15	30.61	3	16.67	18	26.87	
26-50 %	5	10.20	3	16.67	8	11.94	
51-75 %	4	8.16	2	11.11	6	8.96	
>76 %	7	14.29	1	5.55	8	11.94	
Total:	**49**	**100.00**	**18**	**100.00**	**67**	**100.00**	

Table 14-3 Kabazi V, Unit IV: cortex percentages, by blank types.

Cortex

The flake and blade assemblages show some differences in the amount of dorsal cortex and cortex placement (Tables 14-3 and 14-4). About 60 % of both flakes and blades exhibit some dorsal cortex. However, blades are – on average – less corticated than flakes (Table 14-3), and there is a higher percentage of blades completely lacking cortex. Therefore, and it follows, that the percentage of flakes completely covered by cortex is also higher. Laterally and distally corticated items comprise about one-third of the available cortex variations among flakes. The lateral placement of cortex is dominant in the blade assemblage, but distally corticated blades are less significant. The difference in cortex placement between flakes and blades might reflect their different positions in the core reduction sequence.

Below, correlations between debitage size and cortex area / position are based on studies of the flake and blade assemblages recovered from level IV/1, the samples of unbroken flakes and blades from levels IV/2 and IV/3 being statistically insignificant. In the debitage assemblage from level IV/1 real primary flakes – longer than 50 mm and completely covered by cortex – are represented by a total of 7 pieces. The smallest non-corticated flakes also occur in the level IV/1 assemblage, measuring on average 34.82 mm long and 33.06 mm wide. However, among the non-corticated flakes a number of relatively large items (>60 mm), including Levallois ones, were also found. The average dimensions of heavily corticated flakes with transversal proportions are as follows:

Flakes with >76 % surface cortex are 36.03 mm long, and 43.69 mm wide.

	Flakes		Blades		Total		
	#	%	#	%	#	%	
None	143	37.14	53	41.09	196	38.14	Level IV/1
Proximal	8	2.08	3	2.32	11	2.14	
Lateral-proximal	8	2.08	1	0.78	9	1.75	
Central	7	1.82	4	3.10	11	2.14	
Lateral	73	18.96	40	31.01	113	21.98	
Bilateral	10	2.59	4	3.10	14	2.72	
Lateral-distal	37	9.61	9	6.98	46	8.95	
Distal	55	14.29	9	6.98	64	12.45	
Distal-proximal	13	3.38	3	2.32	16	3.11	
>76 %	31	8.05	3	2.32	34	6.62	
Total:	**385**	**100.00**	**129**	**100.00**	**514**	**100.00**	
None	57	37.50	19	45.24	76	39.18	Level IV/2
Proximal	3	1.97	1	2.38	4	2.06	
Lateral-proximal	4	2.63	·	·	4	2.06	
Central	6	3.95	1	2.38	7	3.61	
Lateral	21	13.82	11	26.20	32	16.49	
Bilateral	4	2.63	1	2.38	5	2.58	
Lateral-distal	20	13.16	4	9.52	24	12.37	
Distal	19	12.50	4	9.52	23	11.86	
Distal-proximal	2	1.32	·	·	2	1.03	
>76 %	16	10.52	1	2.38	17	8.76	
Total:	**152**	**100.00**	**42**	**100.00**	**194**	**100.00**	
None	18	36.74	9	50.00	27	40.30	Level IV/3
Proximal	4	8.16	·	·	4	5.97	
Central	1	2.04	·	·	1	1.49	
Lateral	6	12.25	6	33.32	12	17.91	
Bilateral	2	4.08	1	5.56	3	4.48	
Lateral-distal	3	6.12	·	·	3	4.48	
Distal	5	10.20	1	5.56	6	8.95	
Distal-proximal	3	6.12	·	·	3	4.48	
>76 %	7	14.29	1	5.56	8	11.94	
Total:	**49**	**100.00**	**18**	**100.00**	**67**	**100.00**	

Table 14-4 Kabazi V, Unit IV: cortex placement, by blank types.

Flakes with 51-75 % surface cortex are 38.42 mm long, and 39.05 mm wide.

Flakes with 26-50 % surface cortex are 34.04 mm long, and 35.51 mm wide.

Finally, flakes with 1-25 % surface cortex display the most elongated proportions; these pieces are on average 38.69 mm long, and 34.69 mm wide.

To conclude, whereas non-corticated flakes are generally small, heavily corticated flakes are usually short and wide, and flakes with 1-25 % cortex coverage display the most elongated forms.

In the blade assemblage correlations between dimensions and surface cortex is much more complicated. The only blade with in excess of 76 % surface cortex is 64.04 mm long and 20.04 mm wide. The average dimensions of blades with cortex coverage are as follows: blades with 51-75 % surface cortex are 54.25 mm long, and 22.79 mm wide; blades with 26-50 % surface cortex are 54.34 mm long, and 23.58 mm wide; finally, blades with 1-25 % surface cortex are 50.38 mm long, and 20.65 mm wide.

In consideration of these above dimensions of blades with cortex coverage, it becomes apparent that non-corticated blades are in fact the smallest of all blades, they being on average 47.55 mm long, and 19.91 mm wide. The largest blades are those with 26-50 % lateral cortex, being on average 55.09 mm long, and 22.56 mm wide. At the same time, the biggest blade in level IV/1 assemblage (87.4 mm long; 35.71 mm wide) exhibits no surface cortex whatsoever. Further, no cortex was found on the dorsal surfaces of Levallois and *enlèvement deux* blades longer than 60 mm. *Débordantes* blades display lateral cortex, which is, in fact, associated with partly corticated supplementary platforms on the back side of cores.

To conclude, there are no apparent direct correlations between surface cortex and the size of both flakes and blades. This would suggest the implication of complicated methods of flint knapping. Probably, the relatively large amount of flakes resulted from permanent and repeated core shaping processes. The reshaping of flaking surfaces on cores was realised via both main and supplementary striking platforms, and often included the reshaping of the back side of cores, which were usually covered by cortex. The blades, as well as the non-corticated flakes, were removed preferentially from the main striking platform(s). Thus, different stages of core exploitation were responsible for both corticated and non-corticated blanks.

All in all, the high amount of blanks partly covered by cortex, as well as the occurrence of primary flakes, are suggestive of intensive on-site flaking.

To some extent, the cortex placement on flakes from level IV/1, and on all kinds of debitage from level III/2 assemblages, are similar. Both show the dominant role played by blanks with lateral-distal and distal cortex (Chapter 8, Table 8-4, this volume). On the other hand, the clear dominance of laterally corticated pieces in the level IV/1 blade assemblage has no analogy in Micoquian complexes.

Dorsal scar pattern

There are no significant differences among the dorsal scar patterns observed on both flakes and blades (Table 14-5). Blanks with unidirectional and unidirectional-crossed scars are dominant in both flake and blade assemblages. It is of note, however, that whereas bidirectional, bidirectional-crossed and crested types of dorsal scars are more common in the blade assemblage, in the flake assemblage, radial and cortex covered blanks are more frequent. One of the specific features in the Unit IV assemblage is the somewhat low ratios (particularly with regard to the WCM) of bidirectional and bidirectional-crossed blanks. Although these are the lowest recorded for a WCM assemblage so far, similar values were also observed for WCM assemblages at Kabazi II, levels II/7C (for flakes) and II/7E (for blades) (Chabai 1998b). This feature finds some substantiation in the observed dominance of unidirectional core types.

The Levallois blanks have radial, bilateral and three directional dorsal scars. Most of the *débordantes* display a secondary crested scar pattern. The *enlèvement deux* blanks are characterised by unidirectional crossed scar patterns.

Shapes & axes

Most flakes are of trapezoidal, rectangular, or irregular shape (Table 14-6), and flakes removed on- and off-axis are represented by roughly equal amounts (Table 14-7). On the other hand, rectangular shaped blades dominate, and nearly all were detached symmetrically to the axis.

There is an equal number of on- and off-axis *débordantes*. The shape of *débordantes* is mostly irregular. The shape of Levallois blanks is rectangular, and all are on-axis.

Blank profiles and cross-sections

There are two important types of lateral profiles among flakes, these being flat and incurvate medial, whereby the former dominates. Blades demonstrate quite different patterns of lateral profiles. Among the latter, twisted profiles are dominant, followed by incurvate medial and flat profiles (Table 14-8). On the other hand, there are no significant differences between distal profiles observed on blades and flakes; about half of all distal profiles are feathering for both

	Flakes #	Flakes %	Blades #	Blades %	Total #	Total %	
Cortex	31	8.18	3	2.34	34	6.71	Level IV/1
Lateral	23	6.06	5	3.91	28	5.52	
Bilateral	10	2.64	2	1.56	12	2.37	
Radial	13	3.43	2	1.56	15	2.96	
Converging	41	10.82	14	10.94	55	10.85	
Unidirectional	106	27.97	35	27.34	141	27.81	
Unidirectional-crossed	104	27.44	34	26.56	138	27.22	
Bidirectional	26	6.86	13	10.16	39	7.69	
Bidirectional-crossed	17	4.49	8	6.25	25	4.93	
Crested	7	1.85	12	9.38	19	3.75	
Plain (Yanus flake)	1	0.26	·	·	1	0.19	
Total:	**379**	**100.00**	**128**	**100.00**	**507**	**100.00**	
Unidentifiable	6		1		7		
Cortex	15	10.14	1	2.38	16	8.42	Level IV/2
Lateral	7	4.73	2	4.76	9	4.74	
Bilateral	3	2.03	1	2.38	4	2.11	
Radial	2	1.35	·	·	2	1.05	
Converging	8	5.41	8	19.05	16	8.42	
Unidirectional	50	33.78	14	33.33	64	33.68	
Unidirectional-crossed	37	25.00	5	11.91	42	22.11	
Bidirectional	15	10.14	6	14.29	21	11.05	
Bidirectional-crossed	6	4.05	2	4.76	8	4.21	
Crested	5	3.37	3	7.14	8	4.21	
Total:	**148**	**100.00**	**42**	**100.00**	**190**	**100.00**	
Unidentifiable	4		·		4		
Cortex	7	14.89	1	5.88	8	12.50	Level IV/3
Lateral	1	2.13	2	11.77	3	4.69	
Bilateral	·	·	1	5.88	1	1.56	
Radial	1	2.13	·	·	1	1.56	
Converging	·	·	·	·	·	·	
Unidirectional	18	38.29	5	29.41	23	35.94	
Unidirectional-crossed	17	36.17	5	29.41	22	34.38	
Bidirectional	1	2.13	·	·	1	1.56	
Bidirectional-crossed	2	4.26	3	17.65	5	7.81	
Crested	·	·	·	·	·	·	
Plain (Yanus flake)	·	·	·	·	·	·	
Total:	**47**	**100.00**	**17**	**100.00**	**64**	**100.00**	
Unidentifiable	2		1		3		

	Flakes #	Flakes %	Blades #	Blades %	Total #	Total %	
Rectangular	76	26.21	59	47.97	135	32.69	Level IV/1
Triangular	16	5.52	9	7.32	25	6.05	
Trapezoidal	81	27.93	·	·	81	19.61	
Trapezoidal elongated	28	9.66	33	26.83	61	14.77	
Ovoid	20	6.90	·	·	20	4.84	
Leaf-shaped	4	1.37	7	5.69	11	2.67	
Crescent	20	6.90	8	6.50	28	6.78	
Irregular	45	15.51	7	5.69	52	12.59	
Total:	**290**	**100.00**	**123**	**100.00**	**413**	**100.00**	
Unidentifiable	95		6		101		
Rectangular	30	26.55	15	42.86	45	30.41	LevelIV/2
Triangular	5	4.43	10	28.57	15	10.14	
Trapezoidal	34	30.09	·	·	34	22.97	
Trapezoidal elongated	13	11.50	4	11.43	17	11.49	
Ovoid	2	1.77	·	·	2	1.35	
Leaf-shaped	1	0.88	·	·	1	0.67	
Crescent	5	4.43	4	11.43	9	6.08	
Irregular	23	20.35	2	5.71	25	16.89	
Total:	**113**	**100.00**	**35**	**100.00**	**148**	**100.00**	
Unidentifiable	39		7		46		
Rectangular	12	35.30	5	38.46	17	36.17	Level IV/3
Triangular	4	11.77	3	23.08	7	14.89	
Trapezoidal	5	14.71	·	·	5	10.64	
Trapezoidal elongated	3	8.82	3	23.08	6	12.77	
Ovoid	2	5.88	·	·	2	4.26	
Leaf-shaped	3	8.82	·	·	3	6.38	
Crescent	2	5.88	1	7.69	3	6.38	
Irregular	3	8.82	1	7.69	4	8.51	
Total:	**34**	**100.00**	**13**	**100.00**	**47**	**100.00**	
Unidentifiable	15		5		20		

Table 14-6 Kabazi V, Unit IV: shapes, by blank types.

◄ **Table 14-5** Kabazi V, Unit IV: dorsal scar pattern, by blank types.

	Flakes		Blades		Total		
	#	%	#	%	#	%	
On-axis	153	52.22	113	87.60	266	63.03	**Level IV/1**
Off-axis	140	47.78	16	12.40	156	36.97	
Total:	**293**	**100.00**	**129**	**100.00**	**422**	**100.00**	
Unidentifiable	92				92		
On-axis	59	49.58	32	80.00	91	57.23	**Level IV/2**
Off-axis	60	50.42	8	20.00	68	42.77	
Total:	**119**	**100.00**	**40**	**100.00**	**159**	**100.00**	
Unidentifiable	33		2		35		
On-axis	20	58.82	11	78.57	31	64.58	**Level IV/3**
Off-axis	14	41.18	3	21.43	17	35.42	
Total:	**34**	**100.00**	**14**	**100.00**	**48**	**100.00**	
Unidentifiable	15		4		19		

Table 14-7 Kabazi V, Unit IV: axes, by blank types.

assemblages (Table 14-9). Triangular and trapezoidal types of mid-point cross-sections dominate in both flake and blade assemblages (Table 14-10).

Platform preparation

An intentional production of blades is reflected in platform preparation. Faceted platforms are more common for blades than for flakes (Table 14-11). On the other hand, plain, dihedral, and polyhedral platforms are more common for flakes than blades.

In level IV/1 the faceting indexes for blades are as follows: Ifl=75.00; Ifs=64.47. The same indexes for flakes are significantly lower: Ifl=62.30; Ifs=38.12. The joint indexes for all kinds of blanks lie between these aforementioned values: Ifl=65.31; Ifs=44.37.

In level IV/2 the faceting indexes for blades are as follows: Ifl=68.00; Ifs=56.00. The same indexes for flakes are lower, especially the index of fine faceting: Ifl=58.76; Ifs=28.87. The joint indexes for all kinds of blanks are: Ifl=60.67; Ifs=34.43.

Due to the statistical incompleteness of the debitage assemblage from level IV/3, faceting indexes for flakes and blades have not been calculated (Table 14-11). At the same time, it is of note that dihedral, polyhedral, and faceted platforms represent a pronounced component of platform preparation in this level. With regard to platform preparation, material most closely resembling Kabazi V, levels IV/1 and IV/2 is found in the WCM assemblages at Kabazi II, levels II/5, II/6 and II/7 (Chabai 2004c).

The semi-lipped and unlipped platforms with obtuse and right angles are the most frequent in both the flake and blade assemblages (Table 14-12 and 14-13). Semi-lipped right angle platforms are a little more common among blades. In fact, the blade platform dimensions are comparable to those of flakes (Fig. 14-3). At the same time, the average width and thickness of blade platforms are smaller than observed for flakes (Table 14-14). On the other hand, such clustering indicates that the numbers of flakes display the same platform parameters as blades.

The preparation of debitage platforms (faceting, angles, lipping) in Kabazi V, Unit IV has absolutely nothing in common with the platform preparation observed in Kabazi V, level III/2, nor with the material from any other Micoquian occupations.

Blank dimensions

As to be expected, blades are longer, narrower, and thinner than flakes (Table 14-14). At the same time, however, on the basis of length/width dimensions, flakes and blades compose a joint cluster of values (Fig. 14-4), i.e. a number of flakes display length/

width attributes similar to those of blades. The Levallois, *enlèvement deux* and *débordantes* were found among both flake and blade assemblages, and there are elongated flakes with short to transversal proportions. This variety of debitage sizes and proportions once again suggests a complicated core reduction strategy, which included the detachment of blanks from the main and supplementary striking platforms of cores. As a rule, blanks removed from main platforms tend to be more elongated than core shaping blanks detached from supplementary platforms. Indeed, to some extent, it may be stated that blades and elongated flakes were a "desired product" of Unit IV core reduction technology.

Debitage dimensions for Kabazi V, Unit IV prove larger than for Kabazi V, level III/2 (compare Tables 14-14 and 8-15).

Summary of attribute analysis

The differences between blade and flake attributes might be viewed as those separating "desired products" from "waste products". Whereas the "desired products" are blades and elongated flakes removed from main platform(s), "waste products" comprise primary blanks and flakes detached from supplementary platforms during core reshaping processes. The transition between these two product types is, however, more or less continuous. Obviously, Levallois blanks, as well as the most part of blades and a number of elongated flakes, were desired results from flaking. The majority of attributes associated with the "desired" debitage are similar to those of the blade assemblage, i.e. elongated proportions, whereby the length of the blank does not exceed 50 mm; faceted platforms; flat or slightly

	Flakes		Blades		Total		
	#	%	#	%	#	%	
Flat	104	29.55	27	21.09	131	27.29	Level IV/1
Incurvate medial	96	27.27	44	34.38	140	29.17	
Incurvate distal	69	19.60	10	7.81	79	16.46	
Twisted	53	15.06	45	35.16	98	20.42	
Convex	30	8.52	2	1.56	32	6.66	
Total:	**352**	**100.00**	**128**	**100.00**	**480**	**100.00**	
Unidentifiable	33		1		34		
Flat	45	31.47	12	28.57	57	30.81	Level IV/2
Incurvate medial	34	23.78	7	16.67	41	22.16	
Incurvate distal	28	19.58	4	9.52	32	17.30	
Twisted	28	19.58	19	45.24	47	25.41	
Convex	8	5.59	·	·	8	4.32	
Total:	**143**	**100.00**	**42**	**100.00**	**185**	**100.00**	
Unidentifiable	9		·		9		
Flat	17	37.78	4	22.22	21	33.33	Level IV/3
Incurvate medial	5	11.11	4	22.22	9	14.29	
Incurvate distal	4	8.89	1	5.56	5	7.94	
Twisted	14	31.11	9	50.00	23	36.50	
Convex	5	11.11	·	·	5	7.94	
Total:	**45**	**100.00**	**18**	**100.00**	**63**	**100.00**	
Unidentifiable	4		·		4		

Table 14-8 Kabazi V, Unit IV: lateral profiles, by blank types.

		Flakes #	Flakes %	Blades #	Blades %	Total #	Total %
Level IV/1	Feathering	176	56.22	46	50.55	222	54.95
	Hinged	58	18.53	18	19.78	76	18.81
	Overpassed	7	2.24	5	5.49	12	2.97
	Blunt	72	23.01	22	24.18	94	23.27
	Total:	**313**	**100.00**	**91**	**100.00**	**404**	**100.00**
	Retouched	7		4		11	
	Missing	65		34		99	
Level IV/2	Feathering	56	46.67	17	56.67	73	48.67
	Hinged	30	25.00	4	13.33	34	22.67
	Overpassed	1	0.83	1	3.33	2	1.33
	Blunt	33	27.50	8	26.67	41	27.33
	Total:	**120**	**100.00**	**30**	**100.00**	**150**	**100.00**
	Retouched	6		·		6	
	Missing	26		12		38	
Level IV/3	Feathering	9	29.03	5	45.46	14	33.33
	Hinged	14	45.16	3	27.27	17	40.48
	Overpassed	2	6.45	·	·	2	4.76
	Blunt	6	19.36	3	27.27	9	21.43
	Total:	**31**	**100.00**	**11**	**100.00**	**42**	**100.00**
	Retouched	5		1		6	
	Missing	13		6		19	

Table 14-9 Kabazi V, Unit IV: distal end profiles, by blank types.

incurvate lateral profile and feathering distal end; and rectangular symmetrical or trapezoidal-elongated slightly asymmetrical shapes. The attributes associated with the "waste products" closely resemble those of the flake assemblage, i.e. short, sometime transverse blank proportions; plain or dihedral/polyhedral platforms; mainly incurvate lateral profile, but feathering distal extremity; and a mainly trapezoidal asymmetrical shape.

Evidence for an intensive on-site core reduction and tool production are the occurrence of a raw material reserve in the form of flint chunks, precores, exhausted and fragmented cores, *débordantes*, primary blanks, as well as a relatively high ratio of blanks with dorsal cortex. There is no reliable evidence for on-site bifacial tool production, or for bifacial tool rejuvenation. Ten flakes and two blades with obtuse lipped platforms are not from the same flint as bifacial tools, and these "bifacial thinning" blanks might have actually resulted from the reshaping of cores.

One of the ways to evaluate the plausibility of on-site bifacial tool production is to compare debitage from Kabazi V, level IV/1 with that from Kabazi V, level III/2; the latter is thought to be the best example of the predominant, if not exclusive, implication of bifacial plano-convex flaking. The comparison of debitage from levels IV/1 and III/2 shows more differences than similarities. Each debitage assemblage comprises two parts; in level IV/1 the aforementioned "desired" blades and "waste" flakes, in level III/2 "regular" and "bifacial thinning" flakes and blades. In the case of level III/2 both "regular" and "bifacial thinning" debitage resulted from bifacial plano-convex flaking (Chapter 8, this volume).

In the case of level IV/1 both "desired" and "waste" blanks are believed to have resulted from the prevailing core reduction strategy, i.e. core exploitation with supplementary striking platforms. To some extent, the technological meaning of "waste" and "regular" blanks are similar, that is to say, the preliminary shaping of cores and bifacial tool preforms, respectively. Such attributes as cortex placement, dorsal scar pattern, lateral and distal profiles, butt angle and lipping are very similar for both "waste" and "regular" blanks (compare Tables 14-4 and 8-4; 14-5 and 8-5; 14-8 and 8-8; 14-9 and 8-9; 14-12 and 8-12; 14-13 and 8-13). However, there are no similarities between the techno-typological attributes of "desired" and "bifacial thinning" blanks, and there are very few common features among "desired" blanks on the one hand, and "regular" and "waste" blanks on the other (compare the Tables 14-4 and 8-4;

	Flakes		Blades		Total		
	#	%	#	%	#	%	
Flat	5	1.41	·	·	5	1.03	Level IV/1
Triangular	128	35.96	59	45.74	187	38.56	
Lateral steep	46	12.92	18	13.95	64	13.19	
Trapezoidal	98	27.53	41	31.78	139	28.66	
Polyhedral	38	10.67	4	3.10	42	8.66	
Convex	12	3.37	5	3.88	17	3.51	
Irregular	29	8.14	2	1.55	31	6.39	
Total:	**356**	**100.00**	**129**	**100.00**	**485**	**100.00**	
Unidentifiable	29		·		29		
Flat	1	0.70	·	·	1	0.55	Level IV/2
Triangular	43	30.28	15	36.59	58	31.69	
Lateral steep	22	15.49	9	21.94	31	16.94	
Trapezoidal	48	33.81	15	36.59	63	34.43	
Polyhedral	5	3.52	1	2.44	6	3.27	
Convex	11	7.75	1	2.44	12	6.56	
Irregular	12	8.45	·	·	12	6.56	
Total:	**142**	**100.00**	**41**	**100.00**	**183**	**100.00**	
Unidentifiable	10		1		11		
Flat	·	·	·	·	·	·	Level IV/3
Triangular	15	34.09	6	33.33	21	33.87	
Lateral steep	3	6.82	3	16.67	6	9.68	
Trapezoidal	14	31.82	7	38.88	21	33.87	
Polyhedral	2	4.54	1	5.56	3	4.84	
Convex	6	13.64	1	5.56	7	11.29	
Irregular	4	9.09	·	·	4	6.45	
Total:	**44**	**100.00**	**18**	**100.00**	**62**	**100.00**	
Unidentifiable	5		·		5		

Table 14-10 Kabazi V, Unit IV: cross-sections, by blank types.

	Flakes #	Flakes %	Blades #	Blades %	Total #	Total %	Level
Cortex	21	8.61	5	6.58	26	8.13	Level IV/1
Plain	71	29.10	14	18.42	85	26.56	
Dihedral	35	14.34	7	9.21	42	13.13	
Polyhedral	24	9.84	1	1.32	25	7.81	
Faceted straight	36	14.75	17	22.37	53	16.56	
Faceted convex	46	18.85	18	23.68	64	20.00	
Faceted lateral	11	4.51	14	18.42	25	7.81	
Total:	**244**	**100.00**	**76**	**100.00**	**320**	**100.00**	
Crushed	38		6		44		
Missing	103		47		150		
Cortex	8	8.25	1	4.00	9	7.37	Level IV/2
Plain	32	32.99	7	28.00	39	31.96	
Dihedral	14	14.43	2	8.00	16	13.12	
Polyhedral	15	15.46	1	4.00	16	13.12	
Faceted straight	13	13.41	4	16.00	17	13.93	
Faceted convex	10	10.31	6	24.00	16	13.12	
Faceted concave	2	2.06	1	4.00	3	2.46	
Faceted lateral	3	3.09	3	12.00	6	4.92	
Total:	**97**	**100.00**	**25**	**100.00**	**122**	**100.00**	
Crushed	16		1		17		
Missing	39		16		55		
Cortex	5	19.23	·	·	5	13.51	Level IV/3
Plain	7	26.92	3	27.27	10	27.03	
Dihedral	3	11.54	1	9.09	4	10.81	
Polyhedral	6	23.08	1	9.09	7	18.92	
Faceted straight	3	11.54	5	45.46	8	21.62	
Faceted convex	2	7.69	·	·	2	5.41	
Faceted lateral	·	·	1	9.09	1	2.70	
Total:	**26**	**100.00**	**11**	**100.00**	**37**	**100.00**	
Crushed	5		1		6		
Retouched	2		1		3		
Missing	16		5		21		

Table 14-11 Kabazi V, Unit IV: platform types, by blank types.

	Flakes #	Flakes %	Blades #	Blades %	Total #	Total %	
Lipped	42	17.21	8	10.53	50	15.63	Level IV/1
Semi-lipped	113	46.31	43	56.58	156	48.75	
Unlipped	89	36.48	25	32.89	114	35.62	
Total:	**244**	**100.00**	**76**	**100.00**	**320**	**100.00**	
Unidentifiable	141		53		194		
Lipped	17	17.00	7	28.00	24	19.20	Level IV/2
Semi-lipped	41	41.00	7	28.00	48	38.40	
Unlipped	42	42.00	11	44.00	53	42.40	
Total:	**100**	**100.00**	**25**	**100.00**	**125**	**100.00**	
Unidentifiable	52		17		69		
Lipped	3	11.54	2	18.18	5	13.51	Level IV/3
Semi-lipped	4	15.39	4	36.36	8	21.62	
Unlipped	19	73.07	5	45.46	24	64.87	
Total:	**26**	**100.00**	**11**	**100.00**	**37**	**100.00**	
Unidentifiable	23		7		30		

Table 14-12 Kabazi V, Unit IV: lipping, by blank types.

	Flakes #	Flakes %	Blades #	Blades %	Total #	Total %	
Acute	3	1.23	·	·	3	0.94	Level IV/1
Obtuse	105	43.03	27	35.53	132	41.25	
Right	136	55.74	49	64.47	185	57.81	
Total:	**244**	**100.00**	**76**	**100.00**	**320**	**100.00**	
Unidentifiable	141		53		194		
Acute	·	·	2	8.00	2	1.63	Level IV/2
Obtuse	52	53.06	12	48.00	64	52.03	
Right	46	46.94	11	44.00	57	46.34	
Total:	**98**	**100.00**	**25**	**100.00**	**123**	**100.00**	
Unidentifiable	54		17		71		
Acute	·	·	·	·	·	·	Level IV/3
Obtuse	11	42.31	6	54.55	17	45.95	
Right	15	57.69	5	45.45	20	54.05	
Total:	**26**	**100.00**	**11**	**100.00**	**37**	**100.00**	
Unidentifiable	23		7		30		

Table 14-13 Kabazi V, Unit IV: platform angles, by blank types.

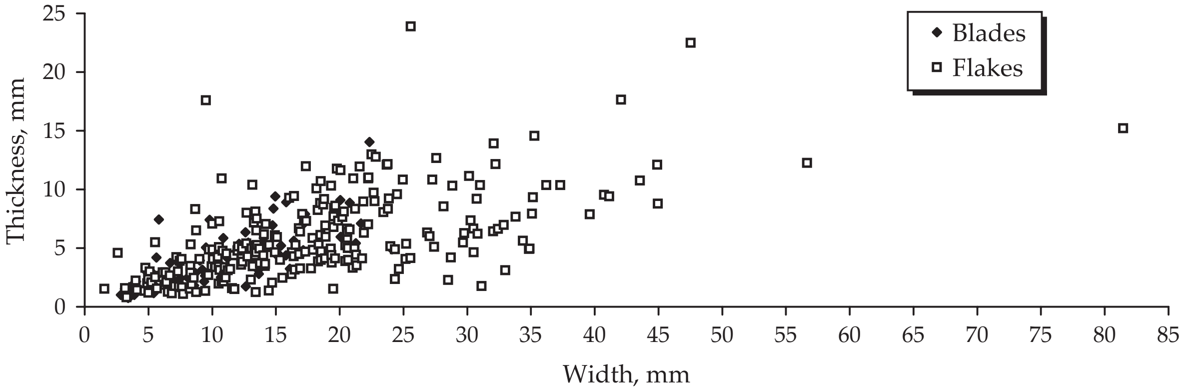


Fig. 14-3 Kabazi V, level IV/1. Width/thickness scatterplot with striking platforms of blades and flakes.

	Blank types	IV/1	IV/2	IV/3
Length	flakes including tools	36.26	34.82	35.41
	blades including tools	50.60	43.17	58.64
	blanks (flakes & blades)	39.24	34.82	33.12
	tools	54.11	45.48	64.82
Width	flakes including tools	34.43	32.82	29.21
	blades including tools	20.13	19.04	20.78
	blanks (flakes & blades)	30.64	28.92	26.48
	tools	36.38	34.78	27.57
Thickness	flakes including tools	6.09	6.22	5.39
	blades including tools	5.76	5.47	4.87
	blanks (flakes & blades)	5.99	5.85	4.65
	tools	7.96	7.66	6.86
Platform width	flakes including tools	18.19	16.79	15.34
	blades including tools	11.44	10.12	10.56
	blanks (flakes & blades)	16.57	15.58	13.80
	tools	19.95	13.91	14.40
Platform thickness	flakes including tools	5.90	5.25	5.09
	blades including tools	4.25	4.54	4.02
	blanks (flakes & blades)	5.51	5.20	4.75
	tools	6.99	4.29	4.89

Table 14-14 Kabazi V, Unit IV: average dimensions, in mm.

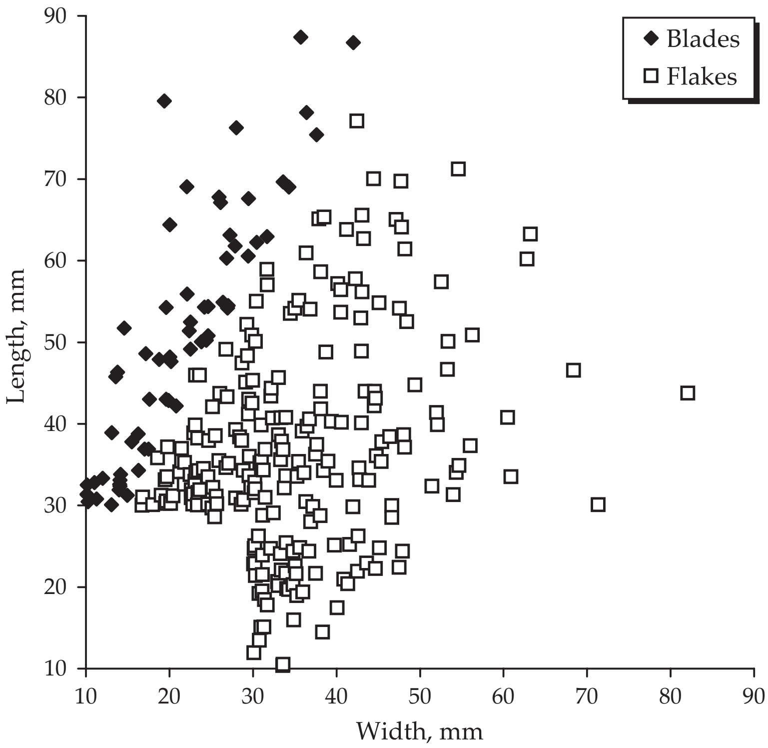


Fig. 14-4 Kabazi V, level IV/1. Width/length scatterplot for blades and flakes.

14-5 and 8-5; 14-8 and 8-8; 14-9 and 8-9; 14-12 and 8-12; 14-13 and 8-13).

Together with the differences regarding technological and morphological attributes, all above mentioned debitage groups also differ with respect to their sizes, e.g. maximum size of artefacts, and width/thickness of platforms. Indeed, there are three observable patterns in artefact dimension distribution, and these can be termed "plateau", "gradual" and "sharp peak". All studied dimensions of "desired blanks" can be assigned to the plateau pattern (Fig. 14-5; 14-6; 14-7); about 60 % of maximum dimensions among "desired" blanks fall into the metrical interval 40 mm to 60.99 mm (Fig. 14-5). As such, the maximum dimensions of "desired blanks" correspond well with the parameters of their platforms. A similar plateau situation can also be observed with regard to platform width and thickness values with about 70 % of "desired" blanks falling into metrical intervals 4-15.99 mm and 2-5.99 mm, respectively (Fig. 14-6; 14-7). Such a pattern might be viewed as evidence of at least an attempt to standardize the relative size of "desired" blanks.

The distribution of maximum dimensions of "waste" blanks shows a gradual pattern (Fig. 14-5). The distribution of platform dimensions among "waste" blanks can also be termed plateau-like (Fig. 14-6; 14-7).

Unlike "desired" and "waste" blanks, "regular" and "bifacial thinning" blanks are the only artefacts characterised by the "sharp peak" pattern (Fig. 14-5; 14-6; 14-7). Moreover, in all cases these peaks are either on the periphery, or even beyond the plateaus, of "desired" and "waste" blanks.

All in all, the contrast between blanks from levels III/2 and IV/1 might be interpreted as the difference between bifacial *façonage* ("regular" and "bifacial thinning" blanks) and core debitage ("desired" and "waste" blanks). Features of the Kabazi V, level IV/1 flint assemblage, such as Levallois, radial, bi- and unidirectional cores, Levallois blanks with lateral and centripetal dorsal scar pattern, *débordantes* and *enlèvement deux* blanks, and blades with bi- and unidirectional dorsal scars, are consistent with the Biache method of core flaking, as previously described for Biache-Saint-Vaast, niveau IIa, and Kabazi II, Unit II (Boëda 1988, Chabai 1998b)

Thus, the blank assemblage from Kabazi V, level IV/1 resulted from the application of the Biache *uni-polaire* method of core reduction. Evidences of bifacial technologies are lacking, and there are no reasons to suggest that on-site bifacial tool production occurred during the level IV/1 occupation.

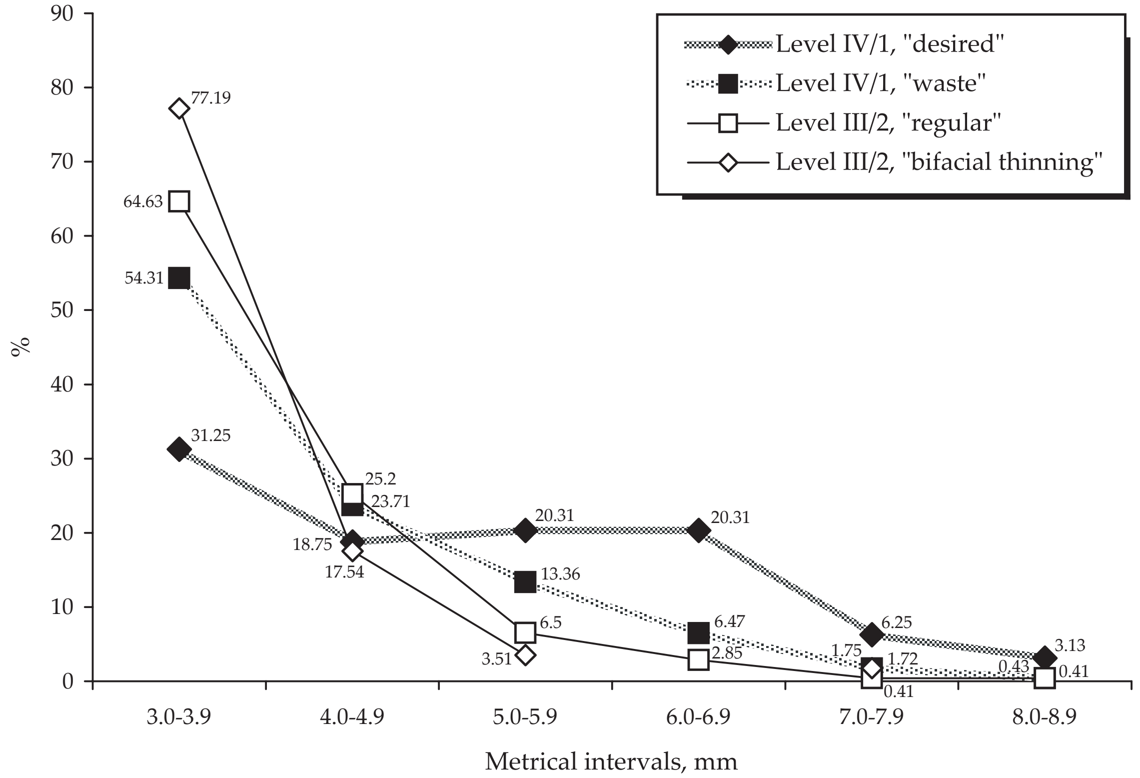


Fig. 14-5 Kabazi V, levels III/2 and IV/1. Maximum dimensions of "desired", "waste", "regular" and "bifacial thinning" blanks, by metrical intervals.

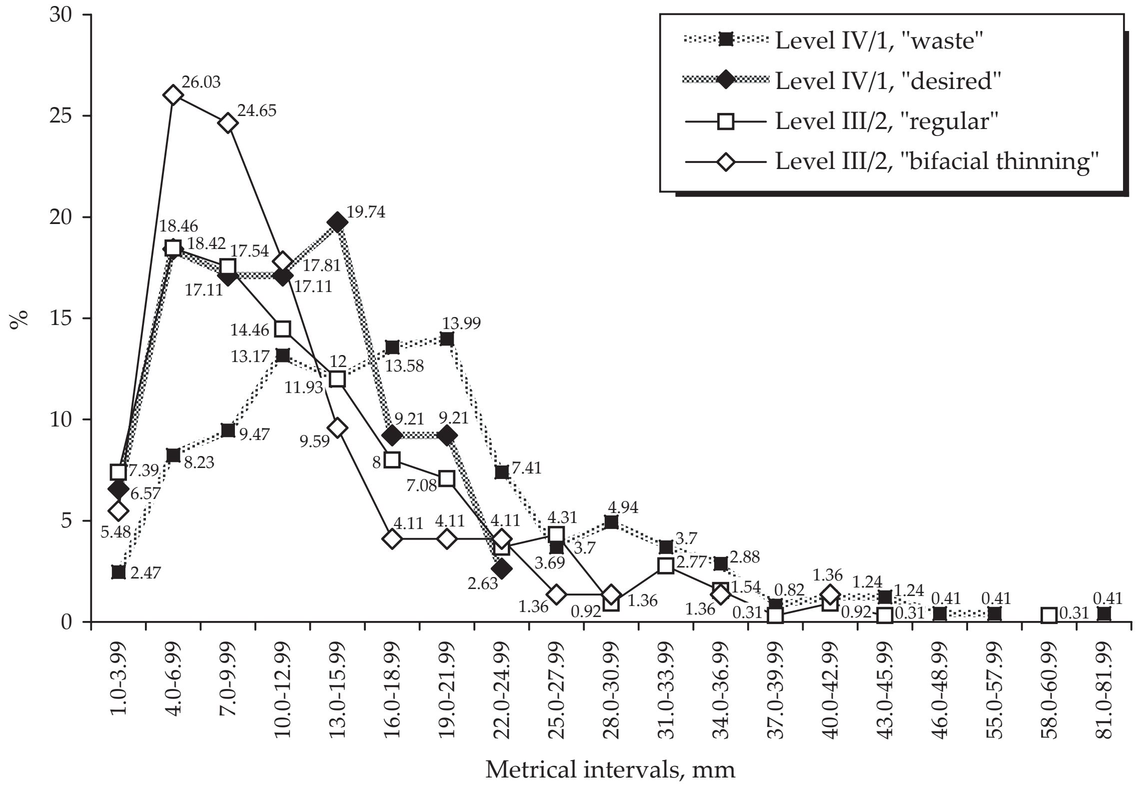


Fig. 14-6 Kabazi V, levels III/2 and IV/1. Striking platform widths of "desired", "waste", "regular" and "bifacial thinning" blanks, by metrical intervals.

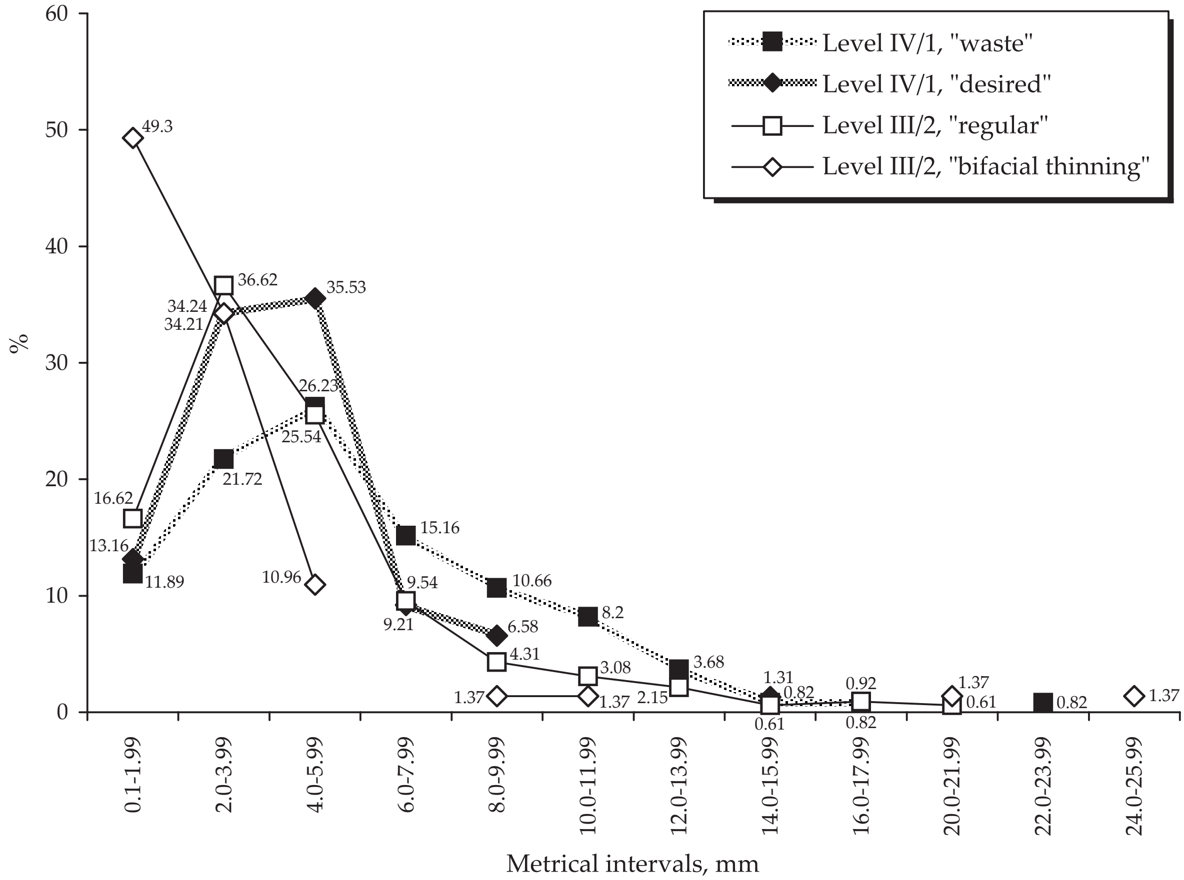


Fig. 14-7 Kabazi V, levels III/2 and IV/1. Striking platforms thicknesses of "desired", "waste", "regular" and "bifacial thinning" blanks, by metrical intervals.

Tools

The largest collection of tools was recovered from level IV/1, with smaller amounts from levels IV/2 and IV/3. Unit IV has yielded a total of 91 tools which includes 87 unifacial and 4 bifacial tools (Table 14-15). Unifacial tools were made on a chip (1 item), on flakes (60 items), on blades (25 items) and on a chunk (1 item). The four bifacial tools were made on a flake, a natural flake, a flint plaquette and on an unidentifiable piece of flint, respectively. The most common tool class is the scraper (29 items), followed by retouched pieces (28 items), points (12 items), bifacial scrapers (3 items), thinned pieces (2 items), a bifacial reutilized tool (1 item), a notched tool (1 item), a truncated-faceted piece (1 item), and a burin (1 item). Unidentifiable unifacial tools comprise 13 retouched fragments of debitage. Two kinds of retouch combinations dominate, these are obverse scalar flat and obverse scalar semi-abrupt (Table 14-16). Tools are relatively large; in level IV/1, 20 of the 28 complete tools are longer than 5 cm; in level IV/2, five of 13 unbroken tools are longer than 5 cm; and in level IV/3, seven of ten complete tools are longer than 5 cm. At the same time, a significant number of good size and good quality blanks were not used for tool production (Fig. 14-8).

Points

Five of twelve points are of distal types (Fig. 14-9, *2*, *3*, *7*, *8*, *9*). One of the distal points exhibits a ventral thinning of its tip. Ventral thinning was applied via a flat burin facet. Two more points display lateral thinning (Fig. 14-9, *1*, *3*). Sub-crescent (Fig. 14-9, *4*), hook-like (Fig. 14-9, *5*), sub-leaf (Fig. 14-9, *6*) and amorphous point types all occur with one artefact each. Distal points were produced using scalar/sub-parallel, and flat/semi-abrupt retouch. Scalar flat/semi-abrupt retouch was used for the elaboration of lateral, sub-crescent, hook-like, subleaf, and amorphous points. Seven of the twelve points were made on blades. Points vary in length from between 50 and 100 mm, their width ranges from 25 to 49 mm.

	Level IV/1	Level IV/2	Level IV/3	Total:	
	#	#	#	#	%
Points					
Distal, dorsal	3	·	1	4	8.34
Distal, dorsal, distally thinned	·	·	1	1	2.08
Lateral, dorsal	1	·	1	2	4.18
Sub-crescent, dorsal	·	1	·	1	2.08
Sub-crescent, dorsal, distally thinned	1	·	·	1	2.08
Hook-like, dorsal, distally thinned	·	·	1	1	2.08
Sub-leaf, dorsal	·	1	·	1	2.08
Amorphous, thinned base	1	·	·	1	2.08
Scrapers					
Transverse-straight, dorsal	1	1	·	2	4.18
Transverse-convex, dorsal	1	2	·	3	6.25
Transverse-wavy, dorsal	1	·	·	1	2.08
Diagonal-convex, dorsal	2	2	·	4	8.34
Straight, dorsal	1	·	·	1	2.08
Straight, dorsal, backed	1	1	·	2	4.18
Straight, dorsal, truncated-faceted base	·	1	·	1	2.08
Convex, dorsal	2	·	1	3	6.25
Convex, dorsal, thinned base	·	1	·	1	2.08
Wavy, dorsal	2	·	·	2	4.18
Straight-convex, dorsal	2	1	·	3	6.25
Double-convex, dorsal	·	1	·	1	2.08
Convex-concave, dorsal	1	·	·	1	2.08
Triangular, dorsal, thinned base	·	·	1	1	2.08
Semi-trapezoidal, dorsal	1	·	·	1	2.08
Semi-trapezoidal, dorsal, distally thinned	·	·	1	1	2.08
Semi-rectangular, dorsal	1	·	·	1	2.08
Notches					
Lateral, dorsal	·	1	·	1	2.08
Burins					
Dihedral, on chunk	1	·	·	1	2.08
Truncated-faceted pieces					
Proximal	·	1	·	1	2.08
Bifacial scrapers					
Semi-crescent, backed	1	·	·	1	2.08
Sub-crescent	1	·	·	1	2.08
Leaf-shaped	1	·	·	1	2.08
Bifacial reutilized					
Leaf-shaped, tip fragment	·	1	·	1	2.08
Sub-total:	**26**	**15**	**7**	**48**	**100.00**

Table 14-15 Kabazi V, Unit IV: tools.

	Level IV/1	Level IV/2	Level IV/3	Total:
	#	#	#	#
Retouched Pieces				
Distal, dorsal	·	·	1	1
Distal, dorsal, thinned base	1	·	·	1
Lateral, dorsal	9	7	4	20
Lateral, ventral	1	·	·	1
Bilateral, dorsal	2	·	·	2
Bilateral, alternate	1	·	·	1
Lateral-distal, dorsal	1	1	·	2
Thinned pieces				
Proximal, ventral	1	·	·	1
Proximal, bifacial	1	·	·	1
Unidentifiable				
Dorsal	4	3	6	13
Total:	**47**	**26**	**18**	**91**

Table 14-15 Continued.

Scrapers

The Unit IV tool assemblage comprises 20 single-edge, 5 double-edge and 4 convergent scrapers (Table 14-15). Among the single-edge scrapers six are classified as transverse, four as diagonal, and ten as longitudinal. Transverse scrapers are represented by straight, convex (Fig. 14-10, *2*), and wavy (Fig. 14-10, *1*) items. These were made using scalar abrupt, stepped abrupt (Fig. 14-10, *1*), and scalar semi-abrupt retouch (Fig. 14-10, *2*). All were obversely retouched and made on flakes. Transverse single scrapers range in length from 30 to 56 mm, with a width of between 37 and 73 mm.

Both diagonal scrapers exhibit convex obversely retouched edges. One was made using scalar flat and scalar semi-abrupt retouch. All diagonal scrapers were made on flakes, and range in size from 30-60 mm long, and 33-62 mm wide.

Single-edge longitudinal scrapers are subdivided, on the basis of the shape of their retouched edges, into the following morphological groups: straight; convex; and, wavy (Fig. 14-2, *2*; 14-11, *1, 4*; 14-12, *4, 5, 6, 7*). Further, the straight edge scrapers comprise three types: straight (Fig. 14-2, *2*); straight, backed (Fig. 14-12, *4*); and straight with truncated faceted base (Table 14-15). Convex scrapers are subdivided into a convex regular type (Fig. 14-11, *1, 4*; 14-12, *7*) and a convex type with a thinned base (Fig. 14-12, *6*). All longitudinal scrapers were produced using obverse scalar flat/semi-abrupt retouch. Blades served as the blanks for straight, backed, and for one wavy scraper. All remaining scrapers were made on flakes, including one *débordante*/Levallois flake (Fig. 14-2, *2*). The complete examples of single-edge longitudinal scrapers are between 38 and 67 mm long and from 24 to 48 mm wide. The largest scraper is a straight, backed piece which had been made on a broken blade (length: 92.14 mm; width: 34.92 mm).

There are five double-edge scrapers, these comprise three straight-convex pieces (Fig. 14-11, *6*), one double-convex piece (Fig. 14-11, *5*) and one convex-concave piece (Fig. 14-11, *3*). The convex-concave and straight-convex scrapers were made using scalar semi-abrupt retouch. Another straight-convex scraper and the single double-convex scraper were elaborated using scalar flat retouch. All but one of the double edge scrapers were made on flakes. The straight-convex scraper was made on a blade. These scrapers range in length from 44 to 64 mm and are between 22 and 56 mm wide.

Convergent scrapers are represented by four different types: triangular with thinned base (Fig. 14-12, *1*), semi-trapezoidal (Fig. 14-12, *3*), semi-trapezoidal with distal thinning, and semi-rectangular. A scalar stepped semi-abrupt retouch was used for triangular, thinned base scraper production. Both semi-trapezoidal scrapers were made using obverse

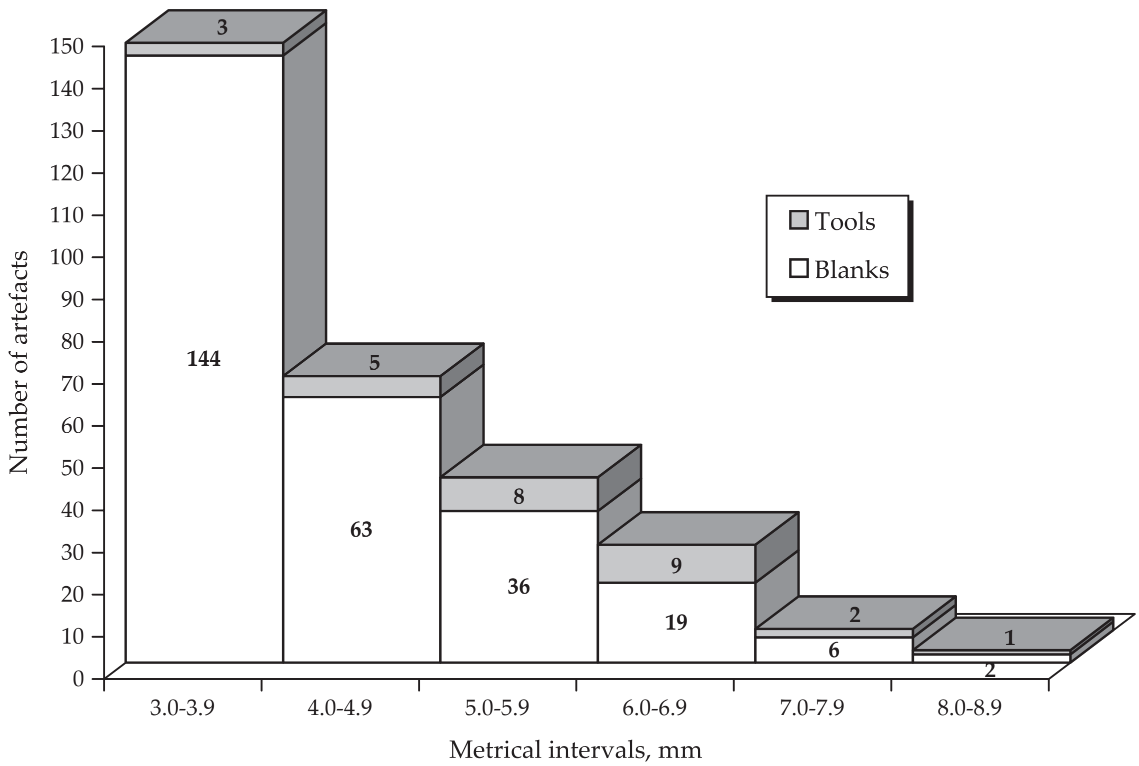


Fig. 14-8 Kabazi V, level IV/1. Tools and unretouched blanks, by metrical intervals.

scalar flat retouch, and semi-rectangular scrapers by obverse scalar semi-abrupt retouch. All convergent scrapers were made on flakes. These pieces range in length from between 36 and 48 mm, and are between 28 and 44 mm wide.

Notch

One notch was made by the application of obverse scalar semi-abrupt retouch to the lateral side of a small broken flake (length: >36.04 mm; width: 29.40 mm; thickness: 3.50 mm).

Truncated-faceted piece

One truncated-faceted piece was made on the proximal part of a fragmented blade (Fig. 14-12, *2*).

Burin

One dihedral burin was made on a chunk. This piece is 49.28 mm long, 49.61 mm wide and 16.28 mm thick.

Bifacial scrapers

There are three bifacial scrapers (Table 14-15). The sub-crescent bifacial scraper was made on transversal flake. It is 99.11 mm long, 55.96 mm wide and 14.55 mm thick (Fig. 14-13, *1*). The straight edge was elaborated by a demi-Quina retouch. The convex edge was made using a scalar flat retouch. The tip of the tool and the straight edge are obversely retouched, while the convex edge is inversely retouched. Thus, the sub-crescent scraper was made in a plano-convex alternate manner.

The leaf (asymmetrical) bifacial scraper was made on a natural flake. It is 113.91 mm long, 53.43 mm wide and 22.25 mm thick (Fig. 14-13, *2*). Both edges are obversely retouched. The straighter edge was made by demi-Quina retouch, while the more convex edge is the result of a scalar semi-abrupt retouch. Therefore, this leaf-shaped bifacial scraper was made in both plano-convex bifacial and unifacial dorsal manners.

The semi-crescent bifacial scraper was made on a flint plaquette. It is 66.49 mm long, 37.86 mm wide and 17.49 mm thick (Fig. 14-14). This tool was made in plano-convex manner using a scalar semi-abrupt retouch.

	Placement	Type	Angle	Level IV/1	Level IV/2	Level IV/3	Total:	%
Points	obverse	sub-parallel	flat	2	·	·	2	2.26
	obverse	sub-parallel	semi-abrupt	·	·	1	1	1.12
	obverse	scalar	semi-abrupt	3	1	·	4	4.50
	obverse	scalar	flat	1	·	3	4	4.50
Scrapers	obverse	scalar	abrupt	1	·	·	1	1.12
	obverse	scalar	semi-abrupt	7	4	·	11	12.36
	obverse	scalar	flat	7	6	1	14	15.73
	obverse	stepped	semi-abrupt	·	1	2	3	3.37
	obverse	stepped	abrupt	1	·	·	1	1.12
Notches	obverse	scalar	semi-abrupt	·	1	·	1	1.12
Bifacial scrapers	alternate	demi-Quina	semi-abrupt	1	·	·	1	1.12
	obverse	demi-Quina	semi-abrupt	1	1	·	2	2.26
	alternate	scalar	semi-abrupt	1	·	·	1	1.12
Retouched pieces	obverse	scalar	flat	·	7	4	11	12.36
	obverse	scalar	abrupt	·	·	1	1	1.12
	obverse	irregular	abrupt	2	·	·	2	2.26
	obverse	irregular	semi-abrupt	1	·	·	1	1.12
	obverse	irregular	flat	8	·	·	8	8.99
	inverse	irregular	flat	1	·	·	1	1.12
	obverse	marginal	flat	2	1	·	3	3.37
	alternate	marginal	flat	1	·	·	1	1.12
Thinned pieces	inverse	scalar	flat	1	·	·	1	1.12
	bifacial	scalar	flat	1	·	·	1	1.12
Unidentifiable	obverse	scalar	semi-abrupt	1	1	1	3	3.37
	obverse	scalar	abrupt	·	·	1	1	1.12
	obverse	stepped	semi-abrupt	·	1	·	1	1.12
	obverse	scalar	flat	3	1	4	8	8.99
			Total:	**46**	**25**	**18**	**89**	**100.00**

Table 14-16 Kabazi V, Unit IV: retouch characteristics.

Bifacial reutilized tool

The zone of breakage of the leaf-shaped tip of a plano-convex bifacial tool had been elaborated by a scalar retouch. The reutilized tool is 40.05 mm long, 44.47 mm wide and 15.47 mm thick.

Retouched pieces

Depending on the exact placement of retouch on an individual piece, retouched pieces are subdivided into 7 types (Table 14-15). The most numerous of these is the lateral, dorsal type (Fig. 14-2, *1*; 14-11, *2*). This type of retouched piece was made by scalar flat, irregular flat, irregular abrupt, irregular semi-abrupt

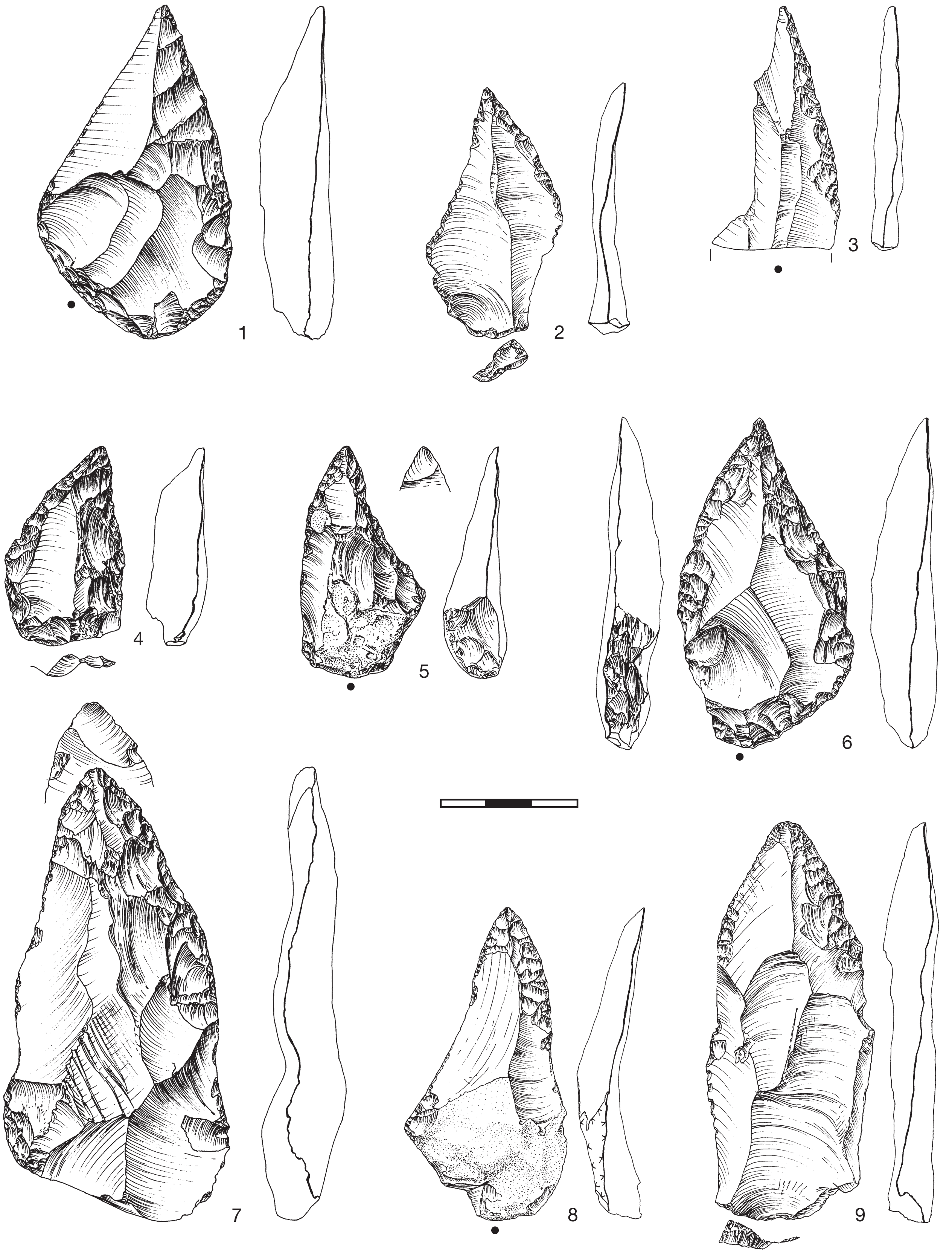


Fig. 14-9 Kabazi V, levels IV/1 (2, 3, 8, 9), IV/2 (4, 6), IV/3 (1, 5, 7). Points: 1 and 3 – lateral; 2, 8 and 9 – distal; 4 – sub-crescent; 5 – hook-like, distally thinned; 6 – sub-leaf; 7 – distal, distally thinned.

and marginal flat retouch. The only lateral ventral piece was realised by an irregular flat retouch. Bilateral retouched pieces (Fig. 14-1, *3*), as well as lateral distal retouched pieces, were produced using a combination of obverse marginal/irregular flat and alternate marginal flat retouch variations. The only retouched piece with a thinned base was made using an irregular abrupt retouch. Ten out of 28 retouched pieces were made on blades, and one piece on a natural flake. Retouched pieces range in length from 32 to 86 mm and are between 28 and 62 mm wide.

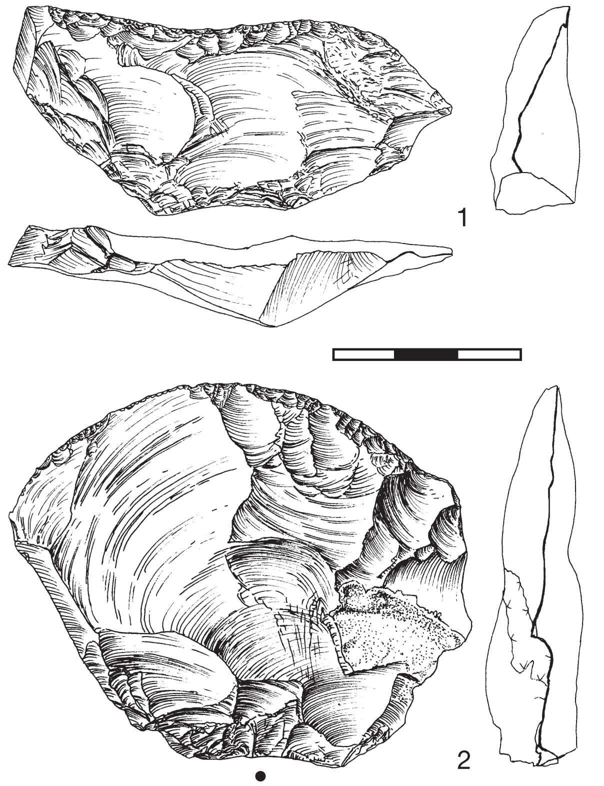


Fig. 14-10 Kabazi V, levels IV/1 (1) and IV/2 (2). Scrapers: 1 – transverse-wavy; 2 – transverse-convex.

Thinned pieces

There are two flakes with a thinned base (Table 14-15). Whereas one piece displays a ventral thinning, the other has both ventral and dorsal thinning. These two pieces range in length from between 39-42 mm and are 26 to 26.5 mm wide.

Unidentifiable tools

Unidentifiable tools comprise tools fragments with an obverse retouch. One of the unidentifiable tools from level IV/1 was heavily burnt.

Discussion: Kabazi V, Unit IV in WCM Context

With the exception of bifacials, all other represented tool types are common to WCM assemblages. Indeed, such types as the distal and lateral points, as well as the simple scrapers on blades, are the most characteristic features of WCM typology. Further, the characteristics of cores, flakes and blades are even clearer evidence of the WCM status of the Kabazi V, Unit IV assemblage. However, three bifacial tools from level IV/1, as well as one bifacial tool from level IV/2, are considered typical for the Crimean Micoquian. Indeed, the occurrence of these pieces alongside WCM artefacts might be the basis for further speculations.

At the present time, the only really reliable statement that can be made, as evidenced from debitage characteristics, is that there is a definite absence of on-site bifacial tool production and/or reshaping. This means that bifacials were brought to the site as already prepared tools. If then we were to assume that bifacials are part of a larger Micoquian assemblage, further "Micoquian" artefacts might include the semi-trapezoidal scrapers. Thus, the most probable scenario in the case of Unit IV at Kabazi V is a mechanical mixture of WCM and Micoquian artefacts in palimpsests.

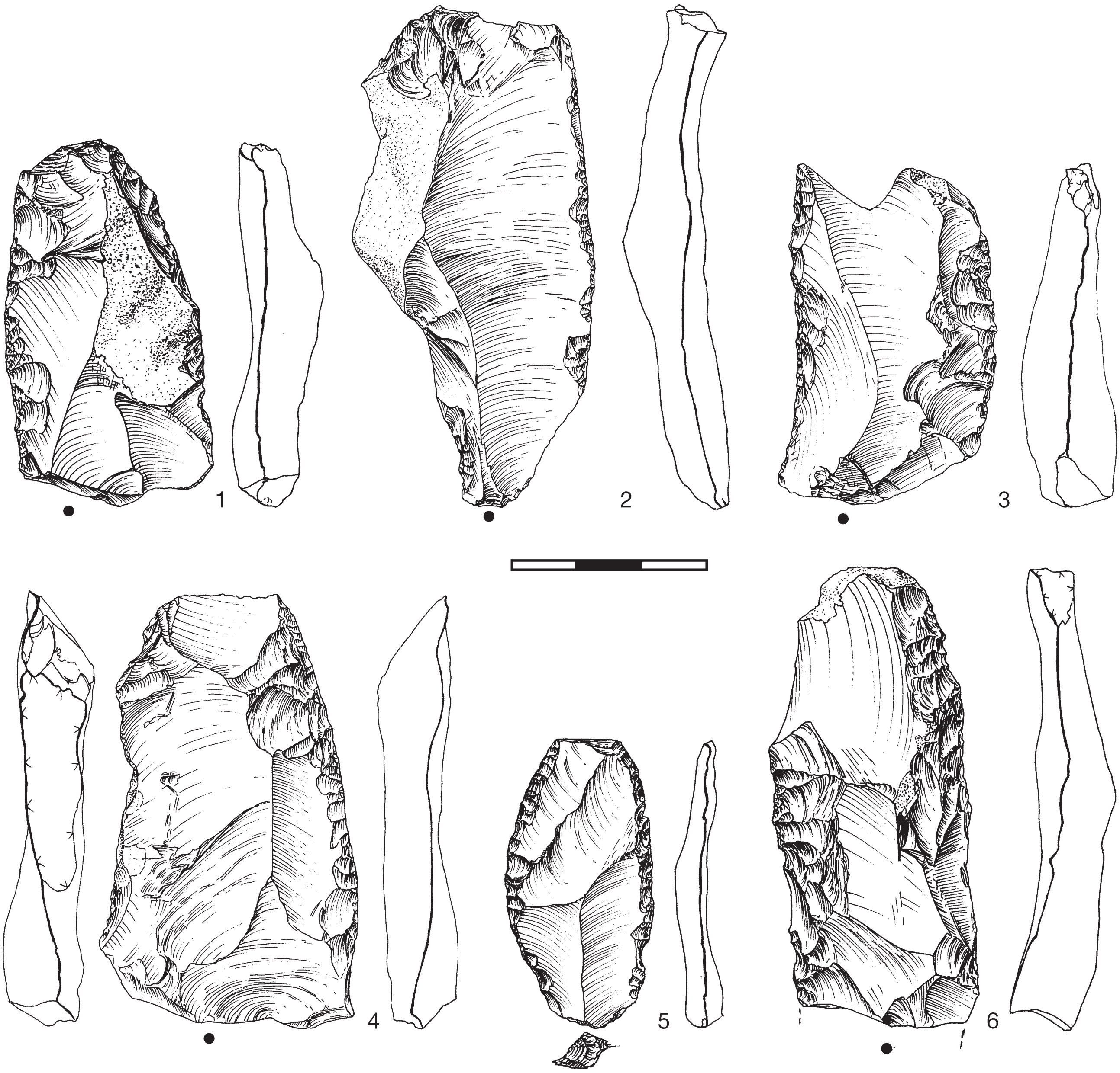
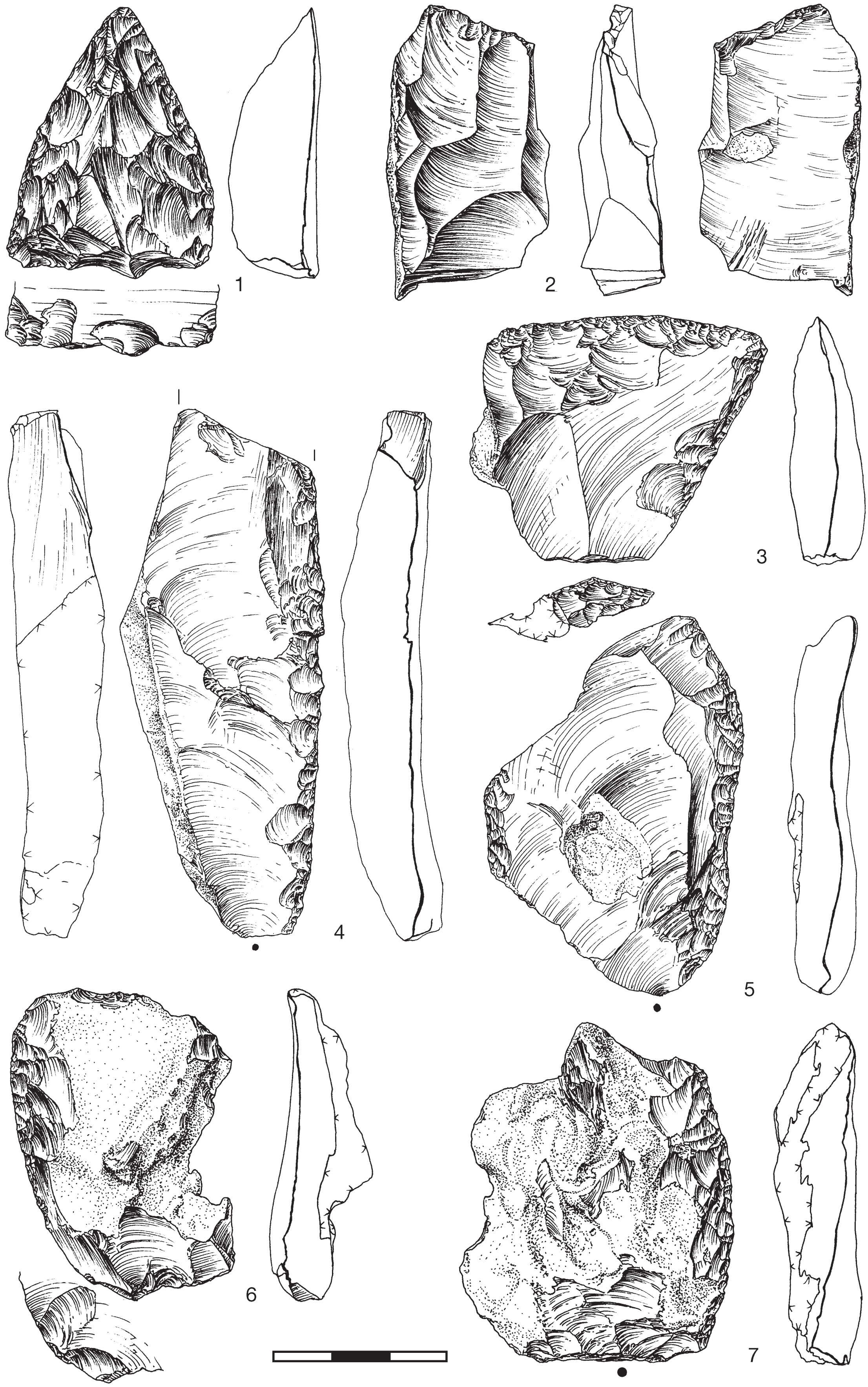
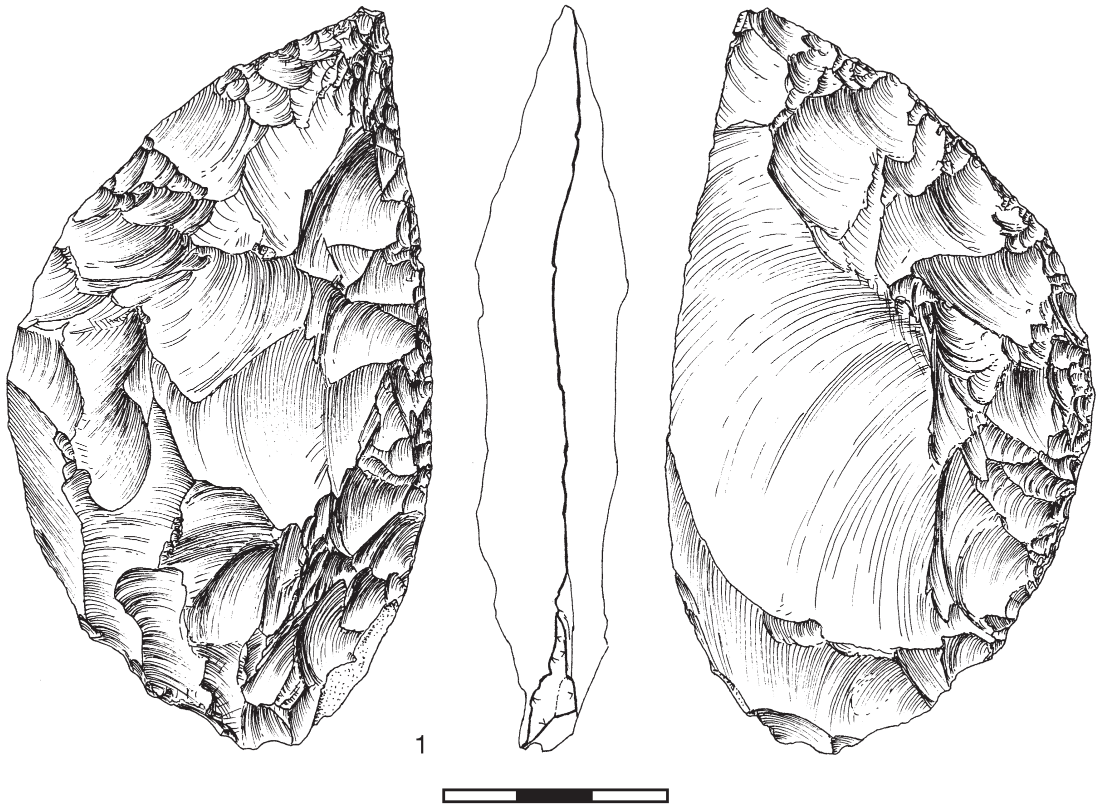


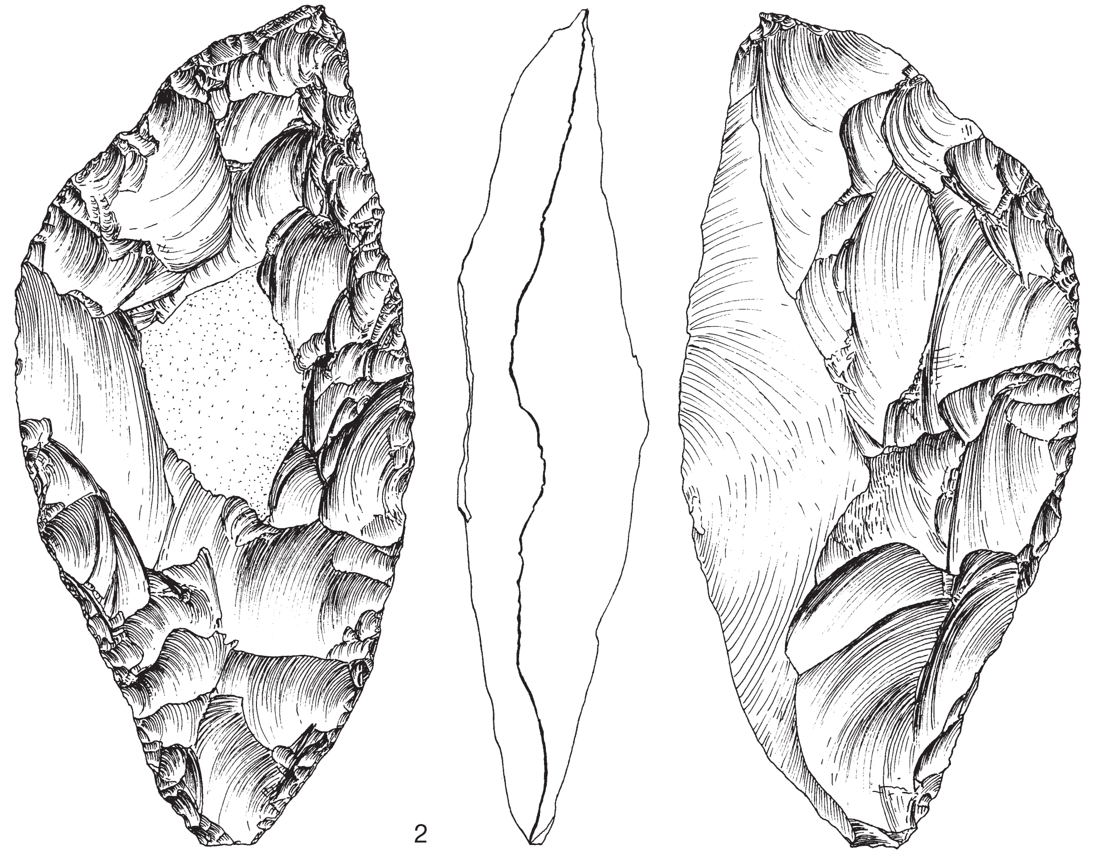
Fig. 14-11 Kabazi V, levels IV/1 (2, 3, 4), IV/2 (1, 5, 6). Tools: 1, 4 – scrapers, convex; 2 – retouched piece, lateral; 3 – scraper, convex-concave; 5 – scraper, double-convex; 6 – scraper, straight-convex.

Fig. 14-12 Kabazi V, levels IV/1 (3, 4, 5), IV/2 (2, 6), IV/3 (1, 7). Tools: 1 – scraper, triangular, thinned base; 2 – truncated-faceted piece, proximal; 3 – semi-trapezoidal; 4 – scraper, straight, backed; 5 – scraper, wavy; 6 – scraper, convex, thinned base; 7 – scraper, convex. ▶


1
2
3
4
5
6
7



1



2

Fig. 14-13 Kabazi V, level IV/1. Bifacial scrapers: 1 – sub-crescent; 2 – leaf-shaped, asymmetrical.

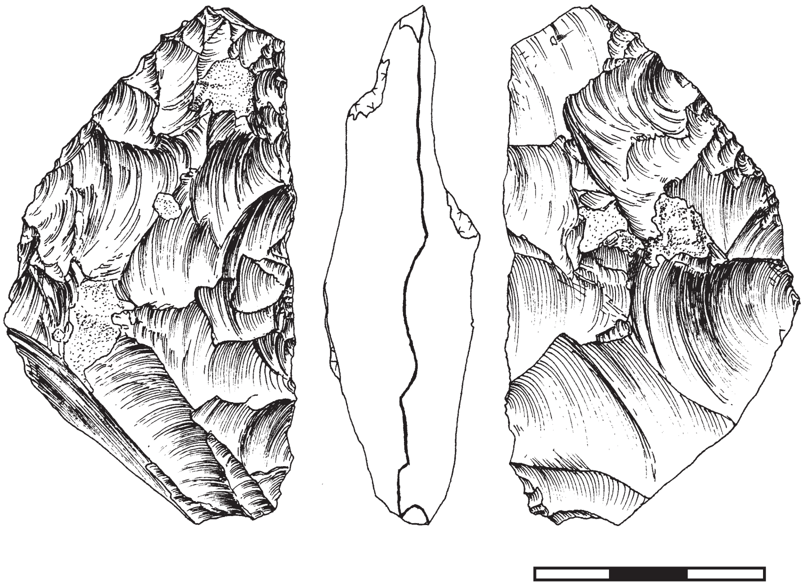


Fig. 14-14 Kabazi V, level IV/1. Bifacial scraper, semi-crescent.

Abstract

КАБАЗИ V, КУЛЬТУРНЫЙ СЛОЙ IV: ЗАПАДНОКРЫМСКОЕ МУСТЬЕ

ЧАБАЙ В.П.

Культурный слой IV представлен тремя археологическими горизонтами IV/1, IV/2 и IV/3, которые являются остатками древних жилых поверхностей. Горизонты IV/1, IV/2 и IV/3 залегают в первичном положении. Каких-либо существенных свидетельств воздействия эрозионных процессов не обнаружено (см. Главу 1 в этом томе).

Общее количество артефактов обнаруженных в IV культурном слое составляет 21563 изделий, в том числе 2 костяных ретушера. Наибольшее количество кремневых изделий происходит из горизонта IV/1 (12980 экз.). Значительно меньше обработанного кремня обнаружено в горизонтах IV/2 и IV/3: 5546 и 3035 экземпляров, соответственно. Без учета чешуек и обломков в структуре комплексов артефактов преобладают отщепы и пластины. Относительно широко представлены орудия и нуклеусы (Table 14-1). Соотношения орудий к нуклеусам составляют 3,6:1, 6,5:1 и 9:1 в горизонтах IV/1, IV/2 и IV/3, соответственно. Соотношения сколов к нуклеусам представлены следующими значениями: 39,4:1 (горизонт IV/1); 42,5:1 (горизонт IV/2); 24,5:1 (горизонт IV/3). Приведенные соотношения характерны

для стоянок-мастерских (Кабази II, II/1A – II/7; Кабази V, III/3), на которых происходил полный цикл нуклеусного расщепления и изготовления орудий из полученных заготовок.

Нуклеусы представлены: бессистемным – 1 экз.; леваллуазским черепаховидным – 1 экз.; радиальными – 3экз. (Fig. 14-1, *7*); дисковидными – 2 экз.; продольными – 3 экз.; бипродольным – 1 экз. (Fig. 14-2, *4*) и неопределимыми – 7 экз. Леваллуазский, бипродольный и продольные нуклеусы оснащены вспомогательными латеральными ударными площадками. Приведенная типологическая структура нуклеусов соответствует методу первичного расщепления Биаш в том виде, как он был описан для материалов Кабази II, II (Chabai 1998c). Подтверждением этого вывода являются находки леваллуазских отщепов и пластин с центростремительными и билатеральными огранками, сколов *enlèvement deux* и *débordantes* (Fig. 14-1, *1, 2, 3, 4, 5, 6, 8*; 14-2, *1, 2*).

Для горизонтов IV/1, IV/2 и IV/3 индекс пластин составляет от 21,6 до 26,9, процент сколов двусторонней обработки (включительно с чешуйками) колеблется от 6 до 10%. Индексы фасетажа ударных площадок для горизонтов IV/1 и IV/2 составляют: Ifl=65,31, Ifs=44,37 и Ifl=60,67, Ifs=34,43, соответственно. На основании анализа технико-типологических признаков сколов было установлено, что комплекс отщепов и пластин подразделяется на две группы: качественных заготовок (desired blanks) и отходов производства (waste blanks). Усредненные параметры «качественных» заготовок: удлиненные пропорции (длина не менее 50 мм); прямоугольная симметричная или трапециевидная удлиненная, слегка асимметричная формы; ровный или слегка изогнутый латеральный профиль; перьевидный дистальный профиль. Признаки «отходов производства» следующие: укороченные, зачастую трансверсальные пропорции; трапециевидная асимметричная форма; искривленный латеральный и перьевидный дистальный профили. «Качественные» заготовки были обнаружены только в леваллуа-мустьерских комплексах и связаны со специфическими методами нуклеусного расщепления. «Отходы производства» обнаружены как в леваллуа-мустьерских, так и в микокских коллекциях и ассоциируются с этапом подготовки выпуклости рабочей поверхности нуклеусов и обработкой двусторонних орудий, соответственно.

Орудия культурного слоя IV представлены следующими классами: остроконечники (12 экз.); скребла (29 экз.); выемчатые (1 экз.); резцы (1 экз.); тронкировано-фасетированные (1 экз.); двусторонние скребла (3 экз.); двусторонние реутилизированные орудия (1 экз.); сколы с ретушью (28 экз.); сколы с утончением (2 экз.); неопределимые односторонние орудия (13 экз.). Двадцать пять из 91 орудия изготовлены на пластинах. Остроконечники подразделяются на следующие морфологические группы: дистальные (5 экз.); латеральные (2 экз.); сегментовидные (3 экз.); листовидные (1 экз.); аморфные (1 экз.). Среди скребел выделены следующие морфологические группы: поперечные (6 экз.); диагональные (4 экз.); продольные (10 экз.); двойные (5 экз.); треугольные (1 экз.); трапециевидные (2 экз.); прямоугольные (1 экз.). Двусторонние скребла (все из горизонта IV/1) представлены полусегментовидным, обушковым, подсегментовидным и листовидным асимметричным изделиями. Два последних обработаны ретушью Кина. Еще одно двустороннее орудие (реутилизированное) было обнаружено в горизонте IV/2. Большая часть сколов с ретушью представлена отщепами с дорсальной латеральной ретушью. Наиболее часто встречающиеся комбинации ретуши – дорсальная чешуйчатая плоская и дорсальная чешуйчатая полукрутая.

Кроме наличия четырех (3 в горизонте IV/1 и 1 в горизонте IV/2) двусторонних орудий ничто не противоречит отнесению кремневого комплекса Кабази V, IV к западнокрымской индустрии. Вместе с тем, среди сколов данного культурного слоя не обнаружено достаточных свидетельств изготовления двусторонних орудий на территории поселений горизонтов IV/1 и IV/2. С другой стороны, дополнительным микокским компонентом могут быть некоторые типы конвергентных скребел. Таким образом, наиболее вероятным сценарием появления двусторонних орудий является механическое смешение материалов микокских и западнокрымских поселений в палимпсесте IV культурного слоя Кабази V.

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UNIVERSITY OF COLOGNE INSTITUTE OF PREHISTORIC
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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

Edited by
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Chapter 15

Kabazi V: Bone and Stone Tools Used in Flint Knapping

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Bone and stone retouchers and hammerstones are an artefact category long attested in studies of the Crimean Middle Palaeolithic (Bonch-Osmolovski 1940; Gvozdover, Formozov 1960; Kolosov 1983; Kolosov 1986; Kolosov, Stepanchuk, Chabai 1993; Stepanchuk 1990; Stepanchuk 1993; Yevtushenko 1998b; Chabai 2004b, 2004c). The collection of bone and stone tools for flint treatment recovered from Kabazi V is, however, the largest ever to have been recovered. In total, there are 255 items: 205 bone retouchers, 35 pebble retouchers, and 15 hammerstones.

The dispersion of bone and pebble retouchers / hammerstones throughout the archaeological occupations is heterogeneous in character. Bone retouchers were found in all archaeological levels of sub-units III/1, III/2, III/4, III/5, III/7, as well as in some levels of sub-units III/3, III/6, and in Unit IV, whereby nearly 80 % of pieces stems from sub-units III/1 and III/5. Pebble retouchers and hammerstones were discovered in practically all archaeological levels of sub-units III/1 and III/3, and also in level III/4-1. The most numerous collection of tools on pebbles was discovered in archaeological levels of sub-unit III/1 where they constitute about 70 % of the total number from the entire Kabazi V sequence. A total of 27 of the 34 pebble retouchers / hammerstones from sub-unit III/1 stems from level III/1A. The analysis of such a large collection of flint treatment tools has revealed some important typological characteristics with which comparative analyses can now be undertaken.

Classification of Bone and Stone Tools Used in Flint Knapping

In the last decade some different approaches have been suggested for classifying bone and stone retouchers and hammerstones. For example, Yevtushenko and Chabai defined bone and pebble retouchers on the basis of size and the positions of their working surfaces (Yevtushenko 1998b; Chabai 2004b, 2004c). In this study these characteristics are complemented by four further attributes. Thus, a total of six attributes of flint treatment tools from all archaeological levels of Kabazi V has been studied. These attributes are the number of working surfaces, the number of working zones, the degree of utilisation, dimensions, weight, and raw material.

1. According to the number of working surfaces bone and pebble retouchers / hammerstones are differentiated as either one-sided (unifacial), two-sided (bifacial), three-sided (trifacial), etc.

2. Each bone and pebble retoucher / hammerstone is classified according to the number of working areas (working zones) which it displays, i.e. concentrations of transverse cuts and longitudinal scratches. Accordingly, there are pieces with one working zone (simple), two working zones double), three working zones (triple), etc.

3. A basic criteria for the classification of retouchers and hammerstones into different groups is the degree to which they have been utilised, i.e. the state of their working surfaces. Accordingly, three types of bone and pebble retouchers / hammerstones are distinguished: slightly utilised, moderately utilised, and heavily utilised. Tools with only a slight degree of utilisation are characterised by pieces with only a small number of cuts on their working surfaces. Retouchers and hammerstones of this type usually display a small working zone that is not overly covered by cuts and artificial striations, and where intact areas of the tool's primary surface remain. Bone and pebbles with moderate and heavy degrees of utilisation display more extensively affected working surfaces with a high density of cuts and scratches, particularly in form of peculiar crumbled cavities, within the limits of the working zone.

4. Dimensions are in mm, and relate to the maximum length, maximum width, and maximum thickness of a piece.

5. Weight in grams. This attribute is of relative significance, particularly due to the obvious difference in the weight of fresh and fossil Pleistocene bones.

6. The type of raw material refers to the material used as a retoucher / hammerstone.

The Bone Retouchers

The six attributes listed above have been recorded for all bone retouchers from all archaeological levels of Kabazi V. All bone retouchers found at Kabazi V are characterised by the presence of a single flat or slightly convex working surface. Among tube bone fragments the exterior surfaces were used as working surfaces. Two types of bone retoucher have been discovered at Kabazi V, the simple bone retoucher (Fig. 15-1, *1-2*; 15-2; 15-3; 15-4, *1, 2*; 15-5; 15-6; 15-7, *1*) and the double bone retoucher (Fig. 15-7, *2*; 15-8; 15-9; 15-10; 15-11; 15-12). All three degrees of utilisation are attested among these pieces, i.e. slight utilisation (Fig. 15-1, *1, 2*; 15-2; 15-3; 15-4, *1*; 15-7, *2*; 15-8; 15-9), moderate utilisation (Fig. 15-4, *2*; 15-5), and heavy utilisation (Fig. 15-6; 15-7, *1*; 15-10; 15-11). Among the double retouchers 2.45 % comprise bone tubes with different degrees of utilisation (Fig. 15-12), and each is characterised by its own quite individual dimensions and weight characteristics. On the basis of these data, statements can be made with regard to the role of bone retouchers in the overall system of flint treatment, and in comparison say with other types of instruments, such as stone retouchers and hammer-stones. As a rule, "blanks" used for the production of bone retouchers comprised fragments of tube bones from animal extremities, and in rare cases rib fragments were also used (Chabai, 2004b, p. 408). The "raw material" for bone retouchers consisted of the remains of animals processed at the site.

Description of Bone Retoucher Assemblages

Sub-Unit III/1

In sub-unit III/1, tube bone fragments were used as retouchers; this collection of artefacts numbers 107 items, thus constituting 52.2 % of all retouchers from Kabazi V. In all archaeological levels of sub-unit III/1 simple types prevail (Table 15-1; Fig. 15-1, *1, 2*; 15-4, *2*; 15-7, *1*), and double retouchers make up about a quarter of all retouchers from sub-unit III/1 (Fig. 15-7, *2*; 15-10; 15-11). A level-by-level analysis of the

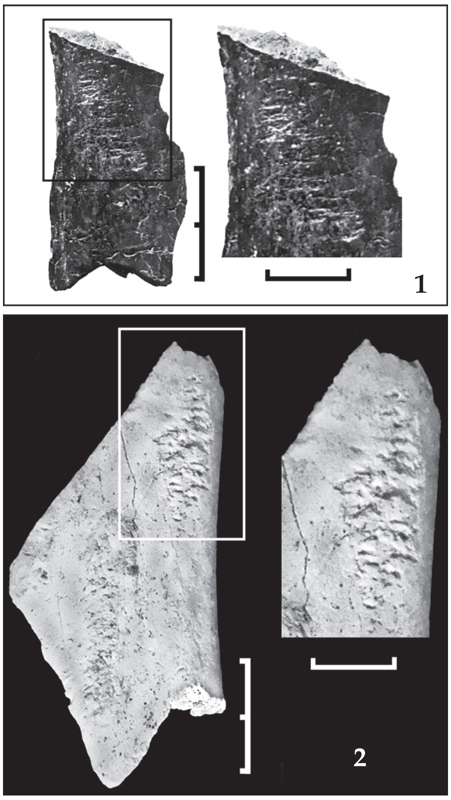


Fig. 15-1 Kabazi V, levels III/1A (1), III/1B (2), bone retouchers: 1, 2 – one-sided simple, slightly utilised.

Fig. 15-2 Kabazi V, level III/4-5, bone retoucher: one-sided simple, slightly utilised.

Fig. 15-3 Kabazi V, level III/5-3, bone retoucher: one-sided simple, slightly utilised.

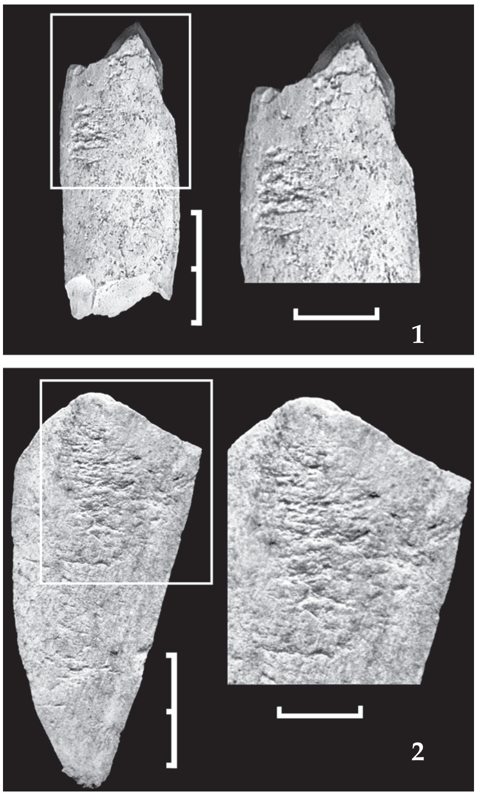


Fig. 15-4 Kabazi V, levels III/6-1-2 (1), III/1A (2), bone retouchers: 1 – one-sided simple, lightly utilised; 2 – one-sided simple, moderately utilised.

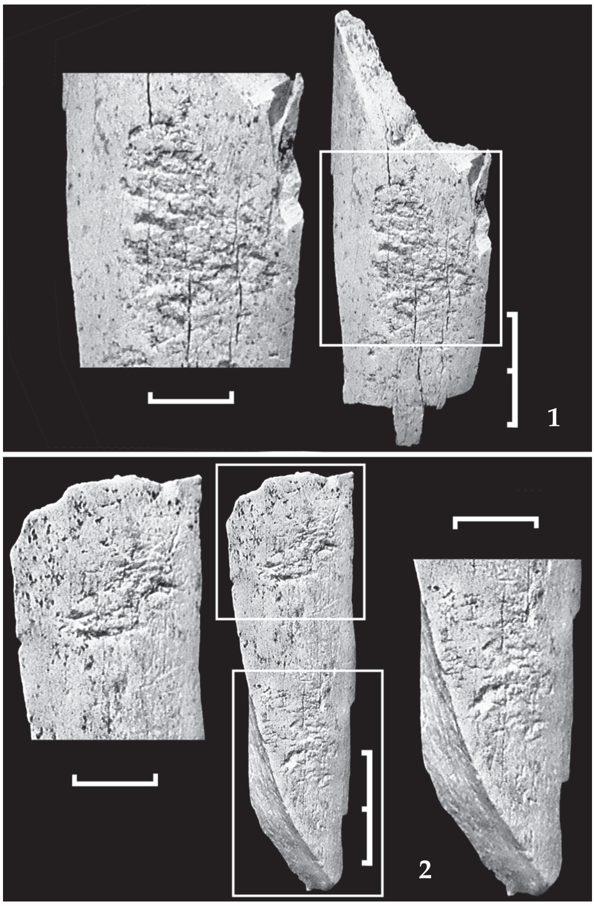
		One-side simple bone retouchers			One-side double bone retouchers				
		light	moderate	heavily	ligth	moderate	heavily	combined *	Total:
Sub-unit III/1	III/1B	5	4	8	·	·	4	·	21
	III/1	8	12	21	5	6	5	3	60
	III/1A	10	6	5	·	·	2	·	23
	III/1C	·	·	2	·	1	·	·	3
Sub-unit III/2	III/2	1	·	1	·	·	·	1	3
	III/2A	1	1	1	·	·	·	·	3
Sub-unit III/3	III/3-1	1	·	·	·	·	·	·	1
	III/3-1B	·	1	·	·	·	·	·	1
	III/3-2A	·	·	1	·	·	·	·	1
	III/3-3	1	·	·	·	·	·	1	2
	III/3-3A	1	·	·	·	·	·	·	1
	III/3-4	·	·	1	·	·	·	·	1
	III/3-5	·	·	·	·	·	1	·	1
Sub-unit III/4	III/4-1	·	·	1	1	1	·	·	3
	III/4-2	·	2	·	·	·	·	·	2
	III/4-3	·	1	1	·	·	·	·	2
	III/4-4	·	·	·	1	·	·	·	1
	III/4-5	1	1	2	·	1	·	·	5
	III/4-6	·	·	·	·	1	·	·	1
Sub-unit III/5	III/5-1	1	1	2	·	·	·	1	5
	III/5-1A	·	1	1	·	·	·	·	2
	III/5-1B	·	1	1	·	·	·	·	2
	III/5-2	2	1	4	·	2	1	·	10
	III/5-2-1	·	1	·	·	·	·	·	1
	III/5-3	·	1	4	·	·	1	·	6
	III/5-3B + III/5-3B1	7	3	2	1	3	2	·	18
	III/5-3B2	2	1	4	·	1	·	·	8
Sub-unit III/6	III/6-1	1	2	1	1	1	·	·	6
Sub-unit III/7	III/7-1	2	·	1	·	1	·	·	4
	III/7-2	1	1	·	·	·	2	·	4
	III/7-3	·	1	·	·	·	1	·	2
Unit IV	IV/2	·	1	·	·	·	·	·	1
	IV/3	·	·	1	·	·	·	·	1
	Total:	**45**	**43**	**65**	**9**	**18**	**19**	**6**	**205**

*one-sided double retouchers with varying degrees of utilisation

Table 15-1 Kabazi V. Classification of bone retouchers.

Fig. 15-5 Kabazi V, level III/5-3B2, bone retoucher: one-sided simple, moderately utilised.

Fig. 15-6 Kabazi V, level III/5-1, bone retoucher: one-sided simple, heavily utilised.



◀ **Fig. 15-7** Kabazi V, level III/1, bone retouchers: 1 – one-sided simple, heavily utilised; 2 – one-sided double, slightly utilised.

Fig. 15-8 Kabazi V, level III/4-6, bone retoucher: one-sided double, slightly utilised.

Fig. 15-9 Kabazi V, level III/5-3B, bone retoucher: one-sided double, slightly utilised

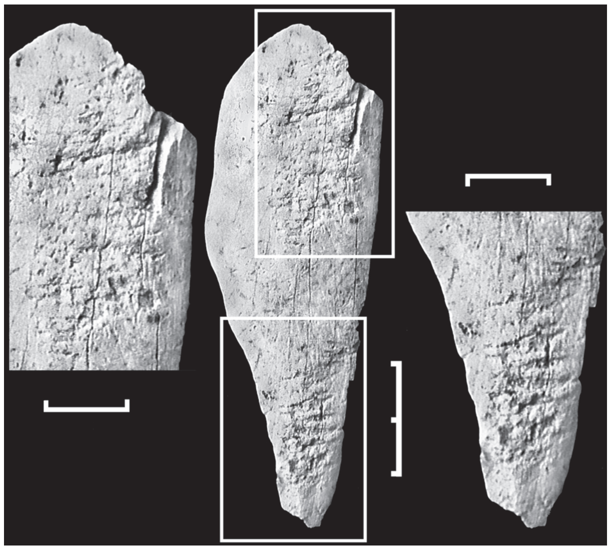


Fig. 15-10 Kabazi V, level III/1, bone retoucher: one-sided double, heavily utilised.

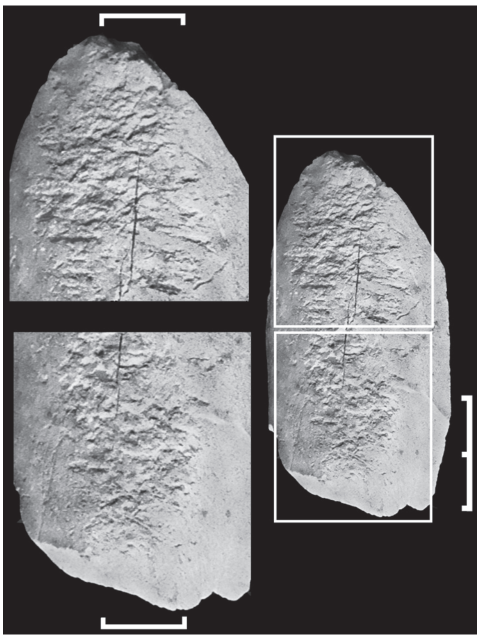


Fig. 15-11 Kabazi V, level III/1A, bone retoucher: one-sided double, heavily utilised

Fig. 15-12 Kabazi V, level III/5-1, bone retoucher: one-sided double, light / moderately utilised.

ratio of simple and double retouchers shows that the greatest numbers of double types occur in archaeological levels III/1 (31.67 %) and III/1C (33.33 %). In levels III/1A and III/1B their ratios are considerably lower, with 8.7 % and 19.5 %, respectively.

Among both simple and double retouchers from sub-unit III/1 heavily utilised items predominate (Table 15-1; Fig. 15-10; 15-11), with the exception of the level III/1A assemblage (Fig. 15-1, *1*) in which only slightly utilised pieces are the most numerous among simple retouchers (Table 15-1). Among the double retouchers in archaeological levels III/1A and III/1B heavily utilised items prevail. Double retouchers in level III/1 comprise slightly, moderate and heavily utilised items in practically equal ratios. The only bone retoucher with a moderate degree of utilisation is the double retoucher from archaeological level III/1C. There are three double retouchers from level III/1, all of which are characterised by different degrees of utilisation; whereas two pieces display slightly and moderately utilised working areas, one piece has one slightly and one heavily utilised surface.

Generally speaking, a prominent feature among bone retouchers from sub-unit III/1 assemblages is a well-defined prevalence of heavily utilised over lightly utilised retouchers, a feature which is characteristic for both simple and double retouchers. For simple retouchers this feature is expressed most clearly in archaeological levels III/1A and III/1B (Table 15-2), while for double retouchers in level III/1 (Table 15-3).

Further, in sub-unit III/1 the heaviest examples of simple and double retouchers were also the most exploited (Tables 15-2 and 15-3). In other words, the most significant attributes when choosing a bone to serve as a retoucher would have been weight, length, width, and thickness. This selection process, which is evidenced in the collection of 107 items, shows very precisely that larger and heavier retouchers were used more intensively than small and lightweight tools.

Sub-unit III/2

The collection of bone retouchers from sub-unit III/2 comprises six items (Table 15-1), all made on fragments of tube bone; five instruments are simple retouchers, with only one double retoucher.

Among simple bone retouchers there are near equal ratios of pieces with heavily, moderately and slightly utilised working surfaces; the double retoucher has one working zone with traces of a slight utilisation, while the other is heavily utilised.

Retouchers from level III/2 differ considerably from other Kabazi V retouchers not only in their recorded width and thickness, but also, and especially, in their weight (Table 15-2). While bones used as retouchers at Kabazi V were usually horse bones, in level III/2 fragments of much larger, but unidentified, animal than *Equus hydruntinus* were used. These heavyweight retouchers show more intense (heavier) signs of utilisation than lightweight pieces; at the same time, the heavyweight retouchers are shorter than the lightweight tools.

Sub-unit III/3

In sub-unit III/3 eight bone retouchers were discovered through seven archaeological levels (Table 15-1); in all cases these retouchers were fragments of tube bones.

With the exception of two double retouchers from levels III/3-3 and III/3-5, all other tools are simple retouchers. Whereas three of the latter are characterised by only a slight utilisation, one is moderately utilised, and two are heavily exploited. The double retouchers are represented by two types of utilization: heavily and light / heavily.

The length, width, thickness, and weight of retouchers from sub-unit III/3 are presented in Tables 15-1 and 15-2.

Sub-unit III/4

A total of 14 bone retouchers were discovered in archaeological levels from sub-unit III/4; all were made on fragments of tube bones (Table 15-1). Whereas archaeological level III/4-5 yielded the most retouchers (5 pieces), in levels III/4-4 and III/4-6 bone retouchers are represented by single items.

In sub-unit III/4 simple retouchers are the most common with nine items(Fig. 15-2), and there are five double retouchers (Fig. 15-8). Level III/4-1 is the only archaeological level of sub-unit III/4 in which double retouchers occur more frequently than simple retouchers (Table 15-1).

There is just one simple retoucher with a slightly utilised working surface (Fig. 15-2), while there are four pieces with moderately utilised and four pieces with heavily utilised surfaces. Double retouchers are represented by both lightly (Fig. 15-8) and moderately utilised pieces (Table 15-1). There are no heavily utilised double retouchers in sub-unit III/4 assemblages.

In the case of level III/4-5 it is of interest that bigger and heavyweight simple retouchers are

		light				moderate			
		length (mm)	width (mm)	thickness (mm)	weight (gr)	length (mm)	width (mm)	thickness (mm)	weight (gr)
Sub-unit III/1	III/1B	52.08	20.63	6.91	6.40	42.8	17.48	7.52	4.75
	III/1	61.25	25.99	7.58	10.75	64.81	25.58	8.65	15.58
	III/1A	59.79	23.08	8.49	9.20	57.57	24.47	9.12	11.00
	III/1C	·	·	·	·	·	·	·	·
Sub-unit III/2	III/2 *	130.88	30.82	18.73	57.00	·	·	·	·
	III/2A *	55.50	23.88	9.41	11.00	96.22	16.91	10.03	20.00
Sub-unit III/3	III/3-1 *	92.01	31.36	9.83	18.00	·	·	·	·
	III/3-1B *	·	·	·	·	61.32	24.68	8.86	8.00
	III/3-2A *	·	·	·	·	·	·	·	·
	III/3-3 *	60.83	17.11	7.93	7.00	·	·	·	·
	III/3-3A *	110.12	45.98	12.37	51.00	·	·	·	·
	III/3-4 *	·	·	·	·	·	·	·	·
	III/3-5	·	·	·	·	·	·	·	·
Sub-unit III/4	III/4-1 *	·	·	·	·	·	·	·	·
	III/4-2 *	·	·	·	·	55.01	21.06	9.07	7.50
	III/4-3 *	·	·	·	·	37.93	20.81	4.06	3.00
	III/4-4	·	·	·	·	·	·	·	·
	III/4-5	111.76	25.92	10.56	34.00	100.34	27.34	6.87	17.00
	III/4-6	·	·	·	·	·	·	·	·
Sub-unit III/5	III/5-1	74.37	22.16	11.76	14.00	59.53	19.73	8.78	9.00
	III/5-1A *	·	·	·	·	70.08	20.6	7.15	10.00
	III/5-1B *	·	·	·	·	59.78	20.83	9.17	9.00
	III/5-2	102.82	26.02	7.98	19.50	55.6	21.65	10.28	13.00
	III/5-2-1 *	·	·	·	·	58.17	28.92	10.64	20.00
	III/5-3	·	·	·	·	98.79	30.43	9.67	30.00
	III/5-3B + III/5-3B1	59.62	23.37	7.72	8.86	71.13	24.43	7.66	12.33
	III/5-3B2	77.89	19.19	6.42	8.00	92.07	22.11	5.75	11.00
Sub-unit III/6	III/6-1	72.42	26.65	9.43	16.00	59.63	20.43	10.78	11.00
Sub-unit III/7	III/7-1	77.41	18.41	8.97	10.00	·	·	·	·
	III/7-2 *	66.22	31.91	8.83	17.00	56.54	28.23	9.49	12.00
	III/7-3 *	·	·	·	·	71.76	26.21	7.32	11.00
Unit IV	IV/2 *	·	·	·	·	48.5	21.66	7.7	5.00
	IV/3 *	·	·	·	·	·	·	·	·

*single piece

Table 15-2 Kabazi V. Average dimensions of simple bone retouchers.

less utilised than smaller and lightweight tools (Table 15-2), thus a quite opposite trend to that observed for sub-unit III/1, even though double retouchers from both level III/4-5 and sub-unit III/1 are still of similar sizes and weight (Table 15-3) However, in archaeological level III/4-3 bigger and heavyweight simple retouchers are once again more intensely exploited than smaller and lightweight pieces (Table 15-2).

It is likely that the observed correlation between metric measurements and utilisation for simple retouchers in both sub-unit III/1 and archaeological level III/4-5 might best be explained by varying availabilities of large fragments of bones. In other words, a deficit of long bone fragments led to the selection of heavyweight pieces (Table 15-2; levels III/1B, III/1 and III/1A). In other levels, such as level III/4-5, where bone fragmentation is not so pronounced, longer fragments of tube bones were selected as retouchers.

heavily			
length (mm)	width (mm)	thickness (mm)	weight (gr)
62.81	25.95	8.02	12.5
68.03	24.24	7.95	13.05
63.64	28.95	9.68	18.20
69.79	25.09	8.58	13.00
94.67	39.1	29.25	70.00
77.72	26.7	9.56	20.00
.	.	.	.
.	.	.	.
94.8	29.66	11.35	25.00
.	.	.	.
.	.	.	.
70.65	20.61	10.83	13.00
.	.	.	.
71.43	15.4	4.08	4.00
.	.	.	.
37.76	25.74	9.8	8.00
.	.	.	.
70.33	21.41	8.01	10.50
.	.	.	.
63.47	30.14	8.66	22
45.44	30.3	5.16	6.00
76.34	39.09	8.89	17.00
58.87	23.52	9.44	11.75
.	.	.	.
52.81	27.09	7.92	8.25
57.71	23.76	11.79	10.50
79.02	29.32	9.72	20.00
42.72	21.43	9.78	8.00
32.93	14.55	8.73	4.00
.	.	.	.
.	.	.	.
.	.	.	.
45.65	23.12	7.45	7.00

Table 15-2 Continued.

Sub-unit III/5

With the exception of two rib fragments in levels III/5-3B + III/5-3B1 and III/5-3B2, all bone retouchers in sub-unit III/5 were made on the fragments of tube bones. The assemblage of bone retouchers from sub-unit III/5 is the most numerous after the aforementioned collection from sub-unit III/1. Retouchers were found in all archaeological levels and number 52 pieces (Table 15-1). The highest number of retouchers (18 items) in this sub-unit stems from level III/5-3B, with ashy cluster III/5-3B1.

More than 76 % of all bone retouchers are simple retouchers (Fig. 15-3; 15-5; 15-6), the rest being double retouchers (Fig. 15-9; 15-12).

In most archaeological levels of this sub-unit simple bone retouchers are usually heavily utilised (Fig. 15-3; Table 15-1), although in archaeological levels III/5-3B + III/5-3B1 slightly utilised retouchers prevail (Table 15-1). Among the double retouchers of sub-unit III/5 moderately utilised pieces are the most common. The only tool with a slight degree of utilisation stems from archaeological level III/5-3B + III/5-3B1 (Fig. 15-9). One more double retoucher shows different degrees of utilisation on its two working areas (Fig.15-12).

Concerning size, two trends can be observed among simple retouchers from sub-unit III/5. First, there is an increase in the size and weight of retouchers relative to their degree of utilisation (Table 15-2). Among bone retouchers from level III/5-3B2 a loss of length is compensated by other factors, such as width, thickness, and weight. Second, in level III/5-2 an opposite trend can be observed; in this case there is a reduction in size among simple bone retouchers relative to the state of utilisation, i.e. from slightly utilised to heavily exploited (Table 15-2). For retoucher assemblages from levels III/5-1 and III/5-3B + III/5-3B1 such correlations are not observed here, the weight of simple heavily utilised retouchers considerably surpasses that of slightly utilised instruments.

In sub-unit III/5, items with all described levels of utilisation occur in level III/5-3B + III/5-3B1. In this level there is also a characteristic reduction of size and weight that is relative to the state of utilisation (Table 15-3).

Sub-unit III/6

In the three archaeological levels of this sub-unit, bone retouchers were found only in level III/6-1-2; all were made on bone fragments. The collection of bone retouchers from sub-unit III/6 comprises 6 tools (Table 15-1): four simple retouchers (Fig. 15-4, *1*), and two double retouchers (Fig. 15-8). Among the simple retouchers, pieces with moderately utilised working zones prevail (Table 15-1). Double retouchers are represented by lightly and moderately utilised pieces in equal ratios, while heavily utilised retouchers are absent (Table 15-1).

On the whole, among simple retouchers a reduction in size and weight is relative to the state of utilisation (Table 15-2).

		light				moderate			
		length (mm)	width (mm)	thickness (mm)	weight (gr)	length (mm)	width (mm)	thickness (mm)	weight (gr)
Sub-unit III/1	III/1B	·	·	·	·	·	·	·	·
	III/1	66.08	19.44	5.29	7.00	66.73	21.42	7.71	11.50
	III/1A	·	·	·	·	·	·	·	·
	III/1C **	·	·	·	·	54.69	17.38	7.35	9.00
Sub-unit III/2	III/2 **	·	·	·	·	·	·	·	·
Sub-unit III/3	III/3-3 **	·	·	·	·	·	·	·	·
	III/3-5 **	·	·	·	·	·	·	·	·
Sub-unit III/4	III/4-1 **	71.23	29.81	8.60	24.00	87.13	36.13	6.91	15.00
	III/4-4 **	61.30	23.43	8.01	11.00	·	·	·	·
	III/4-5 **	·	·	·	·	78.40	44.70	8.36	36.00
	III/4-6 **	·	·	·	·	87.06	25.42	10.71	21.00
Sub-unit III/5	III/5-1 **	·	·	·	·	·	·	·	·
	III/5-2 **	·	·	·	·	58.03	5.13	8.92	12.00
	III/5-3	·	·	·	·	·	·	·	·
	III/5-3B + III/5-3B1 **	118.33	27	9.17	36.00	91.57	28.16	8.26	22.25
	III/5-3B2 **	·	·	·	·	63.74	29.27	6.9	11
Sub-unit III/6	III/6-1 **	60.31	23.63	6.05	9.00	114.69	12.69	10.09	11.00
Sub-unit III/7	III/7-1	·	·	·	·	80.57	35.17	7.93	39
	III/7-2 **	·	·	·	·	·	·	·	·
	III/7-3 **	·	·	·	·	·	·	·	·

* one-sided double retouchers with varying degrees of utilisation
** single pieces

Table 15-3 Kabazi V. Average dimensions of double bone retouchers.

Sub-unit III/7

Sub-unit III/7 yielded a total of 10 bone retouchers (Table 15-1); all were made on fragments of tube bones.

Simple retouchers are more common than double retouchers. Among simple retouchers, slightly utilised instruments are the most numerous; only one heavily utilised simple retoucher was recovered from archaeological level III/7-1. At the same time, among double retouchers heavily utilised instruments prevail (Table 15-1); slightly utilised double retouchers are absent.

On the whole, the size and weight of double retouchers from sub-unit III/7 exceed values recorded for simple retouchers (Tables 15-1 and 15-2).

Unit IV

Bone retouchers were found in levels IV/2 and IV/3. The collection of bone retouchers from Unit IV is the smallest at Kabazi V (Table 15-1). These tools are exclusively simple retouchers with moderate and heavy degrees of utilisation of their working surfaces. Further, these retouchers are the smallest and lightest among the retouchers from Kabazi V. All pieces were made on tube bone fragments.

Pebble Retouchers and Hammerstones

In the following, stone retouchers / hammerstones from Kabazi V are described in much the same way as bone retouchers above, i.e. on the basis of the same six attributes.

Number of working surfaces

Pebble retouchers / hammerstones differ from bone retouchers in the number of potential working surfaces; indeed this can be explained quite simply

heavily				combined *			
length (mm)	width (mm)	thickness (mm)	weight (gr)	length (mm)	width (mm)	thickness (mm)	weight (gr)
77.11	21.45	8.11	14.25	·	·	·	·
74.07	25.81	8.62	15.80	78.04	20.55	8.26	13.33
62.14	31.28	11.05	18.00	·	·	·	·
·	·	·	·	·	·	·	·
·	·	·	·	77.61	28.86	10.64	18
·	·	·	·	86.1	16.31	5.72	10.00
58.52	36.18	8.95	29.00	·	·	·	·
·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·
·	·	·	·	68.3	31.22	9.95	20.00
66.61	15.93	9.92	9.00	·	·	·	·
60.1	26.18	13.39	19.00	·	·	·	·
66.89	23.78	7.23	11.00	·	·	·	·
·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·
·	·	·	·	·	·	·	·
53.97	18.47	8.60	7.00	·	·	·	·
72.83	23.61	10.92	18.00	·	·	·	·

Table 15-3 Continued.

by the natural characteristics of pebbles. Generally speaking, pebbles from the present day Alma River can be assigned to one of two different shapes. First, there are flat pebbles with sub-rectangular or sub-oval outlines, and, second, there are rounded / spherical shaped pebbles. The latter were never used as retouchers / hammerstones in Kabazi V occupations. Depending on the number of working surfaces, pebble retouchers / hammerstones are referred to as either one-sided (Fig. 15-13, *1*, *2*; 15-14; 15-15), two-sided (Fig. 15-16; 15-17; 15-18; 15-19; 15-20), three-sided (Fig. 15-21) or four-sided. The two-sided retouchers and hammerstones are subdivided into two-sided opposite (Fig. 15-16; 15-18; 15-19) and two-sided adjacent pieces (Fig. 15-17).

Number of working areas/zones

According to the number of working areas, stone retouchers and hammerstones are assigned to the following types: simple (single) (Fig. 15-13, *2*; 15-14; 15-15; 15-16; 15-17), double (Fig. 15-13, *1*; 15-18), triple and fourfold (tetrad) tools. Also, some pebbles feature different numbers of working areas on working surfaces (Fig. 15-19; 15-21). Such pieces are referred to as combined forms. To simplify matters, in the following, the combined number of working areas on these pieces will be displayed according to the number of working surfaces using a slash «/». For example, the retoucher in Figure 15-19 is a double-side combined (2/1) piece, i.e. the double-sided retoucher has two working areas on one surface, and on its opposite surface just one working area.

Degree of utilisation

Pebble retouchers and hammerstones comprise three different types; they can be slightly utilised (Fig. 15-13, *1*; 15-16; 15-17; 15-18), moderately utilised (Fig. 15-13, *1*, 15-14) or heavily utilised (Fig. 15-15). Of 28 pebbles, 20 have two or more working surfaces which show different states of utilisation on each surface. The most frequently observed combinations is slight / moderate (N=9) (Fig. 15-19) and slight / heavy (N=9) (Fig. 15-20) utilisation. The combination moderate / heavy (Fig. 15-21) utilisation is less common

Size

Maximum length, width and thickness were measured and recorded.

Weight of retouchers and hammerstones

Concerning the weight of retouchers and hammerstones, each pebble is unique. Complete tools weigh a minimum of 13 grams and a maximum of 554 grams.

Type of material

River pebbles picked up in the floodplain of the Alma River served as "blanks" for stone retouchers and hammerstones at Kabazi V. In 71 % of cases pebbles are of sandstone, with limestone pebbles making up 25 % and quartz pebbles 4 % of raw materials.

Description of Pebble Retouchers and Hammerstone Assemblages

Sub-unit III/1

The assemblage of pebble retouchers and hammerstones from sub-unit III/1 is the most numerous discovered at Kabazi V, it constituting about 70 % of all pebble retouchers and hammerstones from the site. Of the 34 pebble retouchers and hammerstones from this sub-unit, 27 stem from archaeological level III/1A (Table 15-4).

Retouchers on pebbles are represented by 23 pieces (Table 15-4), comprising 6 one-sided tools (Fig. 15-13, *2*), 9 two-sided pieces (Fig. 15-17; 15-18), and 3 three-sided items; 5 pieces could not be assigned to a particular type (Fig. 15-20).

Among one-sided and two-sided retouchers simple types prevail (Fig. 15-13, *2*; 15-17); these include 5 one-sided simple (single) tools, and 4 two-sided simple (single) tools (Table 15-4). Double types comprise 1 one-sided retoucher, and 3 two-sided retouchers (Fig. 15-18). Among the latter, one retoucher displays a combined system of working areas (two-sided combine; 2/1). The three-sided retouchers were assigned to simple, combined and unidentifiable types, respectively.

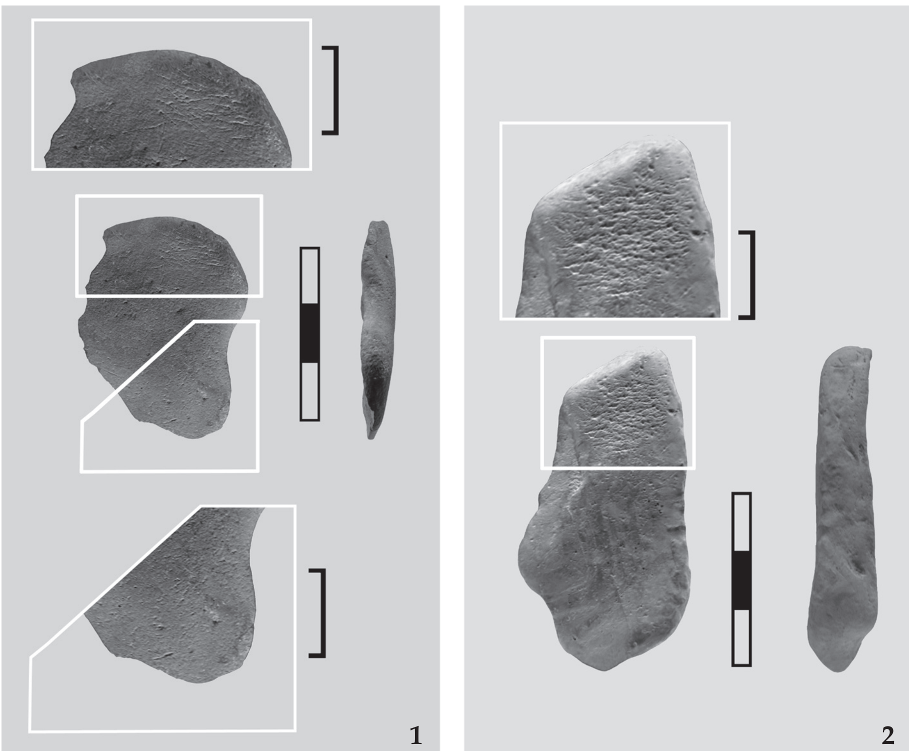


Fig. 15-13 Kabazi V, levels III/3-3A (1), III/1A (2), pebble retouchers: 1 – one-sided double, slightly utilised; 2 – one-sided simple, moderately utilised.

Fig. 15-14 Kabazi V, level III/1A, pebble hammerstone: one-sided simple, moderately utilised.

Fig. 15-15 Kabazi V, level III/3-3, pebble hammerstone: one-sided simple on distal end, heavily utilised.

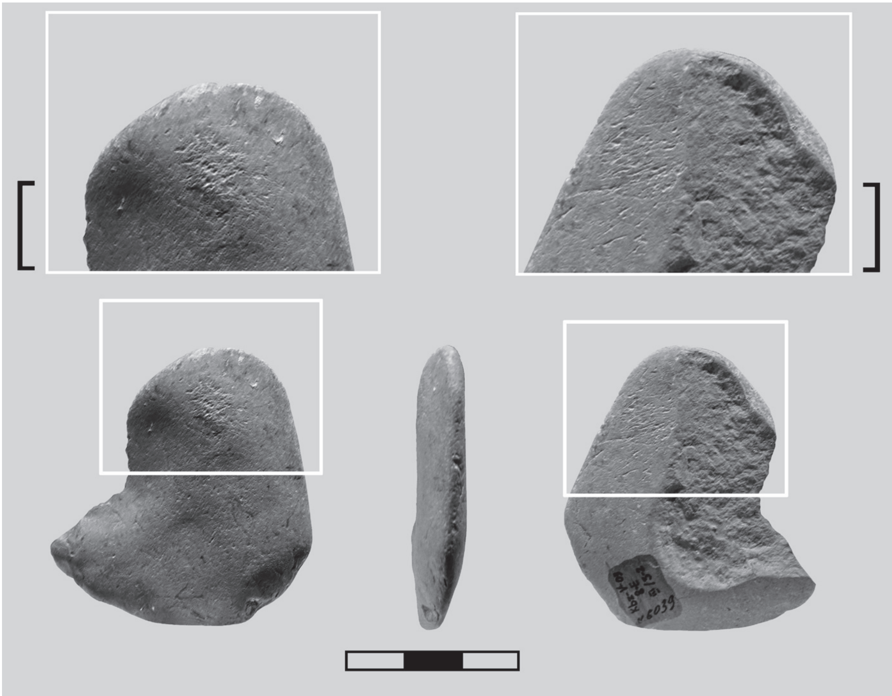


Fig. 15-16 Kabazi V, level III/3-2, pebble retoucher: two-sided simple, lightly utilised.

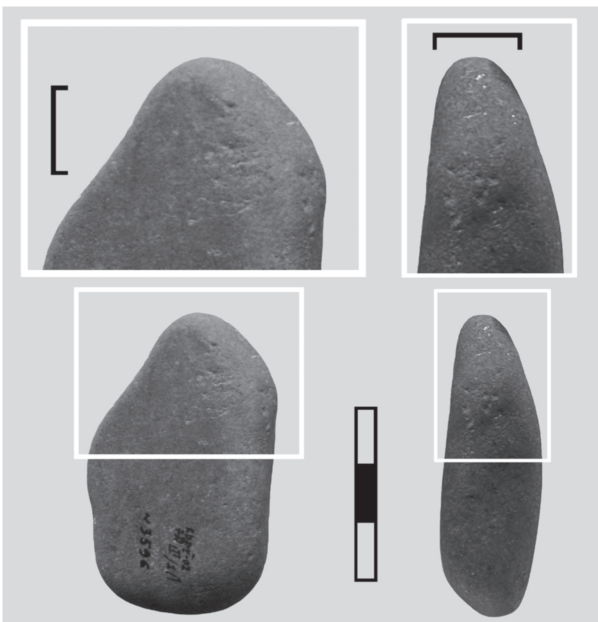


Fig. 15-17 Kabazi V, level III/1A, pebble retoucher: two-sided simple, adjacent, lightly utilised.

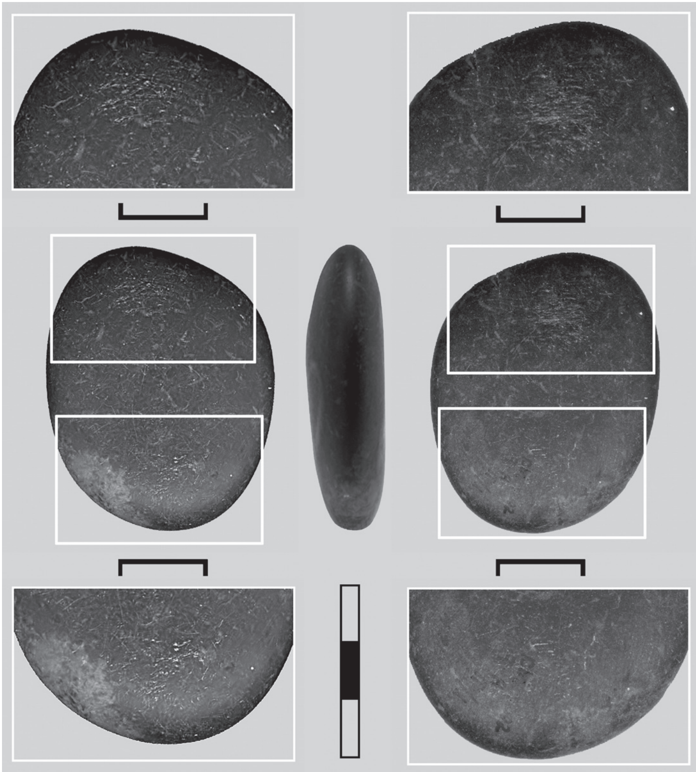


Fig. 15-18 Kabazi V, level III/1, pebble retoucher: two-sided double, lightly utilised.

Among retouchers from sub-unit III/1 there can be observed a tendency towards an increased degree of utilisation relative to the number of working surfaces. Whereas 5 of 6 pebbles used as one-sided simple retouchers show only a slight utilisation of their working surfaces, with the remaining pebble displaying moderate utilisation (Fig. 15-13, *2*), only 2 two-sided retouchers are slightly utilised (Fig. 15-18), with one tool showing slight/moderate degrees of exploitation, two pieces with slight/heavy utilisation (Fig. 15-20), one moderately utilised, one medium/heavily utilised, and two heavily utilised pieces.

Retouchers from sub-unit III/1 are characterised by the following parameters – maximum length: 94.5 mm, minimum length: 31.17 mm; maximum width: 68.89 mm, minimum width: 27.16 mm; maximum thickness: 31.7 mm, minimum thickness: 8.28 mm; maximum weight: 93 gram, minimum weight: 14 gram.

Among the pebbles used as retouchers 18 pieces are on sandstone, 4 are on limestone, and 1 piece is on a sedimentary stone.

The collection of hammerstones from sub-unit III/1 comprises a total of 11 tools (Table 15-4); 10 stem from archaeological level III/1A (Fig. 15-14; 15-21) and one from level III/1C.

The hammerstone assemblage features 3 one-sided tools (Fig. 15-14), 4 two-sided tools, 3 three-sided tools (Fig. 15-21), and one four-sided piece. All one-sided hammerstones are characterised by just one working zone (Fig. 15-14). In the case of two hammerstones, working areas are located at the distal end of pebbles. There are two simple, two-sided hammerstones, one of which has adjacent working surfaces. Among the remaining tools are 1 two-sided double and 1 two-sided combined (3/1) piece. Three-sided hammerstones are all combined types; these feature both three-sided combined (1/2/1) (Fig. 15-21) and three-sided combined (2/1/2) types.

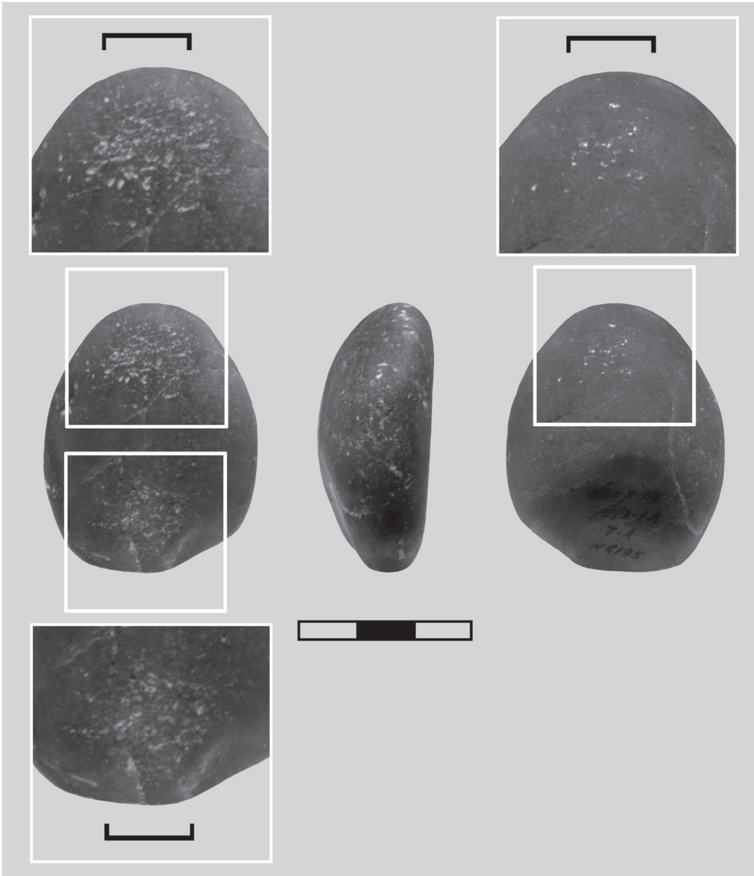


Fig. 15-19 Kabazi V, level III/3-1, pebble retoucher: two-sided combined – 2/1, moderately / slightly utilised.

Further, there is 1 simple (single) and 1 four-sided hammerstone; the latter is of a combined type (4/1/1/1).

Once again, among stone retouchers from this sub-unit it can be observed that the number of working surfaces is relative to increased utilisation of working zones. One-sided hammerstones consist of equal numbers of slightly utilised and moderately utilised pieces (Fig. 15-14), with only one heavily utilised pebble. Among two-sided hammerstones there are heavily, slightly/moderately, slightly/heavily and moderately/heavily (Fig. 15-21) utilised pebbles. Further, three-sided and four-sided hammerstones are characterised by slight/heavily utilisation of their working zones. There is only one three-sided hammerstone with slight/moderate exploitation.

Hammerstones are much heavier than retouchers. The metric parameters of hammerstones are as follows – maximum length: 90.75 mm, minimum length: 54.42 mm; maximum width: 84.76 mm, minimum width: 37.73 mm; maximum thickness: 49.22 mm, minimum thickness: 22.01 mm; maximum weight: 356 grams, minimum weight: 126 grams.

Hammerstones were made on sandstone (10 items) and limestone (1 item) pebbles.

Sub-unit III/2

Only one stone retoucher was discovered in sub-unit III/2 (Table 15-4). This is a bifacial backed tool (Fig. 15-22) made on a flint plaquette. Use traces are located adjacent to its back. Retouchers on flint are known from a number of Crimean Middle Palaeolithic sites, such as Chokurcha I, Zaskalnaya V, and Zaskalnaya VI (Stepanchuk 1993; Chabai 2004b, fig. 24-11, p. 399). However, in these assemblages the working zone was situated at the bulb of percussion.The retoucher from level III/2 is a one-sided simple (single) retoucher with a heavily utilised working zone (Fig. 15-22). It is 88.44 mm long, 40.98 mm wide, 15.88 mm thick, and it weighs 61 grams.

Fig. 15-20 Kabazi V, level III/1C, pebble retoucher: two-sided unidentifiable, heavily / slightly utilised.

Sub-unit III/3

The collection of stone retouchers and hammerstones recovered from sub-unit III/3 comprises a total of 13 tools, with 11 retouchers and 2 hammerstones (Table 15-4). Among the pebbles used for retouchers 4 are on sandstone, 6 are on limestone, and 1 is on quartz. Both hammerstones were made on sandstone pebbles.

Retouchers are represented by three one-sided (Fig. 15-13, *1*), five two-sided (Fig. 15-16; 15-19), one three-sided, and two unidentifiable pieces. Whereas the one-sided retouchers all have two working areas (Fig. 15-13, *1*), the two-sided retouchers comprise 2 two-sided simple (single) pieces, 2 two-sided combined pieces, and one unidentifiable item. The only three-sided retoucher belongs to the combined (2/1/2) type. Most pieces are slightly to moderately utilised, whereby one-sided retouchers display generally slight states of utilisation (Fig. 15-13, *1*); only 1 one-sided retoucher features a combination of slight/moderate utilisation. Two-sided retouchers comprise one slightly utilised tool (Fig. 15-16), three slightly/moderately utilised pieces (Fig. 15-19), and one slightly/heavily utilised tool. The unidentifiable retouchers show slight and moderate degrees of utilisation.

The retouchers from sub-unit III/3 display the following metric parameters – maximum length: 68.43 mm, minimum length: 39.3 mm; maximum width: 44.57 mm, minimum width: 29.1 mm; maximum thickness: 21.25 mm, minimum thickness: 6.22 mm; maximum weight: 69 grams, minimum weight: 13 grams.

One hammerstone was found in each of the archaeological levels III/3-3 and III/3-3A (Table 15-4). Typologically, these are one-sided simple (single) tools with slight and heavy (Fig. 15-15) degrees of working zone utilisation. The hammerstone from level III/3-3 is 132.32 mm long and 67.78 mm wide. It has a maximum thickness of 44.47 mm, and weighs 554 grams. The other hammerstone is 103.79 mm long and 67.67 mm wide. It has a maximum thickness of 49.26 mm, and weighs 339 grams.

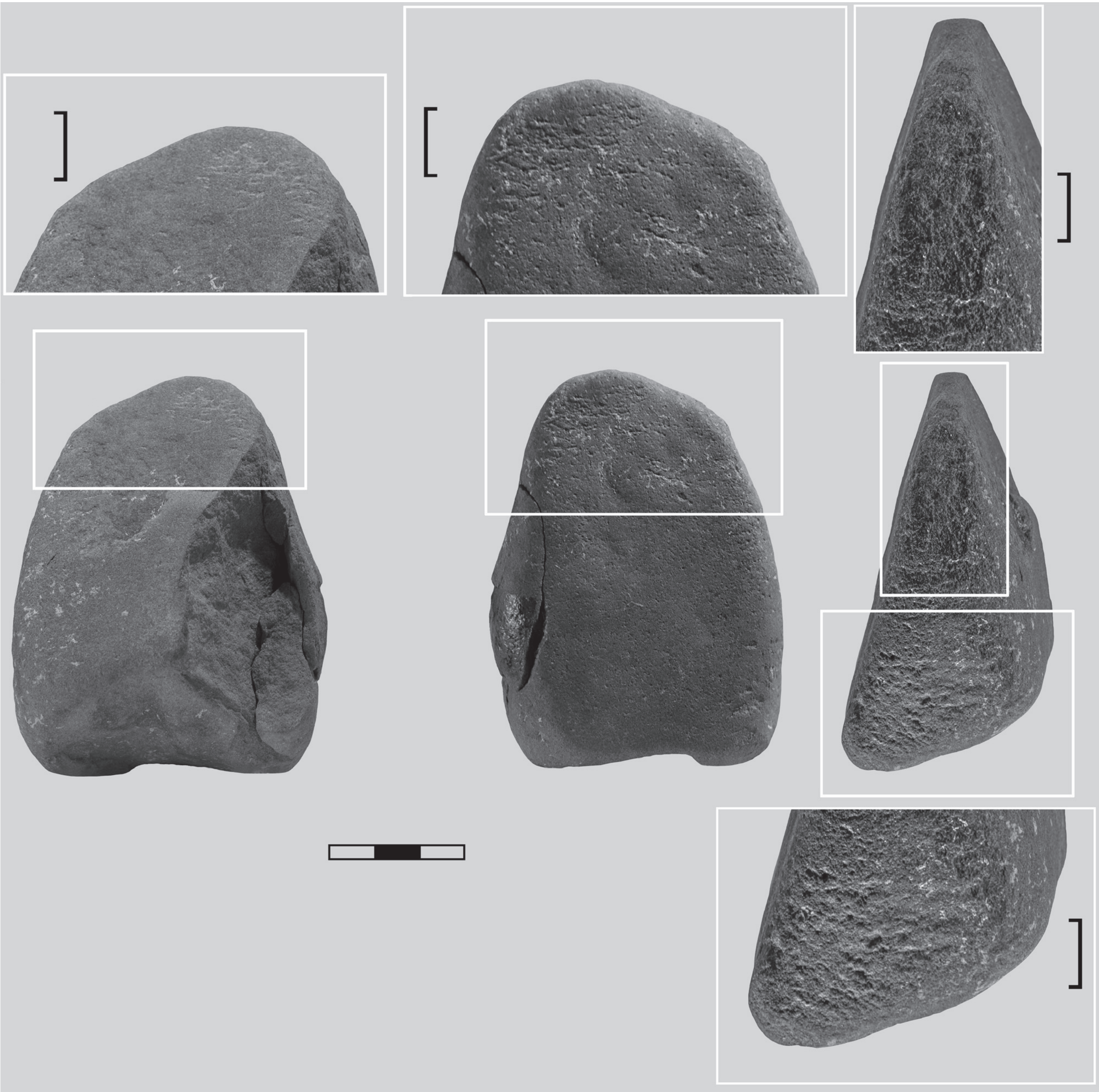


Fig. 15-21 Kabazi V, level III/1A, pebble hammerstone: three-sided combined – 1/2/1, moderately / heavy / moderately utilised.

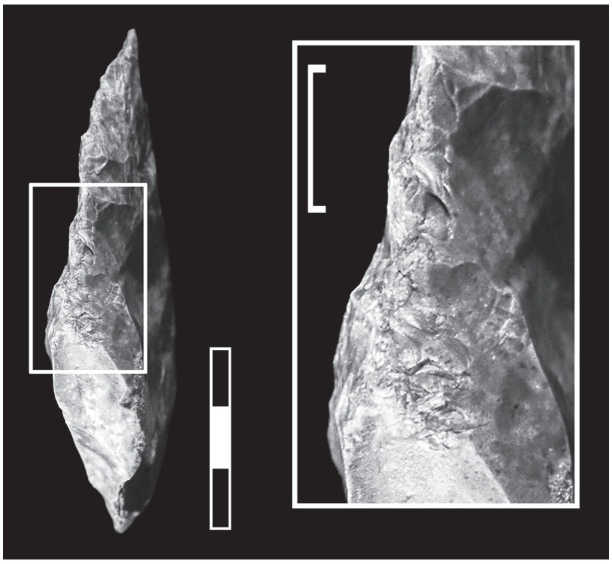


Fig. 15-22 Kabazi V, level III/2, flint retoucher on bifacial tool: one-sided simple, heavily utilised.

Sub-unit III/4

One pebble retoucher and one pebble hammerstone were found in level III/4-1 (Table 15-4). This is a two-side simple (single) retoucher which shows signs of slight/moderate utilisation of its working areas. The retoucher is on a sandstone pebble, 70.43 mm long, 36.63 mm wide, and 17.98 mm thick; it weighs 54 grams.

The hammerstone is a two-sided simple (single) type showing slight/moderate degrees of utilisation in its working areas. It is fragmented. The hammerstone is on a sandstone pebble, 118.7 mm long, 56.99 mm wide, and 15.83 mm thick; it weighs 173 grams.

		Sub-unit III/1			Sub-unit III/2	Sub-unit III/3					Unit III/4	
		III/1	III/1A	III/1C	III/2	III/3-1	III/3-1A	III/3-2	III/3-3	III/3-3A	III/4-1	Total:
Retouchers	one-side simple	1	3	1	1	·	·	·	·	·	·	6
	one-side double	1	·	·	·	·	·	·	1	2	·	4
	two-side simple	·	2	1	·	·	·	1	1	·	·	5
	two-side double	1	1	·	·	·	·	·	·	·	1	3
	two-side combined	·	1	·	·	·	1	·	·	1	·	3
	two-side unidentifiable	·	3	·	·	·	·	·	1	·	·	4
	three-side simple	·	1	·	·	·	·	·	·	·	·	1
	three-side combined	·	·	·	·	·	·	·	1	·	·	1
	three-side unidentifiable	·	1	·	·	·	·	·	·	·	·	1
	unidentifiable	1	4	·	·	1	·	·	·	1	·	7
	Total:	**4**	**16**	**2**	**1**	**1**	**1**	**1**	**4**	**4**	**1**	**35**
Hammerstones	one-side simple	·	3	·	·	·	·	·	1	1	·	5
	two-side simple	·	2	·	·	·	·	·	·	·	1	3
	two-side double	·	1	·	·	·	·	·	·	·	·	1
	two-side combined	·	1	·	·	·	·	·	·	·	·	1
	three-side simple	·	·	1	·	·	·	·	·	·	·	1
	three-side combined	·	3	·	·	·	·	·	·	·	·	3
	four-side combined	·	1	·	·	·	·	·	·	·	·	1
	Total:	**·**	**11**	**1**	**·**	**·**	**·**	**·**	**1**	**1**	**1**	**15**

Table 15-4 Kabazi V. Classification of stone retouchers and hammerstones.

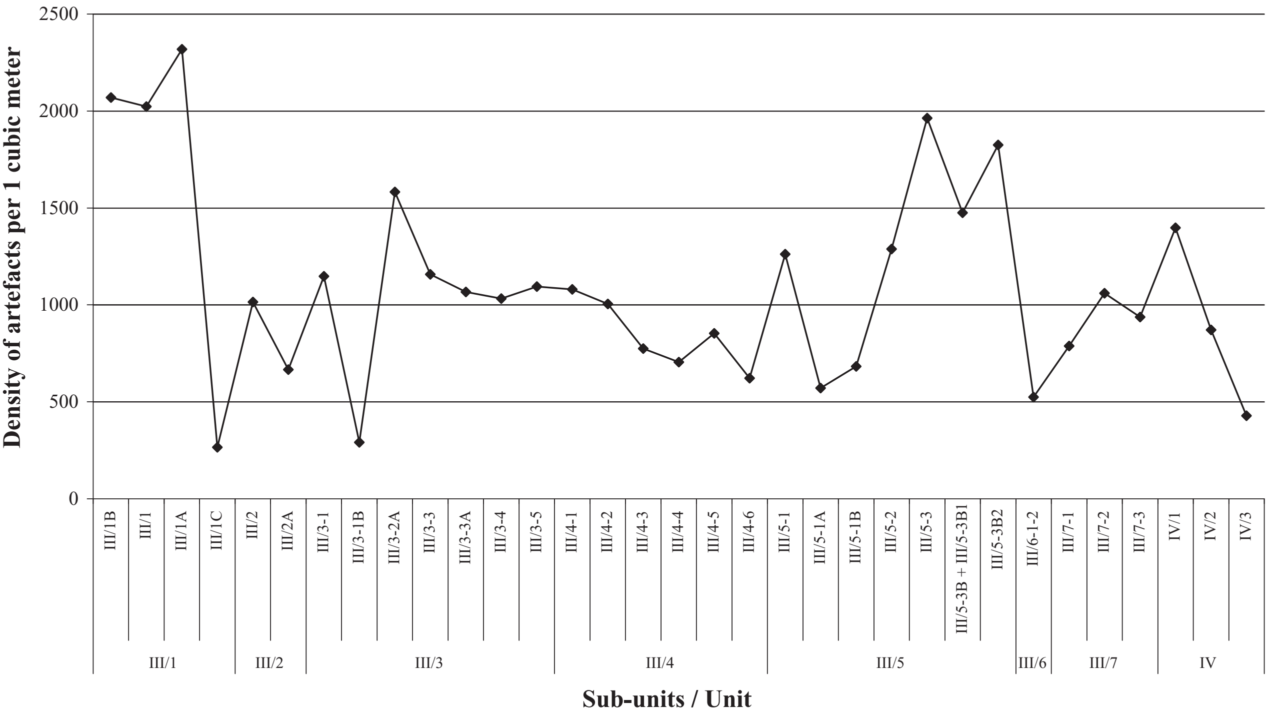


Fig. 15-23 Kabazi V: density of artefacts per cubic metre, by sub-units.

The Comparative Characteristic of Bone Retouchers

Even though investigations at Kabazi V involved the excavation of archaeological levels in an area no larger than 10 square metres, bone retouchers are certainly not equally distributed throughout. Accordingly, bone retouchers are most numerous in the Crimean Micoquian industries of sub-units III/1 and III/5 (Table 15-1). On the other hand, in sub-units with mixed Levallois-Mousterian and Micoquian collections (sub-unit III/4), or in which Levallois-Mousterian collections have been attributed to the Micoquian (sub-unit III/3), far fewer items were recovered; in Unit IV, a Levallois-Mousterian complex that was investigated in an area of about 20 square metres, only two bone retouchers were found. Seeing as bone retouchers are tools used in the treatment of flint treatment it is logical to assume that the quantity of retouchers is relative to the intensity of flint exploitation. A further telltale sign for the intensity of flint treatment in different archaeological levels is the density of stone artefacts per cubic metre (Veselsky 2003, Chabai 2004c). Figure 15-23 shows that this assumption works only for Crimean Micoquian collections; whereas in sub-units III/1 and III/5 high bone retoucher frequency correlates with the greatest intensity of flint exploitation, and in sub-unit III/2 a low intensity of flint processing is apparently confirmed by the smallest number of bone retouchers, in sub-units III/3, III/4 and Unit IV similar correlations cannot be observed. At the same time, the industrial heterogeneity of sub-units III/3 and III/4 assemblages should be underlined, as well as the clear Levallois-Mousterian definition for the Unit IV assemblage. Thus, bone retouchers are a prominent feature of Crimean Micoquian collections. These instruments might be connected with bifacial tool production. For Levallois-Mousterian industries the presence of bone retouchers in archaeological collections is uncommon.

In all occupations at Kabazi V, simple bone retouchers dominate assemblages (Fig. 15-24), the only exceptions being levels III/4-1 and III/4-4 in sub-unit III/4, and sub-units III/6 and III/7, in which double retouchers are more common (Table 15-1).

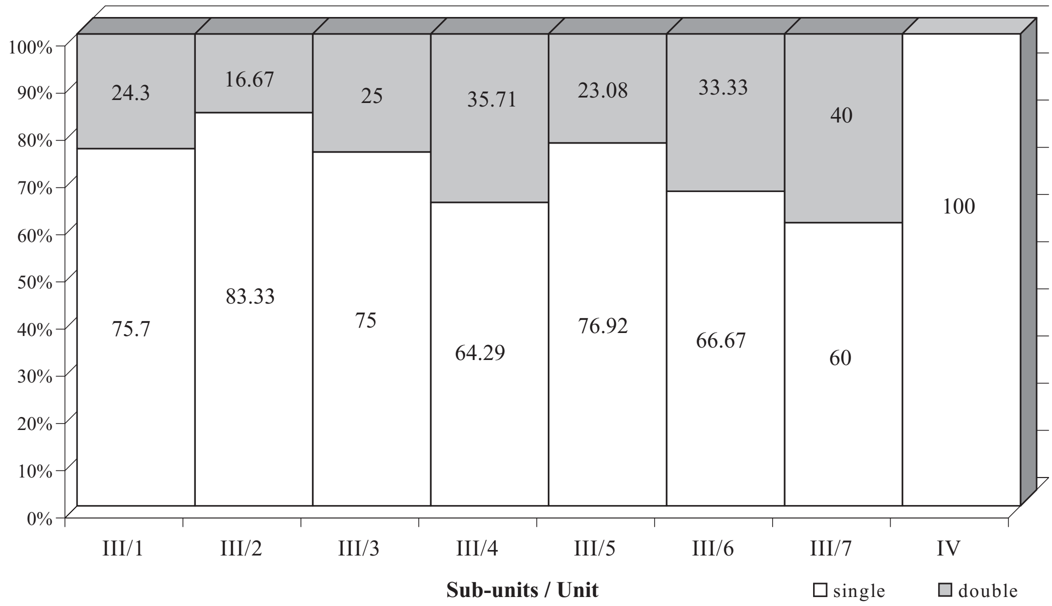


Fig. 15-24 Kabazi V: percentages of simple and double bone retouchers, by sub-units.

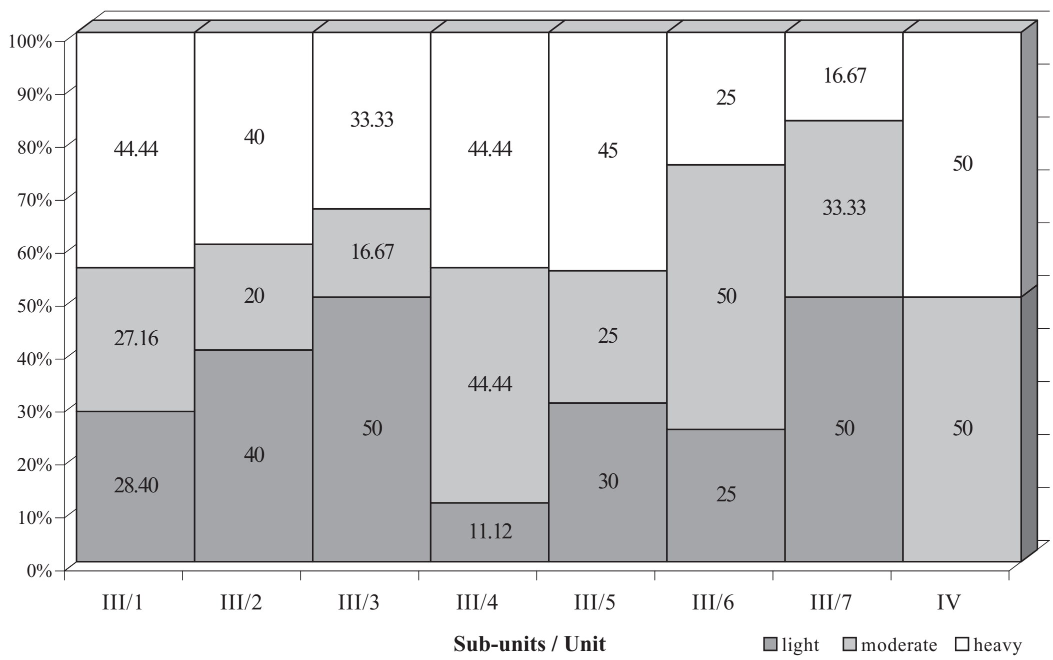


Fig. 15-25 Kabazi V: distribution of simple bone retouchers in sub-units, by degree of utilisation.

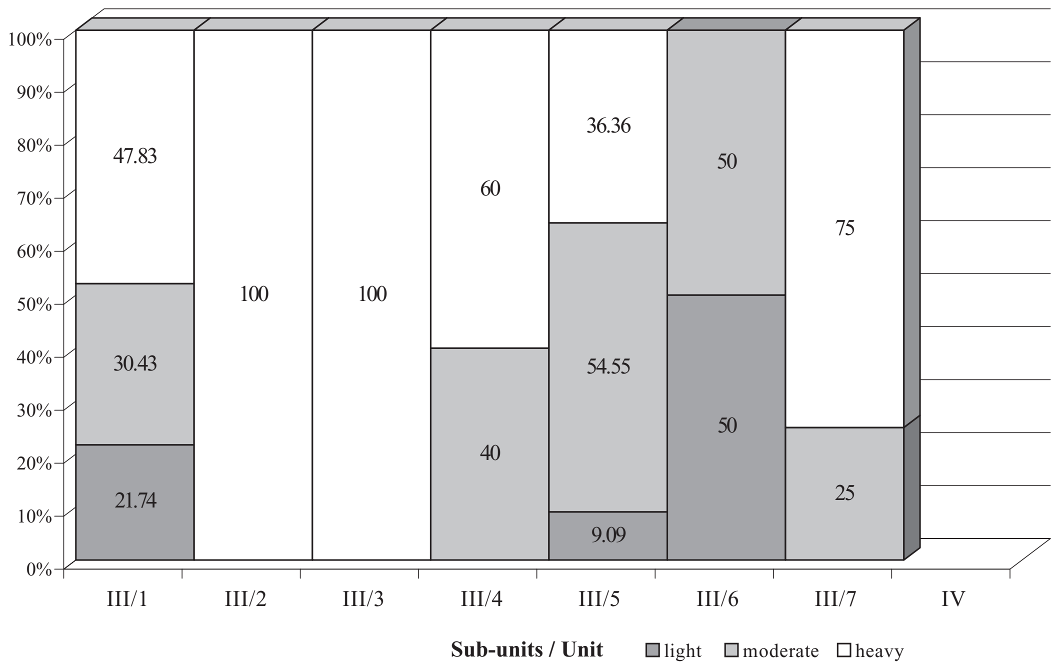


Fig. 15-26 Kabazi V: distribution of double bone retouchers in sub-units, by degree of utilisation.

In fact, in sub-unit III/4, as well as in sub-units III/6 and III/7, double retouchers constitute the highest percentages of assemblages (about 33.33 %), while in other sub-units the numbers of double bone retouchers does not exceed 25 % (Fig. 15-24), and in sub-unit IV are completely absent.

The highest number of slightly utilised simple bone retouchers was found in sub-unit III/3 and III/7 assemblages. In fact, the percentage of slightly utilised bone retouchers is equal to the sum of moderately and heavily utilised instruments (Fig. 15-25). However, the assemblages of sub-units III/1, III/4 and III/5 are characterised by a dominance of heavily utilised simple retouchers over slightly utilised simple retouchers.

Most double retouchers are usually heavily utilised tools (Fig. 15-26), with the exception of pieces from sub-units III/5 and III/6. In sub-unit III/5 retouchers with medium utilisation dominate.

There are two main tendencies regarding correlations between metrical attributes and the state of utilisation among simple bone retouchers. The first of these, which is visible in archaeological levels III/1B, III/1, III/1A and III/5-3B2, is the observation that size and weight increase relative to an increase in utilisation (Table 15-2). The second tendency, noted in archaeological levels III/4-5 and III/5-2, is just the reverse, i.e. that size and weight decrease relative to an increase in utilisation. Similar tendencies are also noted for double retouchers, the first tendency being characteristic for double retouchers from archaeological level III/1, and the second for level III/5-3B + III/5-3B1 (Table 15-3).

An explanation for these two tendencies may lie in the availability of big bone fragments during occupations. During occupations characterised by higher rates of fragmentation of faunal remains (levels III/1B, III/1, III/1A and III/5-3B2) the size and weight of bone retouchers are subordinate to those of pieces from occupations with not so pronounced bone fragmentation (III/4-5, III/5-2 and III/5-3B + III/5-3B1). However, in both cases the main criteria for selection of bones for retouchers would have been weight (Fig. 15-27; 15-28).

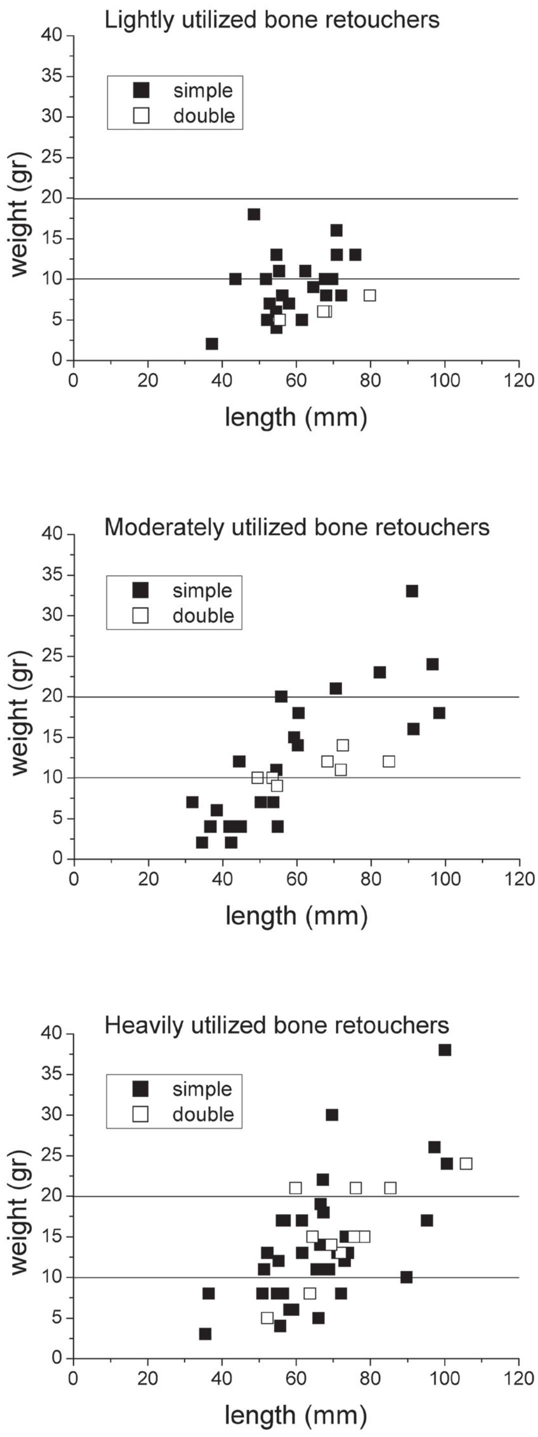


Fig. 15-27 Kabazi V, sub-unit III/1: length/ weight scatter-plot for simple and double bone retouchers, by degree of utilisation.

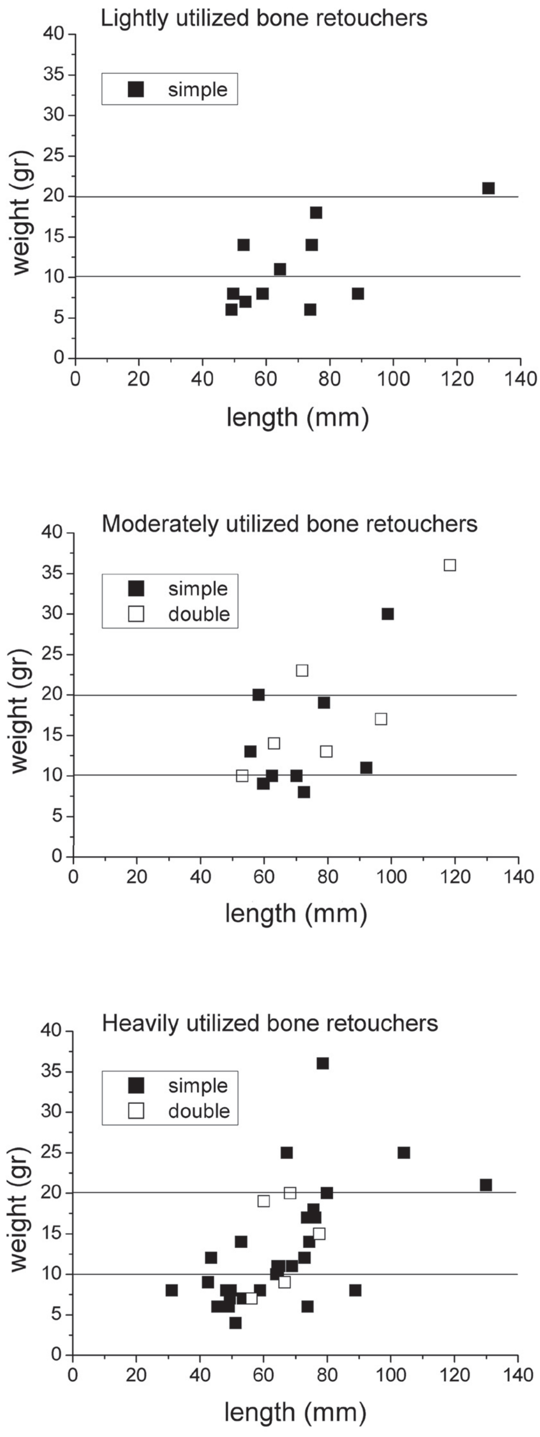


Fig. 15-28 Kabazi V, sub-unit III/5: length/ weight scatter-plot for simple and double bone retouchers, by degree of utilisation.

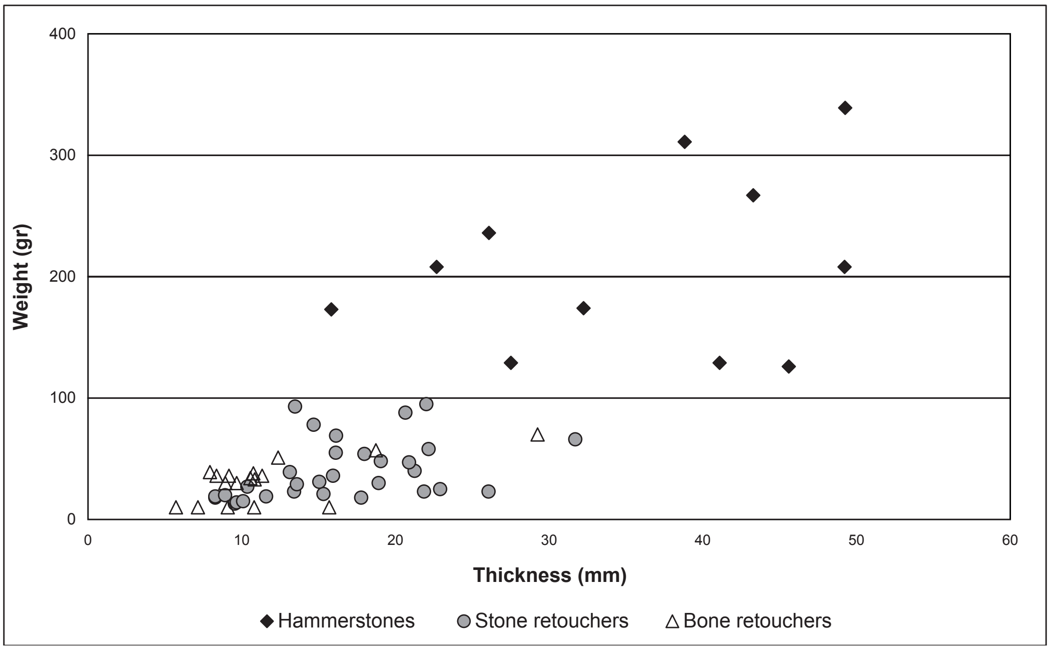


Fig. 15-29 Kabazi V: weight/ thickness scatterplot of distribution of bone retouchers, pebble retouchers and hammerstones.

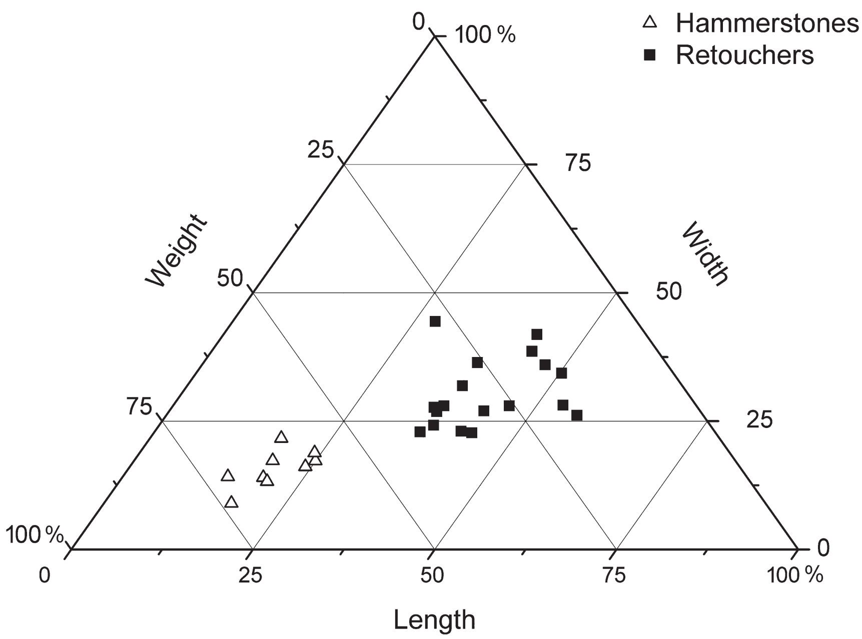


Fig. 15-30 Kabazi V: scatterplot of distribution of pebble retouchers and hammerstones, by length, width and weight.

From a functional perspective, flint treatment tools from Kabazi V comprise retouchers and hammerstones, whereby weight would have been the most important criteria when choosing a particular bone or pebble for this purpose, with all other characteristics secondary. The heaviest bone tool stems from archaeological level III/2 and is 70 grams.

Comparative analyses of stone retouchers / hammerstones and bone retouchers has revealed characteristics which are shared by both tool types, and include such factors as weight and maximum thickness (Fig. 15-29); for example, both pebble and bone retouchers do not exceed 100 grams.

A scatterplot showing length, width and weight of all complete pebble tools suggests the presence of two separate clusters, the first representing stone retouchers, and the second hammerstones (Fig. 15-30).

On the whole, the numbers and typological characteristics of pebble tools used for flint treatment stands in direct relation to the degree of processing of raw materials on site. An increase in the intensity of occupations leads to an increase in the number of tools with poly-sided working surfaces, as well as to and to an increase in exploitation of working areas (Table 15-4; Fig. 15-23).

Traces from blows found on hammerstones are either linear (Fig. 15-21) or conic (Fig. 15-15), which probably attests to the usage of the hammerstone on differently shaped surfaces, e.g. on sharp edges (the edge of a bifacial tool) or a plane (the natural surface of a flint nodule or a core platform).

All bone / pebble tools that were used for flint treatment were employed during different stages of flint tool production or core reduction. It is most likely that bone retouchers were the most important tools in bifacial tool production, their light weight and soft consistency making them particularly practical in the final stages of bifacial tool manufacture, e.g. for the retouching of working edges. It is also possible that bone retouchers were employed at crucial moments, for example when retouching the tips of points on bifacial tools, when excessive weight and hardness may have led inadvertently to the fragmentation of important tool parts.

Abstract

КАБАЗИ V: КОСТЯНЫЕ И КАМЕННЫЕ ОРУДИЯ ДЛЯ ОБРАБОТКИ КРЕМНЯ

ВЕСЕЛЬСКИЙ А.П.

В ходе последних археологических исследований на среднепалеолитической стоянке Кабази V была обнаружена, пожалуй, одна из самых многочисленных коллекций костяных и каменных орудий для обработки кремня. В общей сложности коллекция составляет 255 предметов, среди которых 205 экземпляров являются костяными ретушерами, 49 орудиями на гальках 1 орудие на кремне. Анализ столь многочисленной коллекции орудий кремнеобработки позволил разработать для них типологическую характеристику и провести их сравнительный анализ.

Костяные и каменные орудия кремнеобработки обнаружены в большинстве археологических горизонтов, исследованных на стоянке Кабази V. Почти 78 % всей коллекции костяных ретушеров происходит из двух пачек горизонтов III/1 и III/5.

Наибольшее количество орудий на гальках также характерно для пачки горизонтов III/1, где они составляют почти 70 % от их общего количества. Более того, подавляющее большинство орудий на гальках пачки горизонтов III/1, а именно 27 из 34, происходит из археологического горизонта III/1A.

Принципы классификации орудий для расщепления кремня состоят в следующем. Все орудия кремнеобработки стоянки Кабази V были обработаны по шести основным параметрам: количество рабочих поверхностей, количество рабочих участков, степень утилизации рабочих участков, размер, вес и тип материала.

Статистический анализ орудий на гальках и кости показал, что распределение орудий кремнеобработки по количеству рабочих поверхностей, количеству и степени утилизации рабочих участков непосредственно зависит от интенсивности процессов обработки сырья на памятнике. В целом, эту закономерность можно сформулировать следующим образом: чем выше интенсивность использования кремневого сырья, тем выше содержание орудий кремнеобработки с несколькими рабочими поверхностями и наличием на них большего количества рабочих зон с преобладанием высокой и, в меньшей степени, средней степени изношенности рабочих участков. Одним из основных отличий костяных ретушеров от галечных является то, что все исследованные на стоянке Кабази V орудия на кости характеризуются наличием только одной рабочей поверхности. Этот факт обусловлен типом самой заготовки, использованной в качестве орудия. Заготовками для костяных ретушеров служили преимущественно фрагменты трубчатых костей, в единичных случаях – ребер.

Наличие зависимости между количеством костяных орудий кремнеобработки и степенью интенсивности использования кремневого сырья позволяет сделать еще один важный вывод. Данная зависимость наблюдается исключительно для микокских слоев (пачки горизонтов III/1, III/2, III/5). Для гомогенных леваллуа-мустьерских коллекций эта закономерность не характерна. Даже при наличии высокой интенсивности использования сырья в леваллуа-мустьерских комплексах костяные орудия кремнеобработки полностью отсутствуют. Таким образом, наличие костяных ретушеров является характерной особенностью микокских коллекций, в которых наборы орудий для обработки кремня использовались для производства двусторонних острий и скребел. Для леваллуа-мустьерских индустрий наличие костяных ретушеров в археологических коллекциях не характерно.

Функционально орудия для обработки кремня представлены ретушерами и отбойниками. Все орудия на кости относятся к ретушерам. По сравнению с орудиями на гальках костяные ретушеры значительно легче. Причем, легкость костяных ретушеров и мягкий тип материала позволяет предполагать, что эти орудия использовались на заключительных стадиях производства двусторонних орудий, таких как ретуширование рабочих лезвий. Не исключено, что применение костяных ретушеров имело значение в определенных ответственных моментах изготовления двусторонних острий и скребел, например, ретуширование острийных участков, когда излишний вес и чрезмерная твердость могли привести к фрагментации важных элементов орудия.

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter 16

Kabazi V: Production and Rejuvenation of Bifacial Tools

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Bifacial tools constitute pronounced technological and typological components of Micoquian assemblages. For this reason, reconstructions of bifacial tool reduction sequences on the basis of refittings are of crucial significance (Demidenko, Usik 1993b; Austin et al. 1999; Aubry et al. 2003). Such refittings have been undertaken using material from a number of Kabazi V archaeological levels. The most significant of these are two separate series from levels III/4-2 and III/1A, both of which are associated with Micoquian assemblages and display various stages of bifacial tool production.

The Refitting from Level III/4-2

The first of these refittings involved the material recovered from a pit in archaeological level III/4-2 (Chapter 2, this volume). In this pit was found a "cache" consisting of 2,786 pieces, for the most part debitage comprising many chips. Blanks bigger than 3 cm consisted of 44 flakes and 7 blades. The detailed analysis of these artefacts is presented in Chapter 10, this volume. This "cache" is in so far unique in that all 2,786 blanks (chips, flakes and blades) were struck from a single flint nodule. So far, it is the only case in the Crimean Middle Palaeolithic that waste from the production of a single bifacial tool has been found in such a "cache". While the refitted chips, flakes and blades compose the "cover" of this bifacial tool (Fig. 16-1; 16-2), the tool itself was found neither in the pit, nor upon the living surface of level III/4-2. Using the refits from this "cover" the reduction sequence involved in the manufacturing of this particular bifacial tool could be closely studied. Accordingly, the reduction sequence consists of 11 stages. The total number of refitted items by stage, as well as their typological structure, is represented in Table 16-I.

For the production of the bifacial tool a flat flint plaquette (nodule) of sub-trapezoidal shape was chosen. This was 147.63 mm long, 108.83 mm wide, and 28.27 mm thick. To simplify illustration, the two flaking surfaces of the flint plaquette are referred to in the following as flaking surfaces A and B, while the two lateral sides of the plaquette are referred to as sides 1 and 2 (Fig. 16-1; 16-2).

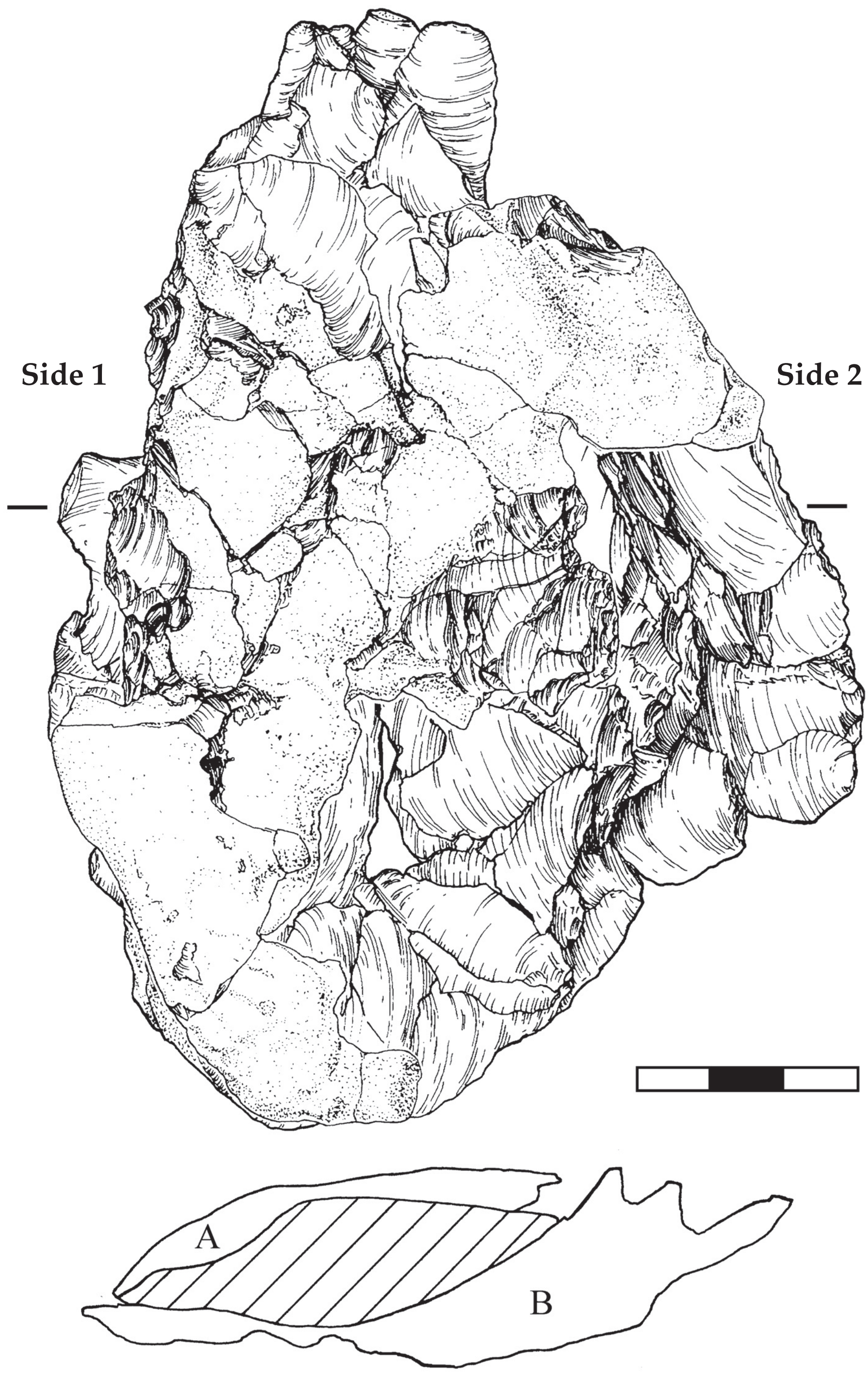


Fig. 16-1 Kabazi V, level III/4-2. Flaking surface A of the refitted flint plaquette and its cross-section.

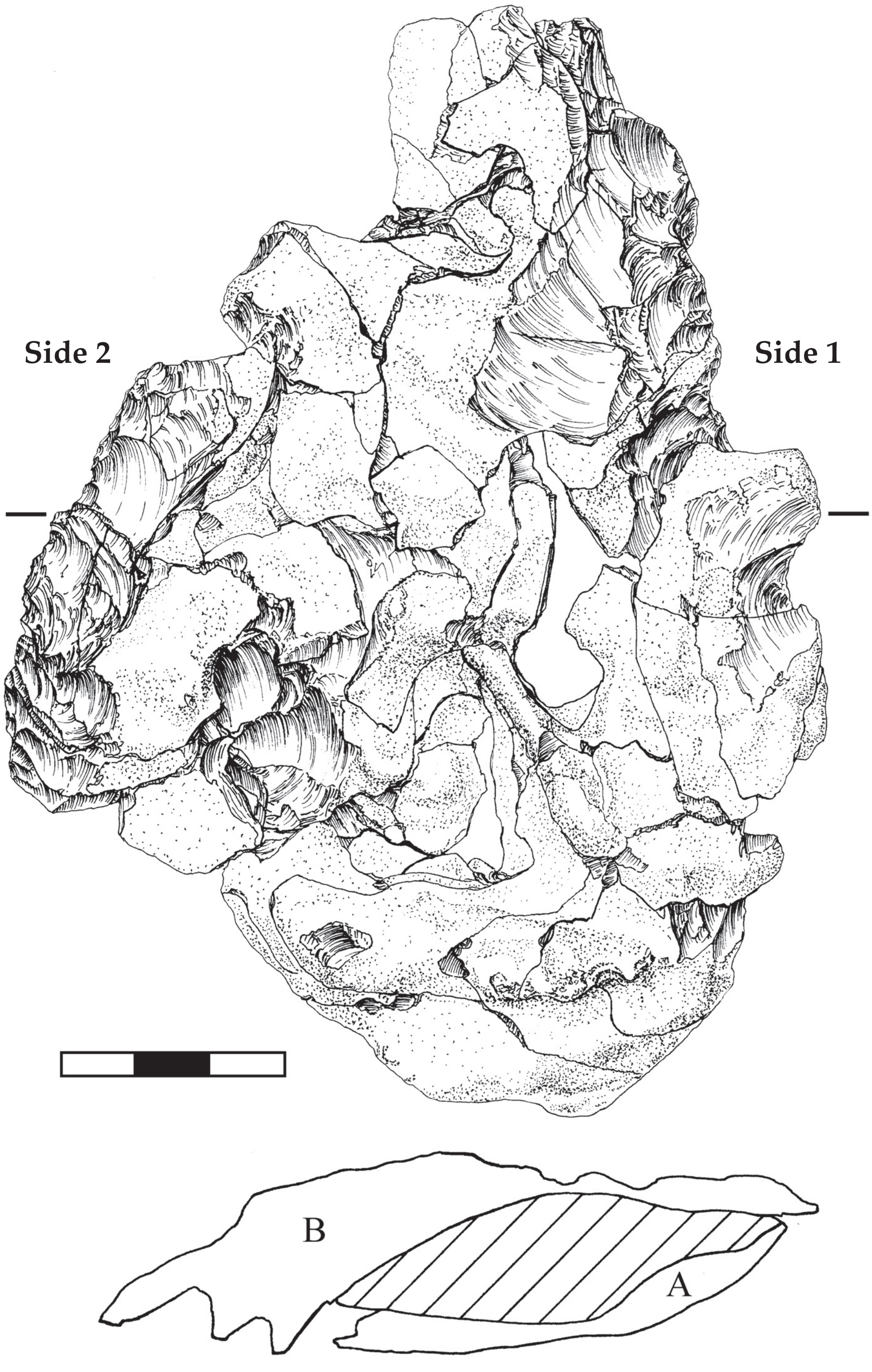


Fig. 16-2 Kabazi V, level III/4-2. Flaking surface B of the refitted flint plaquette and its cross-section.

	The place of flaking		Debitage			
Stages	Surfaces	Sides	Chips	Flakes	Blades	Total:
0	A	1	?	?	?	?
I	A	2	1	1	·	2
Tip thinning	B	tip	·	2	·	2
II	B	1	4	1	·	5
III	A	1	1	4	1	6
IV	B	1	·	2	·	2
V	A	1	·	6	·	6
VI	B	1	4	5	1	10
VIIa	B	2	3	5	·	8
VIIb	B	2	?	?	?	?
VIIc	B	2	2	2	1	5
VIId	B	2	3	2	·	5
VIIe	B	2	·	3	·	3
Tip thinning	B	tip	2	·	·	2
VIII	A	2	4	3	1	8
IX	B	1	·	3	·	3
X	B	2	4	4	3	11
XI	A	1	2	1	·	3
Tip thinning	B	tip	2	·	·	2
		Total:	**32**	**44**	**7**	**83**

Table 16-1 Kabazi V, level III/4-2. Typological structure of refitted artefacts, by reduction stages.

Stages 0 and I, Surface A, Sides 1 and 2

The earliest stage of reduction is documented by one flake and one chip which were detached from side 2 on flaking surface A (Fig. 16-3, 1, 2; 16-4, 1, 2). These pieces were detached perpendicular to the long axis of the nodule. At this point it should be noted that in the following the term "perpendicular" is meant in a relative sense, i.e. it expresses more a tendency than the strict geometrical concept, as the long axis of the plaquette and its lateral edges are not parallel. Therefore, closer to the top of the sub-trapezoidal plaquette the angle between the axis of the detached flakes and the long axis of plaquette is not always 90°.

The small amount of debitage from this first stage of reduction complicates greatly the reconstruction of the exact reduction sequence of lateral side 2. Obviously, the reduction of side 2 was not limited to the detachment of just one flake and one chip. The platforms of flakes and chips detached from surface B at a later stage of reduction (Fig. 16-4, 3, 4, 5, 6) were prepared using the previously struck, but not refitted/missing removals from surface A. Also, at this early stage there are no flakes and chips connected with the reduction of surface B.

The initial stage of the side 1 treatment is connected with flaking surface A only. This conclusion is based on the character of the preparation of the

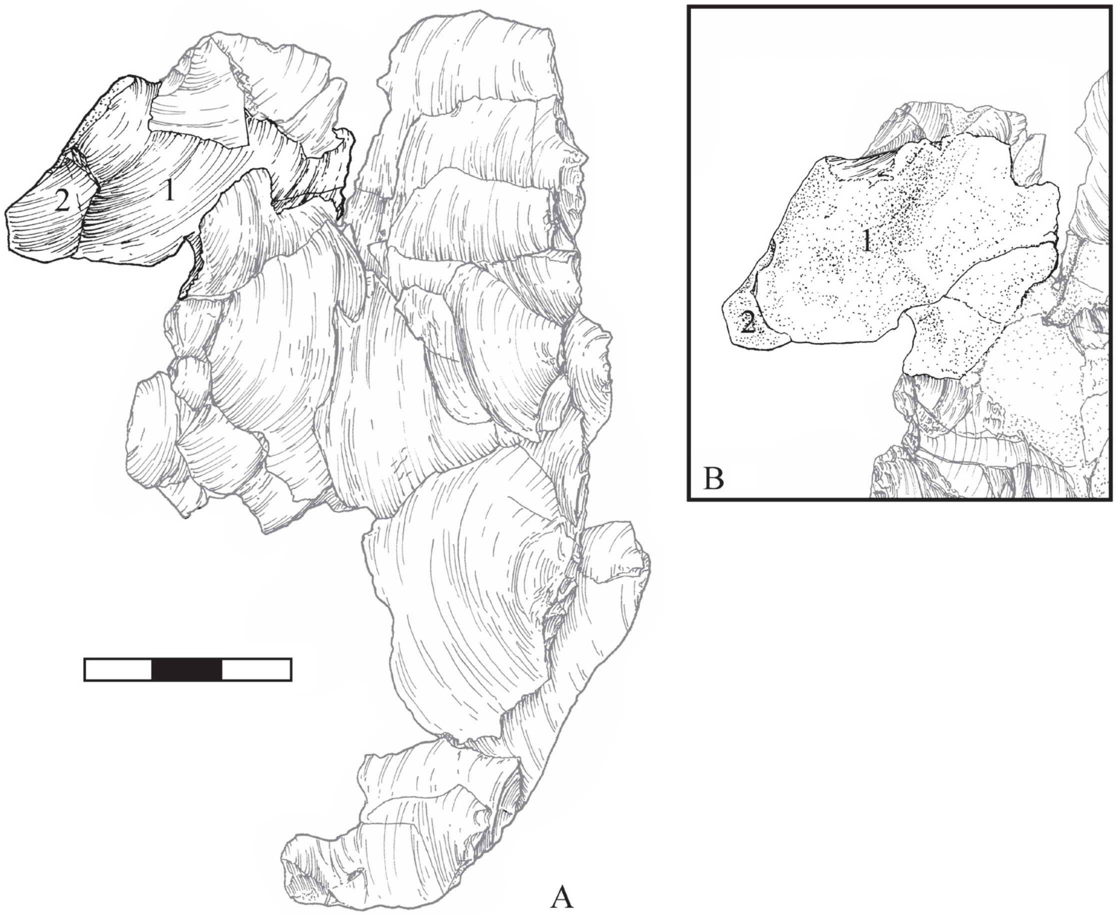


Fig. 16-3 Kabazi V, level III/4-2. Stage I of the flint preform: 1, 2 – refitted artefacts; A – ventral surface; B –mirror image of the dorsal surface. Arabic numerals specify the sequence of removals.

striking platform of a flake which was struck from surface B at a later stage of plaquette reduction (Fig. 16-4, 7). This might be interpreted as evidence of reduction from stage 0 which is not documented by refitted debitage. It is likely that stage 0 reduction did not occur on-site. The base and top of the plaquette at these stages were not processed. In other terms, the tested flint plaquette was brought to the site, with initial flaking from stages 0 and I serving preform preparation. At the same time, such a preform could have later been used to obtain a core (pre-core) or to produce a bifacial tool. Stages 0 and 1 might also have occurred in the opposite order, as there is no evidence of overlapping removals.

As mentioned above, the existing debitage which was detached from surface A at this stage comprised just one flake and one chip. The flake is characterised by transversal proportions and its striking platform and dorsal surface are completely covered by cortex (Fig. 16-3, 1). The striking platform of the chip is also covered by cortex (Fig. 16-3, 2). Both striking platforms are unlipped. No less than 30 % of the dorsal surface of the chip is covered by cortex.

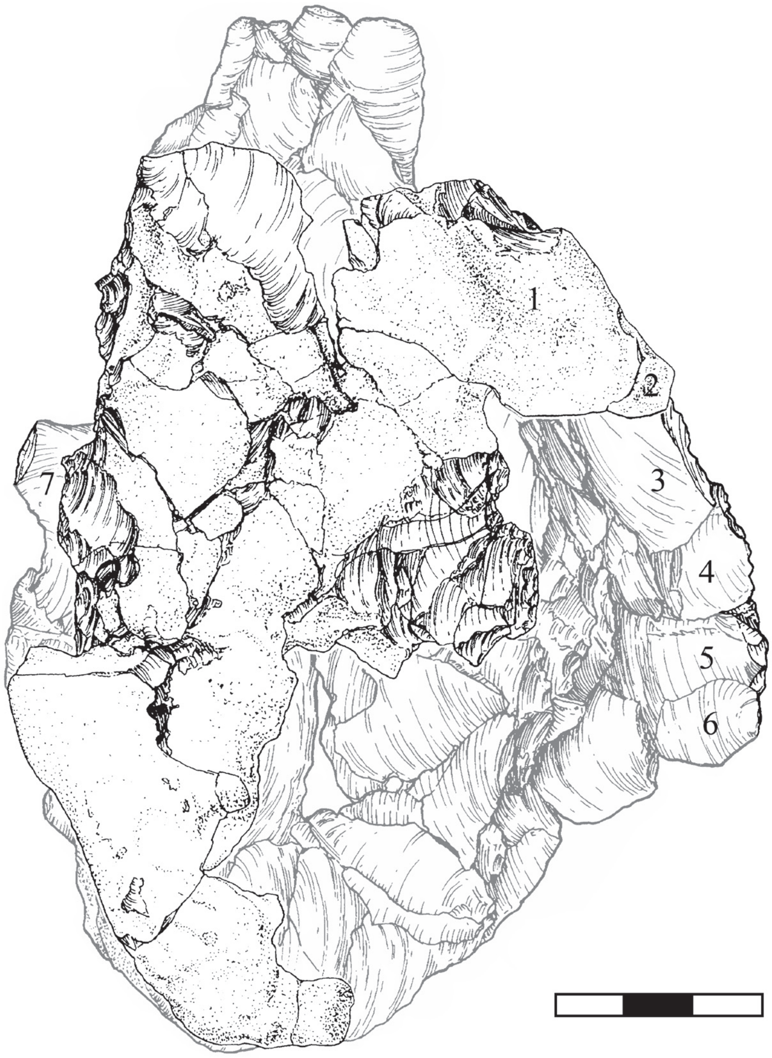


Fig. 16-4 Kabazi V, level III/4-2. Stage I of preform reduction: 1, 2 – refitted artefacts. The assumed stage 0 of flint plaquette reduction: platforms of flakes 3, 4, 5, 6, 7 retain negatives of stage 0 removals. Arabic numerals specify the sequence of removals.

Stage II, Surface B, Side 1

The second stage of plaquette reduction is connected with the exploitation of flaking surface B. At this stage the craftsman's efforts concentrated on working lateral side 1 and the top of the flint plaquette. The refitted debitage comprises seven pieces (Fig. 16-5), of which five were detached from lateral side 1 and two from the tip of the plaquette. Removals 2 and 3 formed a pronounced convexity – protruded ridge on the flaking surface. In the course of further treatment this ridge was detached by subsequent removals (Fig. 16-5, 4, 5). Two more flakes were struck from the tip of the preform. The direction of these removals is parallel to the long axis of the preform (Fig. 16-5, 6, 7). The second stage resulted in a straighter outline of the twisted edge of side 1. In fact, this denotes the beginning of the bifacial tool edge formation. After this stage the preform might undoubtedly be identified as one edge of a bifacial tool preform.

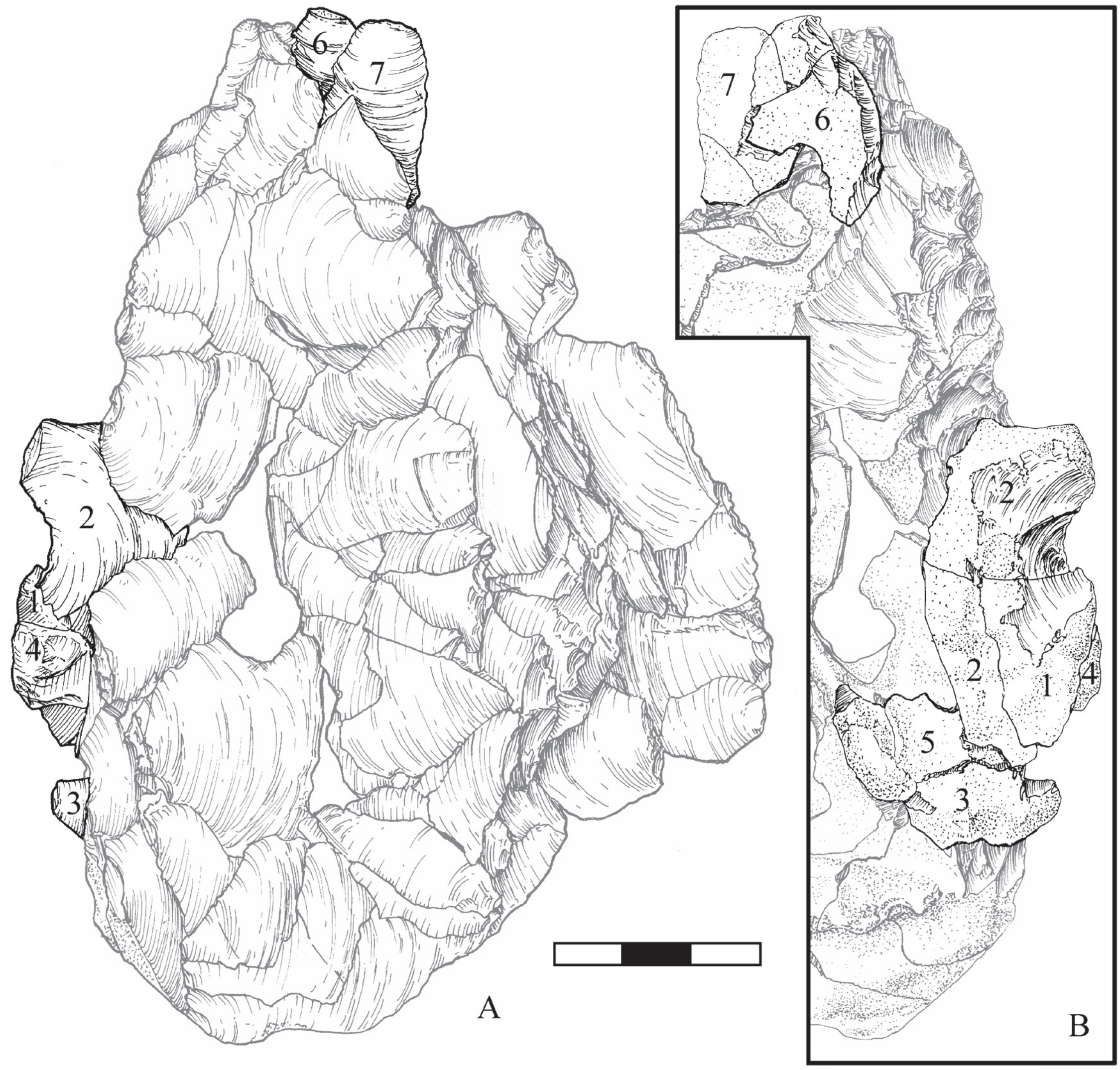


Fig. 16-5 Kabazi V, level III/4-2. Stage II of preform reduction: 1, 2, 3, 4, 5 – refitted artefacts. Tip thinning: 6, 7 – refitted flakes; A – ventral surface; B – dorsal surface. Arabic numerals specify the sequence of removals.

Typologically speaking, the debitage from the second stage and from preform tip thinning comprises 3 flakes and 4 chips. On the whole, the characteristics of the debitage from the first and second stages are similar; flakes are characterised by both longitudinal and transversal proportions, whereby the latter originate from the processing of the lateral edge (Fig. 16-5, 2). All flakes and chips retain more than 50 % cortex cover on their dorsal surfaces (Fig. 16-5, 1, 2, 3, 4, 5, 6, 7). There are two unbroken platforms, both of which are covered by cortex (Fig. 16-5, 6, 7); one of these is lipped (Fig. 16-5, 6), the other is semi-lipped (Fig. 16-5, 7).

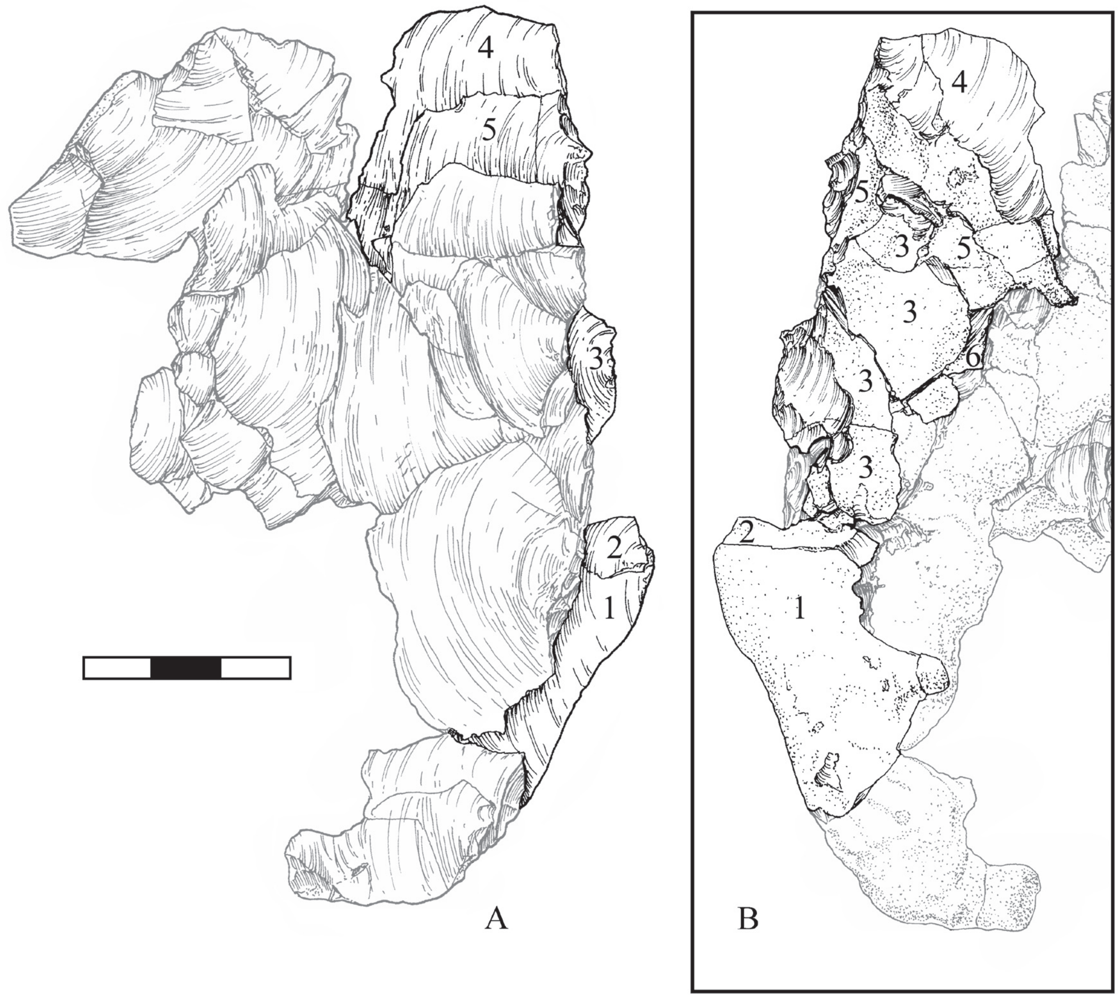


Fig. 16-6 Kabazi V, level III/4-2. Stage III of preform reduction: 1, 2, 3, 4, 5, 6 – refitted artefacts; A – ventral surface; B – dorsal surface. Arabic numerals specify the sequence of removals.

Stage III, Surface A, Side 1

During the third stage the reduction of the same lateral side was continued, though now the opposite surface, i.e. flaking surface A, was processed. Removals followed in divergent directions: toward the base (Fig. 16-6, 1, 2, 3) and toward the tip (Fig. 16-6, 4, 5, 6) of the preform. Each subsequent removal takes away part of a negative of the previous removal, whereby the main technological feature of this stage consists in a more accurate preparation of the striking platforms of flakes prior to their detachment. The method of butt abrasion was employed for those flakes which were removed from the proximity of the preform tip (Fig. 16-6, 3, 4, 5). For this purpose, sandstone pebbles were probably used. The aim of the abrasion technique would have been similar to its later usage in bifacial tool production during the Upper Palaeolithic, i.e. to reduce the edge of the striking platform so as to obtain better control over removals (Bradley et al., 1995).

Typologically the removals from the third stage are represented by 4 flakes, 1 blade and 1 chip. The most part of removals retain about 30 % cortex coverage on their dorsal surfaces (Fig. 16-6, 1, 2, 3, 4, 5). As a rule, cortex remnants are located on the distal ends and on lateral parts of the pieces. The identifiable striking platforms are represented by one corticated (Fig. 16-6, 4) and two plain (Fig. 16-6, 1, 2) butts. There are two unlipped and two semi-lipped platforms.

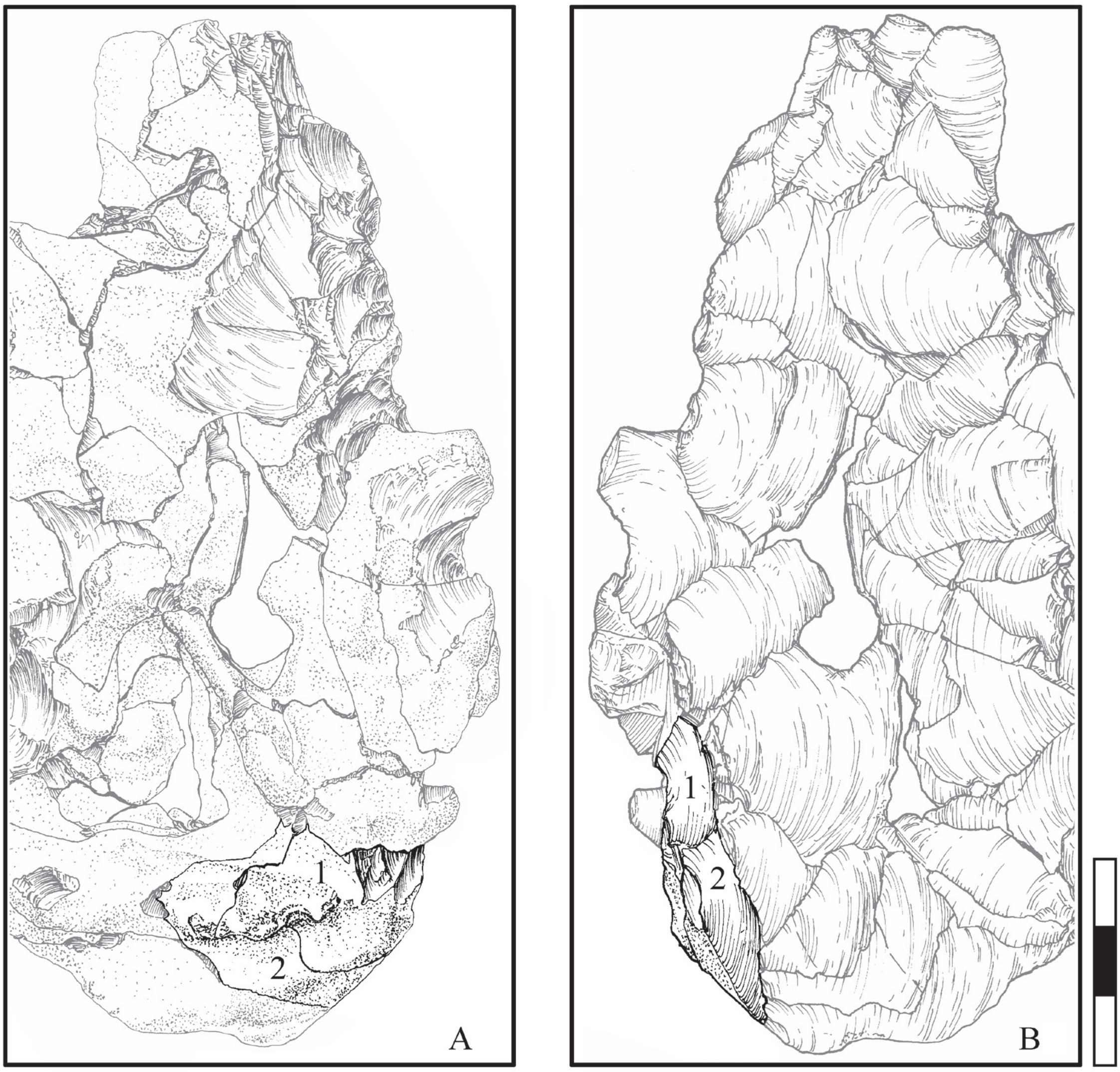


Fig. 16-7 Kabazi V, level III/4-2. Stage IV of preform reduction: 1, 2 – refitted flakes; A – ventral surface; B – dorsal surface. Arabic numerals specify the sequence of removals.

Stage IV, Surface B, Side 1

The processing of the same side continued, but with a change in the flaking surface. Two relatively big flakes were struck from flaking surface B (Fig. 16-7, 1, 2). Due to these removals the elaborated edge increased in length downwards, towards the base of the preform; the edge profile was bestowed a curved contour. The base of the preform remained covered by primary cortex. The first removal shows traces of reduction of the striking platform edge (Fig. 16-7, 1). The second flake was removed without additional preparations. In excess of 50 % of the dorsal surfaces of both flakes are covered by cortex (Fig. 16-7, 1, 2). The unlipped striking platforms of flakes are represented by plain (Fig. 16-7, 2) and dihedral (Fig. 16-7, 1) types.

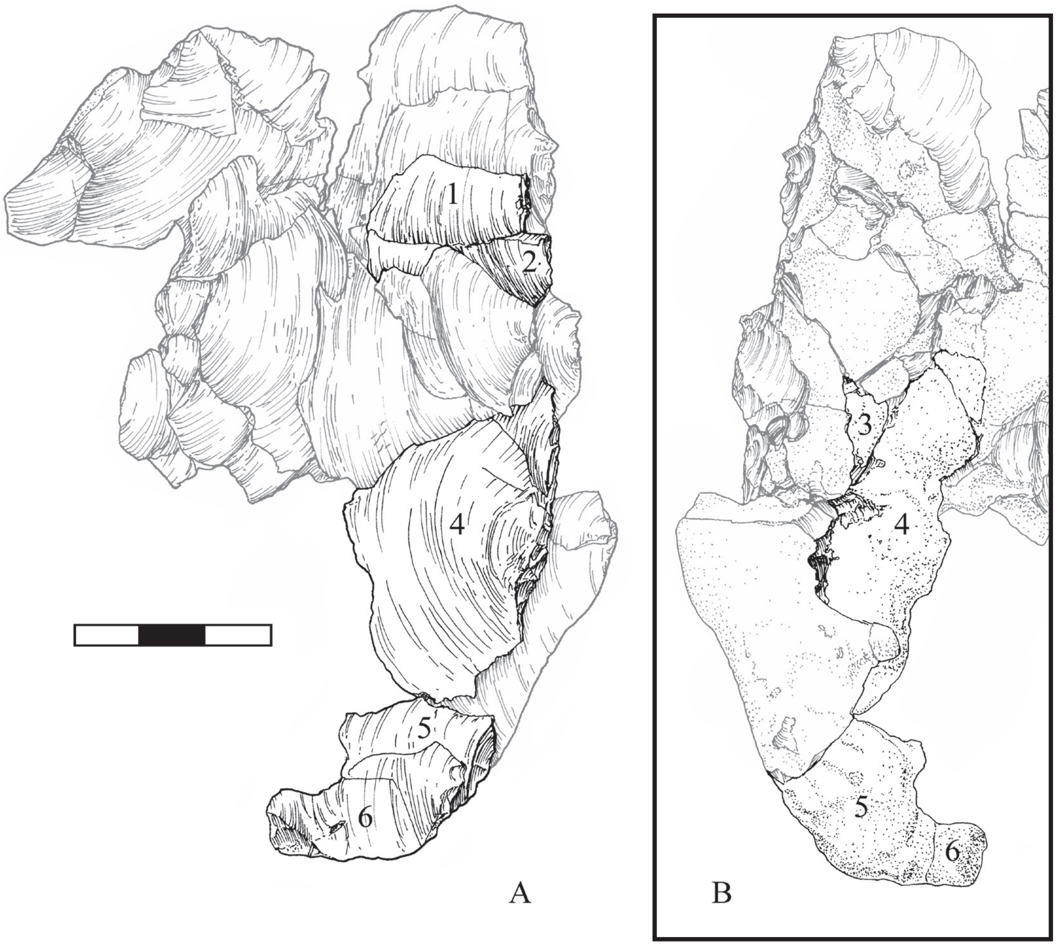


Fig. 16-8 Kabazi V, level III/4-2. Stage V of preform reduction: 1, 2, 3, 4, 5, 6 – refitted flakes; A – ventral surface; B – dorsal surface. Arabic numerals specify the sequence of removals.

Stage V, Surface A, Side 1

At this stage the craftsman again returned to flaking surface A. His efforts concentrated on three local areas of the same lateral side, which had been worked in the previous stages (Fig. 16-8). At first, the convexity on the middle part of lateral side was reduced by a series of removals (Fig. 16-8, 1, 2, 3, 4). Second, the straight profile of the edge was restored by two removals from the preform base (Fig. 16-8, 5, 6). The latter two flakes exhibit about 40 % cortex coverage of their dorsal surfaces and dihedral striking platforms (Fig. 16-8, 5, 6). Also, they show traces of light butt abrasion. The flake from the central part of the edge was especially prepared prior of detachment; it exhibits a dihedral platform and butt abrasion (Fig. 16-8, 4). The aim of these measures was to isolate the point of percussion (Bradley et al., 1995). Moreover, the traces of the most careful abrasive treatment concentrate on the dorsal surface directly in front of the point of percussion.

There is a total of six refitted flakes. Three flakes exhibit broken/crushed striking platforms (Fig. 16-8, 1, 2, 3), two have dihedral striking platforms (Fig. 16-8, 5, 6), and one has a polyhedral platform (Fig. 16-8, 4). There is one non-lipped and one semi-lipped platform, while all others are unidentifiable. Two flakes display < 25 % primary cortex coverage on their dorsal surfaces (Fig. 16-8, 3, 4), two flakes exhibit about 40 % cortex coverage on their flaking surfaces (Fig. 16-8, 5, 6), and two had dorsal surfaces free from cortex (Fig. 16-8, 1, 2).

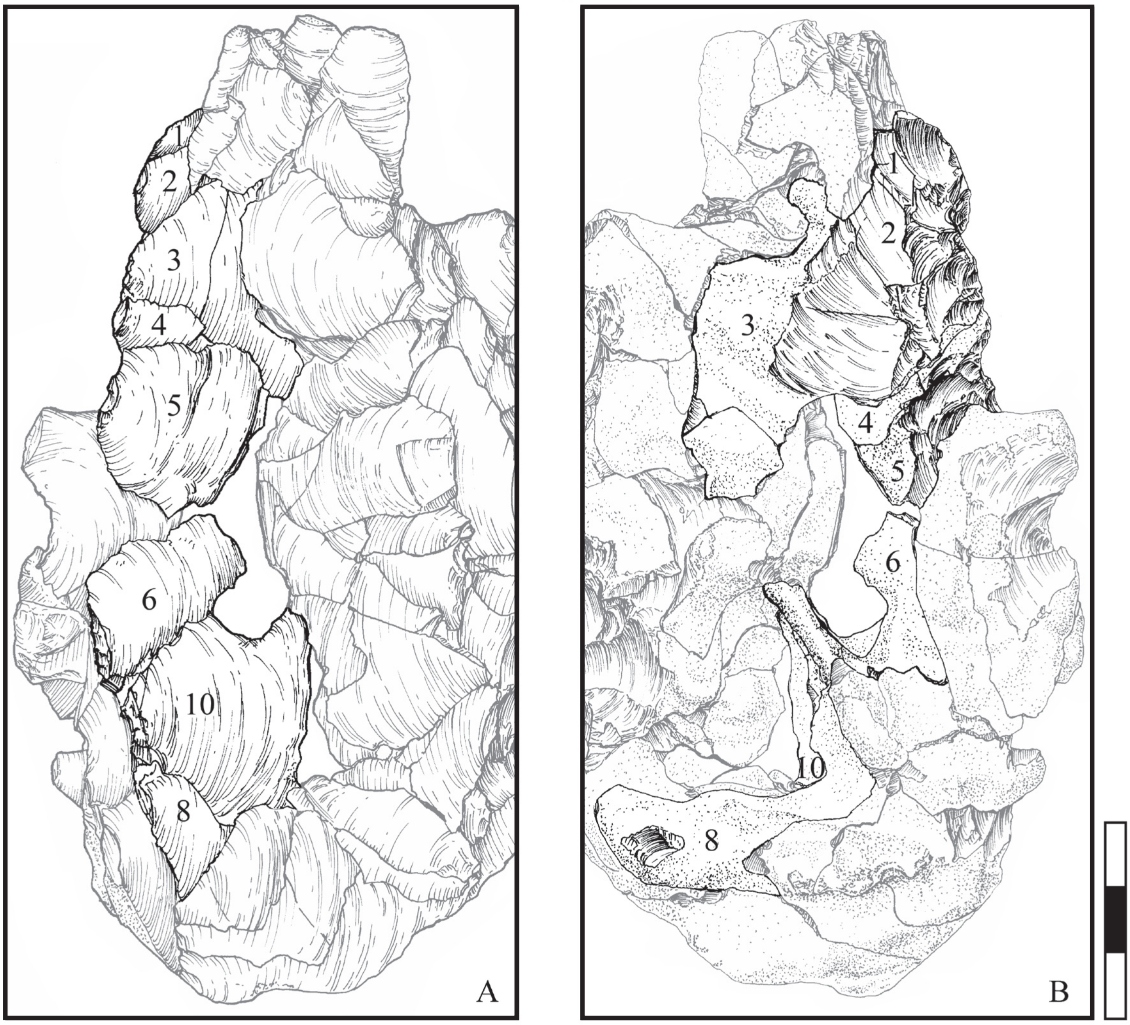


Fig. 16-9 Kabazi V, level III/4-2. Stage VI of preform reduction: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 – refitted artefacts; A – ventral surface; B – dorsal surface. Artefacts 8 and 9 are not visible. Arabic numerals specify the sequence of removals.

Stage VI, Surface B, Side 1

The working surface was changed again, while the lateral side remained the same. On flaking surface B eight removals were struck from the top to the base of the preform (Fig. 16-9, 1, 2, 3, 4, 5, 6, 7, 8). The removals followed one after another. Each new removal partially overlaps the previous removal. Between flakes 6 and 7 (latter is not visible on Fig. 16-9) the pronounced ridge on the flaking surface was removed. To strike this ridge two removals were needed: 9 and 10 (the former is not visible on Fig. 16-9). These efforts resulted in a significant flattening of the preform base. The most characteristic feature of this stage comprises the preparation of each removal by preliminary treatment, which included the isolation of the point of percussion (Fig. 16-9, 2, 3, 5, 6, 10) and butt abrasion (Fig. 16-9, 2, 3, 4, 5). Often, the reduction of the platform edge was undertaken by a series of small removals (Fig. 16-9, 1, 2, 3, 4, 5). This procedure preceded butt abrasion. The debitage of the sixth stage of reduction includes 1 blade, 5 flakes and 4 chips. The majority of removals retain primary cortex on their distal part or on one of the lateral sides (Fig. 16-9, 3, 4, 5, 6, 8, 10). As a rule, cortex does not cover more than 30 % of the total area of dorsal surfaces. Among the unbroken striking platforms, the dihedral (Fig. 16-9, 2, 4) and polyhedral (Fig. 16-9, 3, 5, 6, 8, 10) types were defined. There are two unlipped (Fig. 16-9, 5, 8), one semi-lipped (Fig. 16-9, 3), three lipped (Fig. 16-9, 2, 4, 6), and four unidentifiable platforms.

In fact, this stage completes the preliminary formation of the preform edge on side 1. A total of 9 chips, 18 flakes and 2 blades were struck from this edge in stages II through VI. During the further shaping of this edge (stages IX and XI) 4 flakes and 2 chips were removed from this side.

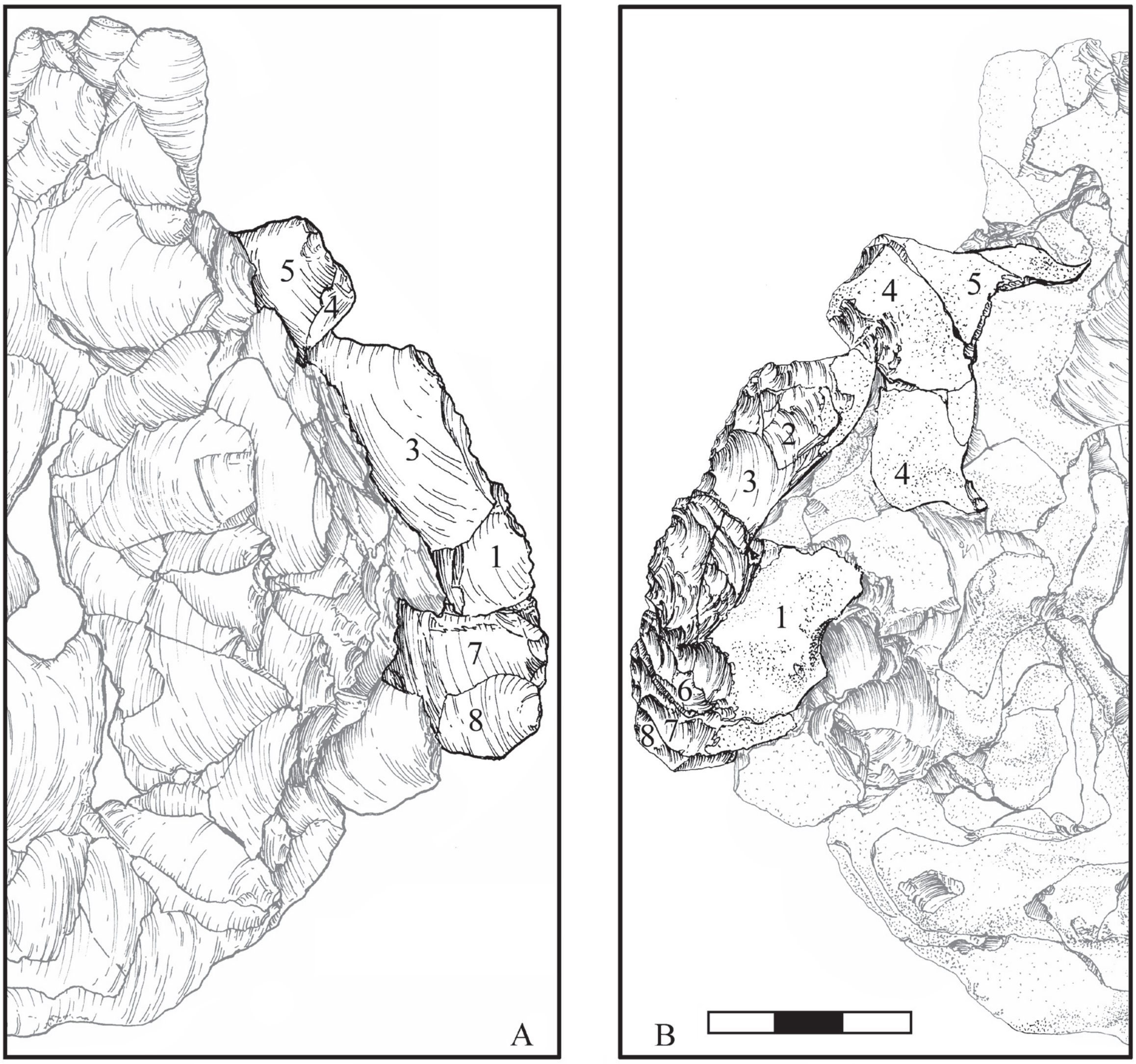


Fig. 16-10 Kabazi V, level III/4-2. Sub-stage VIIa of preform reduction: 1, 2, 3, 4, 5, 6, 7, 8 – refitted artefacts; A – ventral surface; B – dorsal surface. Arabic numerals specify the sequence of removals

Stage VII, Surface B, Side 2

At this stage attention was turned to the opposite side of the preform, this being the first attempt at the elaboration of this side since the initial stages 0 and I. This stage is subdivided into five sub-stages, based on the observed application of different flaking means to remove the excess volume of flint from preform side 2.

Sub-stage VIIa, surface B, side 2

On surface "B" there followed a series of 8 removals (Fig. 16-10). The first flake was removed from the most protruding part of the preform edge (Fig. 16-10, 1), while subsequent removals ran in different directions, i.e. toward the top (Fig. 16-10, 3, 4, 5) and toward the base (Fig. 16-10, 6, 7, 8) of the preform. Some removals show traces of striking platform edge reduction (Fig. 16-10, 1, 3, 6, 7, 8). A chip (Fig. 16-10, 2) which originated from this preparation was refitted to the dorsal part of one of the flakes (Fig. 16-10, 3). Also, the majority of removals display evidence of abrasive treatment of the ridge between dorsal surface and striking platform (Fig. 16-10, 1, 3, 5, 6, 7, 8). However, the points of percussion of the removals from this sub-stage were not isolated.

There is only one flake which is completely covered by cortex (Fig. 16-10, 4), and only one chip which has no cortex coverage whatsoever of its dorsal surface. The dorsal surfaces of all other refitted pieces retain between about 20 % and 50 % cortex coverage. The debitage from this stage comprise 5 flakes and

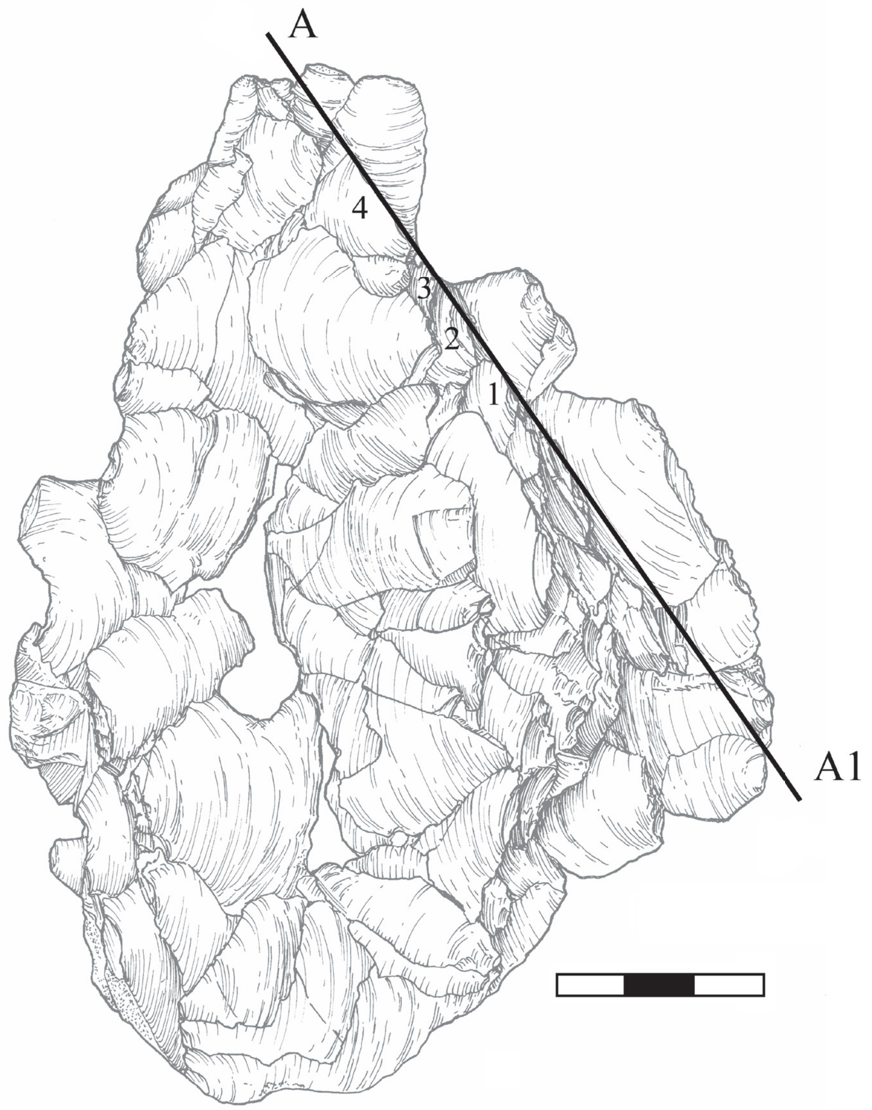


Fig. 16-11 Kabazi V, level III/4-2. Sub-stage VIIb of preform reduction, view of the ventral surface: A-A1 – the assumed position of the crested flake; platforms of flakes 3, 4, 5, 6, 7 retain the negative of the crested flake.

3 chips. The identifiable striking platforms are represented by dihedral (Fig. 16-10, 3) and polyhedral (Fig. 16-10, 1) types, both of which are semi-lipped. All remaining platforms are unidentifiable.

Sub-stage VIIb, surface B, side 2

Sub-stage VIIb was devoted to the processing of side 2 on flaking surface B. Although the debitage associated with this stage is absent, a reconstruction of the related flaking process can be realised on the basis of negatives that are now located on the striking platforms and proximal parts of dorsal surfaces of the subsequent removals (Fig. 16-11, 1, 2, 3, 4).

During this sub-stage it would appear that a large part of the preform edge was removed by a transversal flake (Fig. 16-11, A-A1). This flake may have displayed a crested dorsal pattern, which would have been formed by previous removals. Following the removal of this (assumed) flake, a pronounced back was formed on side 2 (Fig. 16-11, A-A1). The reason for this step, the result of which was deleted by further flaking, is not clear, but it may represent an attempt by the knapper to dispose of an excessive volume of flint, in order to form the more or less symmetrical shape of the preform. In any case, the back of side 2 posed a number of knapping problems which had to be resolved in subsequent stages of reduction.

Sub-stage VIIc, surface B, side 2

This sub-stage might be viewed as the beginning of the back deleting process. The first and second flakes were removed from the transition between back and edge. These flakes were located closer to the plaquette base (Fig. 16-12, 1, 2). These removals resulted in hinge fractures. This new problem was resolved by two subsequent removals, the platforms of which were carefully prepared by isolating their points of percussion (Fig. 16-12, 3, 4). Following their removal, and with them the hinge fractures (Fig. 16-12, 5), a large part of the width of the preform base was lost. Further, the convexity of surface B significantly increased.

The refitted items from this sub-stage comprise two chips, two flakes and one blade. Only one flake has no cortex coverage on its dorsal surface, with all remaining pieces characterised by 20-50 % dorsal surface cortex coverage. Identifiable platforms include two unlipped butts, one of which is straight faceted, and the other crushed.

Sub-stage VIId, surface B, side 2

In this sub-stage the removal of the previously formed back of the preform continued towards the top of the piece (Fig. 16-12, 6, 7, 8, 9, 10). Unlike in the previous stage, these removals were unmistakable. Four removals carry negatives from the pronounced back, either on their striking platforms or upon the proximal parts of their dorsal surfaces (Fig. 16-12, 7, 8, 9, 10). The removals detached in this sub-stage restored the lateral edge symmetry to the preform. Also, these removals resulted in the formation of a more or less symmetrical bi-convex cross-section. At the same time, it must to be noted that surface B, although sufficiently flattened, still showed a more convex outline than surface A.

Refitted pieces from this sub-stage comprise three flakes and two chips. Only one chip has a small amount of cortex on its distal part. Most removals are characterised by butt abrasion, though their points of percussion have not been isolated. Among the identifiable striking platforms are plain (Fig. 16-12, 6), dihedral (Fig. 16-12, 7, 9, 10) and polyhedral (Fig. 16-12, 8) types. The plain platform is semi-lipped, while all others are unlipped.

Sub-stage VIIe, surface B, side 2

Following the removal of the pronounced back, three removals were made from the middle part of the lateral side (Fig. 16-12, 11, 12, 13). These flakes were struck towards the top of the preform. This sub-stage resulted in the smoothly convex outline of the edge, the overall symmetric proportions of the preform, and the thinned terminal part of the future tool. Only one flake display a small corticated area on its dorsal surface. One flake has a plain, semi-lipped platform, and all other platforms are crushed.

Two more chips were removed from the tip of the preform (Fig. 16-12, 15, 14). These have been attributed to the distal thinning procedure.

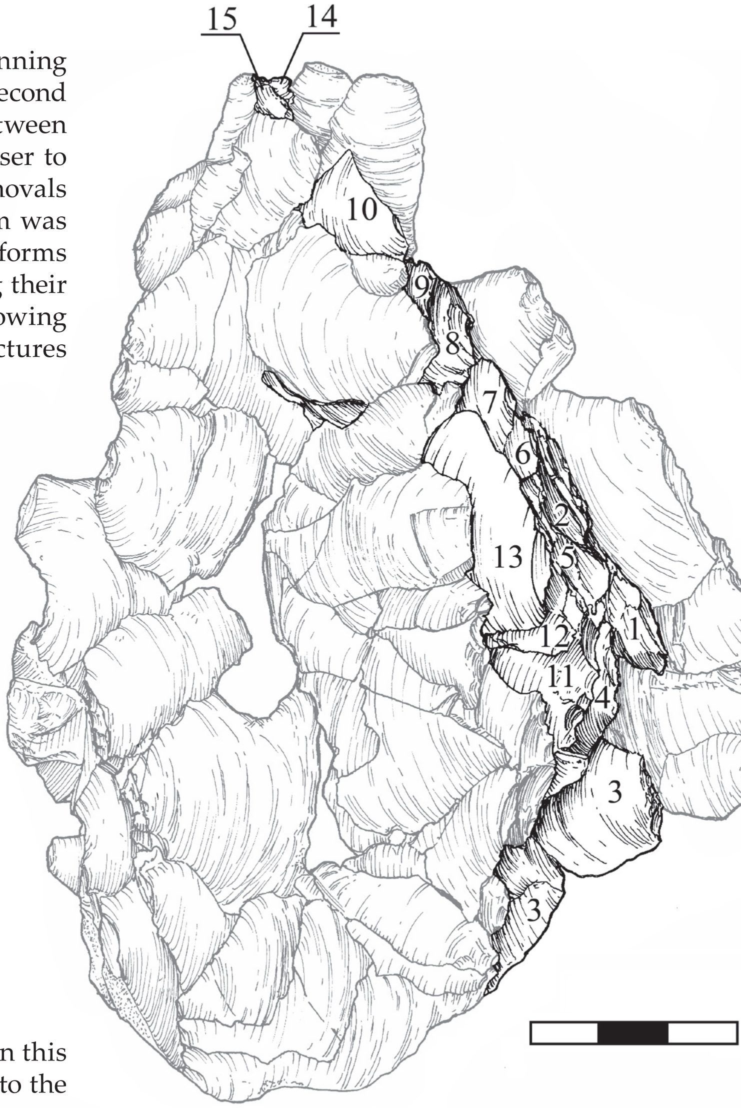


Fig. 16-12 Kabazi V, level III/4-2. Sub-stage VIIc of preform reduction: 1, 2, 3, 4, 5 – refitted artefacts. Sub stage VIId of preform reduction: 6, 7, 8, 9, 10 – refitted artefacts. Sub-stage VIIe of preform reduction: 11, 12, 13 – refitted artefacts. Tip thinning: 14, 15 – refitted chips. Arabic numerals specify the sequence of removals.

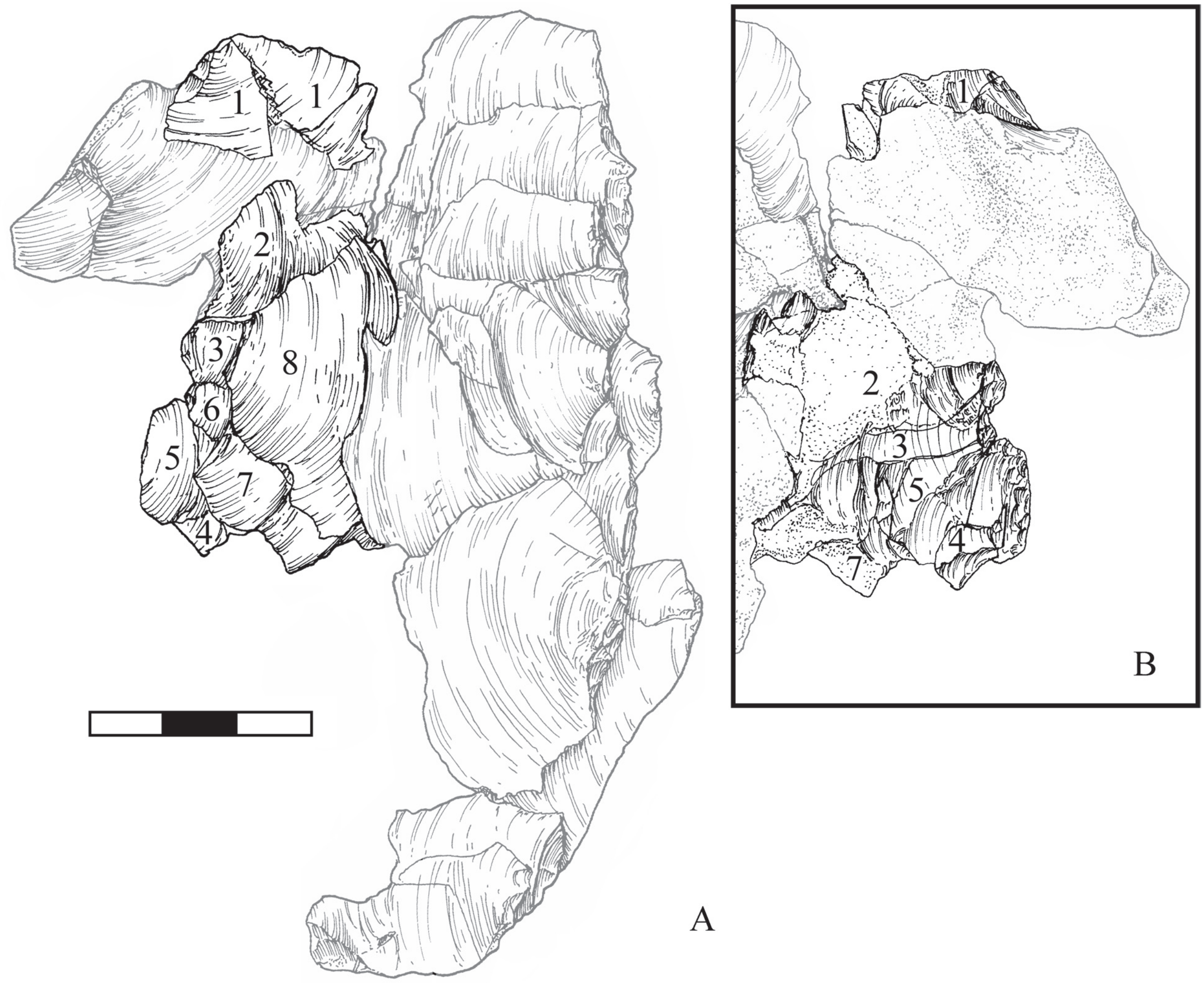


Fig. 16-13 Kabazi V, level III/4-2. Stage VIII of preform reduction: 1, 2, 3, 4, 5, 6, 7, 8 – refitted artefacts; A – ventral surface; B – dorsal surface. Arabic numerals specify the sequence of removals.

Stage VIII, Surface A, Side 2

The elaboration of the same lateral side continued, but this was now undertaken from the opposing surface. The middle / upper part of surface A was flattened by a series of eight removals (Fig. 16-13), comprising 3 flakes, 1 blade and 4 chips. Six of these had smashed or broken striking platforms. Two removals are characterised by the occurrence of butt abrasion and plain unlipped striking platforms (Fig. 16-13, 1, 5). Only one flake displayed more than 50 % cortex coverage of its dorsal surface (Fig. 16-13, 2). Four more items have only small (<25 %) corticated areas (Fig. 16-13, 1, 3, 6, 7), while all remaining pieces have no cortex on their dorsal surfaces (Fig. 16-13, 4, 5, 8).

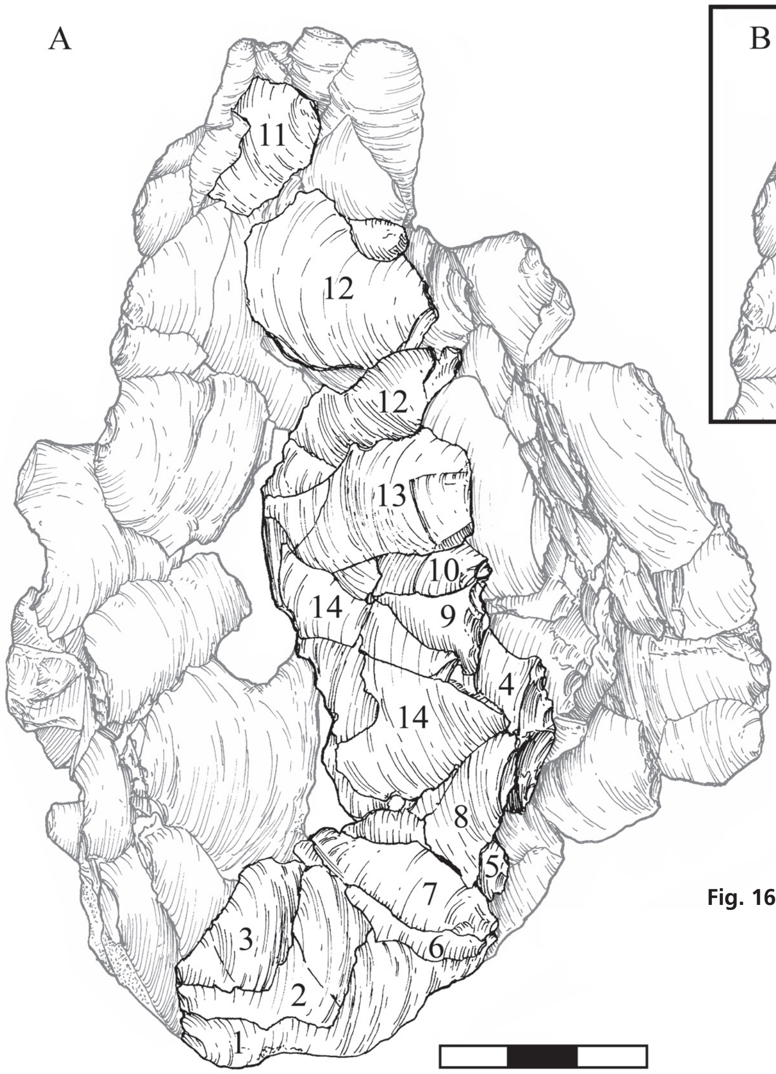


Fig. 16-14 Kabazi V, level III/4-2. Stages IX and X of preform reduction: A – view of the ventral surface. Stage IX: 1, 2, 3 – refitted artefacts. Stage X: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 – refitted artefacts. Tip thinning: B – view of the ventral surface; 1, 2 – refitted chips. Arabic numerals specify the sequence of removals.

Stage IX, Surface B, Side 1

In this stage the same surface was again treated from the opposite side. Three flakes were struck from side 1 (Fig. 16-14, A: 1, 2, 3). The removal of these flakes thinned the preform base. Whereas two of these flakes have lipped plain platforms (Fig. 16-14, A: 1, 2), one flake has an unlipped faceted convex platform (Fig. 16-14, A: 3). The dorsal surface of one flake is covered to about 50 % by cortex (Fig. 16-14, 1).

Stage X, Surface B, Side 2

The thinning of the preform base continues on the same flaking surface, but from the opposite side (Fig. 16-14, A: 4, 5). In fact, stage IX and part of stage X were devoted to the lateral thinning of the preform base.

Further treatment consisted of two separate episodes. First, part of the lateral side, from the base towards the middle part of preform, was elaborated by five removals (Fig. 16-14, A: 6, 7, 8, 9, 10). Second, a further series of removals was directed from the top of the preform towards the base. These two sets of removals meet and overlap at about halfway down the edge of the preform (Fig. 16-14, A: 11, 12, 13, 14). A few removals display distal cortex (< 25 % of dorsal surfaces) which stems from the middle part of the preform. Butt abrasion occurs quite often.

For this stage, a total of 4 chips, 4 flakes and 3 blades were refitted. Four pieces retained small corticated areas on their dorsal surfaces. Identified striking platforms include plain (Fig. 16-14, A: 1, 2) and polyhedral types (Fig. 16-14, A: 3, 4, 6, 8, 12). Two platforms are lipped, one is semi-lipped, three are unlipped, and all other could not be identified.

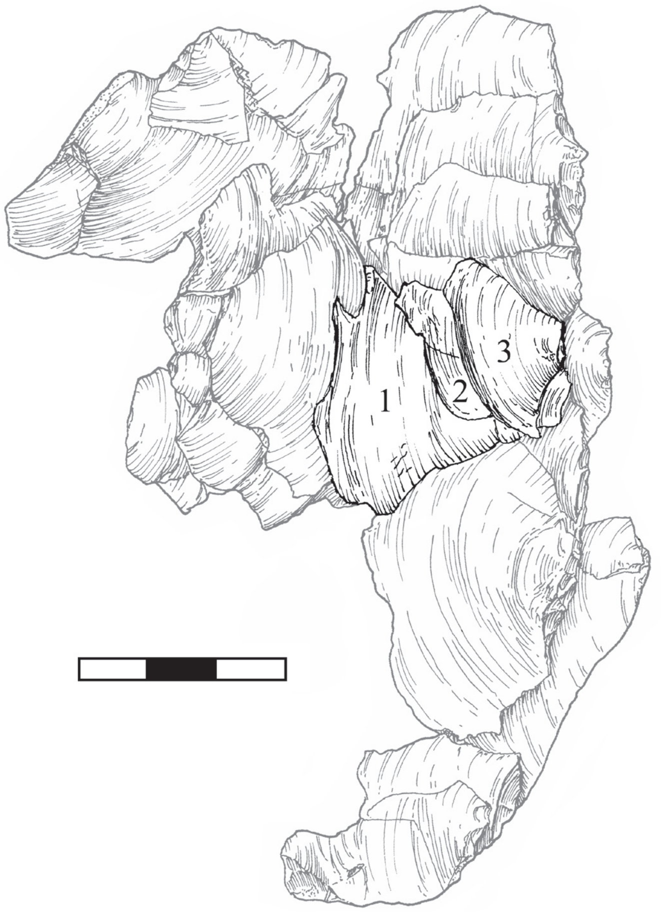


Fig. 16-15 Kabazi V, level III/4-2. Stage XI of preform reduction: 1, 2, 3 – refitted artefacts, view of the ventral surface. Arabic numerals specify the sequence of removals.

Stage XI, Surface A, Side 1

Stage XI is documented by three removals (two flakes and one chip) which thinned the mid part of the edge on side 1 (Fig. 16-15, 1, 2, 3). There is no cortex on the dorsal surfaces of these items. Two platforms are faceted-convex (lipped and semi-lipped); one further platform is broken.

Two more chips were struck from the tip so as to thin the distal part of the bifacial preform (Fig. 16-14, B: 1, 2).

This was the last stage of preform production. Further stages would have been associated with tool production – retouching. These last stage(s) are represented by 2,703 not refitted chips, the majority of which is smaller than 0.5 cm.

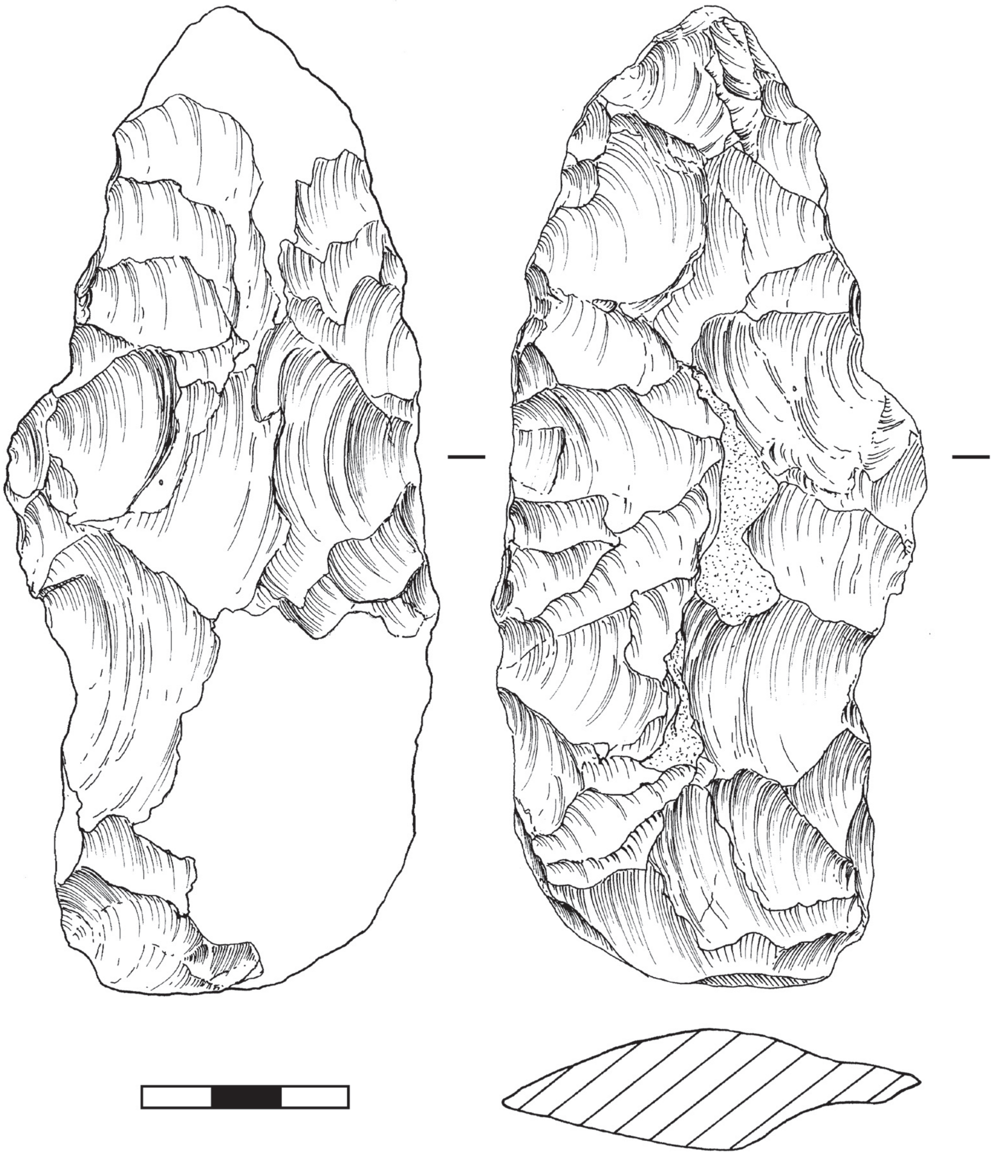


Fig. 16-16 Kabazi V, level III/4-2. Preform of the bifacial tool.

Discussion

The refitted "cover" of the bifacial tool was filled with an artificial wax (paraffin) so as to produce a cast of the missing bifacial tool. This cast resembles a sub-leaf bifacial scraper (Fig. 16-16); it is 14.23 cm long, 6.11 cm wide, and 1.78 cm thick. The orientation of the preform correlates perfectly with the primary form of the flint plaquette, i.e. both the long axis of the plaquette and the long axis of the preform share the same orientation. Thus, the terminal part of the preform is oriented towards the top of the sub-trapezoidal plaquette, and the preform base is oriented towards the basis of the plaquette.

A total of four different preform reduction phases have been identified. The first phase comprises stages 0 and I. During this phase, surface A was treated from both lateral sides (Table 16-1, Fig. 16-17). The second phase, comprising stages II through VI, was devoted to the formation of the edge on side 1. This was formed by alternating removals from surfaces A and B (Table 16-1, Fig. 16-17). In the third phase, stages VII and VIII, the edge on side 2 was formed, also by alternating removals from surfaces A and B (Table 16-1, Fig. 16-17). The last phase involved the formation of the preform edges by alternate removals from both preform surfaces.

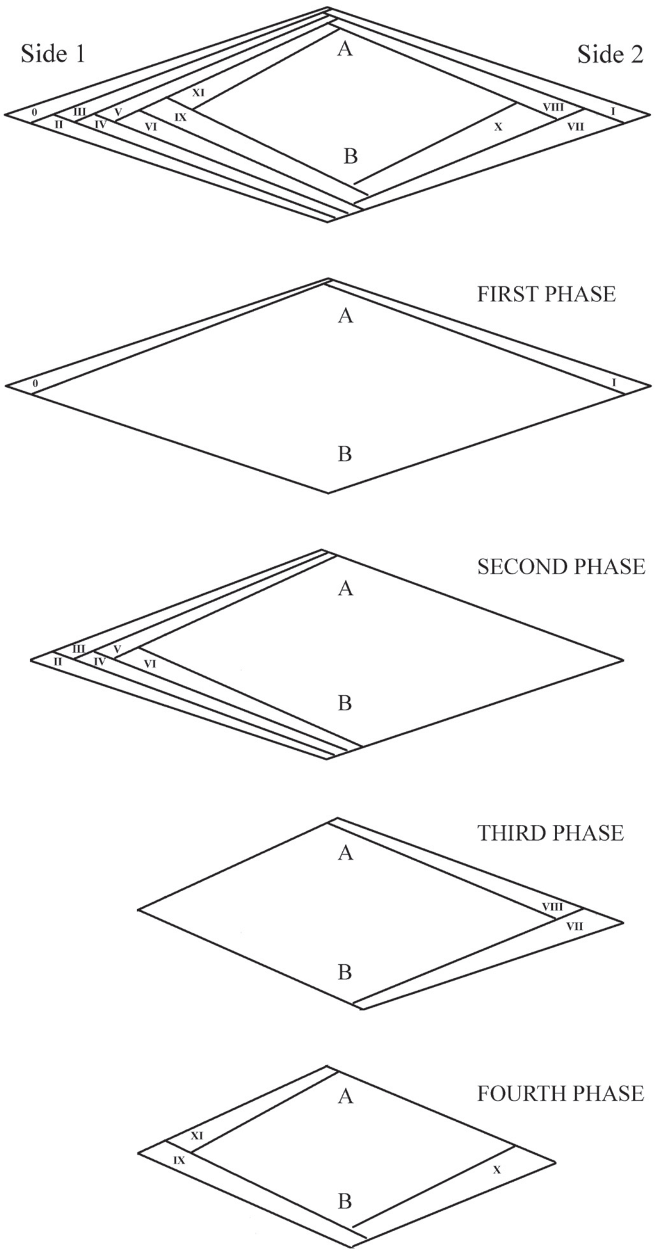


Fig. 16-17 Kabazi V, level III/4-2. Reduction sequence of the preform of the bifacial tool, by phases. Roman numerals indicate stages of the reduction sequence.

Both the second and third phases were connected with continuous treatment of one or another edge. That is, the edges were worked separately, first the edge on side 2, and then the edge on side 1. Altogether the second and third phase produced 58 of 83 refitted debitage pieces (29 pieces each). The alternate treatment of both edges from both surfaces during the fourth phase produced 17 refitted pieces. Even taking into account the probable incompleteness of refitted pieces, it is possible to conclude the importance of the separate continuous treatment of edges. The majority of the flint volume was removed during the second and third phases. These phases resulted in the formation of the bifacial leaf-shaped (in plan) and bi-convex (in cross-section) preform.

The fourth phase is characterised by an alternate treatment of surface and edges, which is usual for Micoquian bifacial tools: "wechselseitig-gleichgerichtete Kantenbearbeitung" (Bosinski 1967, s. 43) or "*plan convexe/plan convexe*" (Boëda 1995, s. 76). However, the bi-convex cross-section of the preform was not changed to plano-convex, although it should be noted that 2,703 chips are still not refitted. It is likely that all of these pieces stem from a phase of preform retouching. There are two main retouch methods observed on bifacial tools from the Crimean Micoquian: the plano-convex method (both edges retouched on one surface) and the plano-convex alternate method (each edge retouched on the opposite surface). To some extent, the retouch might change the cross-section of the tool. The most part of Micoquian bifacial point and scrapers show plano-convex cross-sections with plano-convex retouch. Usually, bi-convex cross-sections are common for tools with plano-convex alternate retouch.

The first phase of preform production is documented by one chip and one flake. Such weak evidence from this stage suggests that the decortication of the flint plaquette probably took place off-site. Evidence for distal thinnings were found on 2 flakes and 4 chips. No doubt, there are further chips, which have not been refitted, that are also connected with or stem from distal thinning.

The majority of stages are characterised by consecutive removals, whereby parts of the previous negative are overlapped by the negatives from subsequent removals. It is not obligatory that the preparation of the whole length of one edge need to have been undertaken in one single stage. As a rule, the processing of a certain area of a lateral edge depends on the way in which problems encountered during the knapping process are resolved, e.g. the flattening of the working surface, the control over the relatively straight lateral profile, the increase in length of the edge by retouching the base, etc.

No particularly dominant direction of treatment is observed, although more often than not, the processing of lateral edges is directed from the base or top of the preform towards its middle part (stage III, Fig. 16-6; stage VI, Fig. 16-9; sub-stage VIIc, Fig. 16-12; stage X, Fig. 16-14, A).

Flakes and chips that were struck in the initial reduction stages were not especially prepared prior to their detachment (stage I, Fig. 16-3; stage II, Fig. 16-5). Platform preparation only began to play a role in the later stages of bifacial tool production. There were three main methods of preparation of striking platforms, all of which served to gain better control over flaking surfaces and processed edges. These involved the reduction of the platform edge, butt abrasion, and the isolation of the point of percussion. The reduction of the platform edge was realised by a series of small removals from the striking platform (stage III, Fig. 16-6; sub-stage VIIa, Fig. 16-10, 2). Quite often, an additional abrasive treatment of the platform edge was used to strengthen it, and thus prevent striking platforms from smashing during percussion. In the final stages of preform shaping, points of percussion tended to be isolated prior to the detachment of the removal (stage V, Fig. 16-8, 4; stage VI, Fig. 16-9, 2, 3, 5, 6, 10; stages IX and X, Fig. 16-14, 3, 4, 6, 8, 12).

The most specialised method required in the production of this bifacial preform was applied in the preparation and subsequent removal of the back of the tool (sub-stage VIIb, Fig. 16-11, A-A1; sub-stages VIIc, VIId, Fig. 16-12). It was this process which then resulted in the symmetrical shape of the tool, and also led to the change in the shape of the preform cross-section; the latter become more plano-convex, i.e. surface B was now bestowed with a more pronounced convexity than surface A.

Upon comparison of the dimensions of the artificial wax (paraffin) cast of the bifacial scraper and the primary size of the flint nodule, it becomes evident that the most obvious changes are to be observed in width and thickness values, both of which decreased during reduction by more than 1.5 times; or in other terms, the coefficient of width reduction lies at 1.78, while the coefficient of thickness reduction is 1.58. On the other hand, the difference between the length of the bifacial tool cast and the original length of the flint plaquette is practically negligible; here the coefficient of length reduction is 1.04. The reduction in thickness, width and length is related to intensive bilateral shaping, i.e. the main method of tool production. The insignificant treatment of the distal part, as well as the absence of any traces of base thinning of the tool, means that the near maximum length of the plaquette was retained. Distal thinning was in evidence in stage II, sub-stage VIIe, and stage XI (Fig. 16-5, 6, 7; 16-12, 15, 14; 16-14, B: 1, 2). A total of four chips and two flakes were removed from the distal part of the preform. The base of the preform was processed exclusively by bilateral removals. It is likely that the bifacial tool would have had a small corticated area on its base. Bilateral shaping resulted in the formation of central ridges on both tool surfaces (Fig. 16-16). The surface ridges correlate with the tool axis.

The statistically incomplete assemblage of flakes and blades with identifiable striking platforms does not provide sufficient substance for detailed typological studies. However, some of the most pronounced characteristics should be underlined. The majority of refitted items display dorsal cortex, 29 pieces have 1-25 % cortex coverage; 12 pieces show 26-50 % cortex coverage; 11 pieces display 51-75 % cortex coverage; and two pieces are completely covered by cortex. Such a composition of corticated pieces is common for the most part of Micoquian debitage collections. Also, the relative deficit of pieces completely covered by cortex might suggest that the decortication process, or intensive testing of the raw material, took place at the flint outcrop itself.

Lipped platforms are common in all stages of the reduction sequence, the only exceptions being the platforms from stages I and II. Of 29 blanks with identifiable striking platforms 20 are characterised by lipped and semi-lipped platforms. The majority of platforms are polyhedral (13 items) and plain (11 items), followed by dihedral (7 items), covered by cortex (5 items) and faceted (4 items) platforms. Those platforms covered by cortex stem mainly from the initial stages of reduction, while dihedral, polyhedral, and especially faceted, platforms were produced during the final stages and are connected with a fine working of the edges. The sum of dihedral, polyhedral and faceted platforms constitutes more than half of all identifiable platforms. This correlate well with the relatively high IF values for Micoquian assemblages at Kabazi V (see Chapters 7, 8, 11, this volume).

To some extent, the characteristics of refitted artefacts might serve as key for a better understanding of the debitage attributes of Micoquian collections.

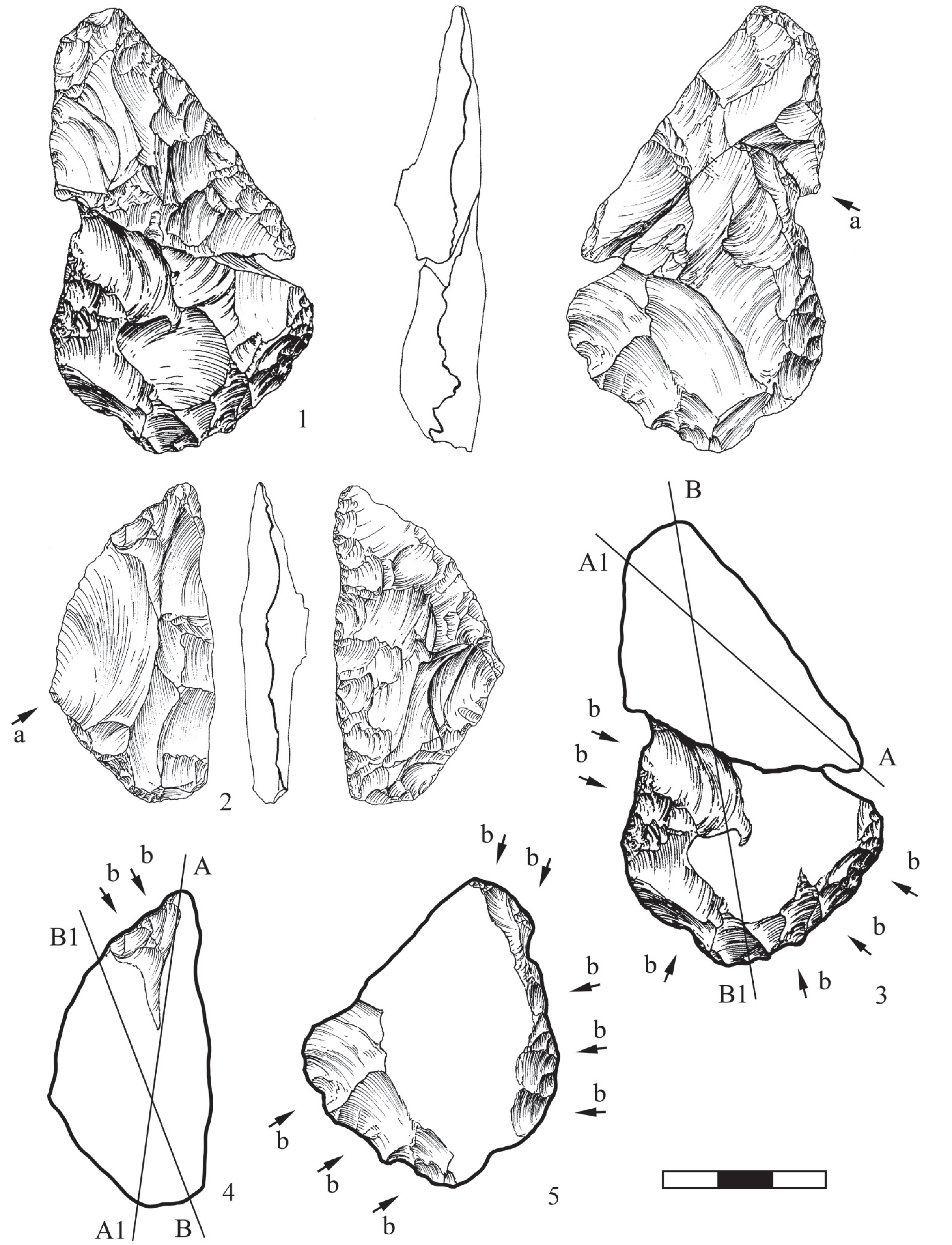
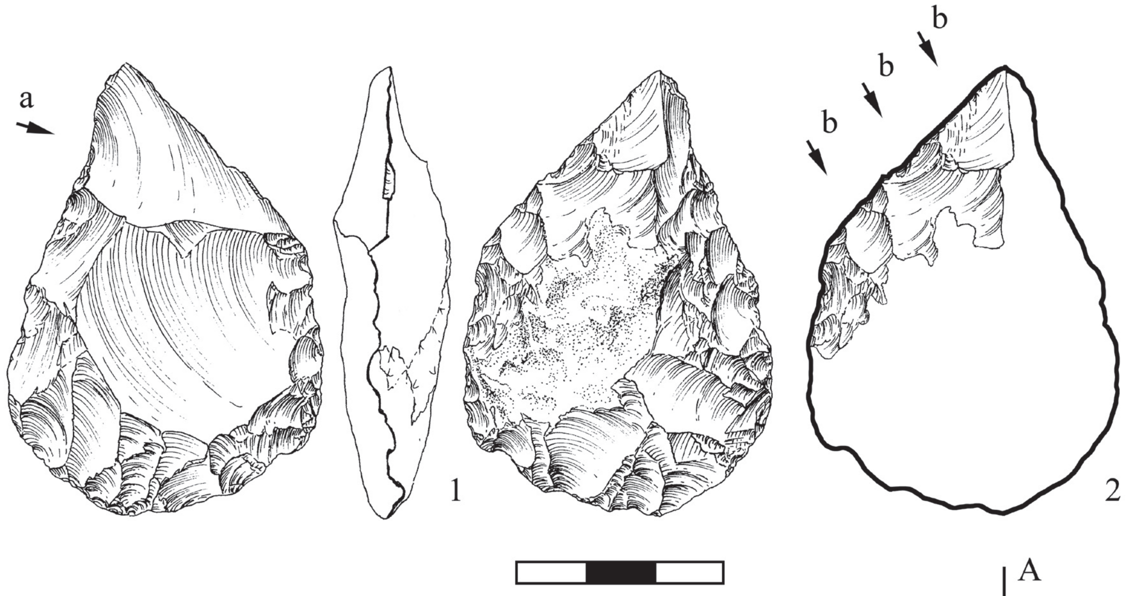


Fig. 16-18 Kabazi V, level III/1A. Bifacial scrapers: 1 –refitted sub-trapezoidal bifacial scraper; 2, 4 –distal part of the sub-trapezoidal bifacial scraper transformed into a sub-crescent bifacial scraper; 3, 5 –proximal part of the bifacial sub-trapezoidal scraper transformed into a straight-convex bifacial scraper; A-A1 –sub-crescent bifacial scraper, central ridge and axis; B-B1 –sub-trapezoidal bifacial scraper, central ridge and axis; a –point of percussion of the blow which led to the breakage; b – area of reutilization retouch.



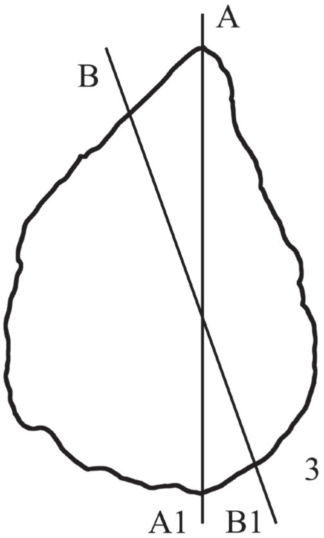


Fig. 16-19 Kabazi V, level III/1A: 1 – reutilized bifacial scraper; 2 – "newly" retouched area; 3 –tool axes before (B-B1) and after (A-A1) breakage; a – the of percussion of the blow which led to the breakage; b – area of reutilization retouch.

Refits from Level III/1A

Two broken bifacial tools collected from level III/1A provide very convincing evidence of their reutilisation (Fig. 16-18; 16-19). It is likely that one of the pieces broke in the course of its production or its reshaping (Fig. 16-18, 1), and prior to breakage was a sub-trapezoidal bifacial scraper. The breakage zone of the tip fragment was then slightly retouched (Fig. 16-18, 2, 4), thus transforming the piece into a sub-crescent bifacial scraper. The minimal retouching created new axes which coincided with the new central ridge of the tool (Fig. 16-18, 3: A-A1, 4: A-A1), although the opposite surface still retained the central ridge of the former sub-trapezoidal scraper. (Fig. 16-18, 3: B-B1, 4: B-B1). The lateral edges of the base fragment of the broken sub-trapezoidal bifacial scraper were also retouched (Fig. 16-18, 3). The newly formed tool might be referred to as a straight-convex bifacial scraper. Thus, the two fragments of the broken sub-trapezoidal bifacial scraper were transformed into two bifacial scrapers: a sub-crescent bifacial scraper and a straight-convex bifacial scraper.

Differing orientations of central ridges and tool axes on opposite surfaces are inherent to a small series of bifacial tools (Veselsky 2006). Further, these bifacials often retain the negative left over from breakage (Fig. 16-19, 1). In some cases, however, this negative has been partially or completely removed by later "reutilisation" retouching (Fig. 16-19, 2; 16-20, 2, 3). The lateral retouch along the breakage zone led to the formation of a new axis on one of its surfaces (Fig. 16-19, 3: A-A1; 16-20, 4: A-A1); thus, on its opposing surface the primary system of scar-pattern remains, as does the direction of the central ridge and the axis of the original tool (Fig. 16-19, 3: B-B1; 16-20, 4: B-B1). In most cases, reutilised bifacial tools are crescent-shaped (Fig. 16-18, 2; 16-20, 1) and are relatively small.

Summary

The refits and their interpretations presented in this chapter reflect some very important aspects of bifacial tool technology, production and reutilization in the Crimean Micoquian. It appears that in the frame of the Micoquian techno-complex the technological approaches to raw material reduction and tool transformation were very variable. Aside from the well-known and characteristic plano-convex bifacials, Micoquian knappers were able to produce bifacial preforms with a bi-convex cross-section, an ability which might also be suggested by the preform found in level III/2 (Chapter 8, Fig. 8-2, this volume). On the other hand, there is no evidence of bi-convex retouching in the Crimean Micoquian; in spite of bi-convex preform shaping, tool retouching was undertaken using the typical plano-convex manner.

The transformation of the shape of bifacial tools, and therefore their typological definitions, is another important aspect of Micoquian bifacial technology. Further, the reutilization of bifacial scrapers and points to have broken in the course of production and/or exploitation resulted in a change of the initial typological structure of tool-kits. The reutilization procedure also led to a decrease in average tool size in bifacial assemblages. All of these factors have been recognised as the basis of typological variability within the Crimean Middle Palaeolithic (Kolosov et al. 1993).

At the same time, it is clear that the refits presented above do not exhaust all technological aspects of the Micoquian tool kit. However, it is hoped that they represent the characteristic occurrences within bifacial tool production and reutilization.

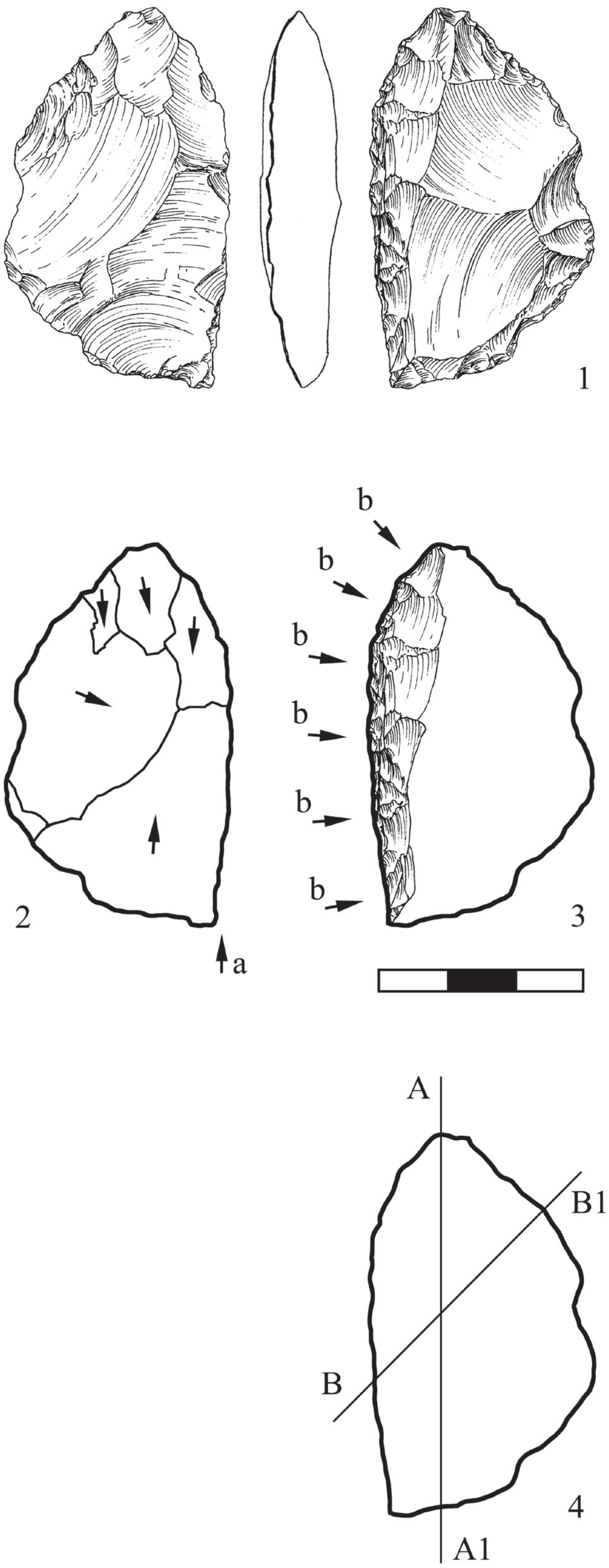


Fig. 16-20 Kabazi V, Sub-unit III/1, level III/1A: 1 – reutilized semi-crescent bifacial scraper; 2 – scar-pattern of "plano" surface of reutilized semi-crescent bifacial scraper; 3 – the "newly" retouched area of the semi-crescent bifacial scraper; 4 –tool axes before (B-B1) and after (A-A1) breakage; a –point of percussion of the blow which led to the breakage; b – area of reutilization retouch.

Abstract

КАБАЗИ V: ИЗГОТОВЛЕНИЕ И РЕУТИЛИЗАЦИЯ ДВУСТОРОННИХ ОРУДИЙ

ВЕСЕЛЬСКИЙ А.П.

Процесс изготовления и реутилизации двусторонних орудий был изучен на основании двух склеек из горизонтов III/1А и III/4-2.

В горизонте III/4-2 в яме на квадрате 9АА было обнаружено 2786 сколов. Подробная характеристика ямы изложена в Главе 2. Все сколы происходят от одной кремневой конкреции. Сколы представлены 2735 чешуйками, 44 отщепами и 7 пластинами. В ремонтаже удалось задействовать 83 скола, которые подразделяются на 32 чешуйки, 44 отщепа и 7 пластин (Table 16-1). Склеенные сколы представляют кремневую плитку трапециевидной формы со следующими параметрами: длина, 147,63 мм; ширина, 108,83 мм; толщина, 28,27 мм. Для анализа последовательности расщепления плитка была подразделена на две рабочие поверхности (А и В) и две стороны (1 и 2) (Fig. 16-1; 16-2). Анализ последовательности расщепления плитки показал, что процесс раскалывания представлен 11 этапами (Table 16-1; Fig. 16-3 – Fig. 16-15). Результатом расщепления плитки стала преформа двустороннего орудия. Сама преформа не была найдена. Преформа была реконструирована посредством парафиновой отливки. Форма парафиновой отливки – листовидная, сечение – двояковыпуклое (линзовидное). Размеры: длина, 142,31 мм; ширина, 61,08 мм; толщина, 17,79 мм (Fig. 16-16). На начальных этапах (0 и I) расщепления был произведен ряд снятий (всего 2 скола) с двух сторон с рабочей поверхности А (Fig. 16-17). Затем в течение ряда этапов (II, III, IV, V, VI) обрабатывалась только сторона 1 (Fig. 16-17). Всего было снято 29 сколов. Следующие 29 сколов были сняты со стороны 2 на этапах VII и VIII (Fig. 16-17). После этого был применен метод альтернативной обработки двух поверхностей с использованием обеих сторон – этапы IX, X, XI (Fig. 16-17). В ходе альтернативной обработки было снято 17 сколов. Еще 6 сколов было получено в результате дистального утончения, которое производилось на разных этапах расщепления (Table 16-1). Таким образом, только последовательность снятий на завершающих трех этапах соответствует микокской технологии изготовления сегментовидных (плоско-выпуклых) в сечении двусторонних орудий (Bosinski 1967, Boëda 1995). В основном, на протяжении большинства этапов каждая сторона обрабатывалась отдельно, что в результате привело к получению линзовидной (двояковыпуклой) в сечении преформы. Вместе с тем, осталось еще 2703 чешуйки. Вероятно, большая часть данных чешуек связана с ретушированием преформы. В крымском микоке известны два варианта размещения ретуши на двусторонних орудиях: плоско-выпуклый и плоско-выпуклый альтернативный. Оба варианта являются характерными для микокских комплексов. Также в микокских коллекциях Крыма встречаются линзовидные в сечении орудия с плоско-выпуклым или плоско-выпуклым альтернативным размещением ретуши. Скорее всего, данная преформа была преобразована в двустороннее острие / скребло с плоско-выпуклым или плоско-выпуклым альтернативным размещением ретуши.

Вторая склейка отражает процесс реутилизации сломанного в процессе изготовления или использования орудия. Из фрагментов дистальной и базальной частей подтрапециевидного двустороннего скребла было изготовлено два орудия: подсегментовидное двустороннее скребло и прямо-выпуклое двустороннее скребло (Fig. 16-18). Подсегментовидное двустороннее скребло было изготовлено с использованием минимального ретуширования зоны слома. Изготовление прямо-выпуклого двустороннего скребла было достигнуто ретушированием имеющихся латеральных сторон. Таким образом, в результате реутилизации произошло изменение количества, типологии и размеров орудий. Характерные черты реутилизированных двусторонних орудий прослеживаются на ряде двусторонних скребел из коллекции горизонта III/1A (Fig. 16-19; 16-20).

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter 17

Site Catchment Analysis in the Late Middle Palaeolithic of Crimea: a GIS Based Approach

Thorsten Uthmeier, Sonja Ickler & Martin Kurbjuhn

Whereas large scale land use patterns have been investigated intensively in the past (for a summary cf. Chabai and Uthmeier 2006), small-scale analysis has focused mainly on such factors as site formation process, the analysis of evident and latent structures, and artefact and environmental studies (for an overview, cf. Chabai 2004c; Chabai, Richter and Uthmeier, eds. 2005, 2006). The aim of the present article is to elucidate land use patterns on a local to regional scale by analysing Neanderthal site catchment at Kabazi V during phases of different environmental settings. The stratigraphy of Kabazi V includes – at minimum – two cycles of climatic change between stadial and interstadial (Chapter 5, this volume). Within this sequence, Level III/1A and the underlying Level III/2 mark a relatively short period of time characterised by pronounced climatic changes; whereas conditions during the formation of Level III/1A were comparably mild and humid, and are assigned to the Denekamp interstadial, Level III/2 is assumed to represent the Huneborg stadial (Chapters 1 and 18, this volume). The aforementioned stadial is the most arid and coldest environment in the entire vegetational history of Kabazi V. Given the fact that both levels belong to the Crimean Micoquian and are separated by a relatively short period of time, any potential difference in site catchment can hardly be explained by cultural changes alone; instead, if severe differences are observed, these can be understood as Crimean Neanderthal adaptation to climatic change.

Methods Applied: Site Catchment Analysis and GIS

C. A. Vita Finzi and E. S. Higgs (1970) first described the method of site catchment analysis. The method itself is based upon distances covered for the acquisition of daily needs between a given archaeological site and areas in which major resources are to be found. The resources itself are divided into "staple food", e.g. those being an essential part of human diet, and "casual food", e.g. those which have a more supplementary character. Staple food resources are an essential part of daily diet. Depending on economy and ecology, these resources might include meat or grain and vegetables, or a combination of both, and are either gathered, hunted, or produced. Equally, they may be consumed immediately or stored for future needs. As such, site catchment analysis makes possible diachronic comparisons.

"Casual food" like spices, delicacies, or medicine and drugs, are considered to be in most cases less relevant for site catchments. Following economical approaches, it is assumed that the reachability of staple food in the "exploitation territory" around a site is important for its choice as a "home base" (Vita Frinzi and Higgs 1970, p. 6), a term that is now widely substituted by "residential camp" (Binford 1980), or as a "transit site", which would now be called "locations" or "stations" (Binford ibid.). Spatial reachability is understood as the distance between the residential camp and the area of resource distribution. A major precondition for this is the assumption that decisions are made on grounds of economically profitable distances, i.e. the energy spent on acquisition should be outweighed by the output of the procurement activity. Thus, amongst identical or similar settings in areas where desired resources exist, short distances will be preferred (Vita Finzi and Higgs 1970, p. 7). C. Vita Frinzi and E. Higgs (1970, p. 7) recommend distances measured in terms of time taken. With reference to ethnographic studies (Table 17-1), they investigated resources that could be reached in a walking time of two hours. M. Walker et al. (2004) use 1 hour, 2 hour, 3 hour, and 4 hour walking distances (each understood as a one way distance). In general, preferences will be determined on the basis of long-term minima, rather than temporal maxima, in the abundance of food resources in certain areas around a site. However, tactical considerations, e.g. a particularly suitable relief for given hunting techniques, may also play an important role. Equally, decision-making may also be influenced by seasonal changes in the availability of staple food resources. If seasonal fluctuations are large, it may be necessary to have more than one exploitation territory. In this case, which is the rule amongst Pleistocene hunter-gatherers, varying numbers of residential camps surrounded by their exploitation areas constitute the annual territory (Vita Finzi and Higgs 1970, p. 7).

In this article the diameters of different walking times are computed using Geographic Information System (GIS), a method which provides an insight into the varying efforts required when moving within different types of relief. For example, distances that can be covered in two hours walking in a plain will differ significantly from those covered in a mountainous landscape. Whereas some tendencies might be foreshadowed by observation of conventional maps, exact values are difficult to estimate. The same applies to the relative amounts of landscape features, such as plateau, steep limestone cliff or flood plain. These are of major importance when reconstructing the potential Pleistocene vegetation, which results from the composition of species in the studies of pollen, spores, snails and small mammals, and their habitat requirements (relief, exposure to sun, etc.). From a methodological point of view, large mammals are a dependent variable of the reconstructed vegetation. It is on the basis of relief and plant cover that the distribution of large mammals is estimated. All GIS calculations were computed with ArcGIS, version 9,2.

	Vita Finzi and Higgs 1970		**Walker *et al.* 2004**	**this article**
	farmer	hunter-gatherer		
average walking distance or time taken for the aquisition of stable food resources (one way)	1 km	2 hours	0.5 hours	1 hour
maximum walking distance or time accepted as "economic" for the acquisition of staple food resources (one way)	3-4 km	10 km (!Kung groups)	2 hours	3 hours (Kabazi II - Bodrak valley)

Table 17-1 Economical rating of walking distances necessary for the procurement of staple food resources as used by several authors in site catchment analyses.

The Setting: Kabazi Mountain

Kabazi Mountain is situated in the second (internal) range of the Crimean Mountains. Altitudes range between 300 and 800 m asl. As the lowermost, third range is hardly visible, the northernmost cuestas of the second range of the Crimean Mountains (including Kabazi Mountain) mark the beginning of a more mountainous landscape. Most cuestas are representative of separate ecotones, i.e. are transitional areas where two or more communities overlap (Vita Finzi and Higgs 1970, p. 5). In the case of Kabazi Mountain, steppe region and medium sized mountains overlap on a large scale, whereas the Alma River and its (wetter) floodplain provide more local to regional components to the environmental diversity. The setting is in so far exceptional in that it favours a combination of complementary resources. The accessibility to steppe and forest species, water and wood (a raw material for many, yet only rarely preserved artefacts, and as fuel) might well explain the fact that major Crimean Palaeolithic sites are situated in river valleys in the lower part of the second range of the Crimean Mountains (Chabai and Uthmeier 2006, Fig. 18-1). Outlier sites such as Karabi Tamchin, situated at an elevation of some 800 m asl., can be explained as exceptions to the rule, possibly reflecting increased aridity leading to nutritious stress among both humans and their prey (Yevtushenko 2003; Chabai and Uthmeier 2006, p. 329). Kabazi V is one of a total of eight Middle Palaeolithic sites known so far from the southern cliffs of the Kabazi Mountain near the small village of Malinovka, some 20 km to southeast of Simferopol (Chabai 2005a, Chapter 1, this volume). Although all sites are situated in a comparable topographical setting, near the top of the same limestone cuesta, and lie no further apart than 500 m, all look back upon remarkably different site formation processes. Only Kabazi V and the open-air site of Kabazi II are deeply stratified Upper Pleistocene sites. Generally speaking, the most part of present day Crimea lies in the "P2 sub-region" of the "Pannonian-Pontian-Anatolian" vegetation zone with feather grass steppe (Lang 1994, pp. 93-97). On the other hand, due to their higher altitudes, the Crimean Mountains are an important exception, belonging instead to the "Temperate zone" (Lang 1994, ibid.). The lower ranges are part of the "T3 sub-region" with sub-Mediterranean and supra-Mediterranean thermophile mixed oak forests, while the higher elevated regions in the south are part of the "T5 sub-zone" described as oriental beech forest. The present day vegetation at Kabazi Mountain itself is classified as "a belt of low mountain forest-steppe, characterized by an alternation of meadow steppes and moderately high forests" (Gerasimenko 1999, p. 115). Although modern humans have severely altered the primal vegetation of the area by felling many trees and destroying many of the tall tree canopies, chernozem-type soils on the plateau show that these were in fact never covered by dense forests (Gerasimenko 1999, pp. 115-117). Instead, the present day vegetation cover of the cuesta plateaus, comprising grasses, some if which are xeric and point to rather dry conditions, must have a long history. Tree vegetation, which is of limited height and is mixed with shrubs, is found at the foot of the limestone cliff. Oaks are dominant, whereas shrub vegetation is quite diverse. The latter also covers the lower parts of the slopes.

The Archaeological Site: Kabazi V at the Time of the Formation of Unit III

In this section only a brief summary of the site formation process will be given (a detailed description is found in Chapter 1, this volume,). All in all, three major phases can be distinguished (Fig. 17-1). Concerning the first phase it could be shown that water was a dominant element at the site, it running down a sharply inclined floor through the rock-shelter; karstic clay which formed in channels of weathered bedrock is indicative of the presence of a karstic spring (Fig. 17-1, *0*). It is not until the second phase that any human occupation is observed (Fig. 17-1, *I*).An increasingly horizontal gradient of the rock shelter floor most probably resulted from a combination of massive rock-fall (lithological layer 15) and sedimentation of fine-grained sediments from weathering of bedrock and limestone walls. During this period, which correlates with lithological layer 14A, remains of only sporadic visits by humans were found. It is only after a second rock-fall (lithological layer 13) that Neanderthals left behind larger assemblages and, if *in situ* sediments were preserved, evident structures (Fig. 17-1, *II*). Despite the generally good preservation of archaeological remains, any interpretation of the sequence was made difficult by fissures and cracks that developed in limestone blocks from rock-fall, and which gradually filled with artefact bearing sediments, as well as water flow. The latter formed not only erosional channels, but in some areas of the excavations

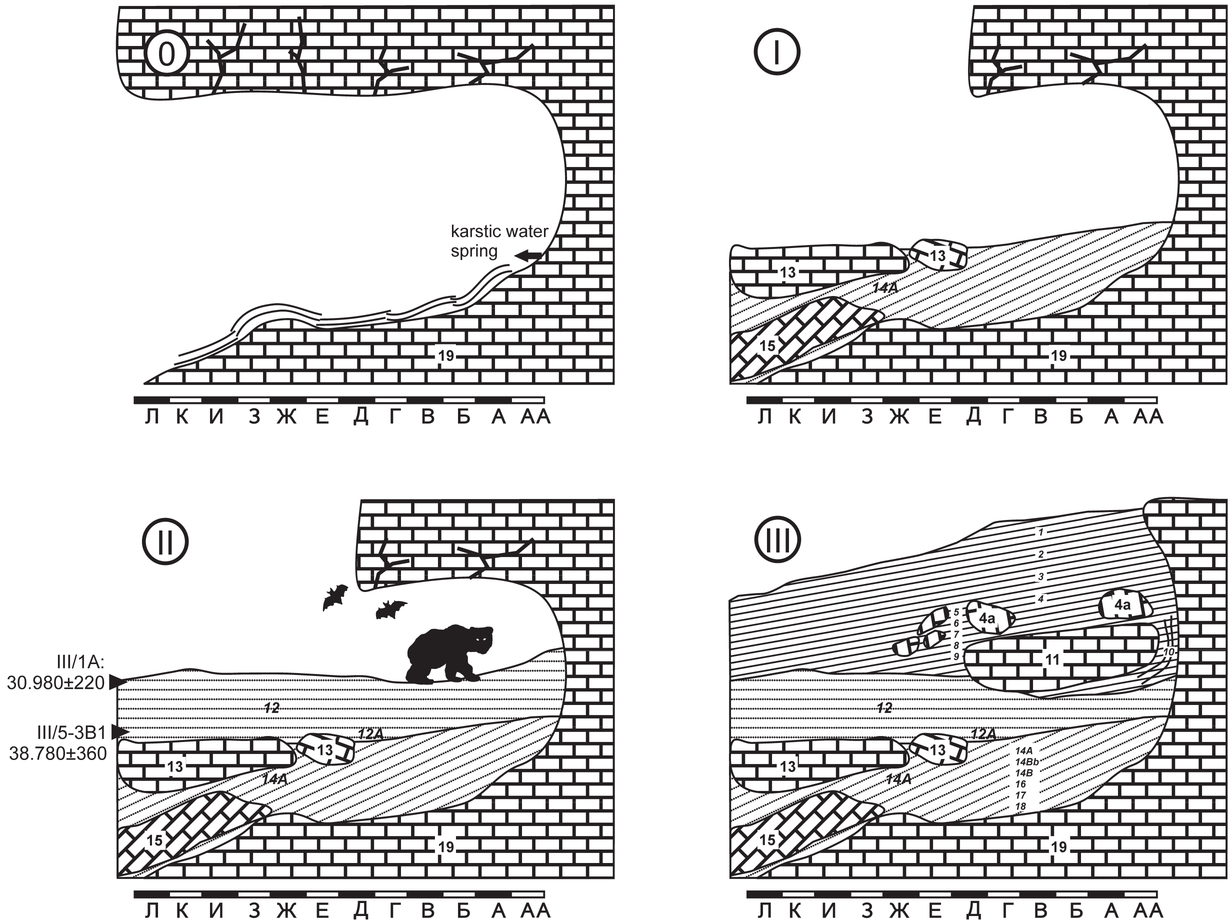


Fig. 17-1 Site formation process at Kabazi V. Levels III/2 and III/1A analysed here were excavated in geological Level 12 (0 development of karstic system with water flowing through the site, I rockfall and sedimentation led to development of a horizontal floor and made possible first human occupations, II phase of more intense usage; the rockshelter is deep enough to host bats and hibernating bears, III collapse of the remaining roof turns Kabazi V into an open-air site).

also removed original surfaces. Both processes resulted in the preservation of archaeological material in lenses only (lithological layer 12A). Larger, uninterrupted artefact scatters, which indicate better conditions of preservation rather than a more intensive site use, occur in sub-unit III/4 to sub-unit III/1 (lithological layer 12). During this period of site formation, Kabazi V was used as a residential camp. Carcasses of smaller species like saiga antelope were brought into or near to the rock shelter, where primary and secondary butchering was carried out (Chapter 6, this volume). Larger species, e.g. equids, were dismembered elsewhere, probably at the kill-site, and only meat bearing parts were transported to the camp. The consumption of food resources is substantiated by the presence of hearths, which are also indicative of longer stays. Notwithstanding, low minimum numbers of individuals (MNI) amongst the prey (Chapter 6, this volume) suggest that visits did not last the entire (summer) season. A fairly restricted duration of some occupations is underlined by the observation that fuel for fireplaces was not totally combusted, but contained large pieces of charcoal and burned bone (Chapter 2, this volume). All in all, stays at the site appear to have been rather short, and group sizes small. The position of the excavation trenches, parallel to the back wall of the rock shelter, makes predictions about its actual size problematic. Nevertheless, the presence of bats (in lithological layer 14A: *Myotis sp.*) and the fact that bears are known to have hibernated in the shelter (lithological layer 12, level III/2) suggests that it was still deep enough to provide considerable areas hidden from daylight. The recurrent arrangement of hearths near to the back-wall (Fig. 17-2) indicates a use of the latter as a heat reflector. At the same time, the succession of hearths on one and the same occupation surface (Fig. 17-2) as well as the fact that each hearth corresponds to a zone of artefact scatter (Chapter 2, Fig. 2-1 to 2-7, this volume) gives the occupations a spatially interrupted and patchy character. Instead of a large scatter of contemporaneous artefacts and structures, each stay was short and corresponds to a single hearth surrounded by a zone of mixed activities. Nevertheless, as some neighbouring hearths mark one and the same area (e.g. in Fig. 17-2, Levels III/1, III/2, and III/3-3), there was either a shared concept for the use of the elongated, but not very deep rock-shelter, or only short periods of time elapsed between visits. Radiocarbon dates from Level III/5-3B2 and III/1A imply that the most intensive usage of the rock-shelter by humans falls within an approximately 10,000 year period, between 38,780 ± 360 BP and 30,980 ± 220 BP (Chapter 1 and 3, this volume). To sum up, activities of human agents during the formation of Unit III indicate that Kabazi V was a residential camp used for shorter stays by small to medium sized groups.

At the end of Unit III, the water regime again changed, and running water took away parts of the upper section of lithological layer 12 near to the backwall. Water flow in this area continued for a while after the remaining parts of the roof collapsed (lithological layers 11 and 4a). From this moment onwards, colluvial and eolian sediments indicate that Kabazi V was no longer a rock-shelter, but became an open-air site (Fig. 17-1, *III*). Archaeological materials from the overlying lithological layers were disturbed by postdepositional processes to varying extents, or were even transported to a secondary position.

To conclude, during the accumulation of levels III/2 and III/1A, Kabazi V was a not very deep, but probably elongated rock-shelter. The platform at the front of the shelter was never protected from erosion and, therefore, must have been small. To the southeast, the platform would have given way to a more or less steep slope. The part of Kabazi Mountain in which the *abri* formed is today part of the limestone cliff, i.e. the site is near to the top of the cuesta and the plateau, and lies in a commanding position above the Alma river valley. The floodplain of the Alma River itself is known to have had a much higher elevation until MIS 4 or the beginning of MIS 3 when river systems began to cut deep into the landscape following a massive drop in the water level of the Black Sea. The fact that the archaeological levels considered here date several tens of thousands of years after this event is taken as an indication that the present land surface can be used for GIS calculations.

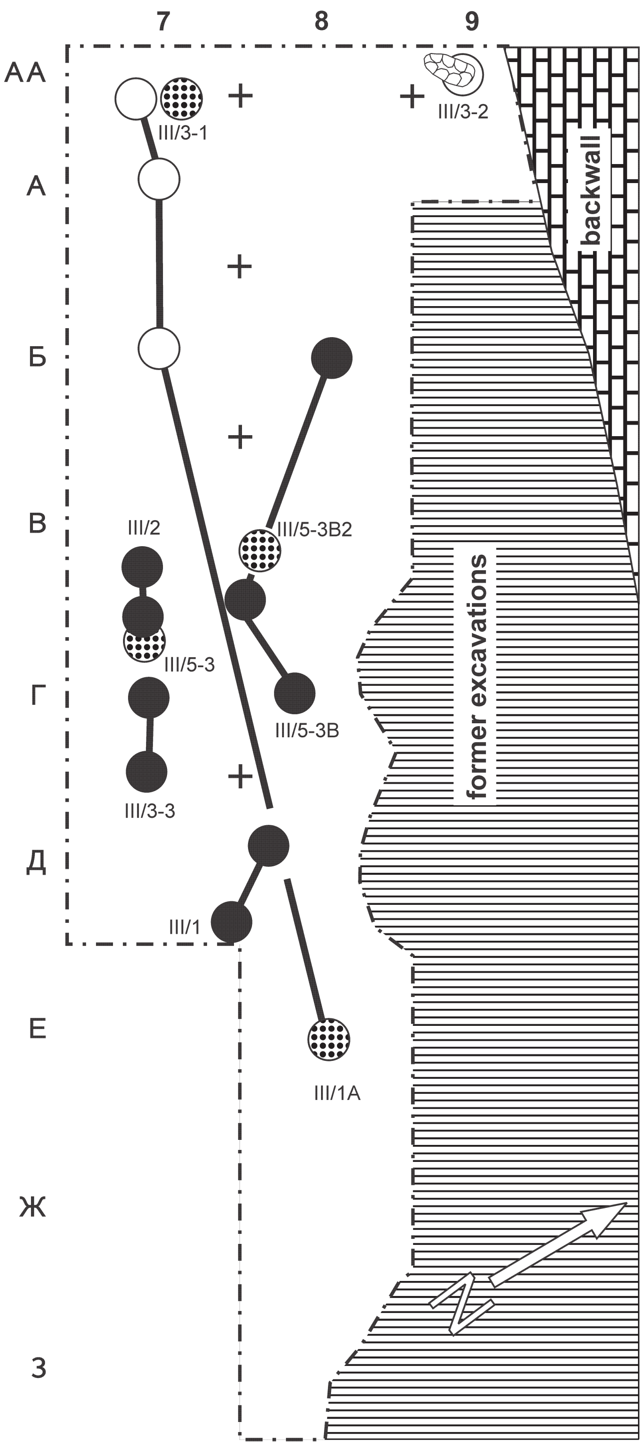


Fig. 17-2 Distribution of evident structures in all archaeological levels of Kabazi V (black = hearth at ground level, grey = fireplaces in natural depressions, white = pit; structures embedded in one and the same level are conjoined). Note that in square 9AA, a pit was filled with the almost complete waste of the production of a bifacial tool (Chapter 16, this volume).

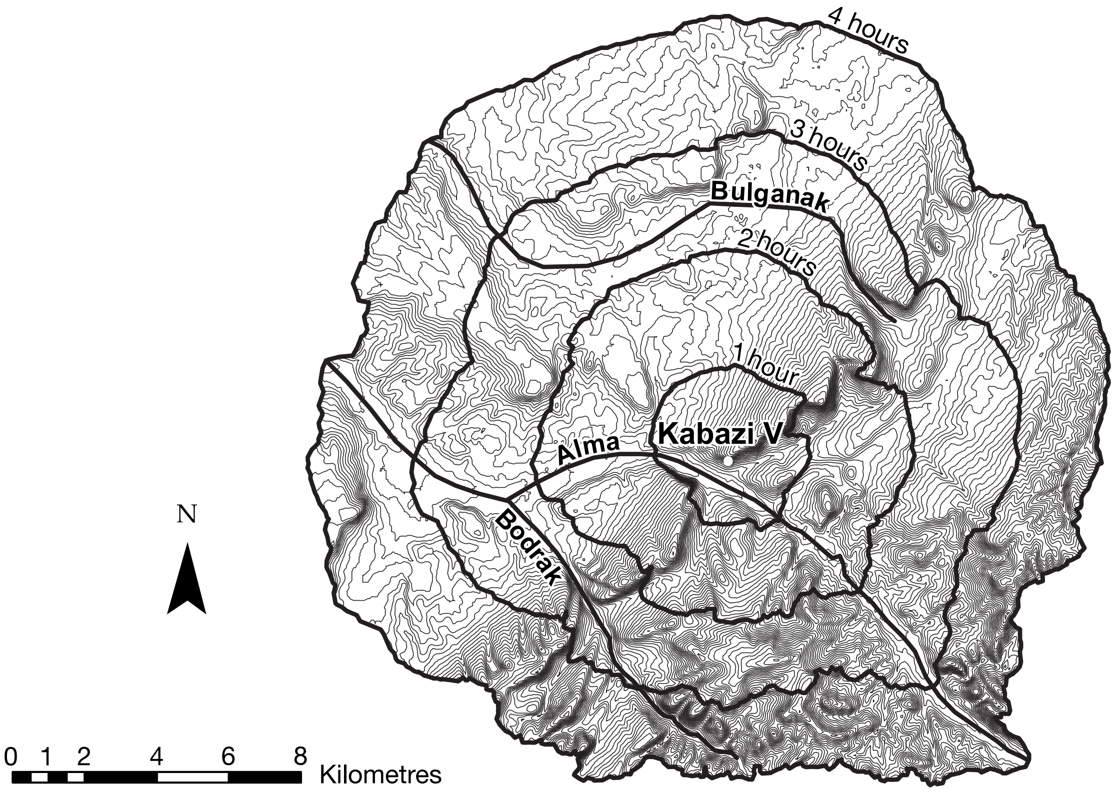


Fig. 17-3 Walking times around Kabazi V, expressed in 1-hour, 2-hour, 3-hour and 4-hour isolines. The inclination of landscape is indicated by grey shading (light grey indicates more even surfaces, dark grey denotes steep limestone cliffs; calculations made with ArcGIS 9,2). Note: the 3-hour isoline represents the foraging radius around Kabazi V in which resources where procured.

GIS-Applications: Walking Ranges and Relief

In most levels of archaeological Unit III, Kabazi V was used as a residential camp. In theory, one has to expect that its topographical position is near to important resources, the number of which would have been determined by the applied subsistence strategies (Binford 1980). Whereas the residential camps of "foragers" are located in the proximity of most staple food resources, those of "collectors" are located near to one or two crucial resources, with others transported to the site over long distances. Elsewhere, it has been argued that the subsistence tactics of Crimean Neanderthals were characterised by a strong focus on just a few species that were hunted at distances hardly exceeding the foraging radius (Chabai and Uthmeier 2006). Except for the last interglacial, no field camps (Binford 1980) have been documented that would point to moves of special task groups to hunting grounds beyond the foraging radius. However, these assumptions are based on raw material transportation distances rather than walking times. To identify both economically acceptable and inacceptable walking time distances for resource procurement by Crimean Micoquian Neanderthals, diameters of 1, 2, 3 and 4 hours were computed using GIS (Fig. 17-3). Calculations were based on an adult individual carrying 20 kg (Watts et al. 2003, p. 539; the values applied are reported by Van Wagtendonk and Benedict 1980). Of course, the load transported during procurement activities differs, i.e. the weights carried on the outward journey would have differed from those carried on the return journey. However, as decisions are made on the basis of minimum values, those modelled for walking times with load are more appropriate. All data refer to the walking time in one direction. As no direct observation is possible, the distance between Kabazi V and flint outcrops in the Bodrak valley is taken as a proxy for the maximum distance accepted as economically efficient for staple food acquisition. These outcrops were recognised as the source for raw material procurement in the frame of logistical moves in Crimean Micoquian levels of Kabazi II prior to the Moershoofd interstadial (Chabai and Uthmeier 2006, p. 346). According to GIS calculations, the walking time between Kabazi V and the Bodrak valley lies between the 2-hour and 3-hour isoline (Fig. 17-3). Therefore, the 3-hour isoline is taken as the longest walking time considered economically efficient by Crimean Micoquian Neanderthals when procuring resources on a daily basis. In contrast to the conventional radius of 10 km (Binford 1980), distances covered here range between 6 and 8 km. However, the pure amount of walking time of 4 to 6 hours required for both directions seem to be critical for activities that should not last any longer than a day. In general, costly walking distances are more likely to be accepted when activities themselves are not time consuming (e.g raw material procurement), when the foraging radius does not provide critical resources, or when resources are regarded as extraordinary valuable (e.g. casual resources). Due to the extra time needed for the procurement itself, this also has to be added; more time consuming activities, such as hunting, probably lie within the 2-hour isoline – if conducted on a daily basis.

It goes without saying that distances covered in a given walking time decline towards the southeast where more elevated areas are situated. Furthermore, the accentuation of steep slopes in Figure 17-3 shows that especially towards the south the landscape is characterised by uneven territories with many erosional channels draining into the floodplains. In fact, an imaginary line along the slopes of the cuestas divides the landscape within the 3-hour and 4-hour isolines in two parts. In the northwest, inclined plateaus and broad valleys running parallel to the questas form a landscape surface with much lower dynamics than is the case southeast of this line where surfaces are much more fissured. Like today, these differences would have influenced the vegetation and, therefore, the areas in which stable food resources were to be found. However, the general impression is that the impact of landscape on walking distances is less pronounced than one might have expected. At present, several contexts of the Kabazi Mountain ecotone are already reachable within a one hour walk: the steep slope near the rock shelter, large parts of the plateau of the cuesta towards the north, and part of the Alma River floodplain. An investment of 2 hours walking considerably enlarges the contingent, adding more fissured areas in the south. If water supply is a critical factor for the spatial distribution of large mammals as potential prey, than the 3-hour isoline enlarges the diversity quite notably by reaching two additional river valleys, the Bodrak and the Bulganak. In this context it is worth mentioning that its headwater, including the spring, can be reached in 3 hours.

Relevance and Spatial Coverage of Environmental Data from Unit III

Any attempt to reconstruct past environments is difficult as it has to consider the spatial coverage of the data used. In part, the spatial coverage is intertwined with agency: whereas most pollen and spores in a given archive are wind-blown, many mammals are taken by carnivores. It follows that pollen and spores are selected more or less at random, their transportation depending on the strength and directions of the wind. On the other hand, carnivorous agents may hunt or scavenge selectively, thus producing non-representative assemblages with unknown procurement distances. In the case of Kabazi V, three sources of information – snails, small mammals and pollen as well as spores – are used for environmental reconstruction (Fig. 17-4).

As snails are not very mobile, they provide information on the environment near the site (Mikhailesku 2005, p. 67). Unfortunately, samples from Unit III of Kavazi V were small, and therefore not representative (Mikhailesku 1999, p. 107). All that can be said is that steppe-forest surrounded the site, as indicated by xerophile species. The fact that samples also contained mesophile species indicates the existence of small trees and bushes in the immediate vicinity of the site. Locally more humid conditions, probably pointing to ground water or even a nearby spring, are indicated by the presence of *Vitrea subeffusa*. However, it is also possible that their presence simply reflects the absorption of rain and snow water by the surrounding limestone. This is also suggested by *Caecilioides raddei* that prefers humid cracks of calcareous rocks.

Major parts of small mammals are ecologically specialised (Markova 1999, 2004a, 2005, Chapter 4, this volume). As they are herbivorous, rodents and lagomorphs are closely connected to plant cover and, therefore, can be used as a controlling variable for the studies of pollen and spores. However, more or less strong differences or even contradictions may occur between these two sources of information due to

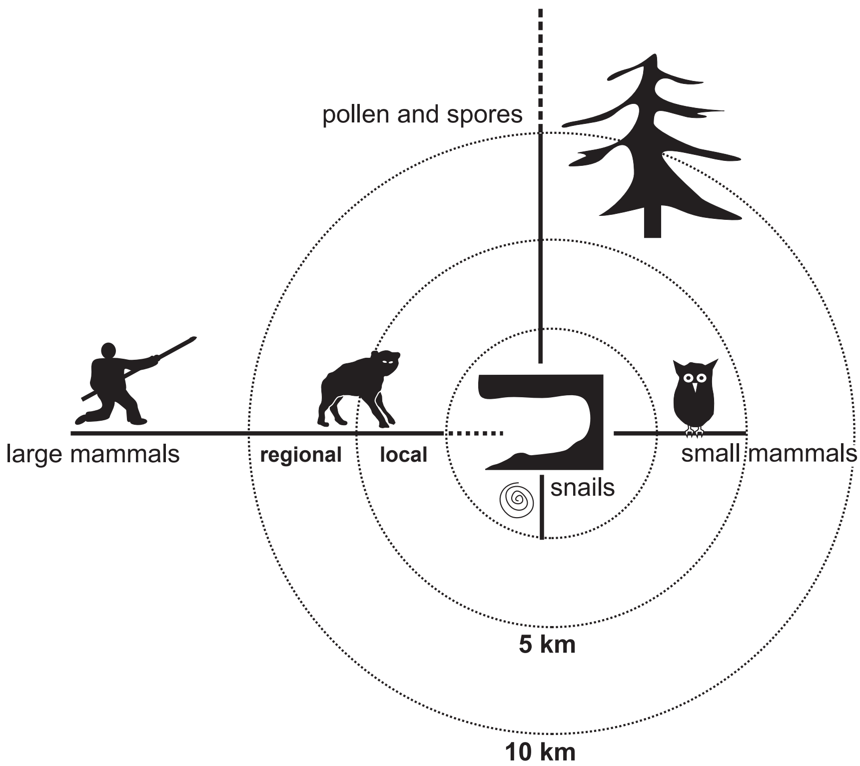


Fig. 17-4 Spatial coverage of environmental data from archaelogical archives. Note: the representivity of pollen data is also dependent on the size of the archive, as well as the local relief.

different transportation distances. Most small mammal remains stem from pellets of hunting birds. Especially owls are known to have nests in caves and rock-shelters (Vita Finzi and Higgs 1970, p. 15; Chapter 4, this volume). As their hunting range spans several kilometres, small mammal fauna is indicative of local to regional conditions (Fig. 17-4).

When pollen data is used for environmental reconstructions, the crucial question is in how far the sample taken at a site is representative for the actual vegetation in its proximity. Present day investigations have shown that in general, vegetation zones like "boreal coniferous forests" or "temperate deciduous forests" are easily determinable (Lang 1994, p. 48). Three major factors are important when dealing with prehistoric samples (Lang 1994, ibid.): (1) the pollen productivity of the vegetation cover, (2) the transportation mechanisms of pollen, and (3) the preservation of pollen in the sediment. Apart from the simple fact that only blossoming plants are represented in the samples, there are significant differences in the amount of pollen produced by different taxa. The pollen of most common trees and plants are transported in the air, which when compared to, for example, pollen transported by insects, make up a large part of any sample. However, among the aforementioned trees, pollen productivity can also vary by a factor of 15 or more (Lang 1994, p. 49). Furthermore, pollen productivity can also differ due to variations in rainfall, temperature etc. When air transported pollen are considered, those blown by wind immediately above the treetops are transported between 5 km and 10 km. It is this regional pollen fall-out that would be most representative for the reconstruction of the vegetation (Fig. 17-5). However, local components may well dominate, depending on the relief and the catchment area of the sedimentological trap. Lang (1994, p. 50) refers to lake and peat archives. With a diameter of 30 m, local components dominate lake and peat deposits with percentages of 80 % to 100 %, whereas a diameter of 1 km leads to a decrease of local pollen to 10 % and a dominance of regional transportation distances of 70 %. Therefore, pollen data from archaeological sites with terrestrial sediments tend to over-emphasise local components.

The pollen and fauna from Kabazi V itself is heavily influenced by the nature of the site. In

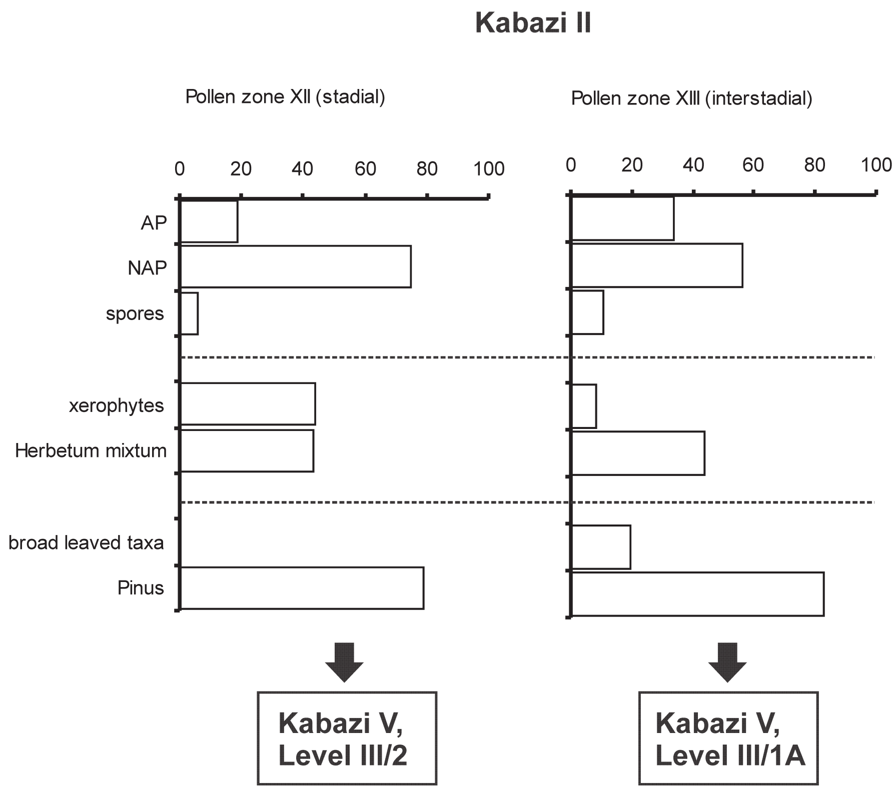


Fig. 17-5 Selected and summarised information of pollen zones from Kabazi II and correlation with Kabazi V, Levels III/2 and III/1A. The relation of arboreal (AP) and non-arboreal pollen (NAP) was used for GIS-based reconstructions of vegetation within the 1-hour isoline.

general, rock-shelters do not preserve pollen and spores very well, and broad-leaved trees are especially affected by this (Chapter 5, this volume). Within the relatively small and poor sample, spores of shade resistant plants characteristic for local environments at the entrance of caves and rock-shelters predominate. The comparably bad preservation of pollen and spores at Kabazi V is underlined by the fact that for Level III/2 no data is available at all. To compensate this deficit, data from the neighbouring site of Kabazi II is used. As the distance between the two sites is only 500 m, air transported pollen and spores found at Kabazi II should also be representative for regional, but not local, conditions at Kabazi V. In this regard, the correlation of layers is of major importance. From the pollen and spores point of view, the incompleteness of the samples from Kabazi V do not allow a secure correlation with pollen zones from Kabazi II. Absolute dates at Kabazi V are, again, somewhat problematic as there is a significant gap between radiocarbon dates and those obtained by U-series and OSL/TL dating methods (Chapter 3, this volume). At present, it is assumed that an AMS radiocarbon date of (OXA-X-2134-75) 30,980±220 is the most reliable estimation of the age of Level III/1A. On this basis, it is assumed that Kabazi V, Level III/1A corresponds to pollen zone XIII at Kabazi II. Such a correlation is also supported by AMS-dates from the Kabazi II sequence (e.g. Chabai 2006, Table 1-1). At Kabazi V, Level III/2 underlies Level III/1A without a hiatus, as such it is correlated with pollen zone XII of Kabazi II.

Large mammals usually have wide ranges and therefore their remains are less indicative for local conditions (Fig. 17-4). Apart from carnivores, which use caves and rock-shelters as dens, or bears that hibernate in such settings, large mammals will have lived at some distance to the excavated area of Kabazi V. Although the presence of carnivores capable of carcass transportation is well documented in the archaeozoological record from Kabazi V by digested bones (from hyena) and gnawing marks (e.g. from fox), the overall impression is that the contribution of non-human agents to the faunal assemblages of Kabazi V were minimal (Chapter 6, this volume). The overwhelming part of large mammal remains results from human activities.

Human Staple Food Resources

In general, resources essential for the physical survival of humans fall into two main categories, water and food (Table 17-2). For the survival of most large mammals, including humans, water is more important. Depending on the ambient temperature and the intensity of physical activity, the amount of time tolerable without rehydration varies between several hours and three days (Nehberg 2004, p. 320). Times spent without food is reported to have exceeded several weeks: in a temperate climate an average person can survive 50 days without food (Nehberg 2004, p. 149; every kg of body fat equals 9,000 kilocalories). Nevertheless, these are extreme values. Simulations have shown that under Pleistocene conditions, Neanderthals may have required 4,000 kilocalories per day (Churchill 2006). In how far fire was necessary for the preparation of food and / or for the maintenance of body temperature is an open question. However, the relatively frequent occurrence of hearths, or more or less destroyed remnants of these features (Chapter 2, this volume), in the archaeological levels of Kabazi V suggests that they were an integral feature of camps used – at minimum – overnight. Additionally, at Kabazi V water would have been available from the nearby Alma River, and time and energy spent on acquiring fuel for the fire would have largely depended on the availability of wood (or bones).

In the past, several investigations have shown that the diet of Neanderthals in general was based on meat (Bocherens et al. 2005). Crimean Neanderthals relied on the hunting of two species, *Equus hydruntinus* and *Saiga tatarica* (Burke et al. 1999; Chabai and Uthmeier 2006). Only if these species were, for one reason or another, not accessible, would additional species like red deer, giant deer, bovid and caprids have been taken. Such a two-fold classification of meat resources is analogous to the distinction of C. Vita Frinzi and E. S. Higgs (1970, pp. 3-4) between "normal" and "emergency" food resources (Table 17-2). In the following, the variability of species recognised as a human food resource will be compared to the overall list of species documented from contemporaneous Crimean sites. Human food resources include species identified as staple food, and additional large mammal species found in the archaeological levels investigated. For large mammals, the attempt will be made to differentiate between the winter and summer season, as most animals of the then environments are thought to have migrated between winter and summer pastures (Fig. 17-6 and 17-8). However, such suggestions are made on grounds of present day behaviour, which might be a misleading analogy (Burke et al. 2007).

staple food	
normal	*emergency*
water	
equid	
saiga antelope	
	red deer
	giant deer
	bovid
	caprid
other resources needed	
fuel for fire (± daily: wood, bones)	
flint raw material (long term needs)	

Table 17-2 Classification of staple resources required by hunter-gatherers.

All species classified as staple foods were flight animals experienced in detecting carnivorous enemies. This means that a purely steppe vegetation would not have made for ideal hunting conditions. Once on the run, potential prey would have quickly reached high speeds, going out of the reach of lances and spears. Therefore, it is assumed that Neanderthals practised ambush hunting. The notion that successful hunting based on the surprise attack of a few hunters is believed to be valid even for those cases in which driving of herds is considered (Patou-Mathis 1999). With regard to site catchment, Neanderthals would have needed a relief or vegetation in which the group could hide whilst on the hunt. In the following, the habitat and the behaviour of species identified as staple food resource is described in more detail.

Ethology of Species Identified as "Normal" Food Resources

Generally speaking, equids are grazers, but they can also cope with bark, leaves, buds, fruits, and roots if other resources become sparse (MacDonald 2001, p. 471). Dominant males establish territories of approximately 15 km^2 (MacDonald 2001, p. 472), while the inferior males live in bachelor groups. Essential for the social and spatial organisation is water supply. Therefore, if water resources and advantagous grazing grounds do not occur together then lactating and non-lactating females will split from the herds to secure easy access to water. In these cases, dominant males will try to control either the major thoroughfares to and from the water or the best foraging grounds. Under dry conditions, the different water supply of lactating and non-lactating females hinders the formation of harems. As at almost all other sites, equid remains at Kabazi V that were classified on a species level were attributed to *Equus hydruntinus*. Based upon generalisations for *Equus hemionus*, some features of the social behaviour as well as the habitat of Pleistocene *Equus hydruntinus* can be reconstructed (Burke et al. 2007, pp. 896-898). It is assumed that these equids preferred open grassland, i.e. ranges in valleys and gently sloping hills from 300 to 600 m asl. (Table 17-3). During autumn, winter and spring it is most likely that the animals fed on steppe grasses such as wormwoods. In the dry summer months, *Equus hydruntinus* would have lived on herbaceous plants, and positioned itself at a maximum distance of no more than 10 to 15 km from water sources. In general, the behaviour of equids largely depends on the magnitude of aridity. For example, if resources are scarce, breeding males will defend only seasonal territories during spring and early summer. As far as the pattern of seasonal mobility is concerned, it is assumed that *Equus hydruntinus* moved between winter and summer pastures, the distances between these depending on rainfall patterns. For the winter, when the animals are less tied to water, it is expected that limiting factors triggering migration would have been wind chill and snow depths.

Compared to *Equus hydruntinus*, which reached a living weight of 180 to 200 kg (Patou-Mathis 2005, p. 92), *Saiga tatarica* (MacDonald 2001, pp. 564-566) is a small animal. The living weight of a male adult does not exceed 50 kg. Today, saiga antelope is a generalist grazer that feeds on 150 different plants (MacDonald 2001, p. 564) and is known to migrate large distances (Table 17-3). It spends the winter in desert areas with low snow cover and in the spring moves approximately 1,000 km northwards into the steppe region. The huge migrating herds with up to 200,000 individuals split seasonally into groups of tens to thousands, the normal herd size in seasonal pastures counting 30 to 40 individuals. Between April and May, saiga antelopes break their migration to give birth in huge groups. As this happens in a period of 10 days only, predators are literally swamped with the sheer numbers of offspring. Despite its dependency on water supply during the summer, saiga must have been rather difficult to hunt. One reason for this is that saiga antelope move considerable distances to avoid bad weather, food shortage, and predators. Even their average meanderings take them as far as 40 km a day (MacDonald 2001, p. 566). In addition, saiga are among the fastest animals in the world, moving at speeds of up to 70-80 km/h, and are also good swimmers. Neanderthal hunters may have taken advantage of the fact that saiga do not move well over uneven ground, and that they have bad eyes, hearing and smelling constituting the primary senses.

Ethology of Species Identified as "Emergency" Food Resources

Both the habitat and the behaviour of the extinct giant deer are difficult to predict. The dimensions of teeth (von Koenigswald 2002, p. 72) suggest that its lifeways were close to that of the modern moose. If so, giant deer lived solitary except for the winter when individuals of both sexes assembled to small herds (Table 17-3). Moose prefer mixed forest where they live from leaves, lichens, and bark. In how far these observations apply to giant deer is an open question; while S. Pichler (1996, p. 33) suggests that giant deer lived in open habitats where they were not handicapped by their large antlers (that could span up to 4 m), von Koenigswald (2002, p. 72) describes them as a species well adapted to interglacial conditions with dense forests. The ubiquitous presence of giant deer during most phases of the Upper Pleistocene underlines the tolerance of certain species towards a whole range of different climates and environments. Nevertheless, the enormous amount of minerals needed for the production of 40 kg of antler points to a (seasonally strong) dependence on high quality food.

Bovid remains from the Crimean Middle Palaeolithic have been classified mainly as *Bison priscus*.

	species	diet	habitat	behaviour	summer pasture	winter pasture
Normal	*Equid*	grazer	open grassland, valleys and gently sloping hills from 300 to 600 m asl.	- males (seasonally) territorial - bachelor groups and inferior males separated - females and foals near water resource	migrates (in correlation to rainfall)	
					herbaceous plants 10 – 15 km from water source	worm-woods (steppe grasses)
Normal	*Saiga*	grazer	patchy steppe environments	- migrating herds (> 1000) brake in seasonal groups - moves on daily basis up to 40 kms	migrates over long distances	
					steppe region	areas with low snow cover
Emergency	*Bovid*	grazer	mixed woods with undergrowth and open spaces	- less efficient at feeding on short grasses - water-dependent (wallowing) - female herd-dwellers - solitary males	migrates app. 300 km	
					30 sqkm	80 sqkm
Emergency	*Caprid*	grazer	cliffs	- males live solitary, territorial and defend resources	migrates between different contour lines	
					high altitudes	woodland in lower attitudes
Emergency	*Giant deer*	grazer / browser	prefers mixed forest, but can cope with open habitats	- lives solitary except for winter when assembling to small herds	?	
Emergency	*Red deer*	browser	woodland and woodland edge	- "concentrate selectors" - herds differentiated by sex	may migrate if environments are patchy	

Table 17-3 Selected features of the ethology of species classified as "normal" and "emergency" staple foods in the Crimean Middle Palaeolithic.

Today, several species of bison are distinguished. The European bison (*Bison bonanus*) lives in mixed woods with undergrowth and open spaces. The American bison (*Bison bison*) is split into two subspecies, the plain bison that prefers grassland and aspen parkland, and the wood bison whose preferred habitat is coniferous forests. However, all species and sub-species are interfertile and represent variants of one and the same species, as has been substantiated by investigations into DNA, blood typing, and protein sequence (MacDonald 2001, p. 541). Bovids belong to the grazers, but are less efficient at feeding on short grasses (Table 17-3). About 90 % of the food supply of *Bison bison* is covered by grass, complemented by sedges, herbs, leaves, lichens, and bark (Pichler 1996, p. 35). Except for winter, when it may cover its water supply by eating snow (MacDonald 2001, p. 532), bison are water dependent. Equally, they need wallowing due to the low number of sweat glands per unit area of skin. If no mud is available, they behave like cattle and seek shade (MacDonald 2001, p. 534). Bison are herd-dwellers. Females live constantly in herds that consist of cows with their offspring. Outside the breeding season, males live alone (MacDonald 2001, p. 540). While usual group sizes in American and European bison hardly exceed 20 to 60 individuals (MacDonald 2001, p. 534), temporary aggregation happens on particularly favourable feeding grounds, and during the rut. In these cases, herd sizes grow up to 1000 animals (Pichler 1996, p. 34). *Bison bison* migrates between winter and summer pastures over distances of about 300 km, seasonal territories are estimated to measure between 30 square kilometres during the summer, and 80 squarekilometres in the winter.

From a diet point of view, red deer is a "concentrate selector" (MacDonald 2001, p. 508). Much like giant deer, the growth of antlers requires a high mineral intake. Therefore, deer are limited to high quality vegetation (Table 17-3). In general, they are considered to be resident game, having preferred woodlands and woodland edges where they could have fed on herbs, leaves, and lichens (Pichler 1996, p. 33).

If classified to the species level, caprids from the Crimean Middle Palaeolithic have mostly been recognised as chamois (*Rupicapra rupicapra*). These grazers are specialised to steep cliffs (Table 17-3). Males are resource-defenders that, with the exception of the rut, live solitary. At first snowfall, the flocks of females and young disperse and move to woodland winter ranges at lower altitudes.

Modelling of Seasonality in Staple Food Resources

The question whether, and over what distances, a species migrates each season is mainly a question of range quality and, for those species heavily dependent on water, rainfall regime. Often, it is assumed that species that are known to migrate between winter and summer pastures today, also did so under Pleistocene conditions (Pichler 1996). However, this is questionable. For example, if snow cover is the main reason for leaving mountainous regions, then Crimea is no good example. Simulations (Barron, van Andel and Pollard 2003) have shown that snow cover was insignificant even during „cold events" of MIS 3 – at least in the lower altitudes. Only mountainous species such as caprids that are adapted to high mountain ranges will have been forced by winter snow cover to move into less elevated areas. Here, small valleys provided additional shelter from winterly wind chill. On a large scale, it must be expected that the different altitudes of the Crimean Mountains comprised an enlarged biodiversity – even larger than that of the mosaic character of the Pleistocene "Mammoth steppe " (Guthrie 1990). Archaeozoological analyses have already shown that the behaviour of Upper Pleistocene species occasionally differed from that of present day analogies. For example, in contrast to Asiatic ass (Burke et al. 2007, p. 896), Interplenigacial *Equus hydruntinus* is known to have spent the winter in the second range of the Crimean Mountains (Patou-Mathis 1999, 2006; Chabai and Uthmeier 2006, Fig. 18-3). Nevertheless, some conventionally migratory species might still have rotated between uplands and lowlands. First of all, this is likely for species with rather large populations densities. Saiga, bovid and reindeer might have exploited regional resources up to carrying capacity which then may have forced them to move, even though winter conditions were not very sharp. For saiga antelope this is indeed attested by archaeological evidence, as it is only known from archaeological levels assigned to the warm (summer) season (Chabai and Uthmeier 2006, Fig. 18-3). Perhaps the exclusive presence in the warm period of the year also applies to giant deer, which – despite low population densities – needed large amounts of high quality food, not only to supply its large body, but also to produce its impressive antlers.

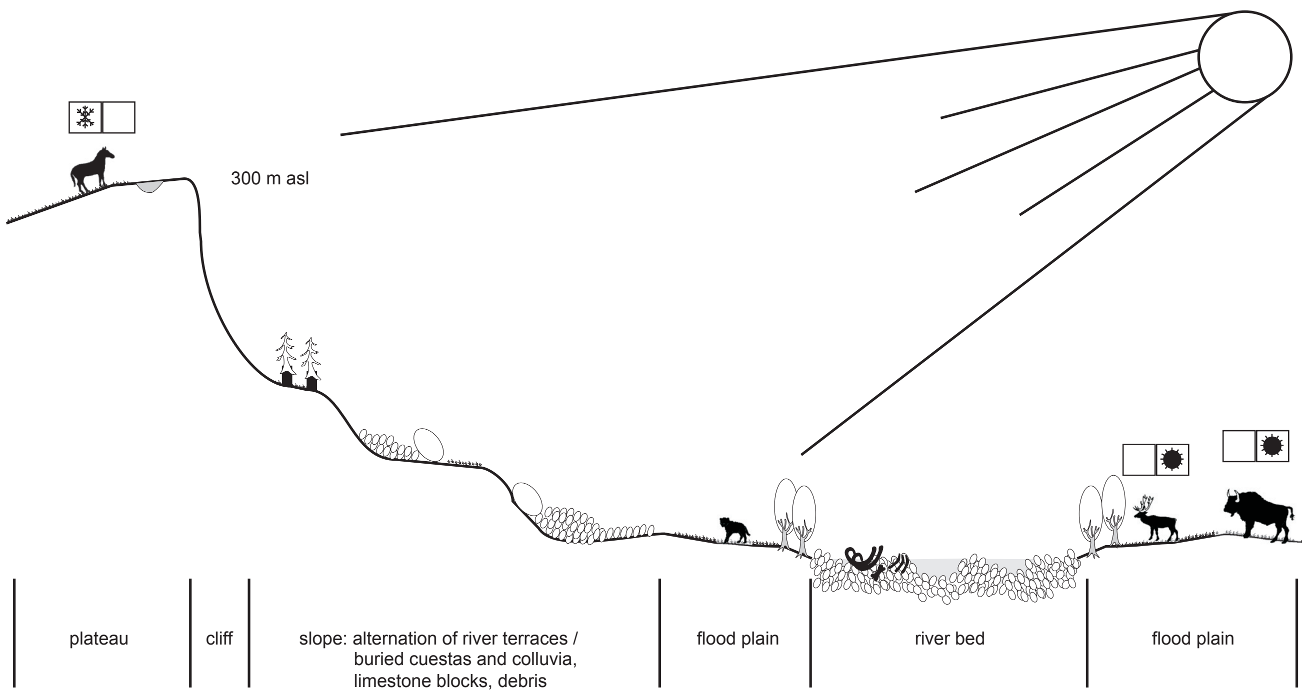


Fig. 17-6 Possible distribution of plants and animals under stadial conditions in a low mountain range.

Reconstruction of Plant Cover and Distribution of Staple Food Resources

The main problem in the reconstruction of Pleistocene plant cover is the question in how far the environmental data from the excavated area reflects not only local, but also regional conditions. As discussed above, this is difficult to determine, but much speaks for the assumption that the archives used here are biased towards local conditions. Therefore, a modified model of vegetational zoning in low mountain ranges published by J. Hahn (1983, Fig. 155) was used for data transfer. Its validity for the lower parts of the second range of the Crimean Mountains has been substantiated by pollen data from Kabazi II. For GIS-based reconstructions of local to regional environments of Kabazi V, the following preconditions were made:

– steep cliffs of the cuestas have no vegetation at all;

– slopes below the cliffs have shrubs and, if at all, scattered tree vegetation;

– plateaus of cuestas have grass vegetation;

– river valleys hold humid conditions and, therefore, are indicative of forest vegetation.

It is expected that these preconditions apply for both stadial and interstadial conditions. As far as the river courses are concerned, a buffer of 150 m was set to model flood plains. In this area not only conifers, but also broad-leaved trees such as beech will have survived even during stadials. Other considerations refer to more specific climates. With regard to the amount of forest and steppe vegetation during interstadials it was concluded that inclined surfaces of karstic limestone formations are indicative of more arid conditions. Karstic limestone absorbs rainfall, while at the same time the surface inclination hampers the accumulation of thick sediments capable of storing water. The present chernozem character of the soil cover of the cuestas (Gerasimenko 1999, 2005) supports this scenario. More or less horizontal surfaces, on the other hand, enable the accumulation of aeolian, colluvial or fluviatile sediments, which – under moderate climate – will be transformed by pedogenesis. The higher content of clay will store water and provide more humid conditions. Therefore, it is concluded that under interstadial conditions landscape surfaces with an inclination comparable to cuestas were characterised by a steppe vegetation, whereas less inclined ground levels

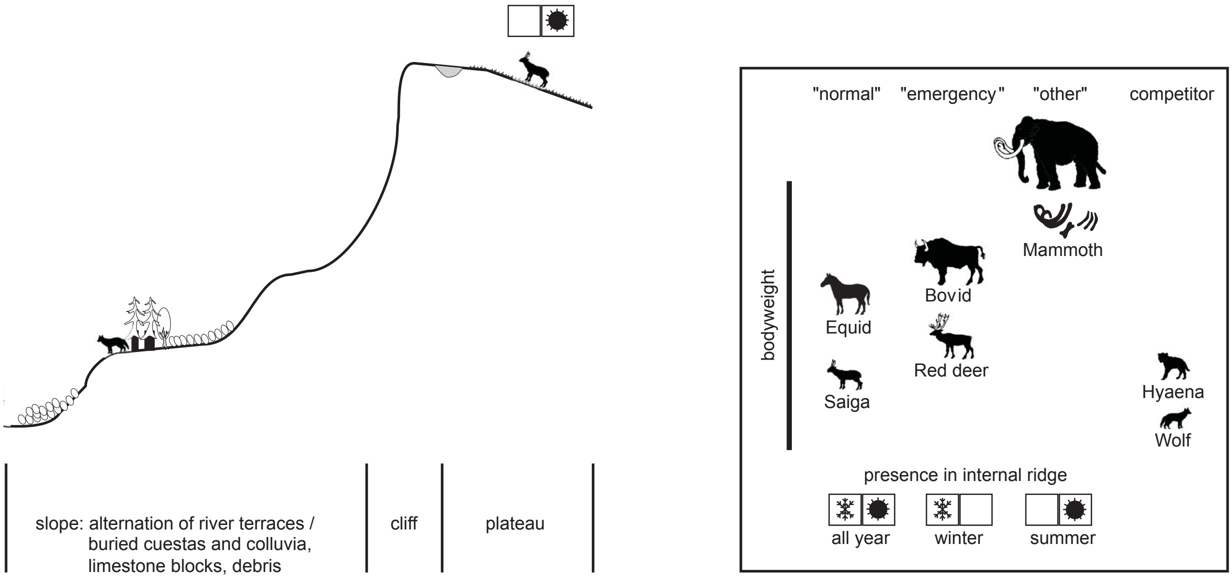


Fig. 17-6 Continued.

provided conditions capable of supporting forests. With these preconditions in mind, the attempt was made to shift the border between inclined (i.e. steppe vegetation) and less inclined (i.e. forest) areas in such a way that the relation between these two vegetation types within the 1-hour isoline corresponded to the pollen record from Kabazi Mountain (for the methods used for GIS-calculations of spatial proportions of vegetation types see Ickler 2007, p. 368).

Sub-Unit III/2, Level III/2

As mentioned previously, snail fauna from Kabazi V is only badly preserved and, in general, not very informative. Among the malacofauna, the presence of *Vitrea subeffusa* may go back to a spring near the site.

The Altaian vole, which is typical for meadow-steppe, dominates the small mammal remains from Level III/2. It by far outnumbers remains of other identified taxa. Among these, *Arvicola terrestris* indicates banks of water reservoirs, such as the Alma River. Small mammals from steppe-like environments are much more diverse, including steppe lemming species and great hamsters. *Lagurus lagurus*, which is a steppe mammal, and the semi desert species *Pygeretmus pumilio* point to the aridity of the stadial environment (Chapter 4, this volume). The presence of forest species, though in small numbers, shows that some forested areas must have existed. Seeing as pollen and spores are not preserved at Level III/2 of Kabazi V, it is necessary to use data from the neighbouring site of Kabazi II (Gerasimenko 1999). At the time of Kabazi V, Level III/2, pollen and spores at Kabazi II show a severe decline of forested areas (Fig. 17-5), which will not have existed in the nearer vicinity of the site (pollen zone XII: Gerasimenko 1999, p. 133). Later on, birch, buckthorn shrubs, and even conifers such as pine grew in refugia only. At Kabazi II, samples from the middle and upper sections of pollen zone XII contain no pollen of broad-leaved trees at all. Others indicate that, even under these relatively cold and dry conditions, alder still survived adjacent to the Alma River. Apart from such sheltered sections, steppe grasses with a strong component of xerophytic species dominate the plant cover. Therefore, major parts of pollen zone XII are classified as steppe vegetation (Gerasimenko 1999, p. 125). In sum, it is interpreted as the equivalent of the Huneborg stadial (Gerasimenko 2005).

The environmental model used as the basis for GIS-calculations is shown in Figure 17-6. The resulting reconstruction of vegetation cover (Fig. 17-7) shows that the plant cover within the 4-hour isoline was dominated by steppe and meadow-steppe. Major exceptions were the flood plains where tree vegetation would have been found. The pollen data from Kabazi even shows some broad leaved trees can be expected close to the river, although pine trees would have been the most common taxa. Apart from the flood plains, also slopes and foothills below the steep cuesta cliffs would have provided improved conditions necessary for plant growth (Schultz 2002, p. 125). Small patches of snow or ice, as well as ponding rainfall, would have survived longer in shaded or leeward positions of limestone formations and boulders, thus providing increased (and prolongated) humidity. Especially when exposed to the south, more sunlight would have increased ground temperature. Therefore, it is expected that shrubs would have been found in the foothills.

The small amount of tree vegetation would have influenced the distribution of staple food resources (Fig. 17-6). Although being adapted to woodland and woodland edge (Table 17-3), red deer was generally present at Crimean sites dating to the Huneborg stadial (Chabai and Uthmeier 2006, Fig. 18-2). During the Huneborg stadial, red deer must have been confined to forested floodplains. Given the restriction in wooded areas, this species was almost certainly forced to move within its seasonal range in search of sufficient food. Much like red deer, also bovids (e.g. *Bison priscus*) would have lived near to the river valleys. Although being grazers, they also sojourn in mixed woods with undergrowth, and require water sources for wallowing during the summer months. Ambush at the preferred wallows would have promised a higher success rate for the hunt at this time of the year. Especially red deer, but probably also bison, would have migrated seasonally due to snow cover or as a consequence of low carrying capacity in the forests along the river courses. Saiga and equids are adopted to open vegetation, which – in this scenario – prevailed. The whereabouts of saiga antelopes would thus be difficult to predict. Best chances to target them would have been the game passes when they headed for water. The territorial behaviour of equids would have simplified hunting. In the uniform steppe vegetation, these animals would have chosen as grazing grounds higher elevated plateaus near river valleys. As their carcasses are rather heavy, Neanderthals most probably tried to find hunting locations as near to the residential camp as possible. With regard to the existence of red deer, it is not easy to explain why more undemanding species like reindeer or caprids do not appear in the faunal record of archaeological sites. The main reason for this will be the choices of carnivorous agents. If mammoth were food at all, then animals were scavenged, but much speaks for a use of mammoth remains as fuel for fireplaces (Chapters 2 and 6, this volume).

Sub-Unit III/1, Level III/1A

Several aspects of the small mammal fauna of Level III/1A is comparable to those of the underlying Level III/2. Equally, open steppe and meadow steppe species are most numerous, with some species indicating areas with forest and shrubs. As far as pollen and spores are concerned, sample #22 from Kabazi V, level III/1A (Chapter 5, this volume) contained mainly spores of mosses (*Bryales*) and ferns (*Filicales*). The pollen fraction consists of many unidentified herbs, and arboreal pollen which include pine, birch, and buckthorn. What can be deduced from this is a dominance of green mosses at the entrance of the rock-shelter, and woods that covered part of the slopes. More open sections of the landscape were covered by meadow-steppe vegetation. At Kabazi II, Kabazi V, Level IIII/1A accumulation corresponds to pollen zone XIII (Fig. 17-5), which at the same time is interpreted as equivalent to the Denekamp Interstadial (Gerasimenko 1999, p. 139). Meadow grasses replaced the undemanding steppe assemblages of the preceding stadial and indicate comparably humid conditions (Gerasimneko 1999, p. 125). Beside pine trees (*Pinus*), which dominate with up to 83 %, broad-leaved trees like hornbeam (*Carpinus*) and oak trees (*Quercus*) spread from their refugia. The environment around Kabazi II is of a forest-steppe type. Soil formation visible in the profiles of the excavation area shows that herbaceous vegetation covered the middle part of the slope. Again, an environmental model was used to reconstruct vegetation cover by GIS-based calculations (Fig. 17-8). The results are given in Figure 17-9. As in the previous stadial, the steep limestone cliffs had no vegetation at all, and the foot of the slopes were, much like today, overgrown with shrubs. Open vegetation consisting of steppe and - following small mammal fauna – meadow grasses dominated within the 4-hour isoline. In addition, the wooded vegetation in the floodplains again recalls the situation described for Level III/2, but this time broad-leaved trees would have occurred in greater number. Surfaces less inclined than the plateaus of

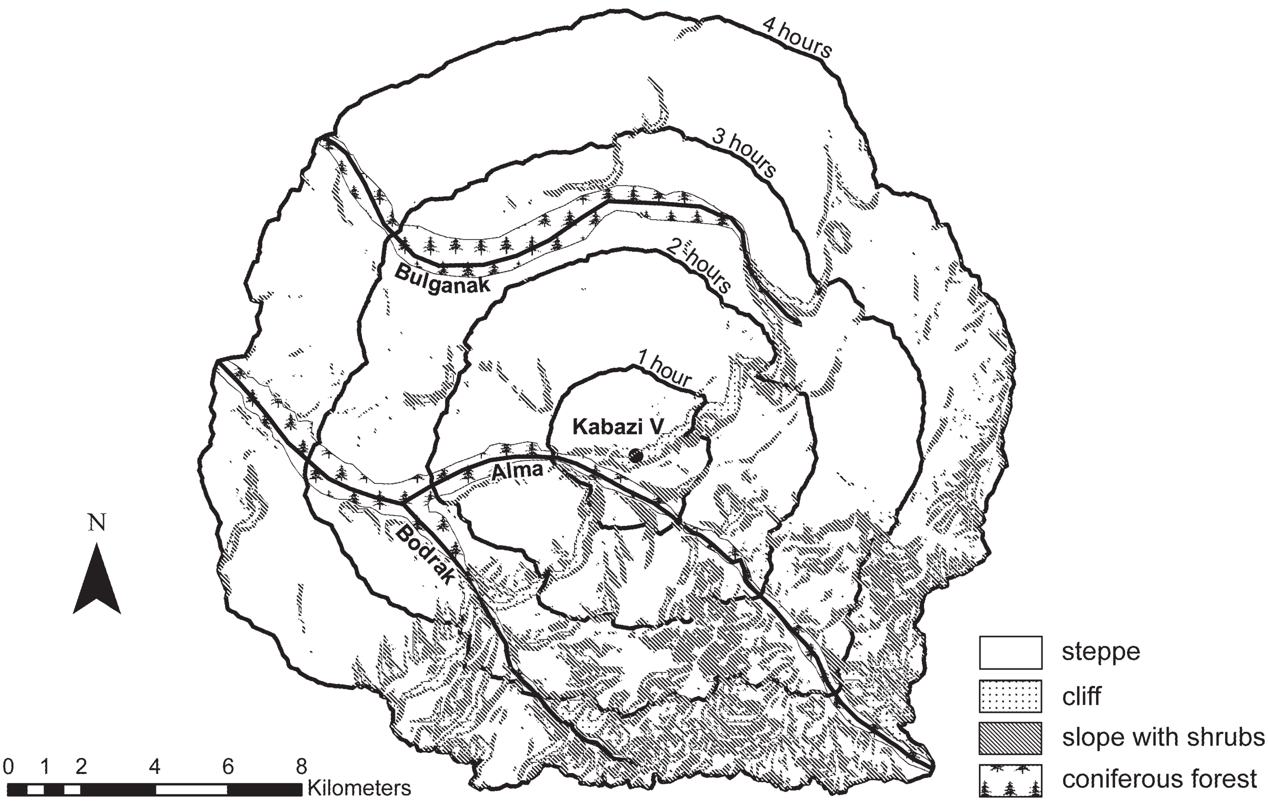


Fig. 17-7 Distribution of vegetation classes during the Huneborg stadial of Level III/2 in isolines representing walking hours around Kabazi V. Note: the 3-hour isoline represents the foraging radius of Kabazi V in which resources where procured (calculations made with ArcGIS 9,2).

the cuestas are thought to have provided conditions that favoured the growth of coniferous forest vegetation. If the inclination indicative for the border between steppe and forest vegetation is set as such that forest vegetation accounts for approximately 40 percent within the 1-hour isoline (which fits best to the local character of the pollen data), than it covers only 20 percent of the area within the 4-hour isoline. The main reason for this lies in the low altitude differences between hinterland and floodplain along the Bulganak River, which simply did not cut as deeply into the landscape as the Alma and Bodrak.

Potential prey, i.e. grazers, would have found good living conditions in this environment (Fig. 17-8). With regard to hunting strategies, small areas of optimal grazing grounds separated from one another by patches of forest may have facilitated the location of herds. Given the large amount of reconstructed steppe environment, the territorial equids could have spent the entire year in the investigated area, a notion that is supported by archaeozoological data from Kabazi II, levels III/2 and II/8 (Chabai and Uthmeier 2006, Fig. 18-3). With regard to the large herd sizes during periods of seasonal migration, *Saiga tatarica* must have been more numerous than equids. Even though seasonal herds were much smaller, this highly mobile species would have moved to other pastures within the summer range to avoid concurrence. The same may apply to bovids, though this species would have been able to cope with some alternatives to grass. Giant deer and red deer with their preference for forest environments would have found rather good conditions during the Denekamp interstadial. However, the still restricted amount of forest will nevertheless have led to seasonal migrations between summer and winter pastures, especially for the larger giant deer. Caprids would have frequented the area during the winter only, after spending the summer in higher altitudes of the Crimean Mountains. Carcasses of mammoth, which was mainly used as a source for fuel, most likely accumulated near water resources, where old, diseased, or injured individuals probably retreated to die.

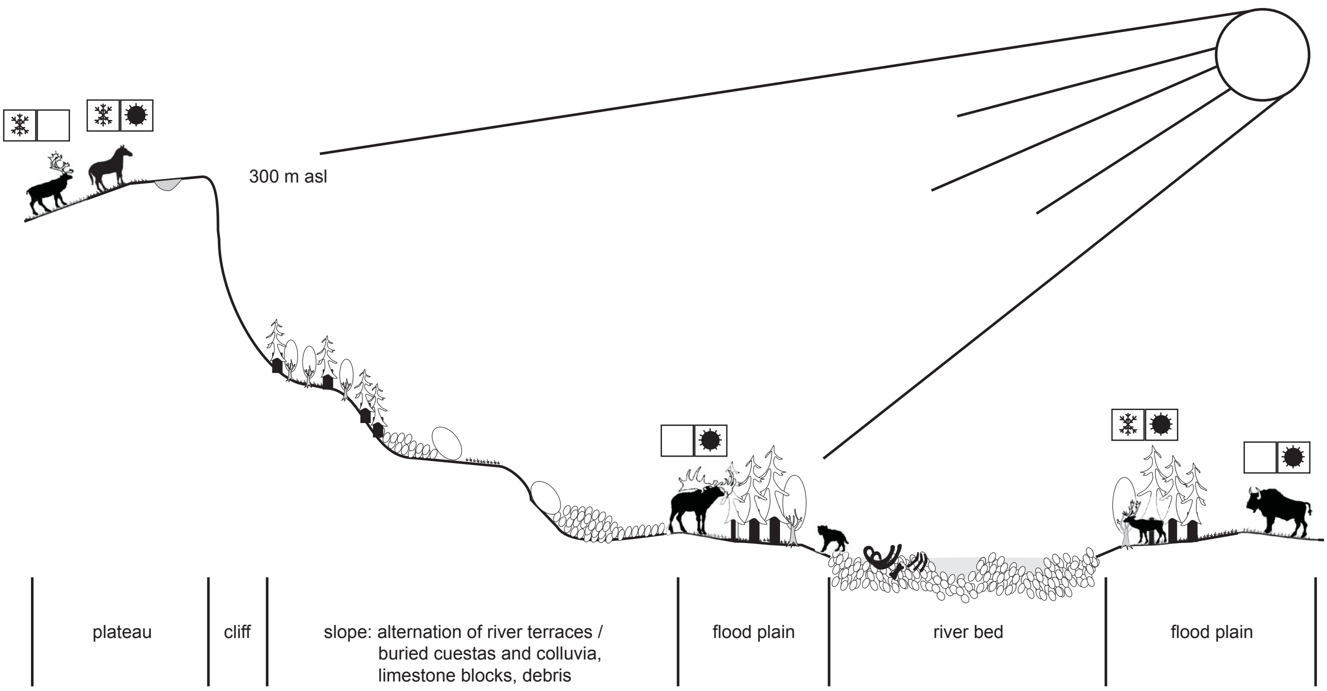
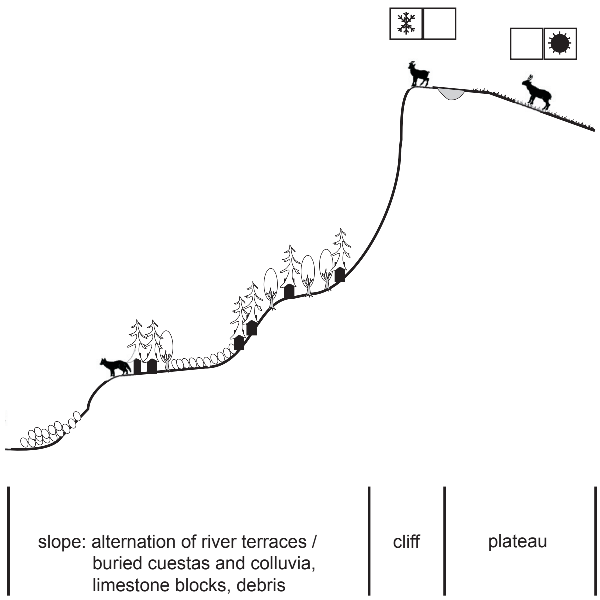


Fig. 17-8 Possible distribution of plants and animals under interstadial conditions in a low mountain range.

Site Catchment at Level III/2

Neanderthals who occupied Level III/2 ate mainly the normal staple food, e.g. *Equus hydruntinus* and *Saiga tatarica* (Table 17-4). Different states of preservation of the bone surfaces of the two species show that they stem from two different episodes (Chapter 6, this volume). As equids were killed in spring, whereas the season of death of saiga was the end of summer, the two occupations were separated by at least several months. This is attested by the high degree of fragmentation of faunal remains, which stems not only from the extraction of marrow by humans, but also from trampling. Although it is difficult to estimate the actual time between to the two episodes with any certainty, it must have been long enough to allow for the weathering of the bones left on the surface. On the other hand, the still visible traces of the hearth on squares 8B-8Γ from an earlier phases of site use within Level III/2, which was later destroyed by trampling (or low energy erosion) (Chapter 2, Fig. 2-3, this volume), underlines that the period could not have been very long.

In contrast to the bones of saiga, which show a much better state of preservation, faunal remains of equids were exposed to weathering and, therefore, correspond to an earlier occupation. These pieces stem from three individuals of *Equus hydruntinus* (Table 17-4). Two of these, a juvenile and a mare pregnant with a foetus which died at the age of 24 weeks, were doubtlessly hunted. M. Patou-Mathis (Chapter 6, this volume) suggests that the second female was scavenged. In the case of active hunting, kill and butchering sites were located at some distance to Kabazi V, as only meat bearing parts were transported to the rockshelter. However, the carcasses of *Equus hydruntinus* were heavy, which is not indicative of long transportation distances. Faunal remains of saiga antelopes, which were without exception actively hunted by humans (Chapter 6, this volume), were distributed in more or less the same part of the excavation area (Fig. 17-10). Judging from the composition of age and sex, the individuals found at Kabazi V were members of a herd of females with their offspring, i.e. all individuals were probably killed in one event (Table 17-4). As the living weight of these animals is low, whole carcasses were transported from the kill site to the rockshelter. The exploitation of saiga was complete and included the consumption of meat, the extraction of marrow, and the use of the skin. The nearest hunting ground for both equids and saiga, indicated by water sources and uneven landscapes near to grazing grounds with open vegetation, appear to have been situated in the Alma floodplain, at a distance of less than 1 hour walking time (Fig. 17-7). Large limestone boulders, shrubs on the slopes



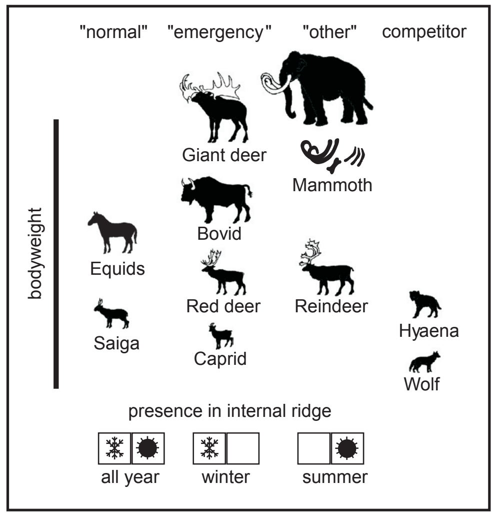


Fig. 17-8 Continued.

and trees along the river offered good opportunities for ambush hunting. If deep river passages through the limestone formation of the cuestas were preferred hunting grounds for this species, then comparable topographical situations were also to be found at distances of 2 to 3 hours from Kabazi V at the Bodrak River (Fig. 17-7; however, this value is already close to, and possibly even beyond, the critical value for walking distances thought to be relevant to Neanderthal hunting activities. It is uncertain whether the Bulsanak River provided a comparable setting. At least in the reconstruction, the narrow headwater did not allow the development of a forested floodplain that would have made ambush hunting easier. With regard to the amount of staple food resources procured, both occupations were short (Table 17-4). Given the fact that only one fireplace existed at a time, it is fair to imply that only small social units, most probably (nuclear) family groups of five persons, used Kabazi V. For these groups, the amount of meat from equids of 250 kg would have lasted for little more than 10 days (calculated after Chabai and Uthmeier 2006, p. 341). Similarly, the second occupation, connected with the consumption of saiga, would not have lasted longer than about a week.

The extent to which all other species were associated with one of the two hunting episodes described above is unclear (Chapter 6, this volume). Species discussed as food resources include one hare and the remains of a red deer, which was probably scavenged (Table 17-4). Elsewhere, it has been suggested that a selection of hare as small game may indicate nutritious stress, because the output of hunting these fast but small animals is relatively low (Stiner et al. 2000). However, this does not apply to the Crimea, where small prey was never important. Nevertheless, hare cannot be regarded as a staple food. Both in occurrences and numbers, this species is generally rare in Crimean Middle Palaeolithic faunal assemblages. Apart from Buran-Kaya III, Level C (Laroulandie and d´Errico 2004), it is reported in low MNI from Kabazi II, Level V/5, Zaskalnaya V, IV, Zaskalnaya VI, III, Chokurcha I, IV-M, Kiik-Koba, upper, and Prolom sites I and II (Kolosov et al. 1993; Patou-Mathis 2004), all of which are attributed to the Crimean Micoquian. Whereas hare was most probably killed on the plateau near the site, red deer would have inhabited the forested flood plains. In the environment of Level III/2, larger forested areas would have been found only north of the confluence of the Bodrak and Alma rivers. Therefore, it is expected that the red deer remains stem from areas located at walking distances of 2 to 3 hours from the site (Fig. 17-7). Perhaps, the comparably low

	Level III/2										
	staple food								**fuel**		**other agents**
	normal						*emergency*				
	Equus hydruntinus (+ *Equus cf.*)			saiga (*Saiga tatarica*)*			red deer †	hare	mammoth †	wholly rhinoceros †	bear
	♀	♂	♀/♂	♀	♂	♀/♂	♀/♂				
juvenile			1			1***			1		1****
sub-adult											
young adult											
adult			2**		2						
senile						1	1				
undetermined								1		1	
Σ	**3**			**4**			**1**	**1**	**1**	**1**	**1**
amount of meat	juvenile = 50 kg adult = 100 kg **250 kg**			juvenile = 12.5 kg adult = 25 kg **87.5 kg**			selected parts only			no food resources	
days with meat (4 kg/day)	**62.5 days**			**21.8 days**							

* weathered bone surfaces
** 1 pregnant (age of foetus at death 42 month ~ spring time)
*** 4 months (death at the end of summer)
**** deciduous tooth
† scavenging

Table 17-4 Different aspects of prey taken by Neanderthals in Level III/2 (differentiation of age and sex according to Chapter 6, this volume; days with meat were calculated for one adult Neanderthal individual). Note: equids and saiga antelope were killed during two different occupations.

measurable outcome of the hunting-gathering activities that resulted in the procurement of red deer and hare can be taken as an argument that they were somehow related to the two main occupations. Nevertheless, they may also indicate separate, extremely short stopovers. Bones of mammoth and rhinoceros were collected as fuel for fireplaces (Table 17-4). Presumably, most of the undetermined small bone fragments and splinters in the faunal assemblage of Level III/2 also come from these species; 95% of these were burned, and they stem from large sized mammals.

By and large, Neanderthals of Level III/2 made use of most of the resources available in the foraging radius of within 2 to 3 hours walking distance from the site. Compared to species that were included in other faunal assemblages of that time (Chabai and Uthmeier 2006, Fig. 18-2), only bovid was not represented (Fig. 17-11). Most of the food procurement is expected to have taken place near to Kabazi V, probably within the 1-hour isoline. With regard to the vegetation cover, humans from Level III/2 lived in a continuous environment (Fig. 17-12). The relation between forest and steppe hardly changed, even if the activity radius around Kabazi V was increased. With 90 percent or more, steppe environments are by far dominant within all analysed walking-distance contour lines.

	Level III/1A											
	staple food									**fuel**	**other agents**	
	normal						*emergency*					
	Equus hydruntinus (+ *Equus cf.*)			saiga (*Saiga tatarica*)			red deer (✝?)	reindeer (✝?)	bovid (✝?)	mammoth ✝	wolf	bear / hyeana
	♀	♂	♀/♂	♀	♂	♀/♂	♀/♂					
juvenile			1 (+ 1)			1			1			
sub-adult			(+ 1)	1								
young adult										1		
adult	2*		(+ 1)			2	2		1		1	
senile						2		1				
undetermined												1
Σ	**6**			**6**			**2**	**1**	**2**	**1**	**1**	**1**
amount of meat	juvenile = 50 kg adult = 100 kg **450 kg**			juvenile = 12.5 kg adult = 25 kg **125 kg**			selected parts only			no food resources		
days with meat (4 kg/day)	**112.5 days**			**31.2 days**								
	* pregnant (death at spring) ✝ scavenging											

Table 17-5 Different aspects of prey taken by Neanderthals in Level III/1A (differentiation of age and sex according to Chapter 6, this volume; days with meat were calculated for one adult Neanderthal individual). Note: equids and saiga antelope were killed during two different occupations.

Site Catchment Level III/1A

Much of the site catchment of Level III/1A recalls that of the underlying Level III/2. Again, remains of equids and saiga antelopes dominate the faunal assemblage by far (Table 17-5), and, once again, whereas only meaty parts of equids were transported to the site, saiga reached Kabazi V as entire carcasses (Chapter 6, this volume). Equally comparable to Level III/2 is the impression that the two species were killed and consumed in the course of different occupations. Otherwise, the well-sorted distribution of faunal remains and artefacts in two separate concentrations (Fig. 17-13) would be difficult to explain. In the western part of the excavated area, saiga remains concentrated near two destroyed hearths, while in an easterly square metre, equid remains were found around a hearth in a natural depression (Chapter 2, this volume). The fuel used to run the hearths extends the list of similarities between the two levels under analysis. As in Level III/2, most mammoth remains were fragmented and burned. Among equid remains, three individuals of *Equus hydruntinus* were identified (Chapter 6, this volume); one juvenile was accompanied by two adult females, both of which were pregnant and, therefore, killed in the spring (Table 17-5). Skulls and meat bearing parts were transported to the rock-shelter after primary butchering at the kill site. Three additional equids did not allow a classification at the species level.

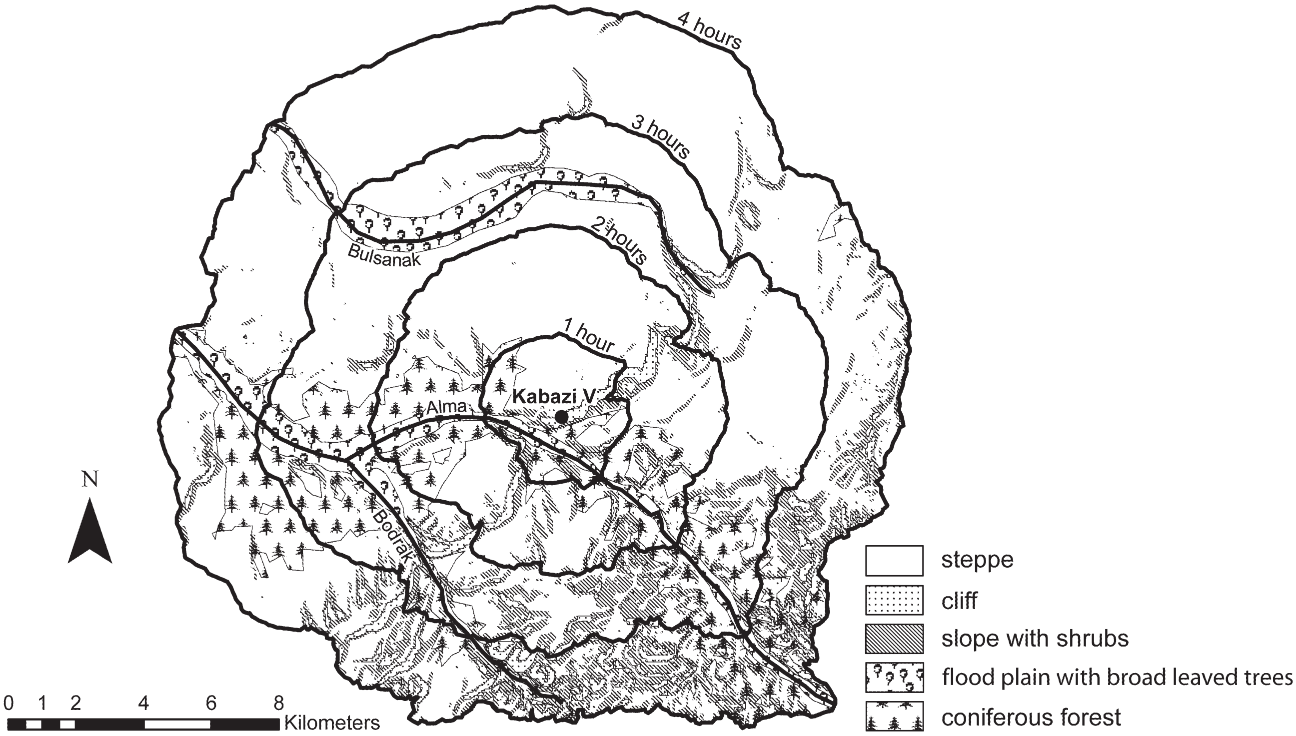


Fig. 17-9 Distribution of vegetation classes during the Denekamp interstadial of Level III/1A in isolines representing walking hours around Kabazi V. Note: the 3-hour isoline represents the foraging radius of Kabazi V in which resources where procured (calculations made with ArcGIS 9,2).

They account for one young, one sub-adult and one adult animal (Table 17-5). For saiga, the season of death is not known (Chapter 6, this volume). The animals that were brought into the rock-shelter as entire carcasses comprise one juvenile, one sub-adult, two adult and two senile (Table 17-5). Under the precondition that the individuals were killed at the same time, the meat of equids would have lasted (for a nuclear family) for approximately 3 weeks (Table 17-5). The meat of the saiga, however, would have provided sufficient calories for no more than one week. Where were the staple food resources procured? Within the foraging radius (i.e. within the 3-hour isoline), it seems unlikely that the grazing grounds of these species would have been situated between the Alma and Bodrak valleys (Fig. 17-9). In this region, the landscape was either hilly with many slopes, or divided by forest. Towards the northwest, large portions of steppe would have been characterised by the vegetation within the 2-hour isoline, which in the direction of the Alma bordered on woodland. Apart from the slopes near to the site which conjoin the cliffs with the Alma valley and offer good hunting opportunities near to possible watering places, conditions for ambush hunting therefore would have been equally good in some distance towards Kabazi V.

One reindeer, two bovids and two red deer complement human staple food resources, though it is unknown whether these animals were hunted or scavenged. Be this as it may, red deer would most certainly have been killed in, or in the proximity of forest. Forest is frequent within the 1-hour isoline, but still larger continuous sections of forest were situated towards the west, at the confluence of the Bodrak and the Alma, some 2 to 3 hours walking distance from Kabazi V (Fig. 17-9). With much higher probability Neanderthals found herds of red deer, or a fresh kill, in this area of the foraging territory. On the other hand, bovid and reindeer are steppe dwellers, roughly found in the same steppe habitat as saiga antelope. However, reindeer is – like the hare in Level III/2 – relatively rare for the Crimean Middle Palaeolithic. Other occurrences of reindeer are reported with low MNI from Zaskalnaya VI, Units II, III and IV, Karabi Tamchin, Units IV and V, and Prolom I and II (Kolosov et al. 1993; Burke 2004). With a high degree of certainty these

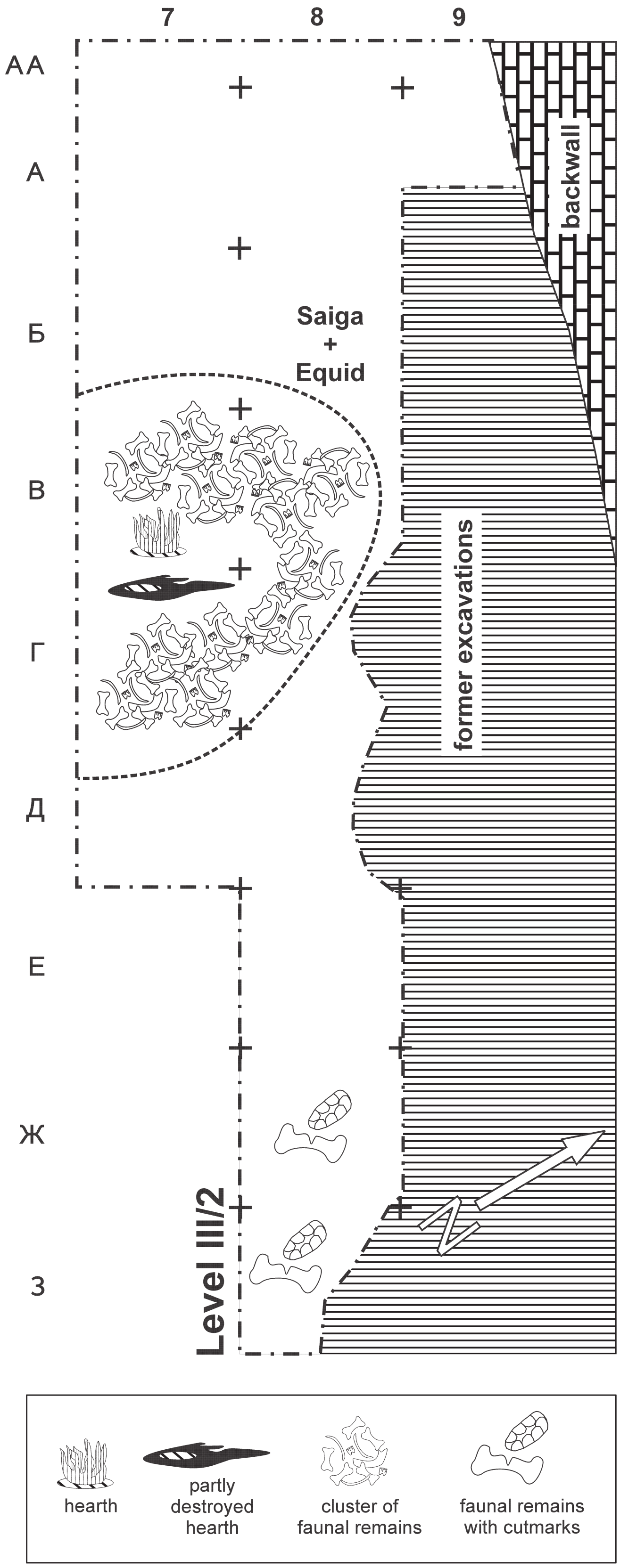


Fig. 17-10 Evident structures of Kabazi V, Level III/2.

animals were not part of the staple food repertoire. The remains of wolf and hyena (or bear) stem from the alternating use of the rock shelter by humans and carnivores. The occasional occurrence of digested bones (from hyena) and traces of gnawing on some bone surfaces point indirectly to the presence of carnivores. However, carnivores never used the rock shelter as a den; their teeth very rarely affected bone surfaces. The fact that Crimean Neanderthals had common ranges with hyena and wolf is in accordance with Middle Palaeolithic faunal analyses from other parts of Europe (Mussi 1999). This finding is interpreted as substantiation of the ability of Middle Palaeolithic humans to concur with large Pleistocene carnivores for the best habitats; Crimean Neanderthals were, without a doubt, at the top trophic level of the ecosystem.

In conclusion, Neanderthals of Level III/1A exploited major habitats found in the foraging radius of Kabazi V. These included forested areas (red deer), areas with more open vegetation, but still with some trees (bovids), as well as open steppe environments (equids, saiga and reindeer). On the basis of species documented in other faunal assemblages from contemporaneous Crimean sites (Chabai and Uthmeier 2006, Fig. 18-2), giant deer and caprids were not taken (Fig. 17-11). Interestingly, the amount of forest declines with the additional surfaces of each contour line of walking time (Fig. 17-12). Within the 1-hour line, the amount of woodland amounts to 40 percent. Within the 2-hour and 3-hour isolines, thought to be representative of the maximum walking distances in the foraging radius, it constitutes just 27 and 28 percent of the area, respectively. The decrease in the contingent of wooded areas points to the fact that the camp was positioned intentionally near to steppe and forest resources, the latter being linked to water resources. The reasons for this have already been discussed in greater detail, i.e. water supply, habitat demands of staple food species, and requirements for ambush hunting. Comparable conditions were to be found at the Bodrak valley, slightly beyond the 2-hour isoline, but not in the shallow Bulganak valley.

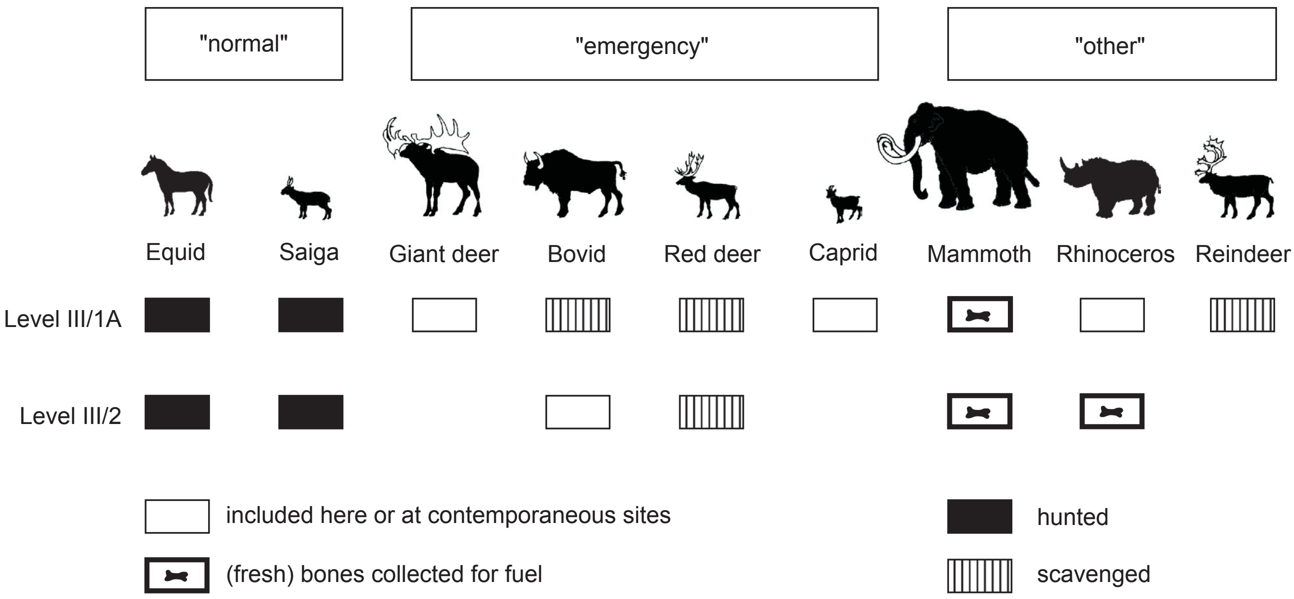


Fig. 17-11 Staple food resources taken and ignored at Kabazi V, Levels III/2 and III/1A.

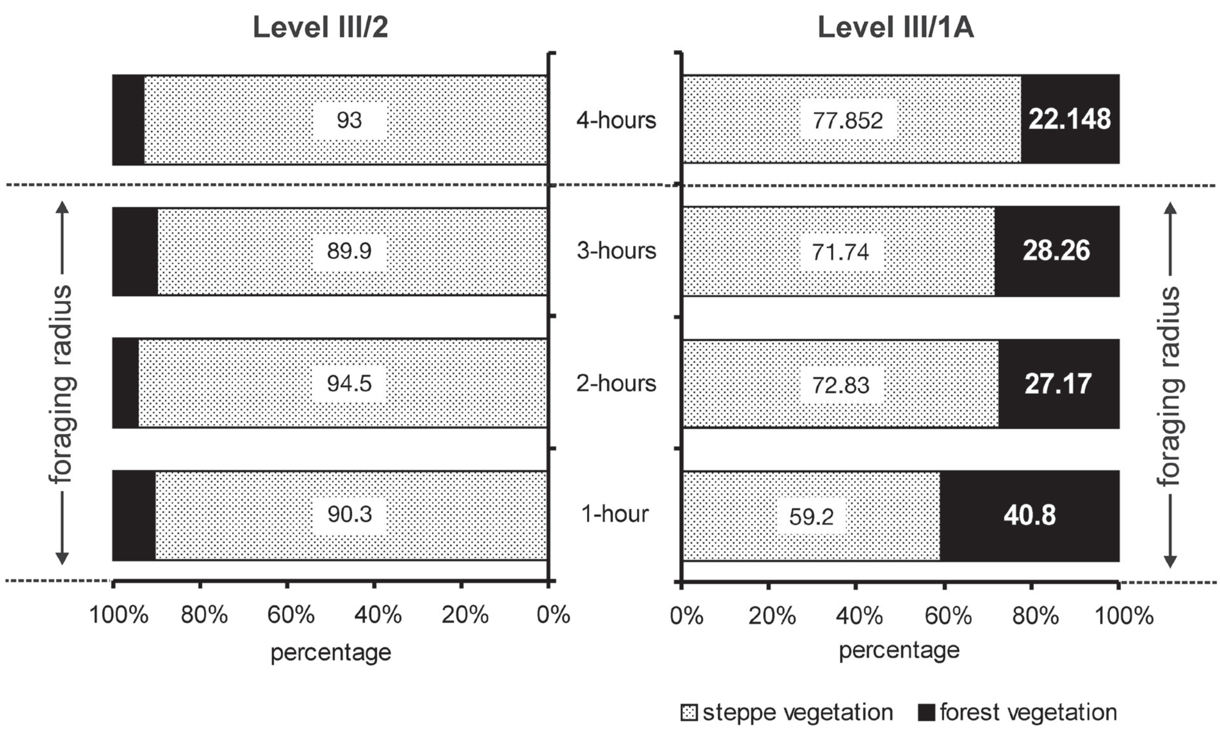


Fig.17-12 Relative amount of forest and steppe vegtation in isolines of walking distances around Kabazi V (surfaces of each isoline of increased walking distance was added to the previous; calculations made with ArcGIS 9,2). Note: the 3-hour isoline represents the foraging radius of Kabazi V in which resources where procured.

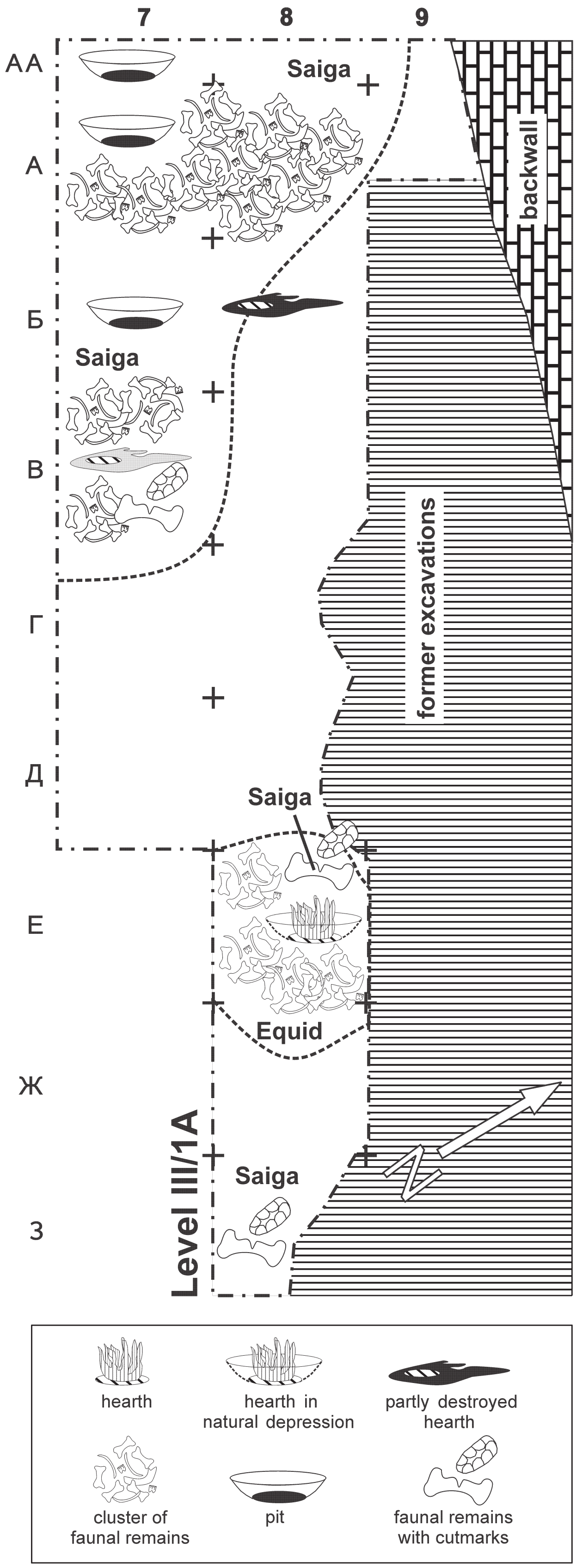


Fig. 17-13 Evident structures of Kabazi V, Level III/1A.

Discussion and Conclusion: Site Catchment at Kabazi V

In both investigated levels, Neanderthals consciously decided to hunt and gather in an ecotone characterised by large amounts of steppe bordering on forested areas and, perhaps more importantly, on a river surrounded by slopes and uneven ground. Within these landscapes they attempted to make comprehensive use of accessible food resources (Fig. 17-14) by concentrating on two species, *Equus hyruntinus* and *Saiga tatarica*, and at the same time took advantage of a relatively large variety of other opportunities which included the hunting of small and large game, as well as scavenging.

In the setting near to a river, the availability of fresh water was no problem, which – on a large scale – accounts for many other localities in the second range of the Crimean Mountains. Due to the landscape gradient, cuestas drain into numerous small to medium sized rivers. Regarding pollen data, proximity to river streams was conterminous with the availability of wood. The question why bones were nevertheless used as fuel is difficult to answer. Perhaps, bone fires had advantageous properties. Experiments (Hahn 1989, pp. 65-66) have revealed that although fresh bones do not burn as hot as log fire, they do burn remarkably constantly. In any case, a severe "shortage" of wood must be excluded, as it is also clear that considerable amounts of wood were needed to light the fire (ratio of wood to bone lying at 1 : 2). Whereas water procurement was less problematic, the distance between the site and hunting grounds were certainly important factors with regard to decisions relating to the site catchment. One species of normal staple food was *Equus hydruntinus*. The estimations of eatable meat per hunting event suggest that *Equus hydruntinus* was – when compared to saiga – a much more effective game. Provided that the average energy invested in hunting and killing one individual did not differ too greatly, it is fair to conclude that *Equus hyduntinus* was the preferred staple food. In both levels investigated, Neanderthals concentrated on female equids with their offspring. As these lived separately in small herds and had an increased water supply, such a strategy would have maximized the outcome of each hunting trip. Saiga is the second most important source of normal staple food. Also a steppe grazer, this animal is in so far complementary to equids as it is not territorial. It cannot be excluded that from time to time the territorial equids were punctually overexploited by carnivores, especially when jump kills conducted by humans were successful, or when animals got into trouble during extraordinary dry or cold years.

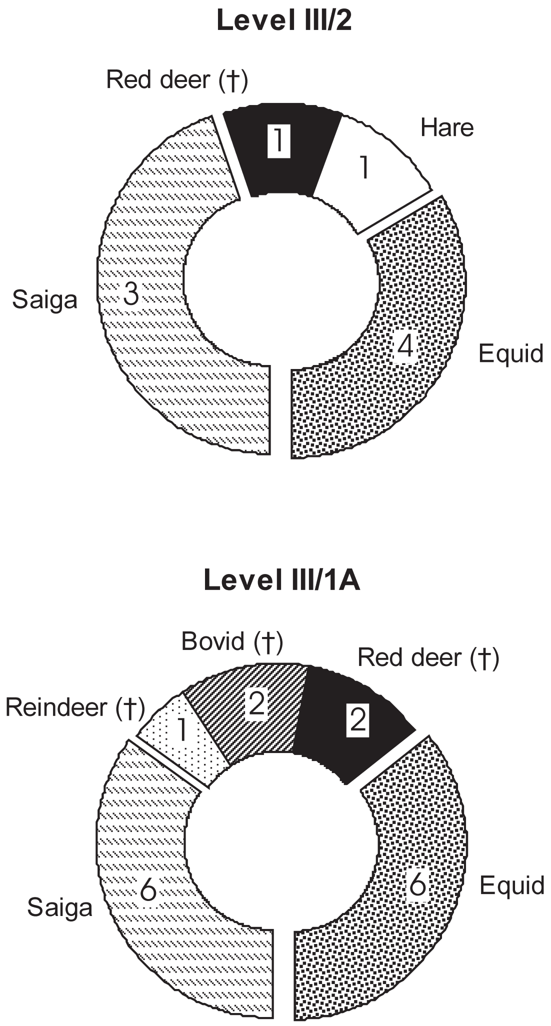


Fig. 17-14 Amount of prey in Levels III/2 and III/1A of Kabazi V in absolute numbers (MNI).

In a simulation, J. Hahn (1995) has shown that last glacial habitats in low mountain ranges had much lower carrying capacities than previously expected. According to Hahn, the killing of 5 to 6 horses at the same time (as seen in Kabazi V in Level III/1A) may have been a severe ecological burden for local equid herds. *Saiga tatarica*, however, was probably less vulnerable in this respect, particularly as population sizes were larger, and seasonal migration distances were greater. In order to avoid the breakdown of local herds of *Equus hydruntinus*, or perhaps as a reaction to it, Neanderthal regularly hunted saiga antelope as an alternative species with similar habitat and behaviour. Nothing can be said about the relation between normal and emergency staple foods. In cannot be excluded that the hunting and scavenging of the latter occurred independently of the procurement of saiga and equids. Normal staple food resources were acquisitioned within the 1-hour isoline, and emergency resources within the 2-hour to 3-hour isolines. In theory, the recurrent switch to emergency staple resources could be interpreted as a consequence of the complete exploitation of local normal staple foods.

In both levels discussed in this chapter, the resulting meat did not last any longer than a few weeks. Instead of long-term seasonal camps provisioned by long-distance hunting parties, the short-term character of the occupations at Kabazi V points to a strategy of high residential mobility to position hunters near to resources. Equally, in both investigated levels, humans returned to Kabazi V after a relatively short period of time, whereby trampling destroyed fireplaces and faunal remains from previous stays. In Kabazi V, Level III/2, occupations occurred at different times of the year – in fact, it might have been the same group which returned months, or even years later to hunting grounds known from previous stays. It is hard to say whether the shift in prey species visible in both levels was merely a coincidence, i.e. the first game encountered on forays. Alternatively, this pattern could have resulted from long-term planning of an exploitation of resources in a seasonal cycle, or may have been enforced by natural causes (i.e. the local decline of a particular species). What can be deduced from the recurrent pattern of short-term visits is that Neanderthals were regularly returning to known foraging territories in search of food resources. In conclusion, the site catchment of Crimean Neanderthals at Kabazi V was guided by a preference of ecotones in the proximity of water streams which provided high biodiversity in a small area. In addition, the proximity to limestone cliffs assured topographical parameters suitable for ambush hunting at passes between grazing grounds and watering places. Apart from this, it was important to access prior knowledge. It is conceivable that during the summer, when equids were most dependent on water, Neanderthal (family) groups moved their residential camp along the same line of cuestas from one potential territory of equids to the other. In general, river valleys and – perhaps afterwards – edges of forests (towards the steppe) were frequently chosen with ambush hunting in mind. Game was mainly taken within a foraging radius of walking distances up to 2 hours from the site. Only if these strategies failed was the radius increased to 3 hours (one way) walking distance from the site, and emergency staple food was obtained not only by hunting, but also by scavenging.

Abstract

РЕСУРСНЫЕ ТЕРРИТОРИИ СТОЯНОК В ФИНАЛЕ СРЕДНЕГО ПАЛЕОЛИТА КРЫМА (НА ОСНОВАНИИ ГЕОГРАФИЧЕСКОЙ ИНФОРМАЦИОННОЙ СИСТЕМЫ)

УТМАЙЕР Т., ИКЛЕР С., КУРБЮН М.

В настоящей главе проведен анализ ресурсных территорий поселений Кабази V, III/1A и III/2. Для времени отложения горизонта III/1A характерны относительно мягкие климатические условия интерстадиала Денекамп, тогда как горизонт III/2 образовался во время более холодного и аридного климата стадиала Хунеборг.

Метод анализа мотивации выбора стоянок состоит в определении расстояний между поселением и районами, содержащими основные ежедневно потребляемые ресурсы. Расчет расстояний произведен при помощи географической информационной системы (GIS) и состоит в определении расстояний, которые может преодолеть пешеход за 1, 2 и 3 часа. Расстояние, покрываемое за 3 часа, составляет радиус зоны заготовок необходимых ресурсов. Ресурсы подразделяются на два типа. К первому типу относятся ресурсы составляющие основу пищевого рациона. Второй тип ресурсов составляет случайная добыча или «критический пищевой ресурс». Гидрунтинусы и сайга являются основным пищевым ресурсом для практических всех крымских среднепалеолитических стоянок, тогда как бизоны, гигантские и благородные олени составляют критический пищевой ресурс. Виды, составляющие критический пищевой ресурс, зачастую попадали на территории стоянок в результате сбора падали.

Условия окружающей среды во время бытования Кабази V, III/1A и III/2 были реконструированы на основании географической информационной системы (GIS), результатов палинологического анализа, изучения фаунистических коллекций мелких млекопитающих и сухопутных моллюсков. Дополнительные основания для реконструкции получены в результате анализа данных геоморфологии и современного растительного покрова. В целом, наиболее существенное различие между реконструированными условиями окружающей среды состоит в степени распространения облесенных участков. Во время аккумуляции культурных остатков горизонта III/2 древесная растительность была сконцентрирована в речных долинах, тогда как во время образования горизонта III/1 лесами были покрыты значительные участки водораздела рек Альма и Бодрак. Обитатели обоих горизонтов предпочитали охотиться и заниматься собирательством на границе степных пространств и облесенных участков. Также для выбора места стоянки значительную роль играло наличие реки, окруженной участками пересеченного рельефа. Данные ландшафты изобиловали двумя основными промысловыми видами *Equus hydruntinus* и Saiga tatarica, которые составляли основу пищевого рациона неандертальцев. Вероятно, во избежание кризиса популяции *Equus hydruntinus*, или же в виде реакции на такой кризис, неандертальцы регулярно охотились на *Saiga tatarica* – вид, занимающий ту же, что и лошади, экологическую нишу. В то же время неандертальцами использовались возможности охоты на другие виды, а также сбор падали. Основной пищевой ресурс был доступен в радиусе одного часа ходьбы, а критический пищевой ресурс – в радиусе 2-3 часовой ходьбы.

В обоих горизонтах добытый мясной ресурс обеспечивал обитателей в течение не более нескольких недель. Неандертальцы после короткого отсутствия регулярно возвращались

на место предыдущих поселений. Время отсутствия было настолько коротким, что ранее оставленные очаги и фаунистические остатки не были перекрыты седиментами и подвергались «вытаптыванию». В свою очередь, это свидетельствует о рекуррентной модели использования ранее известных территорий. Предположительно, что летом, когда лошади были зависимы от водных источников, неандертальцы передвигали свои лагеря вдоль линий куэст от одной занимаемой гидрунтинусами территории к другой. В случае отсутствия гидрунтинусов неандертальцы охотились на сайгу. Если же такая двувидовая стратегия не срабатывала, то ресурсная зона увеличивалась до 3-х часовой, и задействовался критический пищевой ресурс, добываемый охотой и / или сбором падали.

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter 18

Kabazi V in the Context of the Crimean Middle Palaeolithic

Victor P. Chabai

The variability of the Eastern European Micoquian and the Levallois-Mousterian, and the interpretation thereof, constitute an important part of regional Middle Palaeolithic studies. Indeed, the constantly increasing Crimean data provide the bulk of information regarding the Micoquian and Levallois-Mousterian evolution in Eastern Europe. In spite of the fact that stratified Micoquian sites are widespread in Eastern Europe, the typological variability within the Micoquian was defined on the basis of Crimean material. Whereas the typological variability of the Crimean Micoquian is visible in its three different facies (Ak Kaya, Starosele and Kiik Koba), Levallois-Mousterian variability in the region is represented by the Western Crimean Mousterian facie (WCM). One further variation of the Eastern European Levallois-Mousterian is the so called "Molodova culture" which is represented by numerous assemblages in the Dniester River basin (Sytnyk 2000; Chabai 2004d). Not only the definition of the temporal frames of Micoquian and Levallois-Mousterian in the Crimea, but also the question of their coexistence are presently the most discussed subjects within Crimean Middle Palaeolithic studies.

Kabazi V is the only Middle Palaeolithic site in the Crimea which has a documented inter-stratification of Micoquian and Levallois-Mousterian occupations. At such sites as Shaitan Koba, Kabazi II and Karabi Tamchin the Micoquian occupations always underlie deposits with Levallois-Mousterian artefacts (Kolosov 1972; Chabai 1998a, 2006; Yevtushenko 2004). Some components of Levallois-Mousterian, which are represented by Tortoise cores and Levallois flakes with centripetal dorsal scars, were identified in the palimpsests of Zaskalnaya V, layers II, III, Zaskalnaya VI, layers II, IIIa, IV and Prolom II, layer III (Kolosov 1983, 1986). These were interpreted as Levallois-Mousterian admixture in the otherwise Micoquian occupations (Chabai 2004c). On the other hand, the chronological coexistence of Micoquian and Levallois-Mousterian was suggested by the available radiometric dates for such Levallois-Mousterian complexes as Kabazi II, Unit II, and such Micoquian assemblages as Zaskalnaya V, layers I, II, III, Zaskalnaya VI, layer II, Buran Kaya III, layer B, Prolom II, layer II, Prolom I, and Kiik Koba, upper level. In other terms, the time span from Vytachiv, $vt_{1b2\text{-}b1}$ (Hosselo) until Vytachiv, vt_{3b} (Denekamp) was defined as the time of Micoquian and Levallois-Mousterian coexistence. Moreover, from 36/32 ka BP to 29/28 ka BP the Micoquian and Levallois-Mousterian were accompanied in the Crimean foot-hills by the Early Upper Palaeolithic Eastern Szeletian and Aurignacian (Chabai et al., 1998). Such technological and typological mosaics pose a number of interpretational problems, one of the main problems being: Is their sufficient evidence to differentiate between Crimean Micoquian and Levallois-Mousterian traditions?

Kabazi V: The Micoquian and Levallois-Mousterian Chronology and Environment

The enlistment of different dating techniques for the Kabazi V sequence has brought with it several methodological and interpretational problems (Tables 18-1; 18-2; 18-3). The methodology of dating procedures is described in detail in Chapter 3, this volume. The interpretation of the chronological results is presented below.

The chronology of the Crimean Middle Palaeolithic is based on cross-correlations of radiometric dates and commonly adopted ages of climatic cycles. In the case of such sites as Siuren I, Starosele, Kabazi II, Chokurcha I, Buran Kaya III, Zaskalnaya V, and Karabi Tamchin (Gubonina 1985; Gerasimenko 1999, 2004, 2005; Markova 1999, 2004a, 2005; Mikhailesku 1999, 2004, 2005) climatic characteristics used in dating were defined on the basis of studies of pollen, micro-fauna and molluscs. As always, the main role is played by the biggest stratigraphical sequences, such as Kabazi II (14 m), Zaskalnaya V (4.5 m) and Starosele (4 m). For each stratigraphical sequence the agreement between adopted ages of climatic fluctuations and radiometric dates was recognised as the most reliable basis for the dating of deposits.

The range of dating techniques has included the following methods: AMS, ESR, U-series, OSL, and TL (Hedges et al., 1996; Rink et al., 1998, in press; Pettitt 1998; McKinney 1998; Housley et al., Chapter 3, this volume). Whereas bones have served as samples for the radiocarbon method, ESR and U-series dating methods have dated samples of enamel from horse teeth. In Crimean Middle Palaeolithic investigations OSL and TL methods were used for the first time to date Kabazi V sediments and burnt flint samples, respectively. Also, the AMS date from Kabazi V, III/5-3B2 is the first example in which a charcoal sample has been used for AMS dating in the Crimean Middle Palaeolithic.

Generally speaking, there is good consensus between the ESR and AMS dates and bio-stratigraphical studies. On the other hand, U-series, OSL dates and TL definition agree neither with the results from ESR and AMS studies nor with bio-stratigraphical observations. Thus, for now the Crimean Middle Palaeolithic chronologies are represented by two radiometric scales: AMS and ESR on the one hand, and U-series, OSL and TL on the other (Tables 18-2 and 18-3).

Units / Sub-Units / Levels	Levels	"High chronology"			"Low chronology"				Bio-Statigraphy
		OSL	U-series	TL	ESR, EU, mean	ESR, LU, mean	ESR age	AMS	
Levels II/4A; II/7									
Sub-unit III/1	III/1	60.0-100.0	73.3±6.0 (4)		24±2 (3)	31±1	26 – 30		Interstadial (Denekamp)
	III/1A			81.0 ± 9.0	41±2 (1)	55±4	<41	OxA-X-2134-45, **30.98±0.22**	
Sub-unit III/2									Stadial
Sub-unit III/3									
Sub-unit III/4									Interstadial (Hengelo)
Sub-unit III/5	III/5-3B2							OxA-14726, **38.78±0.36**	
Sub-unit III/6									Stadial
Sub-unit III/7									
Unit IV		about 200.0							

Table 18-1 Kabazi V: chronology & bio-stratigraphy*.

* bio-stratigraphical definitions after A. Markova (1999, Chapter 4, this volume), radiometric dates after J. Rink et al. (1998) and R. Housley et al. (Chapter 3, this volume).

Geochronology	Landscapes	Sites, layers / levels	Radiometric dates		Technocomplexes, facie
			AMS	ESR	
Vytachiv, vt_{3b} (Denekamp Int.)	South-boreal to boreal forest-steppe	Buran Kaya III, B	OxA-6674, 28.52±0.46		Micoquian, Kiik Koba facie
			OxA-6673, 28.84±0.46		
		Siuren I, Fb2	OxA-5155, 29.95±0.70		Aurignacian
		Siuren I, Ga	OxA-5154, 28.45±0.60		
		Siuren I, H	OxA-8249, 28.20±0.44		
		Kabazi V, II/4A – II/7			Micoquian, Ak Kaya facie
		Prolom II, II	Ki-10617, 28.10±0.35		Micoquian, Starosele facie
		Zaskalnaya V, I	Ki-10891, 28.85±0.40		
			Ki-10744, 30.08±0.35		
		Kabazi V, III/1		30.0-26.0	
		Kabazi V, III/1A	OxA-X-2134-45, 30.98±0.22	<41.0	
		Kabazi II, A3A – A4			Levallois-Mousterian, WCM
		Kabazi II, II/1A		30.0±2.0	
Vytachiv, vt_2 (Huneborg Stadial)	Boreal xeric grassland	Zaskalnaya VI, II	OxA-4131, 30.11±0.63		Micoquian, Ak Kaya facie
			Ki-10893, 30.70±0.45		
			Ki-10607, 30.22±0.40		
		Zaskalnaya V, II	Ki-10743, 31.60±0.35		
		Kabazi V, III/2, III/2A			
		Prolom I, upper layer	Ki-10896, 29.60±0.55		Micoquian, Kiik Koba facie
			Ki-10614, 30.22±0.45		
			GrA-13917, 30.51±0.58/0.53		
			GrA-13919, 31.30±0.63/0.58		
		Buran Kaya III, C	OxA-6869, 32.20±0.65		Eastern Szeletian
			OxA-6672, 32.35±0.70		
			OxA-6868, 36.70±1.50		
		Kabazi V, III/3-1 – III/3-3A			Levallois-Mousterian, WCM
		Kabazi II, II/1	OxA-4770, 31.55±0.60		
		Kabazi II, II/2	OxA-4771, 35.10±0.85		
		Kabazi II, II/3			
		Kabazi II, II/4	OxA-4858, 32.20±0.90		
		Kabazi II, II/5	OxA-4859, 33.40±1.00		
		Kiik Koba, IV	Ki-8163, 32.30±0.30		Micoquian, Kiik Koba facie
Vytachiv, vt_{1c} (Huneborg Int.)	Boreal to south-boreal forest-steppe	Prolom I, lower layer	Ki-10615, 33.50±0.40		
			Ki-10616, 35.20±0.45		
		Zaskalnaya VI, III	OxA-4772, 35.25±0.90		Micoquian, Ak Kaya facie
			Ki-10609, 38.20±0.40		
			Ki-10894, 36.40±0.45		
		Kabazi II, II/6			Levallois-Mousterian, WCM
		Kabazi II, II/7			
		Zaskalnaya VI, IIIa	OxA-4132, 30.76±0.69		Micoquian, Ak Kaya facie
			OxA-4773, 39.10±1.50		
			Ki-10610, 39.40±0.48		

Table 18-2 AMS and ESR chronology and environment of the Middle Palaeolithic and Early Upper Palaeolithic in Crimea*.
* data after Gubonina 1985; Hedges et al., 1996; Rink et al., 1998, in press; Pettitt 1998; Chabai et al., 1998; Gerasimenko 1999, 2004, 2005, this volume; Markova 1999, 2004a, 2004b, 2005, this volume; Mikhailesku 1999, 2004, 2005; Stepanchuk et al., 2004; Housley et al., this volume.

Geochronology	Landscapes	Sites, layers / levels	Radiometric dates		Technocomplexes, facie
			AMS	ESR	
Vytachiv, vt_{1b2} (Hengelo Int.)	South-boreal forest-steppe	Buran Kaya III, E			Upper Palaeolithic (?)
		Kabazi V, III/5-3B2	OxA-14726, 38.78±0.36		Micoquian, Starosele facie
		Starosele, 1	OxA-4775, 41.20±1.80 OxA-4887, 42.50±3.60	41.2±3.6	
		Starosele, 2		38.0±5.0	Micoquian, ?
		Kabazi II, II/7AB		36.0±3.0	Levallois-Mousterian, WCM
		Kabazi II, II/7C – II/7E			
		Kabazi II, II/8		44.0±5.0	
		Kabazi II, II/8C, IIA/1			
Vytachiv, vt_{1b2-b1} (Hosselo Stadial)	Boreal to south-boreal forest-steppe with xerophytes	**Kabazi V, IV/1 – IV/3**			
		Kabazi II, IIA/2			
		Chokurcha I, IV-I, IV-M			Micoquian, Ak Kaya facie
		Chokurcha I, IV-O	OxA-10877, >45.40		Micoquian, Starosele facie
		Zaskalnaya V, IV	GrA-13916, >46.0		
		Zaskalnaya VI, IV	Ki-10611, >47.0		
Vytachiv, vt_{1b1} (Moershoofd Int.)	South-boreal forest-steppe	Kabazi II, IIA/4			Micoquian, Ak Kaya facie
		Kabazi II, IIA/4B			
Uday,ud; Pryluki, pl_3, (Ognon St.& Int.)	Boreal forest-steppe	Kabazi II, III/1A			
		Kabazi II, III/1			
		Starosele, 3			Starosele, level 3
Pryluki, pl_{1b2}, (Odderade Int.)	South-boreal forest-steppe	Starosele, 4			Micoquian, ?
		Kabazi II, III/2		74.0-85.0	Micoquian, Ak Kaya facie
Pryluki, pl_{1b2-b1}, (Rederstall St.)	Boreal, s.-boreal forest-steppe	Kabazi II, III/2A			
		Kabazi II, III/3		82.0±10.0	
Pryluki, pl_{1b1}, (Brörup Int.)	South-boreal forest-steppe	Zaskalnaya V, V			
		Zaskalnaya V, VI			
Tyasmin, ts, (Herning St.)	???				
Kaydaky, kd_{3b2+c}, (Eemian Intergl.)	South-boreal forest, forest-st.	Kabazi II, V			
		Kabazi II, VI			

Table 18-2 Continued.

This first scale has been discussed in some detail in a number of earlier publications (Chabai et al., 1998; 2004; Chabai 2004c). The main problem of the first scale lies in the dating of bone samples using the radiocarbon method; it has been stressed several times that the dates presented in Table 18-2 must be understood as the minimum age of these samples, only (Hedges et al., 1996; Pettitt 1998; Chapter 3, this volume). At the same time, the proposed radiocarbon chronology, if not in its entirety, then at least partially, does correspond to the temporal frames of periods of climatic fluctuation which have been defined in the main stratigraphical profiles at such sites as Starosele, Kabazi II, Buran Kaya III, and Zaskalnaya V. Of course, the climatic fluctuations were not very pronounced in the Crimea, with variations in the Upper Pleistocene fluctuating mainly between south-boreal and boreal forest-steppe (Table 18-2). An exception is the climatic condition of Vytachiv, vt_2. The deposits associated with this stadial have been studied and dated to about 35/34 – 32/31 ka BP in such stratigraphical sequences as Kabazi II, Buran Kaya III, and Zaskalnaya V (Table 18-2). This stadial was characterised by a harsh continental climate, with landscapes covered by boreal xeric grassland or even semi-desert. Among the inhabitants of these environments is *Pygeretmus pumilio* which is attested twice in the Crimea, but always during stadial conditions, i.e. before Denekamp and after Lascaux (Markova 2004a). An analogy of such environmental conditions was found at Kabazi V, in sub-units III/2 and III/3 (Chapter 4, this volume). The boreal xeric grassland / semi-desert environment studied in Kabazi V, III/2 and III/3 contradicts the "high chronology" hypothesis (Chapter 3, this volume). This hypothesis is based on OSL, TL and U-series dates (Table 18-1; 18-3) and suggests that cultural deposits from Kabazi V might be dated to OIS 4 or even earlier.

Landscapes	Sites, Layers / Levels	Dates			Technocomplexes, facie
		U-series	OSL	TL	
Boreal to south-boreal forest-steppe	Kabazi II, II/8	45.0±7.0 (1)			Levallois-Mousterian, WCM
South-boreal forest-steppe	Kabazi II, III/2	54.0±3.0 (3)			Micoquian, Ak Kaya facie
Boreal to south-boreal forest-steppe	Starosele, 2	60.0 (2)			Micoquian, ?
Boreal forest-steppe	Starosele, 3	67.5 (3)			Starosele, level 3
South-boreal forest-steppe	Starosele, 4	>80.0 (4)			Micoquian, ?
South-boreal to boreal forest-steppe	Kabazi V, III/1	73.3±6.0 (4)	60.0-100.0		Micoquian, Starosele facie
	Kabazi V, III/1A			81.0±9.0	
Boreal xeric grassland	Kabazi V, III/2, III/2A				Micoquian, Ak Kaya facie
	Kabazi V, III/3-1 – III/3-3A				Levallois-Mousterian, WCM
Boreal to south-boreal forest-steppe	Kabazi V, III/5-3B2				Micoquian, Starosele facie
Boreal to south-boreal forest-steppe with xerophytes	Kabazi V, IV/1 – IV/3		about 200.0		Levallois-Mousterian, WCM

Table 18-3 U-series, OSL and TL chronologies and environment of the Crimean Middle Palaeolithic*.
* data after Gerasimenko 1999, 2005, this volume; Markova 1999, 2005, this volume; Mikhailesku 1999, 2005; McKinney 1998; Housley et al., this volume.

In the Crimea the environmental conditions of OIS 4 and OIS 5 vary from boreal to south-boreal forest-steppe. There are no available evidences that a boreal xeric grassland / semi-desert environment existed in the Crimea during OIS 4 and OIS 5, or between 60 and 100 ka BP in OSL terms. In general, the climatic conditions of Vytachiv, vt_2 are an important marker for bio-stratigraphical and chronological studies. In fact, if the Vytachiv, vt_2 climatic conditions did not exist, we would have no problems with the U-series, OSL and TL chronology (Table 18-3).

The "low chronology" hypothesis based on both radiocarbon and ESR dates was proposed for Kabazi V by R. Housley et al. (Chapter 3, this volume), and is much more reliable (Table 18-1). Nevertheless, several traditional problems still exist, i.e. the difficulty in correlating radiocarbon and ESR ages, and the problem of the minimal age of radiocarbon definitions. At the same time, the "low chronology" of Kabazi V is not in contradiction with the environmental characteristics of the observed climatic cycles, and unlike the "high chronology", the "low chronology" is not in contradiction with the adopted age of the Levallois-Mousterian in Eastern Europe and, in particularly, in the Crimea, (Table 18-2). At least, the "low chronology" does not give reason to claim a Middle Pleistocene age for the Crimean Levallois-Mousterian in Kabazi V, Unit IV (Tables 18-1; 18-2; 18-3).

Accordingly, the "low chronology" and the results of environmental studies place the Kabazi V occupations at the end of OIS 3. The earliest occupations in Unit IV of Kabazi V are associated with stadial conditions of Hosselo. These occupations are attributed to the WCM facie of the Eastern European Levallois-Mousterian. The temporal and environmental analogy for WCM in Kabazi V, unit IV is thought to be level IIA/2 at Kabazi II (Vytachiv, $vt_{1b2\text{-}b1}$ Hosselo). These occupations accumulated under the relatively mild environment of boreal to south-boreal forest-steppe with xerophytes, i.e. during the mildest stadial in OIS 3. The next in situ occupations in Kabazi V, sub-units III/5 and III/4 were formed during an interstadial environment. Chronological and environmental analogies for the Starosele facie of the Micoquian in sub-unit III/5 at Kabazi V can be found in Vytachiv, vt_{1b2} (Hengelo) deposits at Kabazi II in levels IIA/1 through II/7AB (WCM), in levels 1 and 2 (Starosele facie) at Starosele, and at Buran Kaya III, layer E (Upper Palaeolithic?). At this time, landscapes would have been covered by south-boreal forest-steppe vegetation. Indeed, it is highly likely that Kabazi V, III/5 and III/4 are associated with the Interstadial Vytachiv, vt_{1c} (Huneborg Interstadial). Unfortunately, however, the pollen preservation at Kabazi V is not sufficient to enable detailed reconstructions of the vegetation at this time. The available radiocarbon date for level III/5-3B2 indicates that both Vytachiv, vt_{1b2} and Vytachiv, vt_{1c} are justifiable (Table. 18-2). If the latter is valid, the temporal and environmental neighbours of Kabazi V, III/5, III/4 would have been located in Zaskalnaya VI, III, IIIa (Ak Kaya Micoquian), Kabazi II, II/6, II/7 (WCM), and Prolom I (Kiik Koba Micoquian). Whereas the cultural deposits from Kabazi V, sub-units III/3 (WCM), III/2 (Ak Kaya Micoquian), Zaskalnaya V, II (Ak Kaya Micoquian), Kabazi II, levels II/5 through II/1 (WCM), and probably Zaskalnaya VI, II (Ak Kaya Micoquian) as well as the upper levels in Prolom I and Kiik Koba (both Kiik Koba Micoquian), all accumulated at a time of harsh continental climate during Vytachiv, vt_2 (Huneborg Stadial). Latest occupations belonging to the Ak Kaya (Kabazi V, II/4A, II/7), Starosele (Kabazi V, III/1, III/1A; Zaskalnaya V, I), and Kiik Koba (Buran Kaya III, B) facies of the Micoquian, to the WCM facie of the Levallois-Mousterian (Kabazi II, II/1A, A3A – A4), as well as to the Aurignacian (Siuren I, F, G, H), all accumulated under relatively mild conditions during Vytachiv, vt_{3b} (Denekamp).

On the whole, the Levallois-Mousterian chronology is much shorter than that of the Micoquian (Table 18-2). The earliest evidence of the Micoquian techno-complex has been identified in OIS 5d, while the earliest manifestation of the Levallois-Mousterian dates to Vytachiv, $vt_{1b2\text{-}b1}$ (Hosselo Stadial). There are no radiometric dates for occupations at this time, and the commonly adopted age for this stadial is about 39-45 ka BP.

With exception of Vytachiv, vt_2, the climatic conditions of the last part of OIS 3 were relatively mild. On the other hand, the alternation of climatic conditions did not affect the main species of hunted fauna. During all of stage OIS 3 this mainly comprised *Equus hydruntinus* and *Saiga tatarica*. In spite of the absence of arcto-boreal rodents, molluscs and flora, the cold adopted mega-fauna is represented by reindeer, mammoth, woolly rhino and polar fox. At the same time, some inhabitants of temperate forest environments, such as red deer, were also found (Chabai, Uthmeier 2006).

Kabazi V: Technological Variability

Kabazi V is situated in the vicinity of flint outcrops. Thus, both Micoquian inhabitants and Levallois-Mousterians would have had access to the same sources of raw material, and the structures of artefact assemblages clearly demonstrate the workshop model of raw material exploitation (Chapters 7, 8, 9, 11, 14, this volume). This to say that both Micoquians and Levallois-Mousterians brought to Kabazi V flint plaquettes and nodules for further flaking. However, the technological approaches to the raw material employed in Micoquian and Levallois-Mousterian occupations are quite different. Whereas the former preferred the elaboration of bifacial preforms and bifacial tool production, the latter concentrated on core reduction with modification of debitage into unifacial tools.

Such a dichotomy is clearly seen in numerous attributes (Chapters 7, 8, 9, 11, 14, this volume). For example, the insignificant role of cores in Micoquian primary flaking is reflected in both a high unifacial tool to core ratio (an average of 26 : 1) and blank to core ratio (an average of 85.6 : 1). For WCM occupations these ratios are characterised by quite different values: no more than 28 flakes and blades were struck from one core and 5 of them were modified into tools. In the case of Micoquian occupations, the majority of flakes and blades stemmed from bifacial tool production. The refitted "cover" of a bifacial tool shows that 44 flakes and 7 blades were struck during the production of this particular tool (Chapter 16, this volume). For Micoquian occupations the ratios of bifacial tools to blanks (flakes and blades) vary from 1 : 33.3 (sub-unit III/2) and up to 1 : 49.8 (sub-unit III/5).

The different origin of debitage in Micoquian and Levallois-Mousterian occupations resulted in blank assemblages with quite different characters. On the whole, blanks from Levallois-Mousterian occupations are longer, wider and thicker (Chapter 14, this volume). The application of a specific core reduction strategy, which is similar to the Biache method, resulted in regularly shaped debitage and high blade indexes (Ilam = 23-24). On the other hand, Micoquian debitage is represented by short, often transversal, flakes with incurvate profiles, low blade indexes (Ilam = 7-14), and irregularly shaped blades (Chapters 7, 8, 11). The bifacial thinning / shaping flakes and blades constitute a minimum of 20 % of the total sum of flakes and blades. Bifacial thinning /shaping chips are about twice as frequent. Often, bifacial thinning / shaping flakes were modified into scrapers and / or retouched pieces.

All bifacial tools from Micoquian occupations were produced in plano-convex manner, and the majority were made from flint plaquettes. Indeed, one might even suggest that the choice of flint plaquettes was a very conscious decision. Plaquettes used for bifacial tool production vary in thickness from between 1.6 and 2.0 cm. The majority of cores from Levallois-Mousterian occupations are of parallel and radial types. The combination of such core types with centripetal Levallois flakes and blades, and *débordantes* and *enlèvement deux* debitage is indicative of a Biache-like core reduction strategy (Chapters 9 and 14, this volume).

Instruments used for flint knapping included bone retouchers, pebble retouchers, and pebble hammerstones. Whereas bone retouchers are characteristic for Micoquian occupations only, pebbles were used by both Micoquian and Levallois-Mousterian knappers (Chapter 15, this volume).

Although no great differences can be observed between the two traditions regarding the types of retouch used in tool production, ventral thinning is only really associated with Micoquian assemblages. About one quarter of scrapers and points exhibit either a thinned back, or thinned terminations. Bifacial scrapers and especially points often have a thinned base.

In summary, whereas Micoquian technology was oriented toward the production of bifacial tools on relatively thin flint plaquettes, the main aim of the Levallois-Mousterian technology was the production of flakes and blades using specific methods of core reduction. Further, Micoquians and Levallois-Mousterians used different knapping instruments to attain their objectives.

Kabazi V: Typological Variability

Detailed typological descriptions of material recovered from Kabazi V in 2002 and 2003 are presented in a number of chapters in this volume (Chapters 7 through 14), and parts of some levels, such as II/4A, II/7, III/1, III/1A, III/2 and III/3 were excavated and published previously by A. Yevtushenko (1998a, 1998b). Yevtushenko's typological definitions were added to the corresponding levels to produce a typological structure of all excavated assemblages (Tables 18-4; 18-5; 18-6).

Kabazi V: Micoquian typological variability

Although technologically homogeneous the Micoquian assemblages from Kabazi V demonstrate some typological variability. Tool-kits are dominated by scrapers, on average 60.9 % of the total number of identifiable tools, with this value fluctuating between 52.2 % in level II/4A – II/7 and up to 62.6 % in sub-unit III/5. The second most frequently observed tool are points, on average 12.7 % of all identifiable tools. The ratio of this tool type does not vary greatly, from 11.5 % in sub-unit III/1 to 16.4 % in levels II/4A – II/7. Bifacial scrapers compose an average of 8.2 % of all tools, ranging from 1.5 % in level II/4A – II/7 and up to 11.3 % in sub-unit III/1. On average, bifacial points comprise 5.5 % of all tools, ranging from 3.4 % in sub-unit III/2 to 10.5 % in levels II/4A – II/7. Reutilised bifacial tools are well represented (2-10 %) in the tool assemblages from levels II/4A – II/7 and sub-units III/1 and III/1A. The sum of denticulates and notches never exceeds 5 %. Scaled pieces, truncated-faceted, end-scrapers, burins, perforators and composite tools are very rare (Table 18-4). Such a typological structure is characteristic for most Crimean Micoquian assemblages, the only exceptions being assemblages with either very small numbers of points (Kabazi II, III, V, VI; Chokurcha I, IV; Sary Kaya) or very high numbers of points (Prolom I; Buran Kaya III, B; Kiik Koba, upper level). In other words, the closest analogies for the Micoquian at Kabazi V are found in Zaskalnaya V and Zaskalnaya VI.

More pronounced variations in the Micoquian assemblage have been observed at the morphological level (Table 18-5). Whereas assemblages from levels II/4A – II/7 and sub-unit III/2 are characterised by a dominance of simple forms (single and double-edge scrapers) over convergent tools (points and convergent scrapers), as well as relatively high amounts of bifacial tools, assemblages from sub-unit III/1 demonstrate a dominance of convergent forms and smaller amount of both bifacial and simple tools. Finally, assemblages from sub-unit III/5 are characterised by a dominance of simple tools and the smallest amount of bifacials (Table 18-5; Fig. 18-1). The differences in ratios of simple, convergent and bifacial tools served as the criteria for the subdivision into different facies of Crimean Micoquian assemblages (Chabai, Marks 1998). Naturally, this subdivision is of a relative character. In some cases Starosele assemblages are more similar to Ak Kaya assemblages than they are to each other. This is the case at Kabazi V, where sub-units III/1 (Starosele) and III/2 (Ak Kaya) display more similarities than the assemblages from sub-units III/1 and III/5 (both belonging to the Starosele facie). At the same time, this subdivision shows quite clearly the tendency of artefact reduction, which in Micoquian industries is expressed in decreasing numbers of simple, bifacial tool forms and overall tool sizes, accompanied by an increasing in convergent tool forms (Fig. 18-1). All of these tendencies together make up the "reduction formula" of Micoquian tool-kits (Chabai 2004c, p. 204; 2005b, p. 128), i.e. the biggest tools are associated

	Levels II/4A, II/7		Sub-Unit III/1				Sub-Unit III/2		Sub-Unit III/5								
	II/4A	**II/7**	**III/1B**	**III/1****	**III/1C**	**III/1A****	**III/2****	**III/2A**	**III/5-1A**	**III/5-1**	**III/5-1B**	**III/5-2**	**III/5-3**	**III/5-3B**	**III/5-3B2**	**Total :**	**esse%**
Points																	
Distal	·	·	1	·	·	1	1	·	·	·	·	·	·	·	·	3	0.33
Lateral	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	1	0.11
Semi-leaf	1	1	·	9	·	2	3	1	·	·	·	·	·	·	·	17	1.85
Sub-leaf	·	·	·	1	·	3	·	·	1	·	1	·	·	1	·	7	0.76
Leaf-shaped	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	1	0.11
Sub-triangular	·	·	·	4	·	5	2	·	·	·	·	2	·	·	·	13	1.41
Triangular	·	·	·	1	·	1	·	·	·	·	·	·	·	·	·	2	0.21
Semi-trapezoidal	·	1	1	3	·	3	·	1	1	·	·	2	·	1	·	13	1.41
Sub-trapezoidal	·	·	·	2	·	·	·	·	·	1	·	1	1	·	·	5	0.54
Trapezoidal	1	·	·	·	·	·	·	·	·	·	·	·	·	·	·	1	0.11
Semi-crescent	3	·	·	3	·	3	3	1	·	·	·	2	·	·	·	15	1.63
Sub-crescent	·	·	·	1	1	1	2	·	1	·	·	·	1	1	·	8	0.87
Crescent	·	1	·	·	·	·	·	·	·	·	·	·	·	·	·	1	0.11
Hook-like	1	·	·	·	·	·	1	·	·	·	·	·	·	·	·	2	0.21
Amorphous	·	1	·	·	·	·	·	·	·	·	·	·	·	·	·	1	0.11
Unidentifiable	·	1	·	2	·	4	1	·	1	1	1	5	4	5	2	27	2.93
Scrapers																	
Transverse-straight	1	·	·	1	·	3	2	1	·	·	·	3	1	1	·	13	1.41
Transverse-convex	1	·	2	1	·	4	5	1	1	4	1	·	2	3	1	26	2.83
Transverse-concave	1	·	·	·	·	1	·	·	·	·	·	·	·	1	·	3	0.33
Transverse-wavy	·	1	·	1	·	·	·	·	·	·	·	1	·	·	·	3	0.33
Diagonal straight	·	·	·	·	·	2	·	1	·	·	·	·	·	·	·	3	0.33
Diagonal convex	·	·	·	5	·	4	3	·	·	1	·	2	2	1	1	19	2.06
Diagonal wavy	·	·	·	·	·	1	·	·	·	·	·	3	·	·	·	4	0.43
Straight	3	3	1	11	·	17	9	1	·	3	1	7	4	7	8	75	8.14
Convex	6	1	4	19	·	17	17	·	6	3	1	6	7	7	3	97	10.53
Concave	1	3	1	5	1	5	2	·	·	·	·	5	·	1	·	24	2.61
Wavy	·	1	·	1	·	5	2	·	·	1	·	1	1	3	·	15	1.63
Double straight	·	·	·	4	·	·	2	·	·	·	·	·	2	·	·	8	0.87
Straight-convex	·	1	3	5	·	3	2	·	2	1	·	·	1	1	·	19	2.06
Straight-concave	·	·	·	1	·	·	·	·	·	·	·	·	1	·	·	2	0.21
Straight-wavy	1	1	·	·	·	·	·	·	·	1	·	·	·	·	·	3	0.33
Double convex	1	·	2	2	·	6	2	·	1	·	·	·	2	·	·	16	1.74
Convex-wavy	·	·	·	·	·	3	·	·	·	·	·	·	·	·	·	3	0.33
Convex-concave	·	·	·	2	·	1	·	·	·	·	·	·	·	·	·	3	0.33
Double concave	·	·	·	·	·	·	·	·	·	1	·	·	·	·	·	1	0.11
Concave-wavy	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	1	0.11
Double wavy	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	1	0.11
Semi-leaf	·	·	·	5	·	7	9	·	·	·	·	·	·	·	·	21	2.28
Sub-leaf	·	·	·	3	1	1	3	·	·	·	·	·	·	·	2	10	1.09
Leaf-shaped	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	1	0.11
Sub-triangular	·	·	·	·	·	7	·	·	·	1	·	1	·	2	·	11	1.19
Triangular	·	·	·	2	·	1	·	·	·	·	·	·	·	·	·	3	0.33
Semi-trapezoidal	·	·	2	11	1	5	4	·	1	2	·	2	·	3	·	31	3.37
Sub-trapezoidal	·	2	1	9	·	6	1	·	·	1	·	·	1	2	1	24	2.61
Trapezoidal	·	·	·	1	·	·	·	·	·	·	·	·	·	·	·	1	0.11
Semi-rectangular	·	2	1	2	·	4	6	·	·	·	·	1	3	·	1	20	2.17
Sub-retangular	·	·	1	·	·	5	·	·	·	·	·	1	1	4	·	12	1.30
Rectangular	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	1	0.11
Semi-crescent	1	2	3	8	·	18	5	·	·	·	·	1	·	1	2	41	4.45
Sub-crescent	·	1	·	2	1	5	·	·	·	·	1	1	·	1	1	13	1.41
Crescent	·	·	·	·	·	2	1	·	·	·	·	·	·	·	·	3	0.33
Hook-like	·	·	·	3	·	·	·	·	1	1	·	·	·	·	·	5	0.54
Semi-ovoid	·	·	·	·	·	·	1	1	·	·	·	·	·	·	·	2	0.21
Convergent amorphous	1	·	·	·	·	·	·	·	·	·	·	1	·	·	·	2	0.21
Convergent unidentifiable	·	·	2	7	·	1	1	·	2	3	·	3	·	·	2	21	2.28

	Levels II/4A, II/7		Sub-Unit III/1				Sub-Unit III/2		Sub-Unit III/5								
	II/4A	**II/7**	**III/1B**	**III/1****	**III/1C**	**III/1A****	**III/2****	**III/2A**	**III/5-1A**	**III/5-1**	**III/5-1B**	**III/5-2**	**III/5-3**	**III/5-3B**	**III/5-3B2**	**Total :**	**esse%**
Denticulates	3	·	·	4	·	7	8	·	1	1	·	4	1	·	·	29	3.15
Notches	2	1	·	4	·	4	4	·	1	3	·	1	1	1	·	22	2.39
Scaled pieces	·	·	·	1	·	8	·	·	·	·	·	·	·	·	·	9	0.98
Truncated-faceted	·	·	·	5	·	1	1	·	·	·	1	4	2	1	·	15	1.63
End-scrapers	·	·	·	·	·	1	2	·	·	1	·	·	·	·	1	5	0.54
Burins	·	·	·	·	·	1	·	·	2	2	·	·	·	·	·	5	0.54
Perforators	·	·	·	·	·	·	·	·	1	·	·	·	·	·	·	1	0.11
Composite tools	·	·	·	·	·	3	·	·	·	·	·	·	·	·	·	3	0.33
Bifacial points																	
Semi-leaf	·	·	·	·	·	·	2	·	·	·	·	·	·	·	·	2	0.21
Sub-leaf	1	·	·	5	·	5	·	·	·	·	·	·	·	·	·	11	1.19
Leaf-shaped	·	·	·	1	·	·	·	·	·	·	·	·	3	·	·	4	0.43
Sub-triangular	·	1	1	1	·	·	·	·	·	1	·	·	·	·	·	4	0.43
Trapezoidal	·	·	·	·	·	1	·	·	·	·	·	·	·	·	·	1	0.11
Semi-crescent	·	·	·	4	·	·	2	·	·	·	·	·	·	·	·	6	0.65
Sub-crescent	·	·	·	1	·	·	·	·	·	·	·	·	·	1	1	3	0.33
Unidentifiable	2	3	1	2	·	3	1	·	·	2	·	3	2	·	1	20	2.17
Bifacial scrapers																	
Straight	·	·	·	1	·	1	2	·	·	·	·	1	·	·	·	5	0.54
Convex	·	·	·	1	·	6	·	·	·	·	·	1	·	·	·	8	0.87
Semi-leaf	·	·	·	7	·	4	4	·	·	·	·	1	·	·	·	16	1.74
Sub-leaf	·	·	·	·	·	·	1	·	·	·	·	·	·	·	·	1	0.11
Leaf-shaped	·	·	·	·	·	·	2	·	·	·	·	·	1	·	·	3	0.33
Sub-triangular	·	·	·	1	·	·	·	·	·	·	·	·	·	·	·	1	0.11
Sub-trapezoidal	·	·	·	1	·	·	·	·	·	·	·	·	·	1	·	2	0.21
Semi-crescent	·	·	·	2	·	3	1	1	·	·	·	·	·	·	·	7	0.76
Sub-crescent	·	·	·	9	·	8	2	1	·	·	·	·	·	·	1	21	2.28
Crescent	·	·	·	·	·	4	·	·	·	·	·	·	·	·	·	4	0.43
Ovoid	1	·	·	·	·	·	·	·	·	·	·	·	·	·	·	1	0.11
Unidentifiable	·	·	·	·	·	3	·	·	·	1	·	1	1	·	·	6	0.65
Bifacial reutilized	3	4	·	5	·	5	11	·	·	·	·	·	·	·	·	28	3.04
Retouched Pieces	11	11	18	201	8	144	62	3	10	15	7	29	25	18	22	584	
Unidentifiable																	
Unifacial	10	8	19	153	8	107	44	2	7	8	4	24	12	15	17	438	
Bifacial	2	2	9	60	1	41	16	·	3	4	·	9	2	7	2	158	
Total:	**58**	**53**	**73**	**606**	**22**	**520**	**258**	**15**	**43**	**63**	**18**	**129**	**84**	**90**	**69**	**2,101**	**100.00**

◄▲ **Table 18-4** Kabazi V: tools from Micoquian occupations*.
*after A.I. Yevtushenko (1998b, Chapter 11, this volume), A.P. Veselsky (Chapter 7, this volume) and V.P. Chabai (Chapter 8, this volume).
**summarised data for assemblages excavated in 1993-96 and 2002-03.

with the Ak Kaya facie, while the smallest tools are found in Kiik Koba assemblages. Certainly, it is impossible to group assemblages into clearly separate clusters on the basis of these tendencies (Fig. 18-1). Indeed, a number of tool-kits might be regarded as "transitional" assemblages (Chabai 1999). For example, the tool-kits from sub-units III/1 and III/2 are a transitional group between Ak Kaya and Starosele assemblages (Table 18-5). Artefact reduction in Micoquian occupations at Kabazi V is best explained in the intensity of artefact utilisation. The average density of artefacts for levels with a Starosele morphological structure is 1,176 artefacts per cubic metre, while the density of artefacts in levels with Ak Kaya assemblages hardly exceeds 600 artefacts per cubic metre. Therefore, bearing in mind the palimpsest character of occupations, previously imported and produced artefacts may have been utilised and reutilised several times by the next visitors to the site. Such utilisation and reutilisation

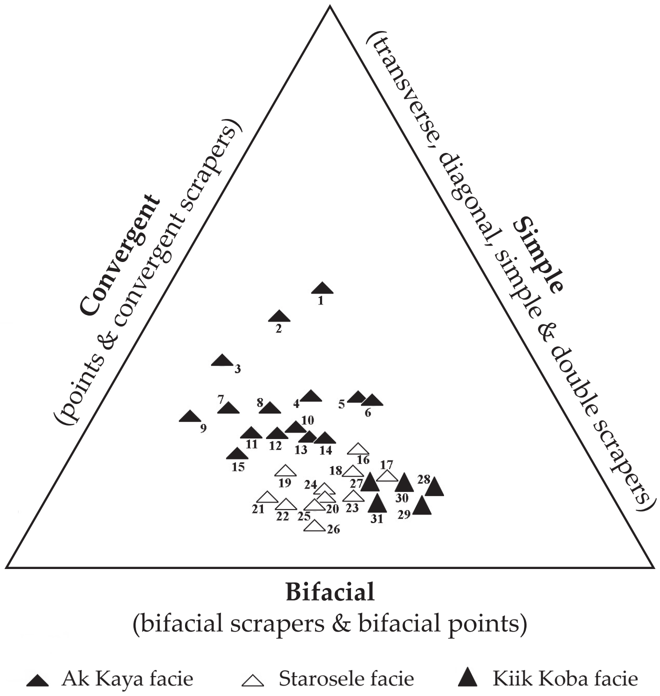

Fig. 18-1 Crimean Micoquian. Tripole graph showing the relationship of tool morphological groups according to different assemblages: 1 – Kabazi II, V-VI; 2 – Sary Kaya, 1986; 3 – Chokurcha I, IV-I; 4 – Zaskalnaya VI, II; 5 – Chokurcha I, IV-M; 6 – Zaskalnaya V, V; 7 – Kabazi II, III; 8 – Chokurcha I, IV; 9 – Sary Kaya, 1977; **10 – Kabazi V, II/4A – II/7**; 11 – Zaskalnaya V, II; 12 – Zaskalnaya V, III; 13 – Zaskalnaya V, VI; **14 – Kabazi V, III/2**; 15 – Zaskalnaya V, III; **16 – Kabazi V, III/1**; 17 – Prolom II, III; 18 – Zaskalnaya VI, V; 19 – Zaskalnaya V, I; 20 – Prolom II, II; 21 – Chokurcha I, IV-O; **22 – Kabazi V, III/5**; 23 – Zaskalnaya V, IV; 24 – Starosele, 1;25 – Zaskalnaya VI, IV; 26 – Prolom II, IV; 27 – Buran Kaya III, B; 28 – Kiik Koba, upper layer; 29 – Prolom I, lower layer; 30 – Prolom I, upper layer; 31 – Buran Kaya III, 7-8.

processes are reflected in the "reduction formula" of the Crimean Micoquian. In fact, it may be stated that the artefacts left on the living surface become the source of raw material for the next visitors.

The way in which tools have been classified in this volume means that some generalisations can be made. For example, leaf, triangular, trapezoidal and crescent shapes dominate point assemblages (Table 18-4). The most frequently observed scraper in scraper assemblages are different types of simple scrapers; transverse scrapers are also important, and convergent scrapers, such as leaf-shaped, trapezoidal and crescent-shaped scrapers, also occur in some number. Therefore, it can be concluded that points and convergent scrapers are represented by similar shapes: leaf, trapezoidal and crescent. An exception are triangular shapes which are well represented among the points, but are rare among scrapers (Table 18-4). Bifacial points and scraper assemblages are dominated by leaf and crescent shapes.

In conclusion, in around 50 % of cases Micoquian tools are represented by simple shapes, in 18 % of cases by crescents, in 13 % of cases by leaf-shaped pieces, and in 11 % of cases by trapezoidal shapes. All remaining shapes (rectangular, triangular and ovoid) play no significant role in Micoquian tools-kits.

Kabazi V: Levallois-Mousterian typological variability

Tool-kits from Kabazi V, sub-unit III/3 and Unit IV, are dominated by scrapers, on average 69 % of all identifiable tools, a value which is characteristic in all associated levels. Points make up an average of 16 % of all tools, though the actual ratios in the different levels of sub-unit III/3 and Unit IV vary greatly. Whereas in levels III/3-1, III/3-1A, III/3-2, III/3-2A and III/3-3 just a few points were found, in levels III/3-3A and Unit IV they constitute 22.9 % and 24.4 % of all tools, respectively. These latter values are similar to those identified in the WCM assemblages from Kabazi II, Unit II (Chabai 1998b). The average percentages of denticulates, notches,

		Simple	Convergent	Bifacial
Ak Kaya facie	Kabazi II, V, VI	26.2	24.6	49.2
	Sary Kaya, 1985-86	35.2	20.2	44.6
	Chokurcha I, IV-I	48.1	15.4	36.5
	Zaskalnaya VI, II	37.8	32.1	30.1
	Chokurcha I, IV-M	30.0	40.0	30.0
	Zaskalnaya V, V	28.2	42.3	29.5
	Kabazi II, III	51.3	20.5	28.2
	Chokurcha I, IV	45.1	26.8	28.1
	Sary Kaya, 1977	58.1	15.3	26.6
	Kabazi V, levels II/4A–II/7	**42.6**	**32.8**	**24.6**
	Zaskalnaya V, II	49.9	26.2	23.9
	Zaskalnaya V, III	46.1	30.4	23.5
	Zaskalnaya V, VI	41.7	35.4	22.9
	Kabazi V, sub-unit III/2	**38.9**	**38.2**	**22.9**
	Zaskalnaya VI, III	53.9	26.1	20.0
Starosele facie	**Kabazi V, sub-unit III/1**	**35.1**	**44.1**	**20.8**
	Prolom II, III	48.3	34.8	16.9
	Zaskalnaya VI, V	37.9	45.4	16.7
	Zaskalnaya V, I	33.3	50.8	15.9
	Prolom II, II	43.6	42.6	13.8
	Chokurcha I, IV-O	53.1	34.4	12.5
	Kabazi V, sub-unit III/5	**51.2**	**37.8**	**11.0**
	Zaskalnaya V, IV	39.9	47.7	12.4
	Starosele, 1	44.3	43.4	12.3
	Zaskalnaya VI, IV	46.9	42.5	10.6
	Prolom II, IV	48.6	44.3	7.10
Kiik Koba facie	Buran Kaya III, B	36.5	49.1	14.4
	Kiik Koba, верх.	26.9	59.3	13.8
	Prolom I, низ.	30.2	59.1	10.7
	Prolom I, верх.	30.9	54.4	14.7
	Buran Kaya III, 7-8	37.0	51.9	11.1

Table 18-5 Crimean Micoquian: morphological tool groups.

end-scrapers, burins, truncated-faceted and composite tools listed in Table 18-6 reflect the real value of these tools in each level. Bifacial tools are not characteristic for the WCM, and those found in Unit IV were imported to the site (Chapter 14, this volume).

Distal and lateral points are the most characteristic tools in the WCM. The "atypical Levallois points", defined by Yu. Demidenko (Chapter 9, this volume) in levels III/3-1A and III/3-3A, are typologically closely related. The distal, lateral and "atypical Levallois points" are characterised by only limited amounts of retouch, i.e. at the tip or both at the tip and along a part of one edge. Distal, lateral and "atypical Levallois points" are referred to as "simple points". The second most important shape among points is the crescent-shaped pieces. All remaining shapes are represented by only insignificant numbers of points. About two thirds of scrapers are represented by simple – one-edged shapes. Also, in most levels trapezoidal-shaped scrapers are important. On average, trapezoidal shapes make up 7.5% of the total number of morphologically identified scrapers. As in the WCM there is a very high percentage of trapezoidal shapes. In the assemblage from Kabazi II, Unit II there were found no trapezoidal-shaped scrapers. The high amount of trapezoidal scrapers,

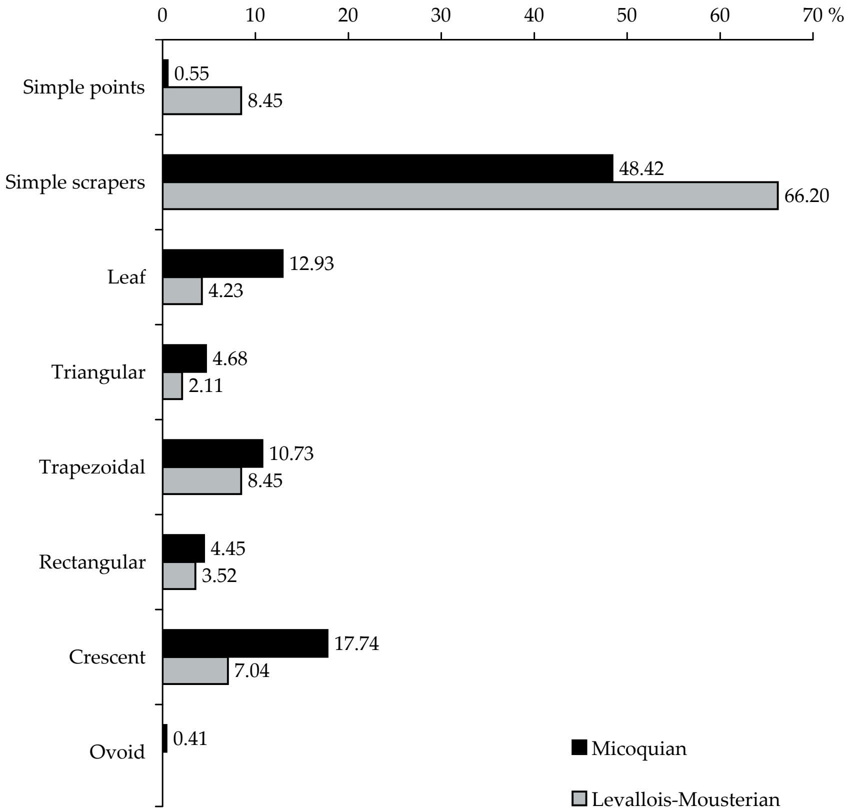

Fig. 18-2 Kabazi V: tool shapes in Micoquian and Levallois-Mousterian assemblages.

as well as the presence of some bifacials, has been interpreted as Micoquian admixture (Chapters 9 and 14, this volume).

In sum, the Levallois-Mousterian tool-kits from Kabazi V are represented by three main shapes: simple shapes make up about 75 % of pieces; crescent-shaped artefacts, about 7 %; and trapezoidal shapes, about 8.5 % of pieces. Triangular, leaf-shaped and rectangular pieces constitute just 2 % to 4 % of tool-kits.

Kabazi V: a comparison of Micoquian and Levallois-Mousterian tool shapes

The morphological structures of Kabazi V Micoquian and Levallois-Mousterian assemblages are shown in Figure 18-2. The main differences can be noted in the occurrence of simple shapes in general, and simple points in particularly, as well as in the frequency of leaf-shaped and crescent-shaped pieces. The triangular, rectangular and ovoid shapes are just as rare in both assemblages, while the similarity in the ratios of trapezoidal shapes is somewhat unexpected.

Levallois-Mousterian tool shapes from Kabazi V and in the archetype WCM assemblage from Kabazi II, Unit II are nearly identical, except in the recorded ratios of trapezoidal shapes. This distinction might be interpreted in two ways: trapezoids are Micoquian admixture (Chapter 9, this volume) or trapezoidal scrapers are more characteristic at camp-sites than they are at killing-butchering stations. The former interpretation appears to be more reliable. Also, it is necessary to note that, in spite of the functional difference between Kabazi II

Table 18-6 Kabazi V: tools from Levallois-Mousterian occupations*. ▶
* after A.I. Yevtushenko (1998b), Yu.E. Demidenko (Chapter 9, this volume) and V.P. Chabai (Chapter 14, this volume).

	Sub-Unit III/3							Unit IV				
	III/3,1994	**III/3-1**	**III/3-1A**	**III/3-2**	**III/3-2A**	**III/3-3**	**III/3-3A**	**IV/1**	**IV/2**	**IV/3**	**Total:**	**esse %**
Points												
Levallois, atypical	·	·	1	·	·	·	2	·	·	·	3	1.71
Distal	·	·	·	·	·	·	1	3	·	2	6	3.43
Lateral	·	·	·	·	·	1	·	1	·	1	3	1.71
Semi-trapezoidal	·	1	·	1	·	·	1	·	·	·	3	1.71
Semi-crescent	·	·	·	·	·	·	3	·	·	·	3	1.71
Sub-crescent	·	·	·	·	·	·	·	1	·	·	1	0.57
Hook-like	·	·	·	·	·	·	·	·	·	1	1	0.57
Sub-leaf	·	·	·	1	·	·	1	·	1	·	3	1.71
Amorphous	·	·	·	·	·	·	·	1	·	·	1	0.57
Unidentifiable	·	1	·	·	1	·	2	·	·	·	4	2.30
Scrapers												
Transverse-straight	1	·	·	·	·	·	·	1	1	·	3	1.71
Transverse-convex	2	·	·	·	·	2	·	1	2	·	7	4.00
Transverse-wavy	·	·	·	·	·	·	·	1	·	·	1	0.57
Diagonal straight	·	2	1	·	·	·	1	·	·	·	4	2.30
Diagonal convex	·	·	·	·	·	·	1	2	2	·	5	2.86
Straight	2	·	·	1	·	2	·	1	2	·	8	4.57
Convex	6	7	5	1	2	6	11	3	1	1	43	24.57
Concave	·	·	1	·	·	1	·	·	·	·	2	1.14
Wavy	1	1	1	·	·	·	·	2	·	·	5	2.86
Double straight	·	·	·	·	·	·	1	·	·	·	1	0.57
Straight-convex	2	·	·	·	·	·	·	2	1	·	5	2.86
Straight-concave	·	·	·	1	·	·	·	·	·	·	1	0.57
Double convex	·	·	·	·	·	2	·	·	1	·	3	1.71
Convex-concave	·	3	·	·	·	·	·	1	·	·	4	2.30
Double concave	2	·	·	·	·	·	·	·	·	·	2	1.14
Sub-triangular	·	·	·	·	·	·	1	·	·	·	1	0.57
Triangular	·	·	·	1	·	·	·	·	·	1	2	1.14
Semi-trapezoidal	·	2	·	1	·	·	1	1	·	1	6	3.43
Sub-trapezoidal	·	·	2	·	·	·	·	·	·	·	2	1.14
Trapezoidal	·	·	·	·	·	·	1	·	·	·	1	0.57
Semi-rectangular	·	·	·	·	·	·	2	1	·	·	3	1.71
Sub-rectangular	·	1	1	·	·	·	·	·	·	·	2	1.14
Semi-crescent	·	·	1	·	·	·	·	·	·	·	1	0.57
Sub-crescent	1	·	·	·	·	·	2	·	1	·	4	2.30
Semi-leaf	1	·	·	1	·	·	·	·	·	·	2	1.14
Sub-leaf	·	·	·	·	·	·	1	·	·	·	1	0.57
Convergent, unidentifiable	·	·	·	·	·	1	1	·	·	·	2	1.14
Denticulates	1	·	·	1	·	5	4	·	·	·	11	6.29
Notches	·	1	·	·	·	1	1	·	1	·	4	2.30
End-scrapers	·	·	·	·	·	·	1	·	·	·	1	0.57
Burins	·	·	1	·	·	·	·	1	·	·	2	1.14
Truncated-faceted	·	·	·	·	·	·	2	·	1	·	3	1.71
Composite tools	1	·	·	·	·	·	·	·	·	·	1	0.57
Bifacial scrapers												
Semi-crescent	·	·	·	·	·	·	·	1	·	·	1	0.57
Sub-crescent	·	·	·	·	·	·	·	1	·	·	1	0.57
Leaf-shaped	·	·	·	·	·	·	·	1	·	·	1	0.57
Bifacial reutilized	·	·	·	·	·	·	·	·	1	·	1	0.57
Retouched pieces	22	23	10	11	7	20	39	15	8	5	160	
Thinned pieces	·	·	·	·	·	·	·	2	·	·	2	
Unidentifiable, unifacial	2	7	1	5	7	7	23	4	3	6	65	
Total:	**44**	**49**	**25**	**25**	**17**	**48**	**103**	**47**	**26**	**18**	**402**	**100.00**

		Kabazi V	Kabazi II
Micoquian	Simple, points	0.55	·
	Simple	48.42	72.22
	Leaf	12.93	5.56
	Triangular	4.68	·
	Trapezoidal	10.73	3.70
	Rectangular	4.54	5.56
	Crescent	17.74	12.96
	Ovoid	0.41	·
	Total:	100.00	100.00
Levallois-Mousterian	Simple, points	8.45	7.52
	Simple	66.20	66.58
	Leaf	4.23	6.96
	Triangular	2.11	6.96
	Trapezoidal	8.45	·
	Rectangular	3.52	1.39
	Crescent	7.04	10.59
	Ovoid	·	·
	Total:	100.00	100.00

◄ **Table 18-7** Kabazi V and Kabazi II: Micoquian and Levallois-Mousterian tool shapes.

and Kabazi V, the Levallois-Mousterians used the workshop model of flint exploitation at both sites.

On the other hand, the shape structures of Micoquian tool-kits from Kabazi II and Kabazi V are very different (Table 18-7), with these differences reflecting the selected character of Kabazi II tool-kits. In other words, such differences might be interpreted as indicating two different models of raw material exploitation: the workshop model at Kabazi V, and the tool-users model at Kabazi II. "Tool-users" tool-kits are characterised by shape structures of a restricted character, i.e. 5 out of 8 potential shapes are represented and about three quarters of identifiable shapes constitute simple shapes. In a certain sense, the morphological structure of Micoquian "users" tool-kits are more similar to Levallois-Mousterian workshop ones. However, such a similarity is feigned, because Micoquian tool-kits comprise about 30 % bifacial tools.

Kabazi V: Fauna Exploitation Model

Only one model of fauna exploitation has been applied to Kabazi V, the consumption of previously dismembered ungulates (Chapter 6, this volume). The main species hunted were *Saiga tatarica* and *Equus hydruntinus*. The role of scavenging was insignificant. In levels III/1A and III/2, which are associated with Micoquian assemblages, mammoth bones were collected as fuel for hearths. The combination of the consumption model of fauna exploitation and the workshop model of flint exploitation is characteristic for camps of type A. This type of camp has been defined for the Levallois-Mousterian occupation at Shaitan Koba and for the Micoquian occupations at Zaskalnaya V and Zaskalnaya VI (Chabai, Uthmeier 2006).

Kabazi V: Hearths and Pits

Hearths are common features for both Micoquian and Levallois-Mousterian occupations (Chapter 2, this volume). Both Micoquians and Levallois-Mousterians preferred to use simple hearths. At the same time, at such sites as Prolom II, II (Micoquian) and Kabazi I (mixed assemblage) hearths surrounded by stones were used (Kolosov 1986; Formosov 1959b). There is no evidence of long-term usage of hearths or hearth renewal in association with Micoquian and Levallois-Mousterian assemblages.

At Kabazi V pits are associated with Micoquian assemblages. Moreover, all pits found from the Crimean Middle Palaeolithic (Kabazi V, III/1A, III/4-2; Zaskalnaya VI, II; Zaskalnaya V, III; Kiik Koba, upper level) are associated with Micoquian assemblages. Nowadays it can be concluded that artificial pits are a characteristic attribute of Micoquian living surfaces.

Discussion

The Levallois-Mousterian and Micoquian assemblages, which coexisted under similar environmental conditions and using similar models of raw material and fauna exploitation, can be differentiated from one another at five different levels. First, regarding the strategy of primary flaking, i.e. core reduction versus bifacial flaking, or in other words, Levallois and blade technologies opposed to bifacial plano-convex tool production. Second, there are the methods of tool elaboration: while ventral thinnings are characteristic for the Micoquian, they are rare in Levallois-Mousterian assemblages. Third, there are the instruments of flaking: hammerstones and pebble retouchers are common for both Levallois-Mousterian and the Micoquian, while bone retouchers were used in Micoquian assemblages only. Fourth, tool shapes and typology are closely connected with a distinction made in primary flaking: whereas unifacial tools of simple and crescent shapes occur in the Levallois-Mousterian, the Micoquian assemblages are characterised by simple-shaped, leaf-shaped, trapezoidal and crescent-shaped unifacial and bifacial tools. Finally, the living surfaces of Micoquian occupations were organised with hearths and pits, while hearths are the only structures associated with living surfaces of Levallois-Mousterian occupations. Also, mammoth bones served to fuel some hearths in Micoquian levels, while there is no evidence for this practice in Levallois-Mousterian occupations.

In fact, four of the five distinctions noted between Micoquian and Levallois-Mousterian are of technological significance, which is undoubtedly related to quite different styles of living. The manner in which living space was organised might reflect the range of economic activity (pit in level III/4-2). Further, the significance of the "digging activity" undertaken by the Micoquians is still unclear. In the Crimean Middle Palaeolithic they left three caches; two of these contained the waste from bifacial tool and core/bifacial tool production (Kabazi V, III/4-2; Zaskalnaya V, III), and one was a hiding place for bifacial tools (Zaskalnaya VI, II).

On the other hand, both Micoquian and Levallois-Mousterian camps at Kabazi V appear to be links in a chain of relatively complicated settlement systems connected with kill and butchering stations (Chabai, Uthmeier 2006). In theory, the Levallois-Mousterian camps at Kabazi V, Unit IV and sub-unit III/3 might have been supplied with *Equus hydruntinus* meat from contemporaneous kill and butchering stations at Kabazi II, levels IIA/2 through II/1. The saiga kill and butchering stations are unknown, as are Micoquian kill and butchering stations that are contemporaneous with Kabazi V, sub-units III/1, III/2 and III/5. In spite of the technological differences and distinctions in the organisation of living floors, the Crimean Micoquian and Levallois-Mousterian show nearly identical models of land use (Chabai, Uthmeier 2006). Therefore, it is likely that the land use models depend rather on the environmental characteristics than on the technological parameters of Micoquian and Levallois-Mousterian techno-complexes. Thus, from both technological and typological points of view, the Crimean Micoquian and the Levallois-Mousterian appear to be stylistically distinct Middle Palaeolithic entities, while the definition of peculiarities in subsistence strategies requires additional studies.

Abstract

КАБАЗИ V В КОНТЕКСТЕ СРЕДНЕГО ПАЛЕОЛИТА КРЫМА

ЧАБАЙ В.П.

Кабази V – это первая стоянка в среднем палеолите Крыма, в отложениях которой обнаружена интерстратификация микокских и леваллуа-мустьерских горизонтов. Хроностратиграфическая позиция культурных отложений Кабази V, а также их корреляция с другими стоянками, приведены в Таблицах 18-1 и 18-2.

На основании комплексных археологических, радиометрических и палеоклиматических исследований Кабази V удалось установить, что леваллуа-мустьерские и микокские поселения сосуществовали в сходных климатических условиях и практиковали сходные модели эксплуатации кремневого сырья. Вместе с тем, между микокскими и леваллуа-мустьерскими комплексами Кабази V существуют пять основных различий. Во-первых, технология первичного расщепления леваллуа-мустье основана на специфических леваллуазских и пластинчатых методах нуклеусного скалывания, тогда как для микока характерно использование плоско-выпуклого метода производства двусторонних орудий. Во-вторых, для микока присуще использование разнообразных приемов вентральных утончений для односторонних орудий и базального утончения для двусторонних орудий, тогда как в леваллуа-мустье вентрально-утонченные орудия встречаются крайне редко. В-третьих, инструменты первичного расщепления в микокских и леваллуа-мустьерских комплексах представлены отбойниками и ретушерами на гальках, тогда как костяные ретушеры использовались только в микоке. В-четвертых, существенные различия в орудийных наборах представлены не только наличием / отсутствием двусторонних орудий, но и морфологической структурой орудийных наборов. Для леваллуа-мустье характерно преобладание простых форм остроконечников и скребел при достаточно существенной роли сегментовидных форм (Fig. 18-2). Морфологическая структура микока представлена: простыми, листовидными, трапециевидными и сегментовидными формами. В-пятых, в микоке жилые поверхности гротов оборудовались при помощи очагов и ям, тогда как в леваллуа-мустье использовались только очаги. Для микокских очагов в виде топлива заготавливались кости мамонтов, тогда как свидетельства преднамеренной заготовки костей в виде топлива для леваллуа-мустьерских очагов не обнаружены.

Микокские и леваллуа-мустьерские поселения Кабази V являются лагерями типа А. На этих лагерях производился полный цикл обработки кремня, включая изготовление и реутилизацию орудий, а также происходило потребление импортированных частей туш сайги и гидрунтинусов. Лагеря типа А являются частью системы поселений, в которой предполагается наличие специализированных стоянок по первичной разделке охотничьей добычи.

Таким образом, носители микокских и леваллуа-мустьерских комплексов, сосуществовали в сходных климатических и сырьевых условиях, использовали одинаковые модели эксплуатации сырьевых и фаунистических ресурсов, но производили технологически и типологически различные артефакты и разными способами обустраивали жилые поверхности. Иными словами, крымский микок и леваллуа-мустье являются примером сосуществующих во времени и пространстве стилистически дискретных традиций.

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KABAZI V: INTERSTRATIFICATION OF MICOQUIAN & LEVALLOIS-MOUSTERIAN CAMP SITES

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Chapter 13

Kabazi V, Sub-Unit III/7: Artefacts

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This sub-unit was first discovered and investigated in 2003. Sub-unit III/7 comprises a total of three different levels: III/7-1, III/7-2 and III/7-3. However, it should be remarked that these levels are not uninterrupted scatters of surface finds, but depressions caused by erosion to the surface of lithological layer 14A, which – in turn – became filled with sediment from lithological layer 12A (Chapter 1, this volume). These depressions take the form of amorphous shallow pits. The investigated areas of archaeological levels III/7-1 and III/7-2 measure ca. 3.5 m², and level III/7-3 was excavated in an area of around 1 m².

The flint material from sub-unit III/7 has been analysed following a classification system developed by Gladilin (1976), and subsequently adopted for Crimean Middle Palaeolithic studies (Chabai and Demidenko 1998). Typological and technological characteristics of artefact assemblages from levels III/7-1 and III/7-2 suggest that these can be attributed to mixed complexes with both Levallois-Mousterian and Crimean Micoquian characteristics. On the other hand, the assemblage from level III/7-3 can be assigned to the Crimean Micoquian.

Structure of the Artefact Assemblage

The 8,291 artefacts recovered from sub-unit III/7 (Table 13-1) can be subdivided into three main groups. The first group (8,278 items) comprises products from flint processing which can be subdivided into six artefact categories (chunks, chips, flakes, blades, preforms, and tools; Table 13-1). The most numerous category in this group are chips, which make up 96.76 % of all flint processing products. Among blanks larger than 3 cm, flakes are dominant, i.e. in the essential count (without chips and chunks) they constitute 68.05 % of blanks, with blades numbering nigh on 6 times fewer pieces. The same relation is observed for all other archaeological levels, except for level III/7-3 (Table 13-1). Tools in the essential counts vary from 14 % in level III/7-3, and up to 24 % in level III/7-1 (Table 13-1). In level III/7-1 tools are represented by unifacial forms. A single complete bifacial leaf-shaped tool was discovered in level III/7-3, and one unidentifiable fragment of a bifacial tool was recovered from level III/7-2.

The second group of archaeological artefacts comprises bone retouchers (Table 13-1). These tools, which would have been essential for flint treatment, are found in all archaeological levels. Finally, the third group is natural river pebbles. These were found only in archaeological level III/7-1, whereby none show traces of use.

The characteristic features of sub-unit III/7 artefact structure are 1) a low to middle range tool ratio, 2) the absence of cores and bifacial preforms, and 3) the dominance of unifacial tools.

Chunks

Chunks were found in two archaeological levels: III/7-1 and III/7-2 (Table 13-1), whereby in excess of 74 % stem from level III/7-2. Chunks can be described as the naturally split fragments of flint from either nodules or plaquettes. A chunk from level III/7-1 was burnt. Due to their limited sizes, chunks from sub-unit III/7 are too small to be considered a raw material reserve; in fact, they might be considered as waste of resources, originating as they do from the utilization of poor-quality nodules. Practically all chunks have dimensions not exceeding 5 cm. The largest observed chunk was encountered in level III/7-1 (length: 52.87 mm, width: 36.21 mm, and thickness: 13.68 mm). On the other hand, average dimensions of chunks are as follows: length – 31.12 mm, width – 20.25 mm, and thickness – 11.42 mm.

Preforms

Only a single item from this category was recorded in sub-unit III/7; a preform fragment was found in level III/7-3 (Table 13-1). Due to its small size (length: 20.26 mm; width: 36.41 mm; thickness: 18.81 mm), it is unclear whether this artefact is the preform of a core or of a bifacial tool.

Blank variability

Blanks from sub-unit III/7 include chips, flakes, and blades. Among blanks, chips are the most frequently observed (97.15 %; Table 13-2). Further, regular chips and chips with broken butts prevail. Chips (1.0 – 2.9 cm) from bifacial thinning make up 27.24 % (Table 13-3) of chips with identifiable striking platforms. The percentages of bifacial thinning chips in chip assemblages from each of the respective levels is as follows: level III/7-1 – 24.68 %; level III/7-2 – 27.7 %; and level III/7-3 – 35.38 %. Similar ratios of bifacial thinning chips have previously been encountered in levels III/1 (22.29 %) and III/2 (35.85 %), both of which have been shown to have yielded Micoquian assemblages. Among flakes and blades, items from bifacial thinning are represented by relatively small amounts, from 1.53 % to 5.76 % in levels III/7-1 and III/7-2, respectively. The blade index of sub-unit III/7 lies at 15.74. The variation in blade indexes ranges from 13.85 in level III/7-1 to 15.38 in level III/7-2. On the whole, blade indexes in archaeological levels belonging to sub-unit III/7 fall within the parameters considered characteristic for the Crimean Micoquian.

In sum, the presence of bifacial thinning items among all types of removals, the complete absence of cores, as well as the low blade index, are all suggestive of the fact that the majority of blanks resulted from the production of bifacial tools.

Flint artefacts	III/7-1	III/7-2	III/7-3	Total:	%	ess %
Chunks	7	20	·	27	0.33	·
Preforms	·	·	1	1	0.01	0.41
Chips	3,745	4,034	231	8,010	96.76	·
Flakes	42	113	9	164	1.98	68.05
Blades	8	18	3	29	0.35	12.03
Tools	16	29	2	47	0.57	19.51
Total:	**3,818**	**4,214**	**246**	**8,278**	**100.00**	**100.00**

Pebble & bone artefacts	III/7-1	III/7-2	III/7-3	Total:
Pebble fragments	3	·	·	3
Bone retouchers	4	4	2	10
Total:	**7**	**4**	**2**	**13**

Table 13-1 Kabazi V, sub-unit III/7: artefact totals.

Chips

Chips are the most numerous artefacts in the sub-unit III/7 assemblage (Table 13-3), as such have been subdivided into five different groups: "regular" chips, bifacial thinning chips, rejuvenating chips, broken chips, and small chips (measuring from 0.1 to 0.9 cm in length). Due to the small size of those pieces attributed to the latter group, it proved difficult to differentiate between those stemming from "regular" and those from "bifacial" thinning processes. Bifacial thinning chips are characteristic for all levels of sub-unit III/7, and they make up about a quarter of all identifiable chips from each of the levels. As a rule, such a high percentage of bifacial thinning chips is characteristic for Micoquian complexes and attests to the on-site production of bifacial tools. Usually, the percentages of "bifacial thinning chips" in Levallois-Mousterian assemblages are three times lower, and as such reflect the preparation of supplementary platforms on cores, e.g. the percentage of "bifacial thinning chips" in Kabazi V, IV/1 (WCM industry) is 7.63 % of all identifiable chips.

Additionally, in archaeological levels III/7-1 and III/7-2, a series of diagnostic removals from the renewal of distal tips of bifacial convergent tools was observed – bifacial thinning removal of type "3B" after Yu. Demidenko (Demidenko 2004a, 2004b). In archaeological levels III/7-1 and III/7-2 rejuvenating tips make up 9.21 % and 10.79 %, respectively, of all bifacial thinning and rejuvenating chips.

	III/7-1	III/7-2	III/7-3	Total:	%
Chips *	3,670	3,881	208	7,759	94.08
Bifacial thinning & rejuvenating chips *	76	154	23	253	3.07
Flakes *	55	125	9	189	2.29
Bifacial thinning flakes *	1	7	1	9	0.11
Blades *	9	22	3	34	0.41
Bifacial thinning blades *	·	2	1	3	0.04
Total:	**3,811**	**4,191**	**245**	**8,247**	**100.00**

* including tools

Table 13-2 Kabazi V, sub-unit III/7: blank variability as numbers and percentages of each type.

	cm	III/7-1	III/7-2	III/7-3	Total:	ess %
Regular	1.0 - 1.9	174	306	31	511	55.00
	2.0 - 2.9	58	96	11	165	17.76
Bifacial	1.0 - 1.9	55	109	16	180	19.38
	2.0 - 2.9	14	30	7	51	5.49
Rejuvenating	0.1 - 0.9	4	2	·	6	0.65
	1.0 - 1.9	2	12	·	14	1.51
	2.0 - 2.9	1	1	·	2	0.21
Broken	1.0 - 1.9	536	932	87	1,555	·
	2.0 - 2.9	100	158	24	282	·
Other chips	0.1 - 0.9	2,801	2,388	55	5,244	·
	Total:	**3,745**	**4,034**	**231**	**8,010**	**100.00**

Table 13-3 Kabazi V, sub-unit III/7: dimensions of chips.

Flakes and blades

Flakes make up 84.26 % of all removals larger than 3 cm. The rest is represented by blades (Table 13-2). The percentages of bifacial thinning flakes and blades are rather small (1.53 – 5.76 %) for Micoquian standards, but too high to be accepted as characteristic for WCM complexes. There are no rejuvenating blades and flakes. At the same time, five *débordante* flakes and blades, and one Levallois flake were found in level III/7-2.

Blank dimensions

In all archaeological levels of sub-unit III/7 there is observed an insignificant prevalence of blank length over blank width for all complete flakes (Table 13-4). Thus, generally speaking, it cannot be stated that elongated blanks among flakes are typical for sub-unit III/7. Furthermore, between 35 % (level III/7-1) and up to 43 % (level III/7-2) of flakes are characterised by transverse proportions, i.e. whereby the width prevails over the length (Fig. 13-1; 13-2). Most flakes range from between 3 and 4 cm in length / width (Fig. 13-1; 13-2), although there are a few flakes longer than 5 cm. The sub-unit III/7 blade assemblage is statistically incomplete to be of significance for parameter studies.

Whereas in level III/7-1 unifacial tools are smaller than unretouched flakes and blades (Fig. 13-1), in level III/7-2 unifacial tools are longer than the latter (Fig. 13-2). At the same time, they do not form a clearly separate cluster of artefacts. Also, in both levels the majority of unifacial tools was made on elongated blanks.

Platform dimensions

The most prominent feature with regard to platform dimensions is the observation that in level III/7-2 blanks with the widest and thickest striking platforms were used for tool production (Table 13-4). This fact once again substantiates that only the largest blanks in this level were used for tool production (Fig. 13-1; 13-2). Further, it may be assumed that some of the unifacial tools found in this same level were actually imported to the site, and were therefore not connected with on-site flint reduction.

Surface cortex

66.67 % of blanks in sub-unit III/7 display cortex on their dorsal surfaces (Table 13-5). With the exception of bifacial thinning flakes, the different blank groups comprise between 66.49 % and 73.53 % of pieces with dorsal cortex coverage. The highest percentage (73.53 %) of corticated blanks is found among "regular" blades, while the lowest percentage (44.44 %) is observed among bifacial thinning flakes.

In each of the blank groups the majority of pieces demonstrate the minimal percentage of

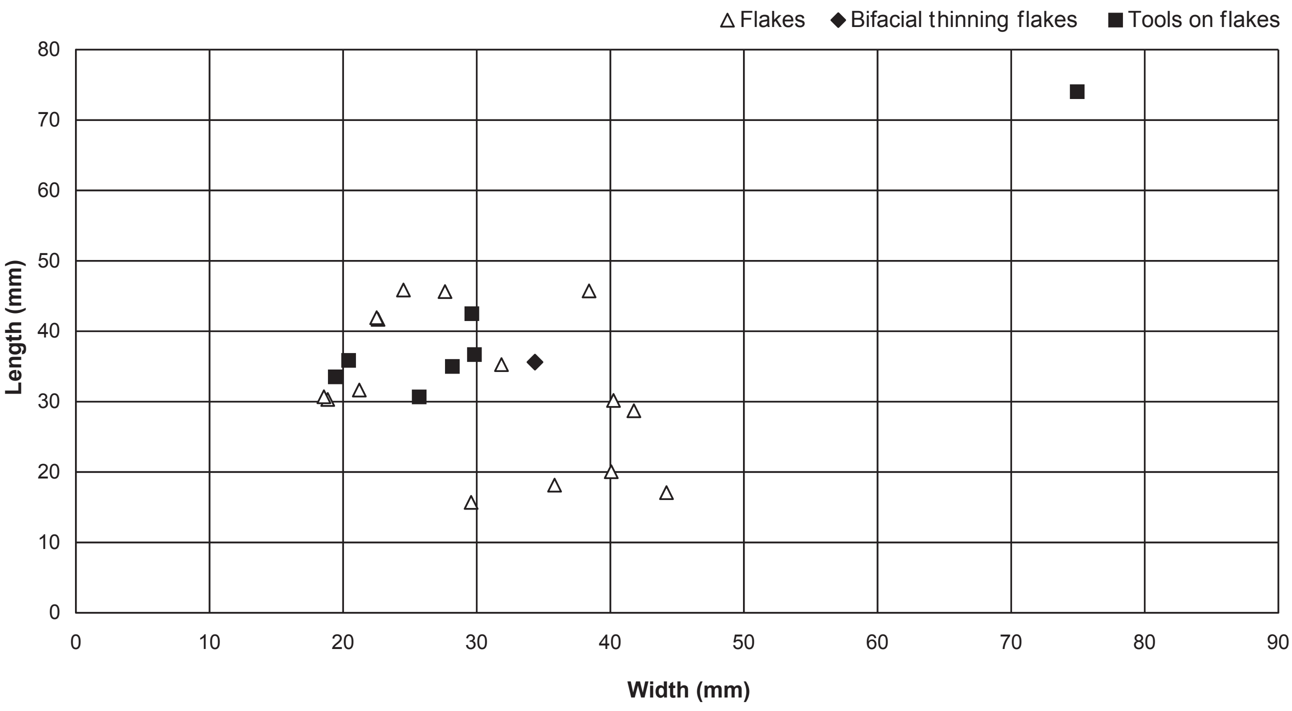

Fig. 13-1 Kabazi V, level III/7-1: distribution of flake types, by length/width parameters.

	Blank types	III/7-1	III/7-2	III/7-3
Length	flakes including tools	34.27	33.24	31.24
	blades including tools	51.40*	48.42	34.26*
	blanks (flakes & blades)	35.99	35.19	24.46
	tools	44.04	46.77	·
Width	flakes including tools	32.66	31.55	28.77
	blades including tools	24.43*	18.59	14.94*
	blanks (flakes & blades)	29.86	29.04	24.16
	tools	30.95	28.74	·
Thickness	flakes including tools	7.11	5.84	5.99
	blades including tools	5.73	5.19	5.23*
	blanks (flakes & blades)	6.83	5.72	5.74
	tools	8.68	7.64	·
Platform width	flakes including tools	13.63	16.49	16.53
	blades including tools	13.51	7.46	7.22
	blanks (flakes & blades)	13.62	15.32	13.43
	tools	11.61	15.77	·
Platform thickness	flakes including tools	3.73	4.46	4.61
	blades including tools	6.82	3.20	4.31
	blanks (flakes & blades)	4.08	4.29	4.51
	tools	4.85	5.50	·

*the number of artefacts is < 3 pieces

Table 13-4 Kabazi V, sub-unit III/7: average dimensions of blanks and blank platforms (mm).

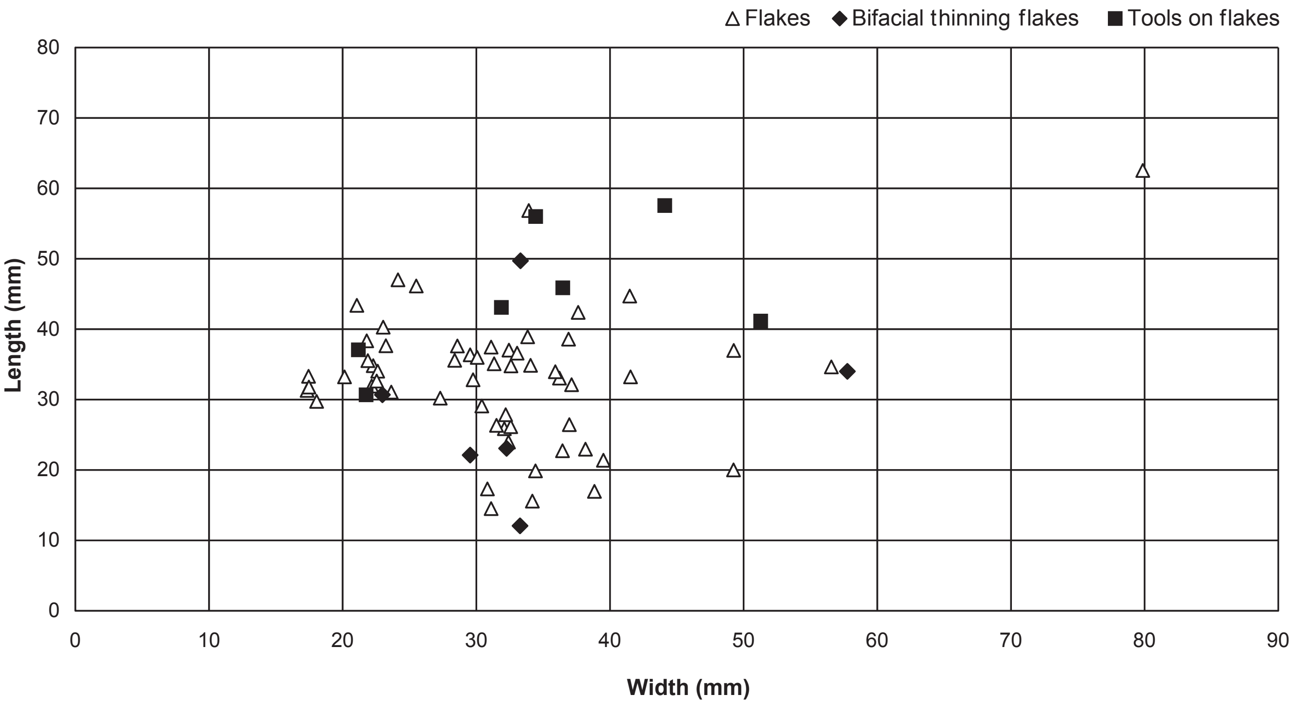

Fig. 13-2 Kabazi V, level III/7-2: distribution of flake types, by length/width parameters.

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
0 %	18	43	3	64	27.00
1-25 %	16	43	2	61	25.74
26-50 %	6	17	2	25	10.55
51-75 %	3	8	·	11	4.64
76-100 %	12	15	3	30	12.66
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
0 %	·	4	1	5	2.11
1-25 %	1	3	·	4	1.69
26-50 %	·	·	·	·	·
51-75 %	·	·	·	·	·
76-100 %	·	·	·	·	·
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
0 %	1	7	1	9	3.80
1-25 %	4	9	1	14	5.91
26-50 %	2	2	1	5	2.11
51-75 %	·	1	·	1	0.42
76-100 %	2	3	·	5	2.11
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
0 %	·	1	·	1	0.42
1-25 %	·	1	1	2	0.84
26-50 %	·	·	·	·	·
51-75 %	·	·	·	·	·
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-5 Kabazi V, sub-unit III/7: flakes & blades – dorsal cortex.

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
Cortex	10	15	3	28	11.81
Lateral	·	2	·	2	0.84
Bilateral	·	1	·	1	0.42
Radial	·	1	·	1	0.42
Converging	10	16	3	29	12.24
Unidirectional	7	33	1	41	17.30
Unidirect.-crossed	2	14	·	16	6.75
Bidirectional	4	15	·	19	8.02
Bidirect.-crossed	1	2	1	4	1.69
Crested	3	5	·	8	3.38
Janus	·	1	·	1	0.42
Unidentifiable	18	21	2	41	17.3
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
Lateral	·	1	·	1	0.42
Converging	·	2	1	3	1.27
Unidirectional	1	2	·	3	1.27
Bidirectional	·	2	·	2	0.84
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
Cortex	2	3	·	5	2.11
Unidirectional	5	4	2	11	4.64
Unidirect.-crossed	·	6	·	6	2.53
Bidirectional	1	1	·	2	0.84
Bidirect.-crossed	·	5	·	5	2.11
Crested	·	2	1	3	1.27
Unidentifiable	1	1	·	2	0.84
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
Converging	·	1	·	1	0.42
Unidirectional	·	·	1	1	0.42
Crested	·	1	·	1	0.42
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-6 Kabazi V, sub-unit III/7: flakes & blades – dorsal scar patterns.

cortex (<25 %) on their dorsal surfaces. Blanks with >50 % of cortex on their dorsal surfaces are found exclusively among "regular" flakes and blades; they are not numerous and make up 14.77 % of the total amount of blanks.

Dorsal scar patterns

A total of 12 different types of dorsal scar patterns have been identified on blanks from sub-unit III/7. The maximum variability of dorsal scar patterns is found on flakes (Table 13-6). Whereas the most frequently observed dorsal scar patterns on flakes are the cortex, converging and unidirectional variants, among blades the most widespread are unidirectional types. The presence of such scar patterns as unidirectional, unidirectional-crossed, bidirectional-crossed, and especially crested flakes, are all attributes considered characteristic of Western Crimean Mousterian (WCM) complexes. In the flake assemblage from level III/7-2 these types of dorsal scar patterns compose 55 % of all identified types, whereby unidirectional scar patterns are the most frequent (Table 13-6). A prevalence of unidirectional scar patterns, together with numerous flakes displaying unidirectional-crossed, bidirectional-crossed and crested dorsal scar patterns, are indirect evidence that at least 55 % of flakes were obtained from cores using a parallel system of reduction. A similar system of core reduction is also typical for WCM industries. Further, the practically equal ratios of dorsal scar pattern types found in the blade assemblage from level III/7-2 (Table 13-6) serve to confirm the previous assumption regarding the characteristic system of core reduction in this level.

Axis

On-axis blanks prevail, with 72.67 % of all flakes and blades being recognised as such (Table 13-7). Among regular flakes 66.14 % are on-axis. The highest percentage of off-axis blanks was found among bifacial thinning flakes (50 %).

Shapes

Flakes are usually either trapezoidal, rectangular or crescent-shaped (Table 13-8). More than 70 % of all identifiable blanks are either trapezoidal or are trapezoidal elongated "regular" flakes. "Bifacial thinning flakes" are represented by trapezoidal shapes only (Table 13-8). Among blades rectangular shaped artefacts are dominant, this shape being observed for 64.28 % of all identifiable blades (Table 13-8).

Lateral profiles

Among "regular" flakes a large part of blanks (30.36 %) displays an incurvate medial profile (Table 13-9), followed by pieces with twisted (24.08 %), incurvate distal (14.14 %), convex (4.71 %) and flat (4.19 %) profiles. Only a small number of flakes with a convex profile were recorded in levels III/7-1 and III/7-2.

Among "bifacial" thinning flakes the incurvate medial profile is also characteristic. Flat and incurvate distal profiles are insignificant among these artefacts (Table 13-9).

The twisted profile is the most frequent among "regular" blades (Table 13-9). Blades with a twisted profile make up 59.46 % all identifiable blades, followed by "regular" blades with incurvate medial profile (35.14 %). Less than 3 % of blades have a flat profile. Bifacial thinning blades are represented in practically equal proportions by blanks with incurvate medial and twisted profiles (Table 13-9).

Distal profiles

Hinged and feathering types of distal termination are the most frequently observed among flakes from sub-unit III/7, with 52.08 % and 41.67 %, respectively (Table 13-10). Among "regular" and "bifacial thinning" flakes the hinged type of distal end is predominant. The blunt and overpassed variations are not numerous and are considered characteristic for "regular" flakes only. Flakes with overpassed distal profiles were discovered solely in archaeological level III/7-2 (Table 13-10). The majority of blades is characterised by a feathering distal profile. Hinged profiles are not numerous, but do occur among "regular" blades. Other variations of end termination include one blade with an overpassed distal profile (level III/7-2) and one with a blunt (level III/7-1) distal profile. The distal ends of roughly half (45.83 %) of all blanks in sub-unit III/7 are missing.

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
On-axis	22	59	3	84	35.44
Off-axis	10	30	3	43	18.14
Unidentifiable	23	37	4	64	27.00
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
On-axis	1	3	·	4	1.69
Off-axis	·	4	·	4	1.69
Unidentifiable	·	·	1	1	0.42
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
On-axis	9	22	3	34	14.35
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
On-axis	·	2	1	3	1.27
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-7 Kabazi V, sub-unit III/7: flakes & blades – axes.

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
Rectangular	4	13	1	18	7.59
Triangular	1	5	·	6	2.53
Trapezoidal	23	57	5	85	35.86
Trapezoidal elongated	1	2	·	3	1.27
Leaf-shaped	·	1	·	1	0.42
Ovoid	1	·	·	1	0.42
Crescent	2	7	1	10	4.22
Irregular	1	·	·	1	0.42
Unidentifiable	22	41	3	66	27.85
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
Trapezoidal	1	7	1	9	3.80
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
Rectangular	5	11	2	18	7.59
Trapezoidal elongated	2	4		6	2.53
Crescent	·	2	·	2	0.84
Unidentifiable	2	5	1	8	3.38
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
Trapezoidal elongated	·	1	·	1	0.42
Crescent	·	1	·	1	0.42
Unidentifiable	·	·	1	1	0.42
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-8 Kabazi V, sub-unit III/7: flakes & blades – shapes.

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
Flat	2	6	·	8	3.38
Incurvate medial	14	41	3	58	24.47
Incurvate distal	6	21	·	27	11.39
Twisted	13	29	4	46	19.41
Convex	3	6	·	9	3.80
Unidentifiable	17	23	3	43	18.14
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
Flat	1	·	·	1	0.42
Incurvate medial	·	6	·	6	2.53
Incurvate distal	·	1	1	2	0.84
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
Flat	·	1	·	1	0.42
Incurvate medial	5	6	·	11	4.64
Twisted	4	15	3	22	9.28
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
Incurvate medial	·	2	·	2	0.84
Twisted	·	·	1	1	0.42
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-9 Kabazi V, sub-unit III/7: flakes & blades – lateral profiles

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
Feathering	15	39	4	58	24.47
Hinged	21	44	4	69	29.11
Overpassed	·	2	·	2	0.84
Blunt	2	5	·	7	2.95
Retouched	5	6	·	11	4.64
Missing	12	30	2	44	18.57
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
Feathering	·	2	·	2	0.84
Hinged	1	5	·	6	2.53
Missing	·	·	1	1	0.42
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
Feathering	4	11	1	16	6.75
Hinged	2	5	1	8	3.38
Overpassed	·	1	·	1	0.42
Blunt	1	·	·	1	0.42
Retouched	·	2	·	2	0.84
Missing	2	3	1	6	2.53
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
Feathering	·	1	·	1	0.42
Missing	·	1	1	2	0.84
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-10 Kabazi V, sub-unit III/7: flakes & blades – distal profiles.

Cross-sections at midpoint

Among flakes and blades triangular and trapezoidal cross-sections are the most common. Whereas triangular cross-sections are dominant among "regular" blanks, trapezoidal cross-sections are most numerous among "bifacial thinning" blanks (Table 13-11). Also, trapezoidal cross-sections are characteristic for all types of blades. Less representative types of midpoint cross-sections for all groups of blanks are convex, lateral steep, polyhedral and flat varieties, whereby the latter was found exclusively among "regular" flakes (Table 13-11). Lateral steep blanks are typical for "regular" removals, and constitute in level III/7-2 14.18 % of all identifiable items. Usually, the lateral steep blanks correspond to *débordante* removals, a supposedly characteristic feature of WCM industries. The polyhedral cross-sections are not numerous. This type of cross-section is inherent to "regular" and "bifacial" flakes.

Platform preparation

Platforms covered by cortex are least numerous among "regular" blanks (Table 13-12). Also, this type of striking platform is not characteristic for "bifacial" blanks. Generally, in all archaeological levels of sub-unit III/7 prepared platforms are the most typical. These constitute 68.03 % of all identifiable butts. Polyhedral platforms are most important among flakes. In levels III/7-1 and III/7-2 dihedral and polyhedral butts of "regular" and "bifacial thinning" blades are found in almost equal proportions. Facetted butts do not exceed the sum of

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
Flat	1	·	·	1	0.42
Triangular	15	22	·	37	15.61
Lateral steep	4	16	·	20	8.44
Trapezoidal	12	48	3	63	26.58
Polyhedral	1	4	1	6	2.53
Convex	5	14	3	22	9.28
Unidentifiable	17	22	3	42	17.72
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
Triangular	1	1	·	2	0.84
Trapezoidal	·	5	1	6	2.53
Polyhedral	·	1	·	1	0.42
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
Triangular	3	6	·	9	3.80
Lateral steep	1	3	·	4	1.69
Trapezoidal	4	10	3	17	7.17
Convex	1	3	·	4	1.69
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
Triangular	·	1	·	1	0.42
Trapezoidal	·	1	1	2	0.84
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-11 Kabazi V, sub-unit III/7: flakes & blades – mid-point cross-sections

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
Cortex	1	6	·	7	2.95
Plain	6	16	1	23	9.70
Dihedral	4	7	·	11	4.64
Polyhedral	9	28	2	39	16.46
Facetted	3	11	2	16	6.75
Crushed	6	17	1	24	10.13
Missing by retouch	1	·	·	1	0.42
Missing	25	41	4	70	29.54
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
Plain	·	1	1	2	0.84
Dihedral	1	·	·	1	0.42
Polyhedral	·	3	·	3	1.27
Facetted	·	3	·	3	1.27
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
Cortex	·	1	1	2	0.84
Plain	·	3	1	4	1.69
Dihedral	1	1	·	2	0.84
Polyhedral	1	1	·	2	0.84
Facetted	1	3	·	4	1.69
Crushed	2	2	1	5	2.11
Missing	4	11	·	15	6.33
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
Plain	·	1	·	1	0.42
Polyhedral	·	1	1	2	0.84
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-12 Kabazi V, sub-unit III/7: flakes & blades – platform types.

dihedral and polyhedral butts in all archaeological levels of sub-unit III/7 (Table 3-12). Faceting indexes are as follows: level III/7-1, Ifs – 14.81, Ifl – 74.07; level III/7-2, Ifs – 19.76, Ifl – 67.44; level III/7-3, Ifs – 22.22, Ifl – 55.55. A low amount of faceted striking platforms is a characteristic feature of the Crimean Micoquian. At the same time, in level III/7-2 a quarter of unifacial tool butts are faceted. In other levels striking platforms on unifacial tools are plain or polyhedral, i.e. this is further indirect evidence that the unifacial tool assemblage in level III/7-2 was imported to the site.

Platform lipping

84.06 % of platforms are unlipped (Table 13-13). Blanks with unlipped platforms prevail among "regular" flakes and blades. Semi-lipped and lipped platforms are less representative. Together, semi-lipped and lipped platforms make up 16.94 % of all identifiable platforms. Among the lipped pieces, blanks with semi-lipped platforms are twice as frequent as the lipped items. There are no lipped platforms among "regular" flakes and blades.

Platform angles

A total of 70.97 % of identifiable flakes display obtuse platforms (Table 13-14). Half of all identifiable blade platforms are either right angled or close to it. Among "bifacial thinning" flakes and blades obtuse platforms are the most dominant; at the same time these are one of the most important attributes when defining bifacial thinning debitage.

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
Unlipped	17	68	3	88	37.13
Semi-lipped	4	4	2	10	4.22
Lipped	·	·	·	·	·
Unknown	34	54	5	93	39.24
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
Unlipped	·	2	·	2	0.84
Semi-lipped	1	·	1	2	0.84
Lipped	·	5	·	5	2.11
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
Unlipped	3	8	2	13	5.49
Semi-lipped	·	1	·	1	0.42
Unknown	6	13	1	20	8.44
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
Semi-lipped	·	1	·	1	0.42
Lipped	·	1	1	2	0.84
Total:	**·**	**1**	**1**	**2**	**1.27**

Table 13-13 Kabazi V, sub-unit III/7: flakes & blades – platform lipping.

	III/7-1	III/7-2	III/7-3	Total:	%
Flakes & tools on flake					
Right, 90°	3	25	1	29	12.24
Obtuse, > 110°	18	47	4	69	29.11
Unknown	34	54	5	93	39.24
Total:	**55**	**126**	**10**	**191**	**80.59**
Bifacial thinning and rejuvenating flakes & tools on bifacial thinning and rejuvenating flake					
Obtuse, > 110°	1	7	1	9	3.80
Total:	**1**	**7**	**1**	**9**	**3.80**
Blades & tools on blade					
Right, 90°	·	5	2	7	2.95
Obtuse, > 110°	3	4	·	7	2.95
Unknown	6	13	1	20	8.44
Total:	**9**	**22**	**3**	**34**	**14.35**
Bifacial thinning blades & tools on bifacial thinning blade					
Obtuse, > 110°	·	2	1	3	1.27
Total:	**·**	**2**	**1**	**3**	**1.27**

Table 13-14 Kabazi V, sub-unit III/7: flakes & blades – platform angles.

Tools

Tools were found in all archaeological levels of sub-unit III/7 (Table 13-1). In 62.22 % of cases, tools were made on flakes (Table 13-15). Blades served as blanks for 17.78 % of tools. A few tools were made either on chips, natural flakes or bifacial thinning debitage. In the assemblage from level III/7-2 the sizes of unifacial tools correspond to the largest unretouched blanks (Fig. 13-2). On the other hand, in level III/7-1 this trend is not observed (Fig. 13-1). The general feature for all unifacial tools in sub-unit III/7 is the prevalence of elongated proportions, especially in archaeological level III/7-1. Unifacial tools with facetted striking platforms constitute three of the twelve complete examples. All of these tools were found in level III/7-2; two were made on blades and one on a flake.

The artefacts constituting the tool-kit from sub-unit III/7 can be subdivided into five different tool classes: points, scrapers, bifacial points, retouched pieces, and unidentifiable retouched fragments. In the essential count, scrapers are the most numerous (66.66 %) (Table 13-16). Points make up 28.58 % of tools in the essential count. Bifacial tools are represented by just two pieces, one of which is a complete bifacial point, the other an unidentifiable fragment. All of these tools are found typically in the Crimean Micoquian tool-kit. The percentage of bifacial tools is 4.76 % of all identifiable tools, without retouched and thinned pieces.

Points

A total of six points were found in two of the three levels (Table 13-16). Four of these stem from level III/7-2. In 4 cases, flakes served as blanks in point productions, two were made on blades. The lengths of blanks used for points range from 33.51 to 59.94 mm, and have mainly elongated proportions. Off-axis blanks with transverse proportions were used for only one point from level III/7-2. Four points were made on on-axis blanks, and in one case this attribute cannot be distinguished. From a typological perspective, each of the points can be assigned to one of the following morphological groups: semi-leaf (Fig. 13-3, *1*, *3*, *7*), semi-trapezoidal (Fig. 13-3, *2*) and unidentifiable. One semi-leaf point has a thinned back and an alternative retouch (Fig. 13-3, *3*). Other points have dorsal secondary treatment. Points were produced mainly using combinations of non-invasive scalar flat (Fig. 13-3, *1*, *2*) and invasive scalar semi-steep

	III/7-1	III/7-2	III/7-3	Total:	%
Tool on natural flakes	·	2	·	2	4.44
Tool on chips	1	1	·	2	4.44
Tool on flakes	11	16	·	27	60.00
Tool on blades	1	6	·	7	15.56
Tool on bifacial thinning flakes	·	1	·	1	2.22
Tool on bifacial thinning blades	·	·	1	1	2.22
Unidentifiable	3	1	1	5	11.12
Total:	**16**	**27**	**2**	**45**	**100.00**

Table 13-15 Kabazi V, sub-unit III/7: blank types used for tool production.

	III/7-1	III/7-2	III/7-3	Total	%	ess %
Points						
Semi-leaf, dorsal	·	2	·	2	4.25	10.00
Semi-leaf, alternative, thinned back	1	·	·	1	2.13	5.00
Semi-trapezoidal, dorsal	·	1	·	1	2.13	5.00
Unidentifiable	·	1	·	1	2.13	5.00
Scrapers						
Straight, dorsal	·	2	·	2	4.25	10.00
Convex, dorsal, terminally thinned	·	1	·	1	2.13	5.00
Concave, dorsal, thinned base	1	·	·	1	2.13	5.00
Double straight, dorsal	·	1	·	1	2.13	5.00
Straight-concave, dorsal	·	2	·	2	4.25	10.00
Double convex, dorsal	1	·	·	1	2.13	5.00
Semi-trapezoidal, dorsal	·	1	·	1	2.13	5.00
Sub-trapezoidal, dorsal	·	1	·	1	2.13	5.00
Sub-rectangular, dorsal	1	·	·	1	2.13	5.00
Semi-crescent, dorsal, thinned back	1	·	·	1	2.13	5.00
Convergent, dorsal, unidentifiable	·	1	·	1	2.13	5.00
Convergent, alternative, unidentifiable	·	1	·	1	2.13	5.00
Bifacial points						
Sub-leaf, thinned base	·	·	1	1	2.13	5.00
Retouched pieces						
On flake, lateral, dorsal	4	4	·	8	17.01	·
On flake, bilateral, dorsal	1	·	·	1	2.13	·
On flake, transverse, dorsal	·	2	·	2	4.25	·
On blade, lateral, dorsal	1	1	1	3	6.39	·
On blade, lateral, ventral	·	1	·	1	2.13	·
Unidentifiable						
Unifacial tools fragments	5	6	·	11	23.39	·
Bifacial tools fragments	·	1	·	1	2.13	·
Total:	**16**	**29**	**2**	**47**	**100.00**	**100.00**

Table 13-16 Kabazi V, sub-unit III/7: tools.

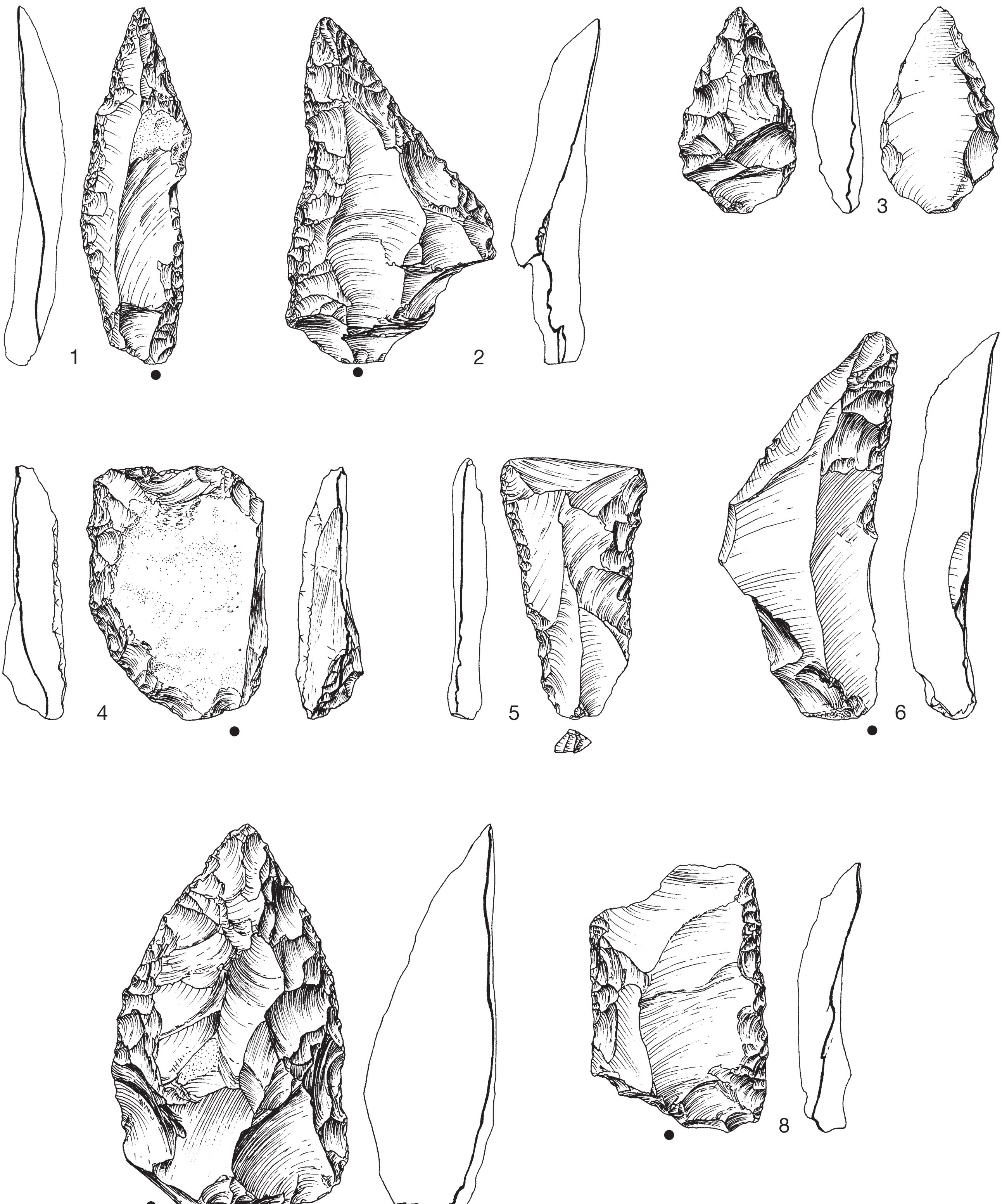

Fig. 13-3 Kabazi V, levels III/7-1 (2, 4, 6) and III/7-2 (1, 3, 5, 7, 8). Points: semi-leaf, elongated (1); semi-trapezoidal (2); semi-leaf, thinned back (3); semi-leaf (7). Scrapers: sub-rectangular, naturally backed (4); straight-concave (5); double straight (8). Retouched piece on blade (6). Tools made on blades (1, 6) and Levallois flake (5).

(Fig. 13-3, *3, 5*) retouch. It is impossible to state unequivocally whether the collection of points corresponds more to the Western Crimean Mousterian or to Micoquian traditions; whereas the semi-leaf point with non-invasive retouch produced on a blade (Fig. 13-3, *1*) is more typical of WCM complexes, the semi-trapezoidal point (Fig. 13-3, *2*) is more important in Micoquian complexes.

Scrapers

Scrapers were found in two of the three levels (Table 13-16), the most pieces (N=10) stemming from level III/7-2. Scrapers are divided into 13 different types, whereby each of these is further subdivided into three basic morphological groups: simple (4), double (4) and convergent (6). Simple and double scrapers are represented by equal proportions of pieces. The most numerous pieces are convergent scrapers (42.86% of all scrapers). At the same time, in the level III/7-2 assemblage the sum of simple and double scrapers prevail over convergent scrapers (Table 13-16). In archaeological level III/7-1, in which four scrapers were found, the sum of simple and double types is equal to the number of convergent scrapers. Flakes are the basic blank for scraper manufacture (85.71%). Scrapers made on blades were recovered from level III/7-2. Among all scrapers, those pieces made on on-axis blanks prevail (12 out of 14 pieces); one item was made on an off-axis blank, and the axis type of one piece was not identifiable. There are nine unbroken scrapers. Whereas the majority of scrapers are between 4 and 5 cm long or wide, three complete scrapers are longer or wider than 5 cm. Scrapers were produced using different combinations of scalar, flat and/or semi-steep retouch, and sometimes even invasive retouch. Ventral thinning was observed on 4 of 12 of scrapers (Table 13-16).

Simple scrapers

Simple scrapers were recovered from levels III/7-1 and III/7-2 (Table 13-16). According to the shape of their working edge, simple scrapers are subdivided into three different types: straight – 2 items, convex – 1 item, and concave – 1 item. All simple scrapers display a dorsal retouch. Ventral thinning was carried out on two of four simple scrapers. One tool with a convex working edge has a distal thinned tip, and another concave scraper has ventral base thinning. With the exception of just one tool, all simple unifacial scrapers were made on flakes; in one case a blade was used. A similar situation was encountered with regard to the preference of on-axis and off-axis blanks for scraper production, with only one tool made on an off-axis blank. Simple scrapers range in length from 30.70 to 74.02 mm, are between 21.76 and 74.95 mm wide, and from 8.79 mm to 15.91 mm thick.

Double scrapers

Double scrapers were discovered in the same levels as simple scrapers (Table 13-16), with the most pieces from archaeological level III/7-2. Consideration of their working edges allows a differentiation between double straight (Fig. 13-3, *8*), straight-concave (Fig. 13-3, *5*), and double convex pieces. All double-edge scrapers were treated by a dorsal retouch, and were produced on on-axis blanks. The straight-concave scraper from level III/7-2 was made on a Levallois flake (Fig. 13-3, *5*). Double scrapers range in length from 36.67 to 47.14 mm, they are from between 24.64 and 31.88 mm wide and 6.00 mm to 12.00 mm thick.

Convergent scrapers

Convergent scrapers are the second most common morphological group of scrapers, being found in two levels of sub-unit III/7 (Table 13-16). Complete convergent scrapers can be assigned to one of three main shapes: trapezoidal (2 items), rectangular (1 item), and crescent (1 item). Trapezoid pieces are further subdivided into semi- and sub-trapezoidal scrapers (Table 13-16). There is only one rectangular (sub-rectangular) convergent scraper (Fig. 13-3, *4*), and one crescent-shaped (semi-cresecent) scraper. All convergent scrapers were made on on-axis flakes. Convergent scrapers are between 34.99 and 57.55 mm long, 28.18 to 44.10 mm wide, and 4.18 mm to 9.73 mm thick.

Bifacial points

The only complete bifacial tool was found in level III/7-3 (Table 13-16), a bifacial point, sub-leaf with thinned base (Fig. 13-4). This bifacial point was made in a plano-convex manner using a combination of scalar and sub-parallel retouch. The angles of the retouched edges vary from flat to semi-step. The bifacial point is 112.80 mm long, 37.54 mm wide, and 13.09 mm thick.

Retouched pieces

Retouched pieces were found in all levels of sub-unit III/7 (Table 13-16), although the majority actually stems from archaeological level III/7-2. Retouched pieces make up 29.77% of the total number of tools. Most pieces were made on flakes (78.57%). Blades served as the blanks for 21.43%

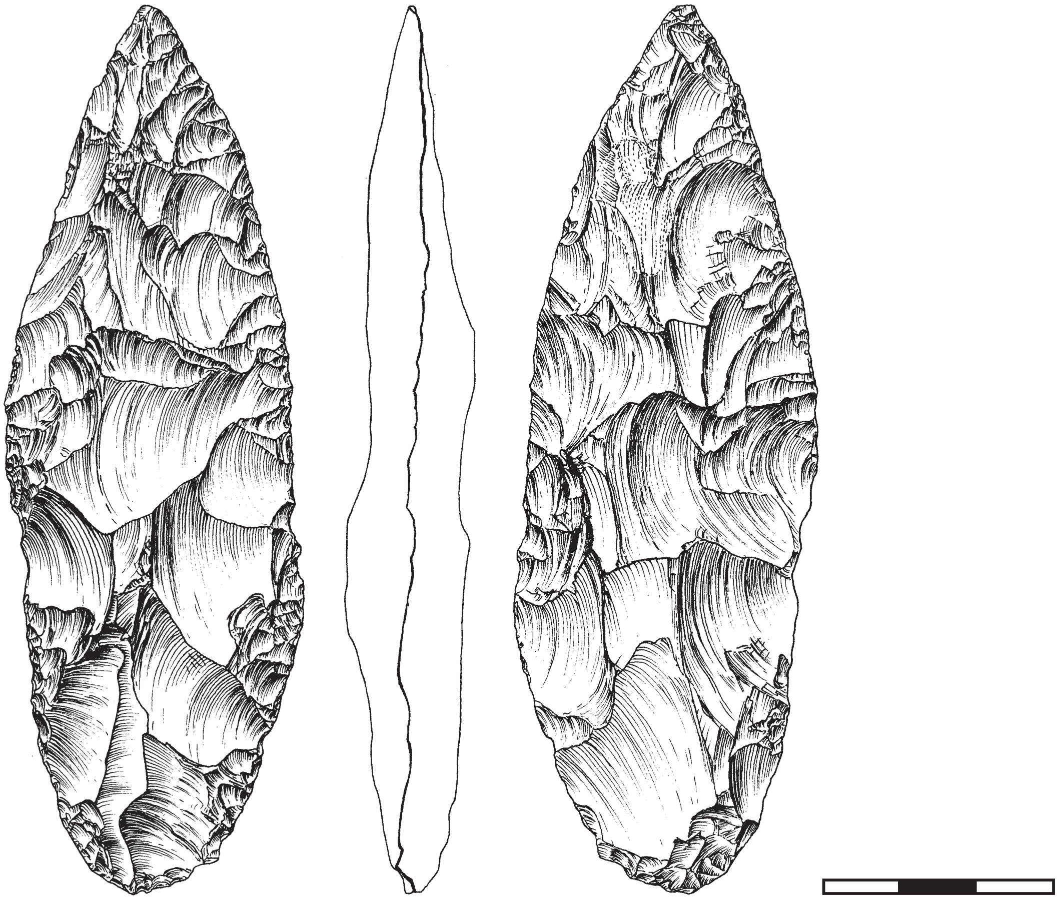

Fig. 13-4 Kabazi V, level III/7-3. Bifacial point, sub-leaf, thinned base.

of retouched pieces. The most common types of retouched pieces are either flakes or blades with one obversely retouched lateral edge (Fig. 13-3, *6*), and correspond to 71.43 % of all retouched pieces. Retouched pieces show no signs of elaboration, e.g. thinning or truncation.

Unidentifiable tools

All tiny tools fragments were assigned to unidentifiable tools. These tool fragments were found in all levels of sub-unit III/7. Unifacial unidentifiable tools comprise 23.39 % of the entire tool assemblage. The fragments of bifacial tools were discovered in archaeological level III/7-2 (Table 13-16).

Bone retouchers

A small number of bone retouchers were found in all three levels of sub-unit III/7 (Table 13-1). The bone retouchers comprise two types: one-side simple (6 pieces) and one-side double (4 pieces). For a more detailed description of the bone retouchers see Chapter 15, this volume.

Pebbles

Three sandstone pebbles were found in sub-unit III/7; all were found in level III/7-1 (Table 13-1), and all are fragmented. They lack any traces of use. The largest piece is 52.03 mm long, 32.2 mm wide, and 17.74 mm thick.

Discussion: Characteristic Features of Sub-Unit III/7 Artefact Assemblages

Artefact assemblages from archaeological complexes from sub-unit III/7 are characterised by bifacial tool production and core reduction. However, the technological chain of both these processes prove incomplete. In each level the initial stages of flint reduction are represented by flakes and blades. Even so, not only cores, but their preforms, as well as half-finished products of bifacial tools, are absent. The results of flint reduction comprise mainly unifacial tools and a few bifacials in archaeological levels III/7-2 and III/7-3.

The levels composing sub-unit III/7 differ with respect to the observed types of blanks. For all levels the ratios of "bifacial thinning" chips are very close to those encountered in the Crimean Micoquian assemblages at Kabazi V, levels III/1A and III/2 (cf. Table 13-17). The highest percentage of "bifacial thinning chips" (35.38 %) was shown for level III/7-3, with the smallest amount in level III/7-1 (23.39 %). At the same time, this latter value still very much exceeds similar parameters demonstrated for the WCM industry of Kabazi V, level IV/1.

Among removals larger than 3 cm, flakes and blades from "bifacial thinning" were found only relatively seldom in all levels of sub-unit III/7. However, in level III/7-1 the percentages of flakes and blades from "bifacial thinning" are the smallest to have been identified in a Micoquian assemblage from Kabazi V. Nevertheless, this amount of bifacial blanks is altogether lower than observed in the mixed assemblages from sub-unit III/4. For levels III/7-2, and especially III/7-3, the "bifacial thinning" blanks prevail just as they do in Kabazi V, levels III/1 and III/1A, but, at the same time, are lower than in Kabazi V, level III/2 (Table 13-17).

The blade indices for archaeological levels III/7-1 and III/7-2 are suggestive that these belong to a WCM industry. On the other hand, they contain too many blanks from "bifacial thinning" and "rejuvenation", and this factor is not particularly conducive of a Levallois-Mousterian techno-complex (Table 13-17). Among all levels of sub-unit III/7 the lowest blade index was found in level III/7-1. It should also be noted that the high index of blades encountered in level III/7-3 is not representative, as artefacts were collected from only 1 m², and these include 14 items larger than 3 cm (Table 13-2).

The indexes relating to striking platform preparation in sub-unit III/7 comply with those characteristic of Micoquian complexes (Table 13-17). Flakes and blades in archaeological level III/7-2 display scar patterns which are most typical for Western Crimean Mousterian complexes, e.g. unidirectional, bidirectional, different crossed combinations, and with numerous crested pieces (Table 13-6), although, at the same time, this level also produced five *débordante* removals and one Levallois flake. This may indicate indirectly the existence of a core reduction strategy which is specific for Levallois-Mousterian complexes.

Among the tools recovered from sub-unit III/7 unifacial forms dominate, with scrapers as the most commonly observed tool type (Table 13-16). Scrapers are represented by simple, double, and convergent types, whereby the later make up near to half of the entire scraper assemblage. The second important group of unifacial tools are the points. The majority of points was found in archaeological level III/7-2. They display characteristic features of both the WCM and the Micoquian. WCM point types

		III/1	III/1A	III/2	III/7-1	III/7-2	III/7-3
"bifacial thinning" chips, 1.0-1.9 cm		13.86	21.78	27.00	17.86	19.60	24.61
"bifacial thinning" chips, 2.0-2.9 cm		2.91	5.85	7.11	4.55	5.40	10.77
"bifacial rejuvenating" chips, 1.0-1.9 cm		1.22	1.08	1.28	0.65	2.16	·
"bifacial rejuvenating" chips, 2.0-2.9 cm		0.30	0.43	0.49	0.33	0.18	·
"bifacial thinning" flakes (%)		5.66	6.75	18.41	1.79	5.30	10.00
"bifacial thinning" blades (%)		4.98	7.01	15.38	·	8.33	25.00
indices of blades		11.22	11.44	9.91	13.84	15.38	28.57
indices of facetting	Ifs	23.52	43.85	14.65	14.81	19.76	22.22
	Ifl	66.24	72.81	52.27	74.07	67.44	55.55

Table 13-17 Kabazi V: lithic variability, by levels.

are, for example, the semi-leaf type (Fig. 13-3, *1*) made on a blade with facetted platforms and with a non- invasive retouch. This type of point was discovered in all levels of sub-unit III/7. On the other hand, semi-trapezoidal points (Fig. 13-3, *2*) are common to the Micoquian. Convergent (points and convergent scrapers) prevail over simple (transverse, simple and double scrapers) unifacial tools. Bifacial tools are very rare. A single complete bifacial point occurs in archaeological level III/7-3. An unidentifiable piece of a bifacial tool was also found in level III/7-2.

To sum up, both the technological and typological characteristics of flint assemblages from levels III/7-1 and III/7-2 demonstrate features common to both Levallois-Mousterian and Micoquian techno-complexes. The collection of artefacts from level III/7-3 is Micoquian without any admixture. A minimal Levallois-Mousterian component (tools typology) was found in level III/7-1. At the same time, the blade and striking platform indexes, as well as the presence of "bifacial" thinning blanks among all kinds of debitage, leads to the assumption that the most part of blanks, including blanks for tools, in level III/7-1 stemmed from bifacial tool production.

In level III/7-2 the Levallois-Mousterian and Micoquian components are represented in approximately equal proportions. Micoquian features are most clearly observed in both the high percentage of "bifacial" blanks and in the presence of one fragmented bifacial tool. The most obvious evidence for Western Crimean Mousterian features, which include the structure of the unifacial tool assemblage, especially with its points, and the presence of *débordantes* and Levallois blanks among removals, is found in archaeological level III/7-2. Slope erosion probably contributed greatly to the heterogeneous character of the assemblages.

Abstract

КАБАЗИ V, ПАЧКА ГОРИЗОНТОВ III/7: АРТЕФАКТЫ

ВЕСЕЛЬСКИЙ А.П.

В данной главе представлен анализ пачки археологических горизонтов III/7. В этом слое в процессе раскопок было выделено три пятна залегания археологического материала – археологические горизонты III/7-1, III/7-2 и III/7-3. Каждый из археологических горизонтов пачки III/7 представлен аморфными участками, которые сохранились в эрозионных понижениях, образовавшихся в верхней части литологического слоя 14А, и заполненных седиментами литологического слоя 12А. В целом, исследованная площадь каждого из археологических горизонтов не превышает 3,64 м ^{2}.

Коллекция археологических материалов из пачки горизонтов III/7 составляет 8291 предмет. Все артефакты подразделяются на три основные группы. Первая группа представлена 8278 каменными предметами, разделенными на шесть категорий артефактов: обломки (27 экз.), преформы (1 экз.), чешуйки (8010 экз.), отщепы (164 экз.), пластины (29 экз.) и орудия (47 экз.). Две другие группы археологического материала представлены костяными ретушерами (10 экз.) и речными гальками без следов использования (3 экз.).

Для структуры археологических артефактов в пачке III/7 отмечаются следующие особенности: процент орудий (около 25 %) характерен для стоянок-мастерских; полностью отсутствуют нуклеусы и преформы двусторонних орудий; среди орудий преобладают

односторонние, которые представлены микокскими и леваллуа-мустьерскими изделиями, особенно, в археологическом горизонте III/7-2; количество двусторонних орудий слишком мало как для микокских индустрий, но абсолютно не приемлемо для леваллуа-мустьерских комплексов.

Коллекция орудий в пачке археологических горизонтов III/7 представлена 5 классами: остроконечники, скребла, двусторонние острия, сколы с ретушью и неопределимые фрагменты. Наиболее представительной группой являются односторонние скребла – 66,66 %. Конвергентные формы односторонних скребел в археологических горизонтах III/7-1 и III/7-2 составляют не менее половины всех односторонних орудий. Остроконечники составляют 28,58 %. Большая их часть обнаружена в горизонте III/7-2. Листовидные формы наиболее распространены среди остроконечников. Также в коллекции присутствуют дистальные и трапециевидные формы. Двусторонние орудия представлены только двумя изделиями. Для пачки горизонтов III/7 процент двусторонних форм составляет 4,76 % всех определимых орудий, без учета сколов с ретушью.

Технико-типологические характеристики горизонтов III/7-1 и III/7-2 сочетают черты леваллуа-мустье и микока. Материал из археологического горизонта III/7-3 не имеет каких-либо примесей и относится с микокскому технокомплексу. Наименьшая примесь леваллуа-мустьерского компонента характерна для горизонта III/7-1. Наличие этого компонента, в основном, прослеживается в типологическои структуре остроконечников, где присутствуют, характерные для западнокрымской индустрии, дистальные формы орудий. В археологическом горизонте III/7-2 леваллуа-мустьерский и микокский компоненты представлены приблизительно в равных пропорциях. Наличие микокских характеристик наиболее четко в горизонте III/7-2 подтверждается достаточно высоким процентом сколов обработки двусторонних орудий и наличием одного фрагмента двустороннего орудия. Типология односторонних орудий, особенно остроконечников; высокий индекс фасетажа; большое содержание пластин; присутствие débordante и леваллуазских заготовок среди сколов демонстрируют наличие леваллуа-мустьерских характеристик в кремневом комплексе археологического горизонта III/7-2. Главную роль в негомогенном характере коллекций сыграли эрозионные процессы, способствовавшие горизонтальной и вертикальной транспортировке археологических материалов.

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Палеолитические стоянки Крыма · Том 3 · Часть 2

КАБАЗИ V:
ИНТЕРСТРАТИФИКАЦИЯ МИКОКСКИХ И ЛЕВАЛЛУА-МУСТЬЕРСКИХ КОМПЛЕКСОВ

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