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KABAZI II: THE 70 000 YEARS SINCE THE LAST INTERGLACIAL

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Chapter
10

Kabazi II, Unit II, Level 8C: Transformation of Raw Material at a Middle Palaeolithic Kill and Butchering Site on *Equus hydruntinus*

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Stratigraphical Position and Distribution of Finds

Level II/8C of Kabazi II is a true living floor, embedded in geological layer 17 and covered by lithics and bones that reached a thickness of between 3 cm and 8 cm (Chabai 1998b; Chapter 1, this volume). All in all, 339 lithic artefacts and 891 faunal remains were recovered (Chabai 1998c), but only 147 artefacts were suitable for a sortation into raw material units. The remaining 192 pieces all fall into the "chips" category. Because the focus of sortation lies on the distinction of individual nodules and single pieces, these artefacts have been classified as "sorting rest". Their fracture planes are too small to represent a reliable cut-out of all raw material attributes as observed in larger pieces. The good preservation of both faunal remains and lithics, the presence of finds of all sizes, and a more or less horizontal position of archaeological objects underline the in-situ preservation of the archaeological horizon, not severely altered by post-depositional processes. Within the long stratigraphical sequence of Kabazi II that covers the time range between the very end of the last (Eemian) Interglacial (Chabai, Richter, Uthmeier 2005, eds.) and the Denekamp Interstadial (Chapter 1, this volume), level II/8C marks the beginning of archaeological Unit II. It is separated from the underlying archaeological horizon IIA/1, as well as from the overlying archaeological horizon II/8, by sterile levels that measure between 3 cm and 15 cm in thickness. Until today, absolute dating has led to ambiguous results. Whereas first ESR-dates on a single tooth from level II/8 have yielded a date ranging from between EU 27±2 ka and LU 39±3 ka (Rink et al. 1998, p. 333-334) depending on the model of uranium uptake, the same sample was recently measured with slightly older ages of ESR, EU 30±2 ka and ESR, LU 44±5 ka, respectively (Rink et al. 1998, in

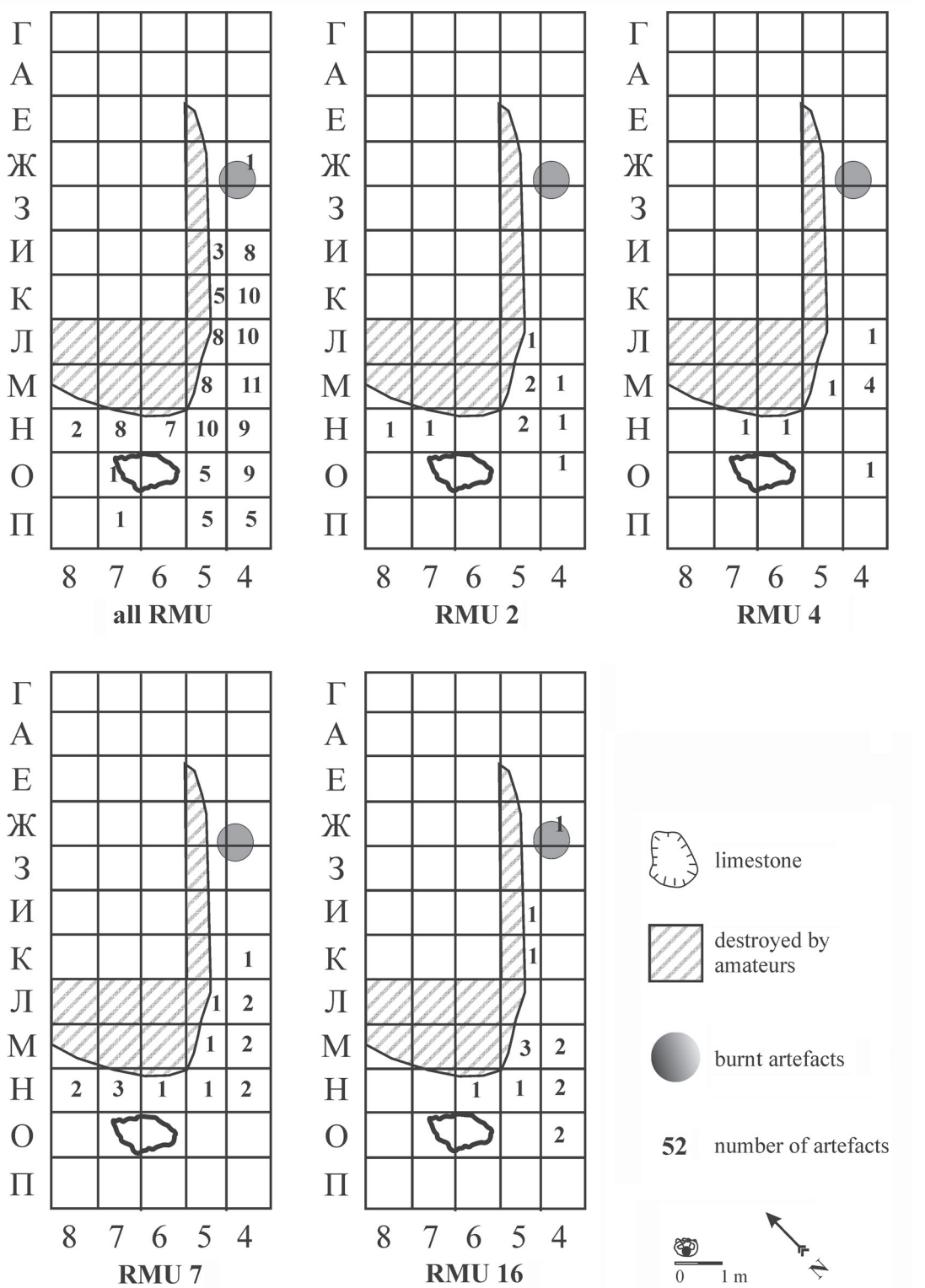

Fig. 10-1 Kabazi II, level II/8C: Distribution of artefacts used for transformation analysis (all RMU, N = 147), and selected raw material units (RMU).

press, Chabai 2005a, p. 21). Given the methodological uncertainties of the method, these dates can only serve to indicate the chronological position of levels II/8 and II/8C in the middle of OIS 3, rather than absolute ages. On the other hand, pollen analysis (Gerasimenko 1999, 2005) has provided some more reliable results which place level II/8C within pollen zone X of the local sequence, which itself is correlated with the Hengelo-Interstadial (Gerasimenko 1999, table 6-1: sample-no. 36; 2005, table 47). This hypothesis is consistent with age estimations based upon U-series that date the sedimentation of levels IIA/1 to II/8 to 39,8±5 ka (McKinney 1998, p. 348). level II/8C was excavated in an area of 60 m^2, but finds were found mainly distributed in the southeastern part of the trench, along square lines 4, 5 and 6 (Fig. 10-1: all RMU). Unfortunately, past activities of local amateurs have led to the destruction of approximately 9 m^2 in the neighbouring squares of the concentration described above (Chabai 1998b, fig. 8-8). This means that the information regarding the exact limits of the main area of activity is somewhat insecure. However, because square lines З, Ж, Е, Д, and Г towards the north are more or less void of finds, the overwhelming part of discard of lithics and faunal remains clearly took place only in the southeastern part of the excavated area. This observation applies not only to the lithics, but also to the faunal remains (Patou-Mathis 1999). While bones of the axial skeleton were spatially more dispersed, those of the upper hind-skeleton, the upper fore-skeleton, the autopodium, as well as the cranial bones were found mainly in and around squares O4 and O5. This suggests that butchering of complete carcasses took place immediately behind the limestone block (Fig. 10-2). In contrast to other archaeological horizons, it seems as if the damage caused by unauthorised excavations in level II/8C has been minimal. Burned bones (Patou-Mathis 1999, p. 53) in squares Ж4, Ж5 und З 4 are indicative of the presence of a fire place situated some metres from the spot at which the animals were dismembered.

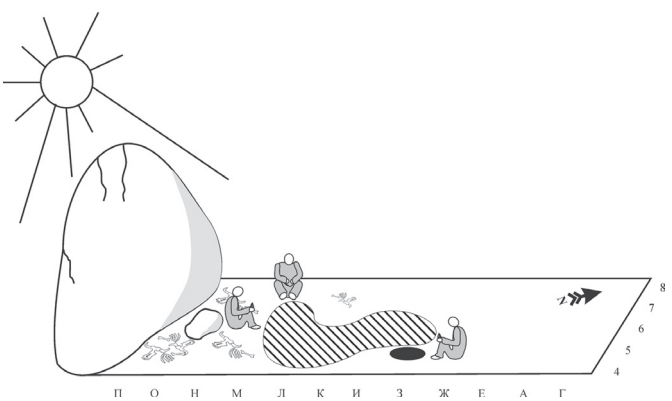

Fig. 10-2 Kabazi II, level II/8C: Reconstruction of the site.

Typological and Technological Features of Kabazi II, Level II/8C

According to the frequency of formal tools (Fig. 10-3), blanks were not used intensively in level II/8C. Only three pieces display a regular retouch of one lateral edge, and for this reason are classified as simple side scrapers (Fig. 10-6, *11*; 10-11, *15*; 10-13, *9*). In one further case, a modified piece, probably another simple side scraper, was rejuvenated by a lateral blow which removed part of the tool tip (Fig. 10-8, *21*). All other blanks, which account for 235 chips and 104 flaked objects > 3cm, were either not used to such an extent that retouch became necessary, or they already had straight lateral edges requiring no extra regulation. Nevertheless, in seven cases lateral edges were slightly splintered or, in part, covered by short negatives forming an irregular retouch (Fig. 10-5, *10, 16*; 10-6, *9, 12*; 10-8, *13,17*; 10-9, *4*). These modifications might either have been caused by minor movements of the pieces, e.g. in the cause of trampling, or alternativeley they may be related to usage. As for the tools, any information relating to the concept(s) of blank production is restricted, this is mainly because – despite the considerably large size of the excavated area – no cores were found. Therefore, reduction processes of raw pieces or cores must be described according to the frequency and the dorsal scar pattern

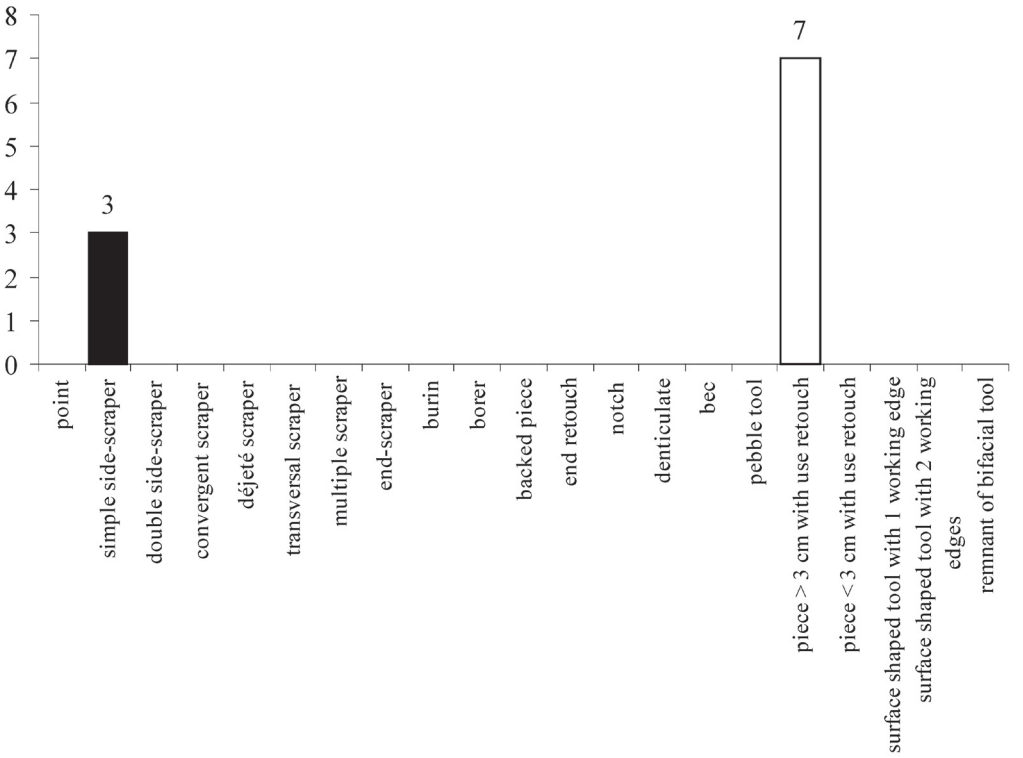

Fig. 10-3 Kabazi II, level II/8C: Frequency of tools.

of blanks (Fig. 10-4). The latter are dominated by simple flakes, which account for 63 pieces, and 43 chips. These blanks indicate little more than the flaking of simple flake cores, or the preparation of cores that were exploited in the course of an explicit concept. Conversely, the presence of one Levallois flake, three Levallois blades and 15 blades clearly speaks for the presence of cores with prepared exploitation surfaces. A single target flake (Fig. 10-9, *11*) which was guided by lateral and distal convexities of the exploitation surface must be seen as the result of the reduction of a Levallois core (RMU 11: Fig. 10-9; 10-13). The same is true for three Levallois blades (Fig. 10-6, *10, 12, 13*) which stem from the same core (RMU 5: Fig. 10-6, *10, 11, 12, 13, 14*) and confirm that knowledge of a Levallois method with recurrent parallel target flakes, described as the "Biache method", was known and practised at the site. According to Chabai (1998c, p. 233), most of the non-Levallois blades are rectangular shaped, removed on-axis, and display a uni-directional-crossed, bi-directional or uni-directional dorsal scar pattern. Given the regular scar pattern, and the fact that volumetric cores appear in considerable frequencies in other levels of Unit II, e.g. level II/7C (Chabai 1998c, Fig. 9-10), it seems more plausible to assume that regular blades were struck from volumetric cores rather than from Levallois cores. This also applies to two core tablets (Fig. 10-6, *3*; 10-7, *4*) in raw material units with regular blades (RMU 4: Fig. 10-6, *1, 2, 3, 4, 5, 6, 7, 8, 9*, RMU 6: Fig. 10-7, *1, 2, 3, 4, 5*) that are similar to those refitted to volumetric cores in level II/7C by V. P. Chabai (1998c). To conclude, the assemblage "[...] appears to contain one more example of the coexistence of Levallois and volumetric methods of flaking" (Chabai 1998c, p. 250). It is still unresolved whether two pieces classified as stemming from soft hammer surface shaping (RMU 16: Fig. 10-12, *12.19*), as well as flakes with lipped platforms (Chabai 1998c, Table 9-10) and / or convex lateral profiles (Chabai 1998c, Table 9-6), really point to bifacial surface shaping (as proposed by Uthmeier 2004b). This is due to the fact that surface shaped tools are completely absent, and attributes of soft hammer technique may also occur when hard direct percussion is applied. The combination of Levallois and volumetric flaking methods,

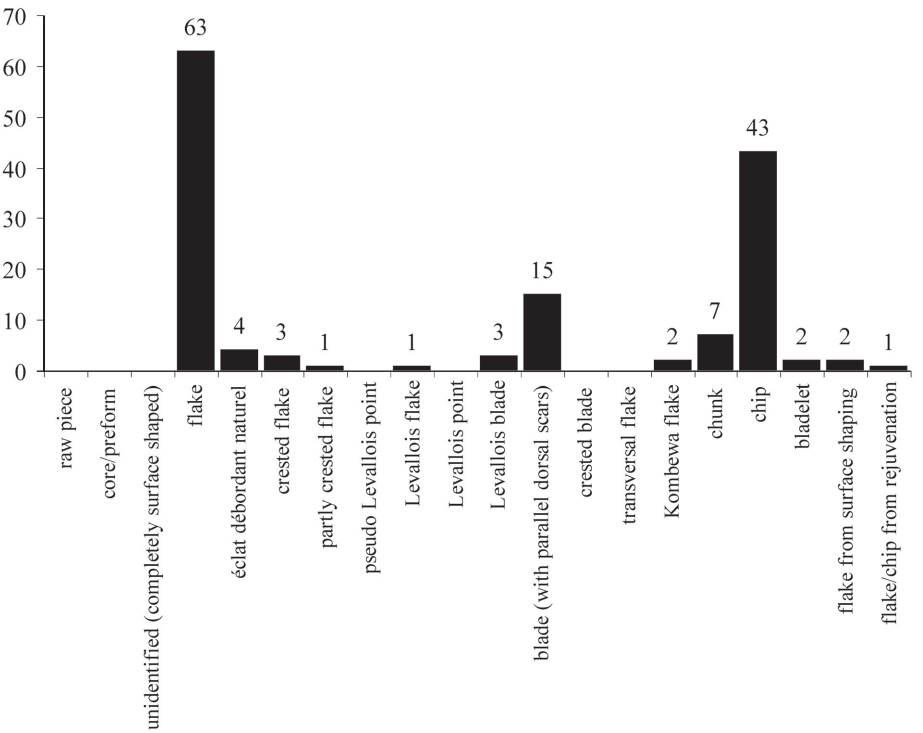

Fig. 10-4 Kabazi II, level II/8C: Frequency of blanks.

and, even more importantly, the absence of surface shaped tools make Kabazi II, level II/8C a typical representative of the "Western Crimean Mousterian" (Chabai 1998c). Whereas the pure presence and absence of typological and technological attributes are used to classify the assemblage, the following features call for further explanations:

1. Low frequency of tools;
2. Low frequency of heavily retouched pieces;
3. Absence of cores.

Sortation of Raw Material Units

In level II/8C, 147 artefacts were sorted into 17 raw material units. One of these, RMU 18, includes 12 artefacts either partly or entirely covered by patina, and which for this reason had to be excluded from the transformation analysis. The frequency of artefacts per raw material unit (Fig. 10-14) varies between 2 and 24 pieces, whereas many of these (9 cases) comprise 5 to 7 pieces only, there are only two raw material units, RMU 16 (Fig. 10-12) and RMU 7 (Fig. 10-8), with 20 and 24 items, respectively. Surprisingly, there are no single pieces. The raw material is a grey, grey-brown to greyish or brownish-black Cretaceous flint, with many white or light grey intrusions, and sometimes dark schlieren. The bulk of the material is of good quality and seems to come not only from the same geological formation, but also from the same outcrop. Only one raw material unit, RMU 8 (Fig. 10-7, *6*, *7*, *8*, *9*, *10*, *11*), which is described as having fracture planes with a marble like change of colour between brownish yellow to dark grey, and with dark red schlieren, is markedly different. With the exception of the sorting rest, containing the patinated artefacts, all raw material units are classified as workpieces, i.e. it is assumed that each unit includes pieces detached from the same raw piece.

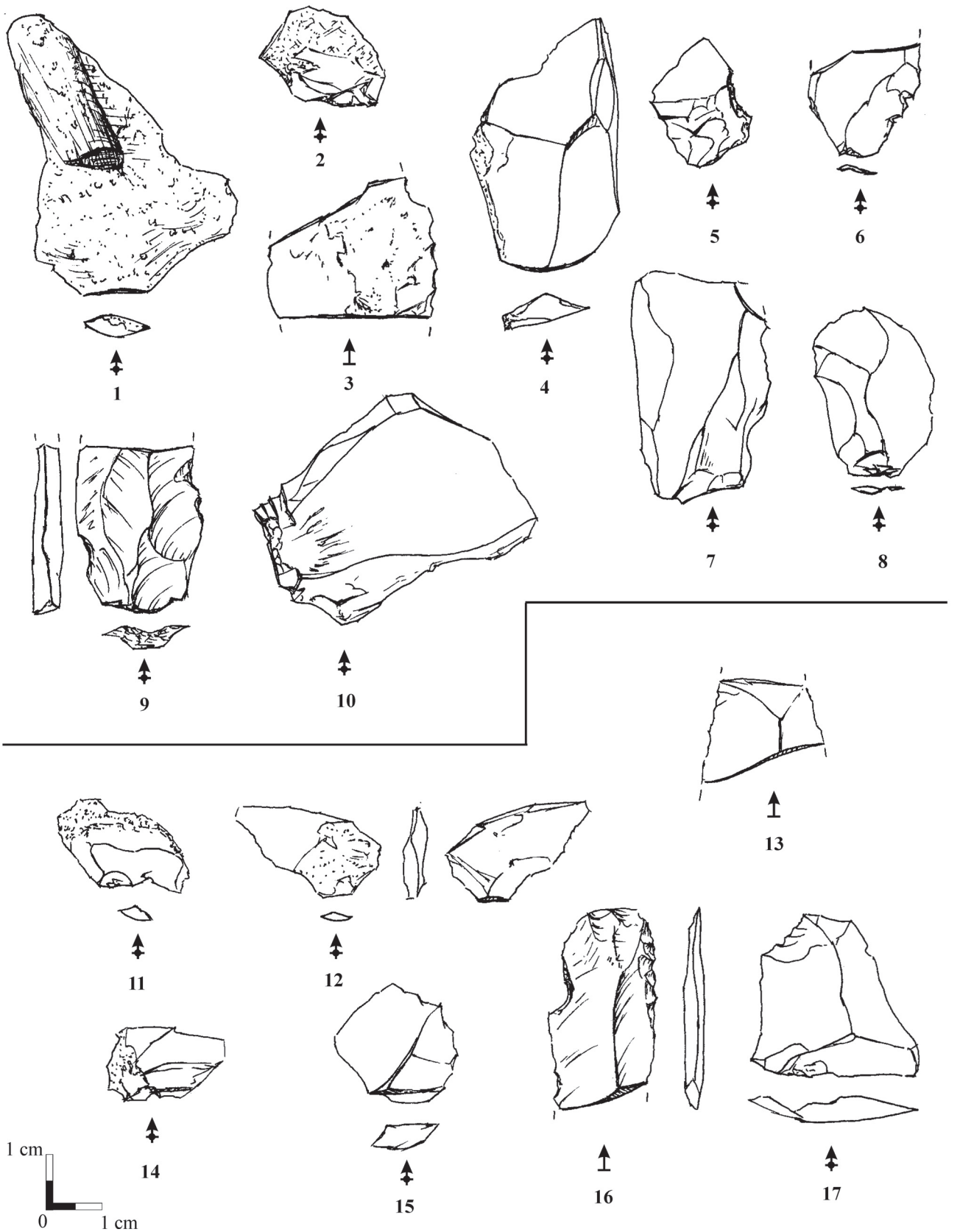

Fig. 10-5 Kabazi II, level II/8C: Artefacts in RMU 2 (1-10) and RMU 3 (11-17).

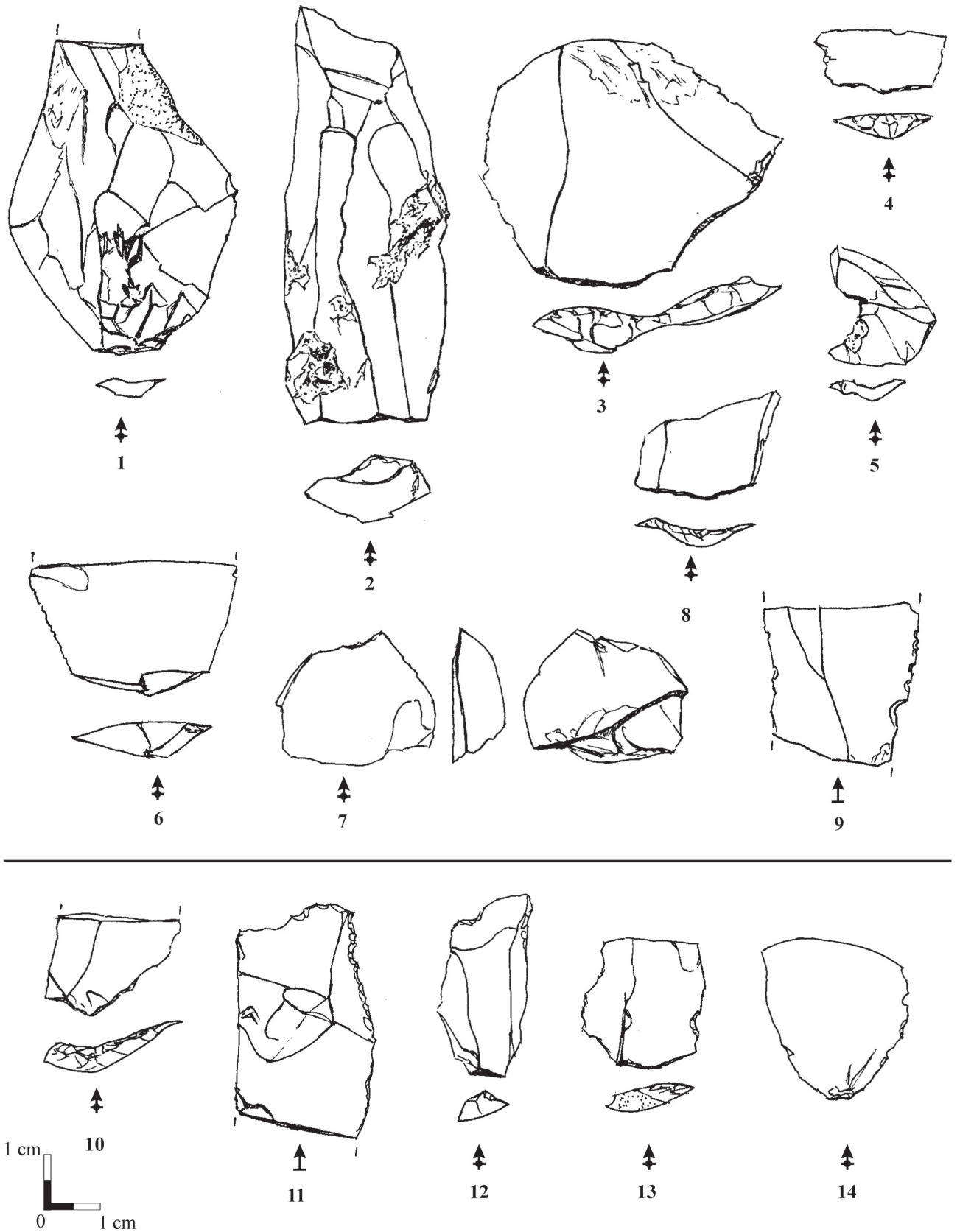

Fig. 10-6 Kabazi II, level II/8C: Artefacts in RMU 4 (1-9) and RMU 5 (10-14).

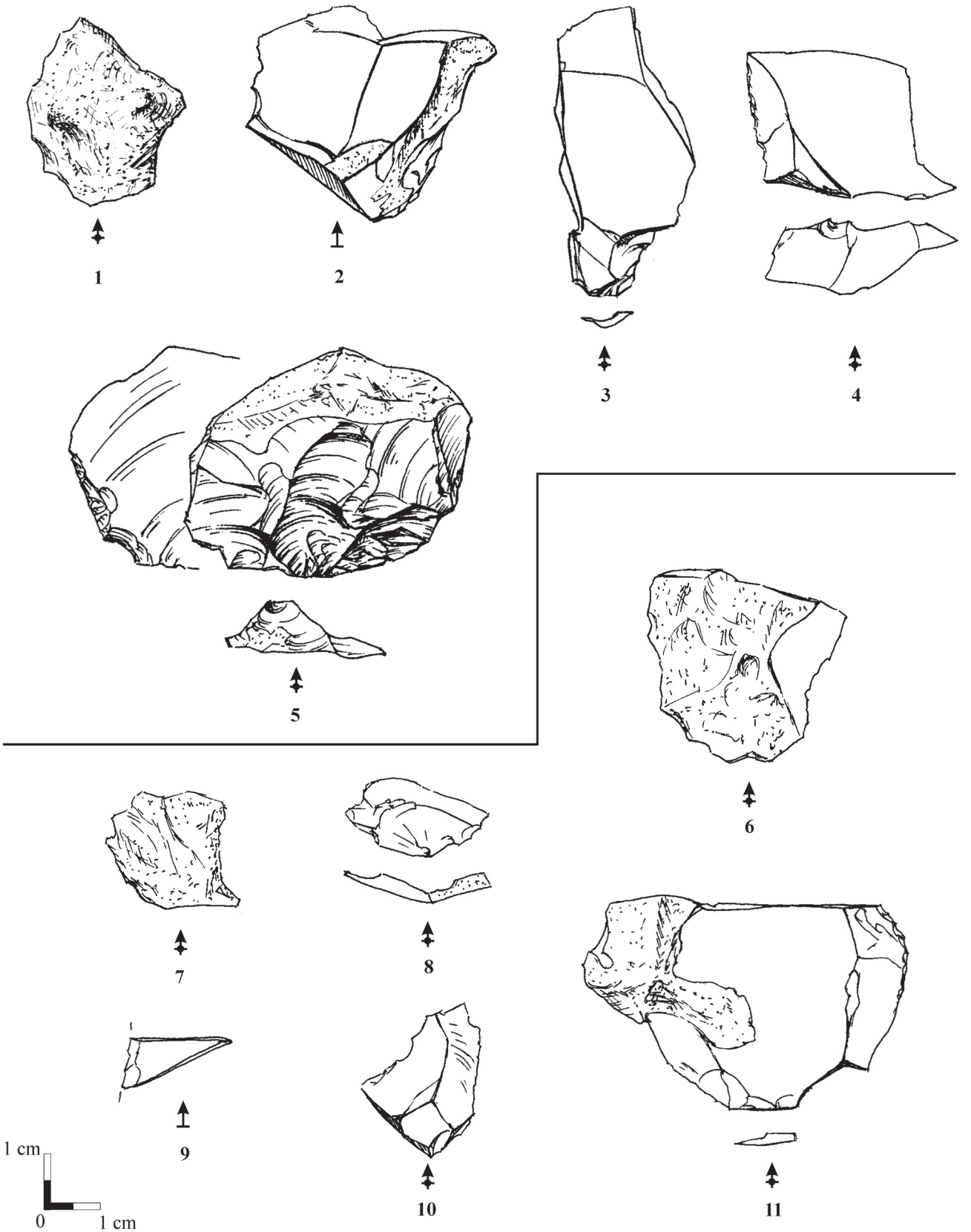

Fig. 10-7 Kabazi II, level II/8C: Artefacts in RMU 6 (1-5) and RMU 8 (6-11).

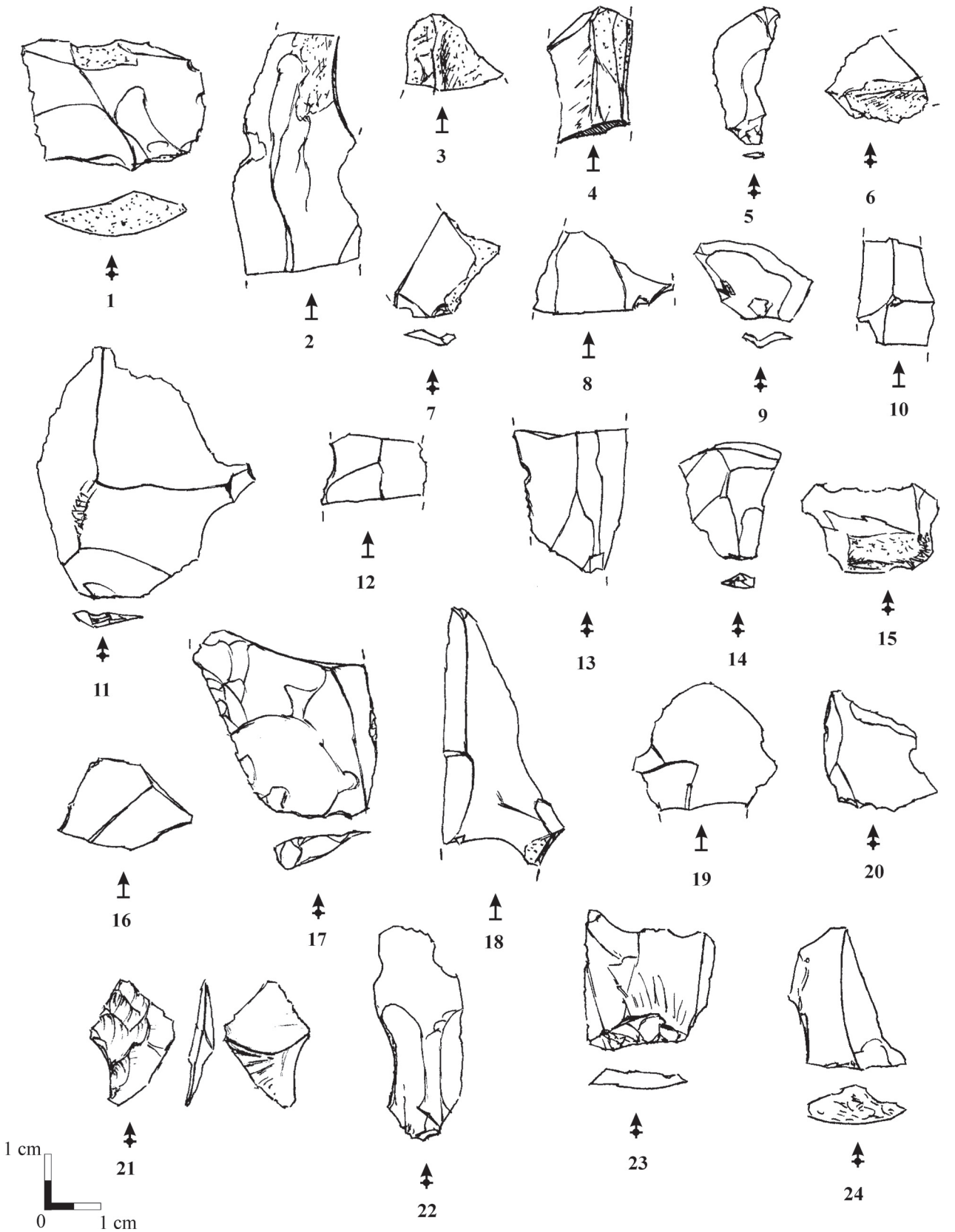

Fig. 10-8 Kabazi II, level II/8C: Artefacts in RMU 7

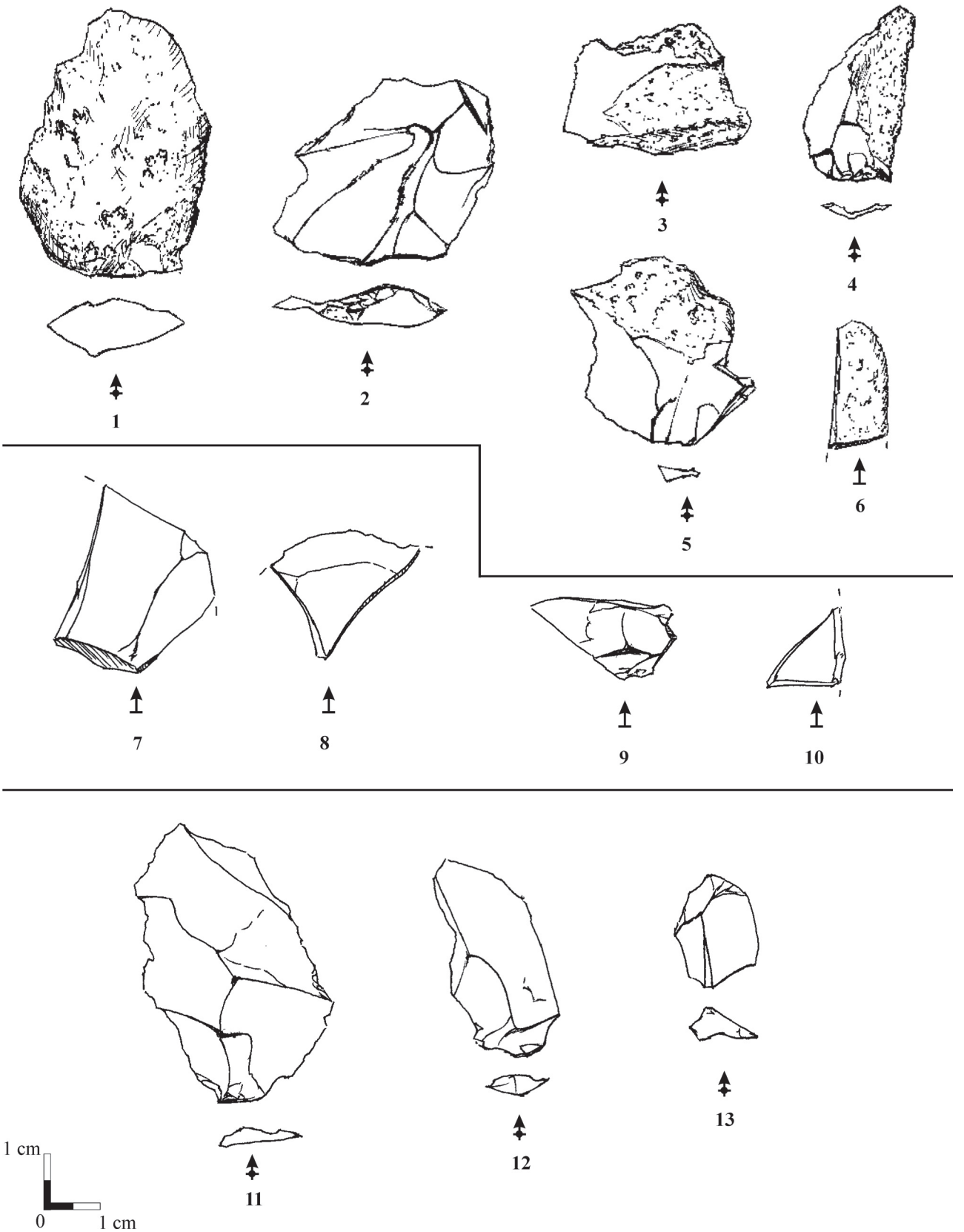

Fig. 10-9 Kabazi II, level II/8C: Artefacts in RMU 9 (1-6), RMU 10 (7-10) and RMU 11 (11-13).

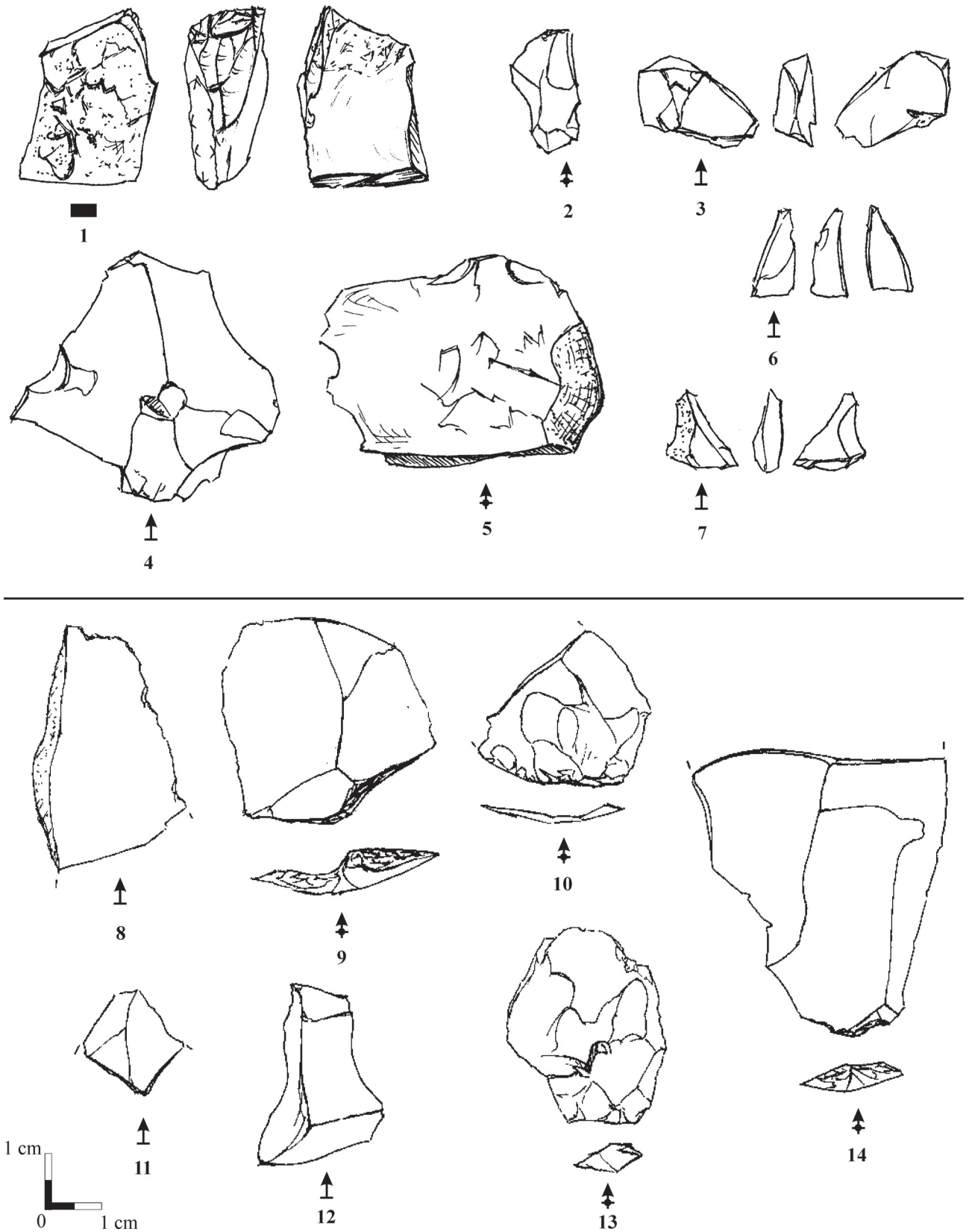

Fig. 10-10 Kabazi II, level II/8C: Artefacts in RMU 12 (1-7) and RMU 13 (8-14).

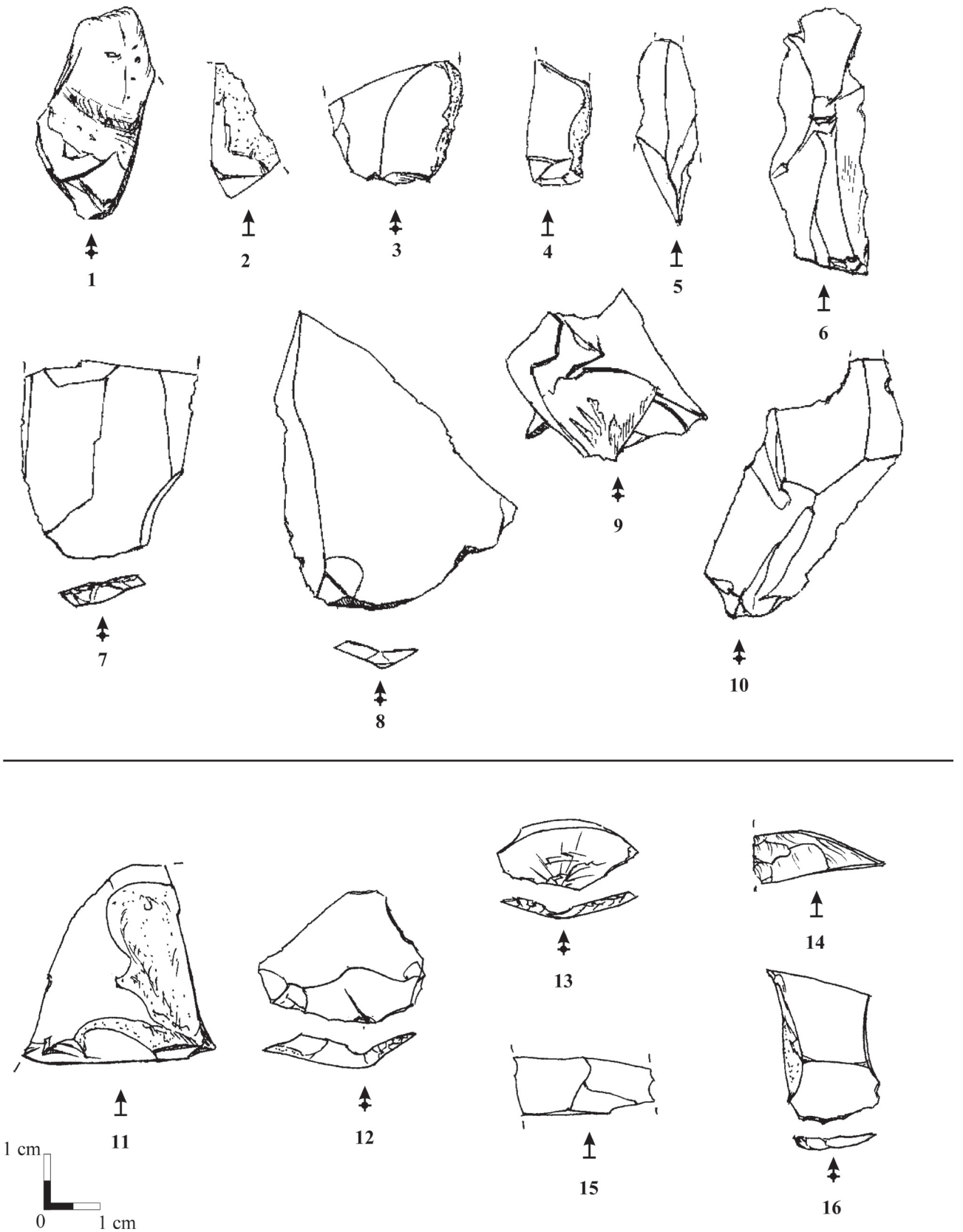

Fig. 10-11 Kabazi II, level II/8C: Artefacts in RMU 14 (1-10) and RMU 15 (11-16).

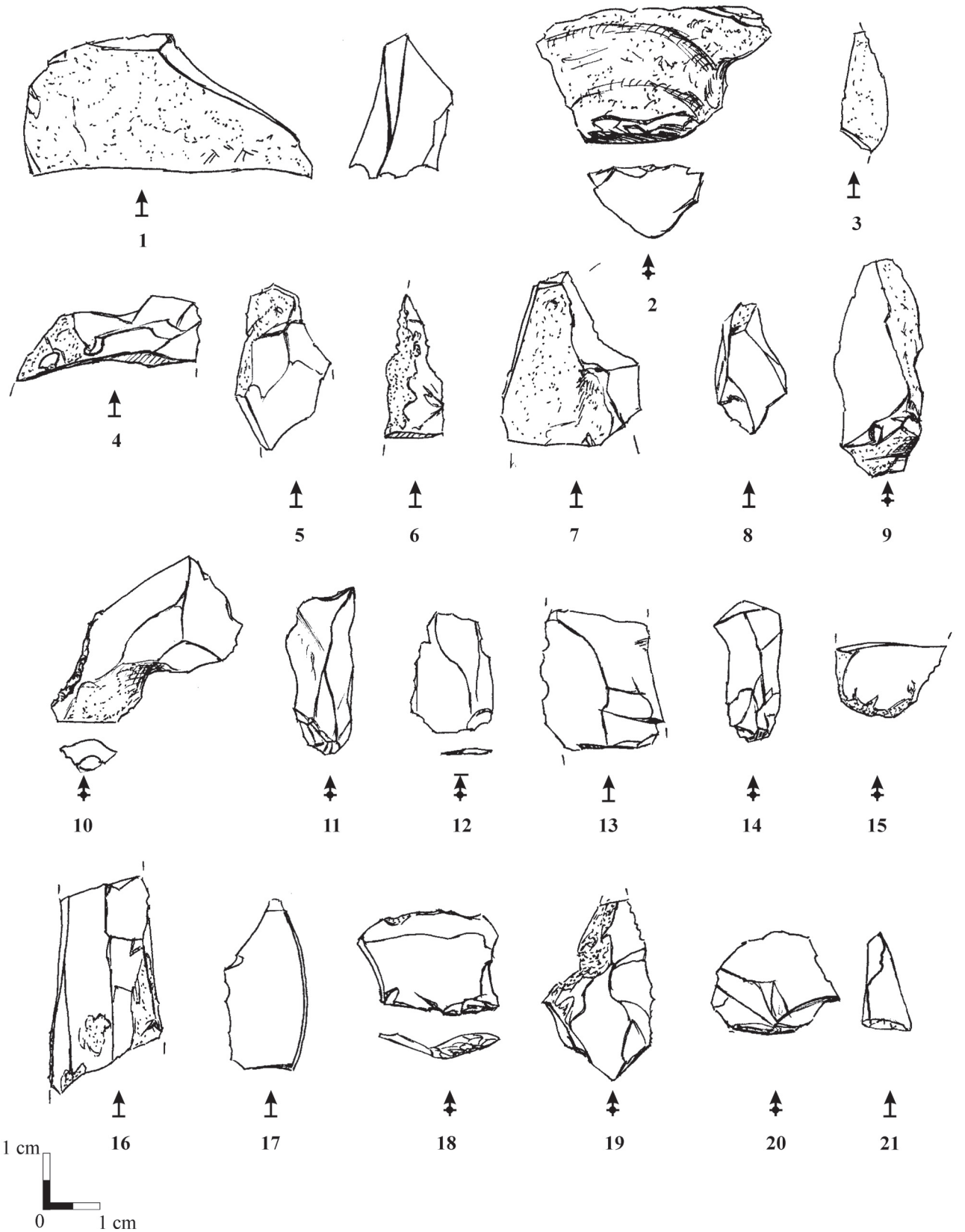

Fig. 10-12 Kabazi II, level II/8C: Artefacts in RMU 16.

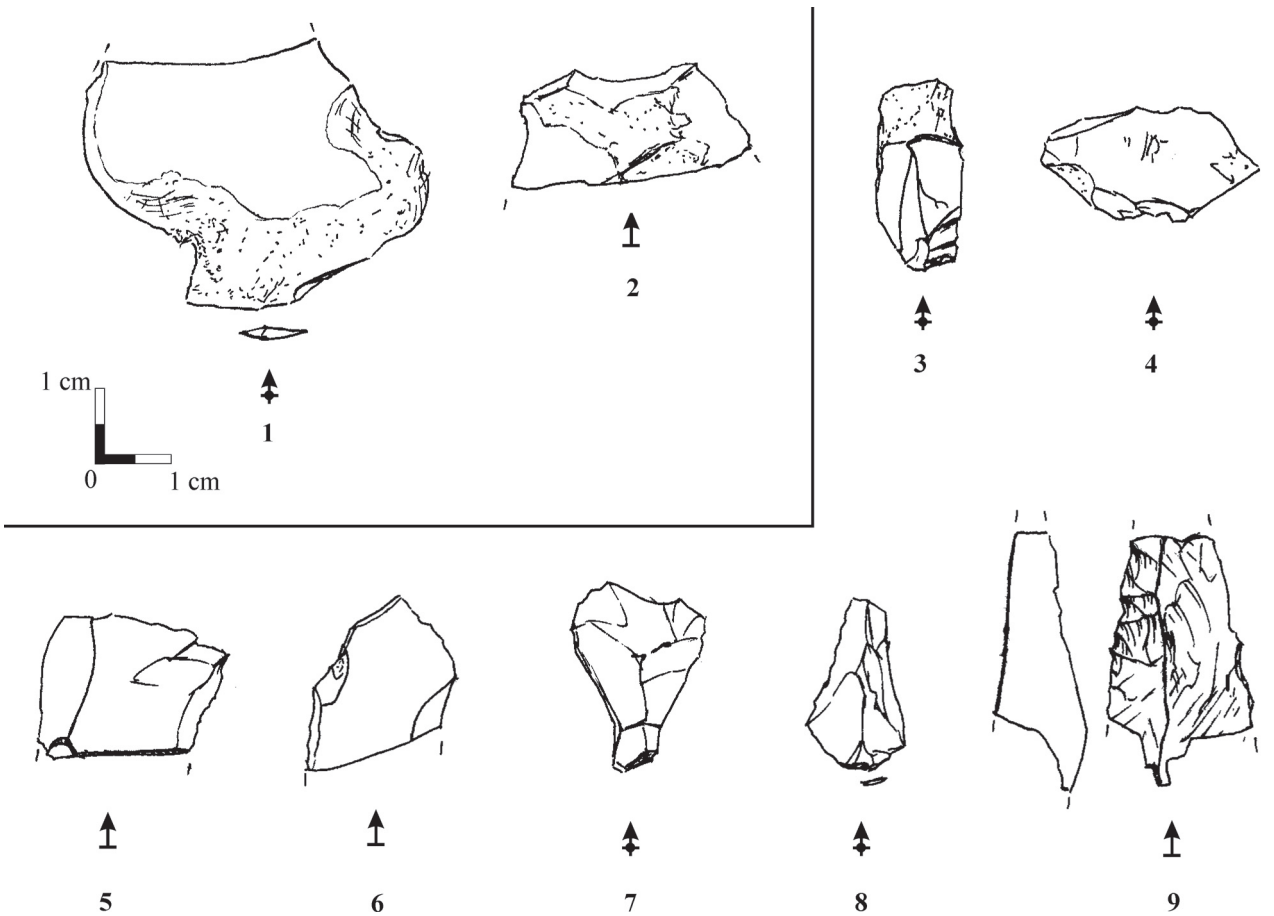

Fig. 10-13 Kabazi II, level II/8C: Artefacts in RMU 17 (1-2) and RMU 1 (3-9).

Some General Remarks on the Transformation of Raw Material at Kabazi II, Level II/8C

As long as workpieces encompass artefacts covered by considerable amounts of cortex, it is not only possible to reconstruct the geological provenance but also the original shape of the raw material pieces (prior to flaking). While one raw material unit (RMU 11: Fig. 10-9, *11, 12, 13*) arrived in the excavated area as a completely decorticated piece, void of any such information, 14 raw material units featured a chalky cortex, and one had a rolled cortex (Fig. 10-15). It is concluded that the latter raw piece had been exposed to chemical and physical decomposition and was therefore collected from a river terrace. Due to most artefacts exhibiting only small amounts of cortex, the original shape of raw pieces could only be reconstructed for 3 units (Fig. 10-11; 10-12; 10-13; 10-14; 10-15; 10-16). Two of these were round nodules, and one was either round flat or a plaquette prior to flaking. To sum up, most workpieces are characterised by a cortex indicative of primary sources, i.e. a grey colour, numerous white intrusions, and dark schlieren. Where a reconstruction of the shapes of raw pieces can be assumed, these were either round or flat. Most attributes are general features of material stemming from the so-called "flint-belt" which stretches along the second range of the Crimean Mountains (Chabai 2004c; Demidenko 2004b; Uthmeier 2004b). Outcrops known today are situated mainly along river valleys running in a northwestern direction, and cutting through the limestone cuesta. The nearest source in the immediate vicinity of Kabazi II is located at Mount Milnaya, some 1500 m to the southeast. According to geological surveys, this outcrop was accessible at the time of settlement, after sinking ground water and sea levels had led the Alma to cut deeper into the landscape during OIS 4 or the

raw material units with cortical/partly cortical flakes and/or chunks only	2
raw material units with simple flakes, chips and/or chunks only	6
raw material units with simple flakes and core trimming elements	2
raw material units with Levallois flakes	1
raw material unit with Levallois blades and core trimming elements	1
raw material units with blades from volumetric cores	2
raw material units with blades from volumetric core and core trimming elements	1
raw material units discussed as surface shaping	1(?)
sum of all raw material units	16
raw material units with modification of tools	3
raw material units with modification and rejuvenation of tools	1
total of raw material units with modification	4

Table 10-1 Kabazi II, Level 8C: main attributes of the *chaîne opératoire* of raw material units according to the presence of blanks, cores and tools in each unit.

beginning of OIS 3 (Chabai, Marks, Monigal 1999). Given the fact that fluvial activities were responsible for the accessibility of local raw materials, it is very likely that the only raw material unit with a rolled cortex, RMU 1 (Fig. 10-13, *3, 4, 5, 6, 7, 8, 9*), also stems from the Alma river terrace. Conversely, the provenance of RMU 8 (Fig. 10-7, *6, 7, 8, 9, 10, 11*), with its striking yellow colour, red schlieren, and a chalky cortex remains unclear.

Thus, the sortation of raw material resulted in the identification of 16 workpieces which in almost all cases were procured from a local outcrop of primary, good quality Cretaceous flint. Prior to the classification of transformation section being described and interpreted in greater detail, some general aspects of the reduction of raw material at Kabazi II, level II/8C are to be discussed. In the whole assemblage there are no single pieces. This implies that no ready made items were transported into the excavated area and discarded without flaking and / or rejuvenation. According to the logics of transformation analysis this means that all artefacts discarded in level II/8C derive from the flaking of 16 raw pieces which reached the excavated area in different states of reduction. This is confirmed by the dominance of small to medium sized items among the classes of longest measurements (Fig. 10-17). The high frequency of chips and small flakes, even in the sample used for raw material sortation, shows that striking platforms and / or flaking surfaces were prepared. In most cases, this occured after raw pieces had been decorticated outside the excavated area. It has already been mentioned that, if present at all, the amount of cortex in raw material units is generally low. This fact is reflected by the frequency of cortex (Fig. 10-18): there are 89 flakes without any cortex, 41 flakes with small amounts of cortex on their dorsal surfaces, and only 10 cortical flakes.

If the presence of specific blank types in raw material units is equated with working steps in the operational chain, it becomes clear that in 6 cases the flaking of workpieces was dedicated to simple flaking only (Table 10-1). Owing to cores being absent, it is uncertain whether these flakes were detached during the preparation of Levallois cores, or from simple flake cores. In two other cases (RMU 4: Fig. 10-6, *1, 2, 3, 4, 5, 6, 7, 8, 9*, RMU 6: Fig. 10-7, *1, 2, 3, 4, 5*), the combination of simple flakes and core trimming elements imply the preparation of a core worked after a specific, yet not securely known concept or method of blank production. Given the fact that in level II/8C – apart from simple flakes – only target flakes from Levallois and volumetric cores are present, it is most probable that the reduction of raw material in RMU 4 and RMU 6 also followed one of these concepts. The similarity of crested flakes from RMU 4 (Fig. 10-6, *3*) and RMU 6 (Fig. 10-7, *4*), with core tablets from other levels of Unit II, e.g. level II/7C (Chabai 1998c, fig. 9-11, *1*), might be taken as an argument for the flaking of volumetric cores in these raw material units. Two workpieces saw the reduction of Levallois cores, one with (RMU 5: Fig. 10-6, *10, 11, 12, 13, 14*) and the other (RMU 11: Fig. 10-9; *13*) without rejuvenation of the core. Three

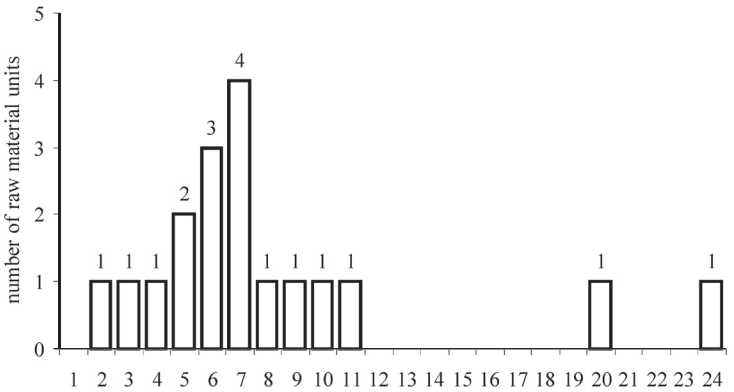

Fig. 10-14 Kabazi II, level II/8C: Number of artefacts in raw material units.

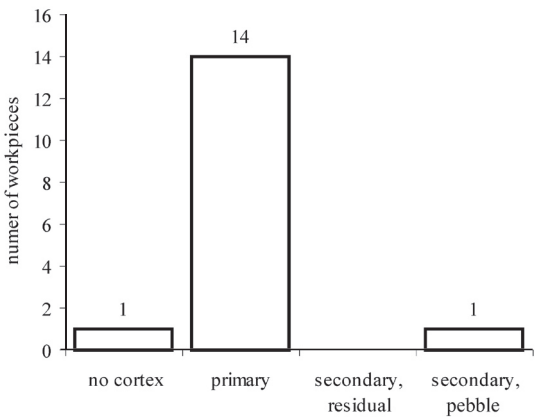

Fig. 10-15 Kabazi II, level II/8C: Geological classification of raw pieces. Hypothesis on the geological provenance of raw pieces are based upon cortical flakes and the assumption that each raw material unit represents a distinct nodule (workpiece).

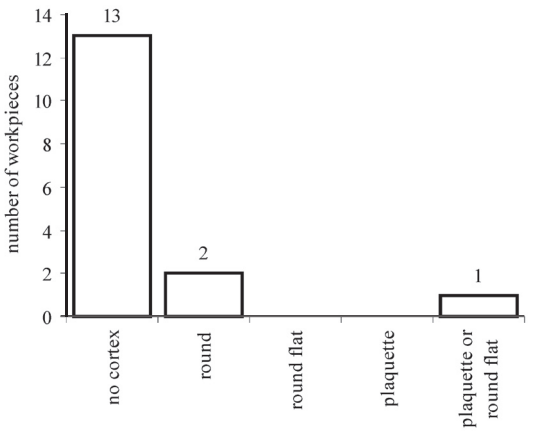

Fig. 10-16 Kabazi II, level II/8C: Original volume of raw pieces before the transformation began. Hypothesis on the shape of raw pieces are based upon cortical flakes and the assumption that each raw material unit represents a distinct nodule (workpiece).

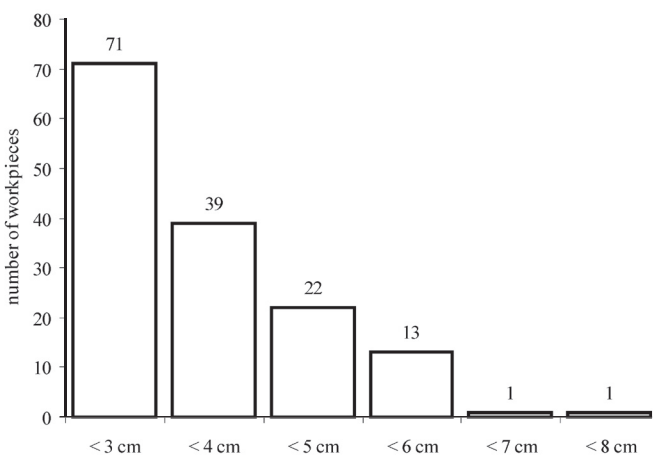

Fig. 10-17 Kabazi II, level II/8C: Longest measurement of artefacts used for transformation analysis.

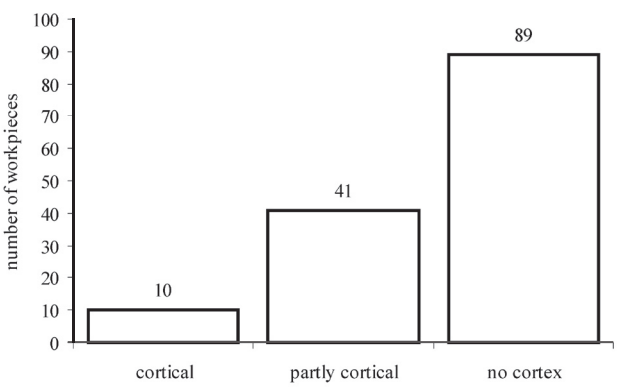

Fig. 10-18 Kabazi II, level 8C: Frequency of cortex on dorsal surfaces of flakes, counted in three broad classes.

workpieces (RMU 2: Fig. 10-5, *1, 2, 3, 4, 5, 6, 7, 8*, RMU 14: Fig. 10-11, *1, 2, 3, 4, 5, 6, 7, 8, 9, 10*, RMU 7: Fig. 10-8) show the production of blades from volumetric cores, again with one example (RMU 2: Fig. 10-5, *1, 2, 3, 4, 5, 6, 7, 8, 9, 10*) for rejuvenation of the core. It is only in four raw material units (RMU 1: Fig. 10-13, RMU 3: Fig. 10-5, RMU 5: Fig. 10-6, RMU 7: Fig. 10-8) that blanks were modified into formal tools, indicated by the presence of retouched pieces (3 cases), or the discard of a lateral sharpening flake (1 case).

On a broad level of analysis based only upon the frequency of blank types (in raw material units), the longest measurement, and the frequency of cortex, it can be stated that the blanks discarded on the excavated paleo-surface of Kabazi II, level II/8C were flaked from simple flake cores, possibly intended as prepared cores, and, in some cases, from Levallois or volumetric cores. Cores were, by and large, at least partly decorticated; whether some raw pieces were still covered by cortex prior to flaking has to be elucidated in the transformation analysis. After the flaking process stopped at Kabazi II, no core was left in the excavated area.

Transformation Analysis

Disregarding the patinated pieces and chips excluded from analysis owing to their unsuitability for raw material sortation, the assemblage used for transformation analysis comprises 147 artefacts sorted into 16 raw material units. Due to the absence of single pieces, indicative of either the import of ready made tools or their rejuvenation followed by export, transformation sections are restricted to either initial steps of the operational chain, or long transformation sections (Table 10-2). In level II/8C, long transformation sections indicate that blank production (Fig. 10-19: Cb, Nb) – sometimes including modification (Fig. 10-19: Cm, Nm) – clearly dominates. There are altogether 14 cases in which flaking surfaces were exploited, whereas raw material units that cover the initial phase of the operational chain only account for two cases only (Fig. 10-19: Np).

In 10 raw material units, flaking began following the decortication of the raw piece outside of the excavated area (Fig. 10-19: Cb, Cm). If the presence of Levallois target flakes, regular blades and / or core trimming elements are taken as being characteristic of the mode of core reduction (Table 10-3), then two raw material units (Table 10-4: RMU 5, RMU 11) were dedicated to the reduction of Levallois cores, and three saw the reduction of volumetric blade cores (Table 10-4: RMU 2, RMU 7, RMU 14). In one raw material unit (Table 10-4: RMU 4), the reduction process ended after a core was (re-)prepared. In all other raw material units which began with a decorticated raw piece (Table 10-4: RMU 1, RMU 3, RMU 13, RMU 15, RMU 16) flaking was interrupted following the removal of some blanks. Only four raw material units (Table 10-4: RMU 1, RMU 3, RMU 5,

phase 0: discarded raw pieces	**phase 1: initial preparation** (unit contains cortical flakes)	**phase 2a: preparation or production of simple blanks** (unit contains flakes partly with and/or without cortex)	**phase 2b: production of Levallois flakes or blades** (unit contains target flakes)	**phase 3: modification** (unit contains chips from modification and/or formal tools)	number of cases
	■				**2**
	■	■			**3**
	■	■	■		**1**
		■			**5**
		■	■		**1**
		■	■	■	**2**
		■		■	**2**

Table 10-2 Kabazi II, Level 8C: comparative overview over the length of the *chaîne opératoire* of raw material units (phases after Geneste 1985, 1988, 1990).

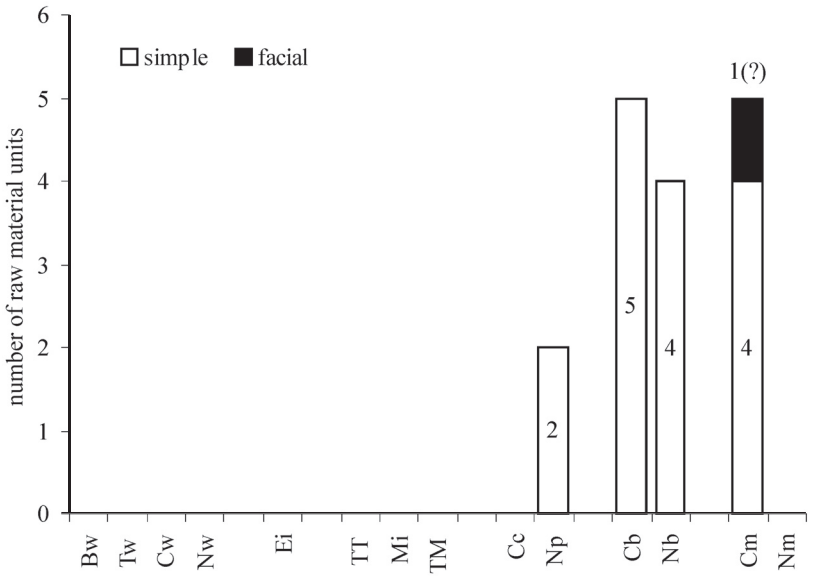

Fig. 10-19 Kabazi II, level 8C: Frequency of transformation sections (Bw = blank without transformation (within the excavated area), Tw = tool without transformation, Cw = core without transformation, Nw = nodule without transformation, Ei = isolated functional part of a tool, including resharpening flake, TT = broken tool with corresponding tip, Mi = two or more isolated chips from modification, TM = tool with corresponding chips from its modification, Cc = correction of a core, Np = preparation of a raw nodule, Cb = blank production from a core, Nb = blank production from a raw nodule, Cm = blank production from a core and modification of blank(s), Nm = blank production from a raw nodule and modification of blanks(s); surface shaping is indicated by flakes from *façonnage* and/or surfae shaped tools).

RMU 7), belonging to transformation sections indicative of the import of decorticated pieces, delivered blanks which were then modified into formal tools (Fig. 10-19: Cm).

In addition, there are four raw material units (Table 10-4: RMU 2, RMU 6, RMU 8, RMU 9) which cover the beginning of the formal operational chain, but did not follow on to modification (Table 10-4: Nb). Again, the presence of typical blanks may be considered as an indicator for the possible shape of the cores. In one case (Table 10-3: RMU 2), regular blades speak for the reduction of a volumetric core, whereas one raw material unit (Table 10-3: RMU 6) ended up as a (re-) repaired volumetric core. In the remaining two raw material units (Table 10-3: RMU 8, RMU 9) only simple flakes were counted.

According to the logics of transformation analysis (for a comprehensive depiction, see Fig. 10-20; 10-21), it is possible to answer the following:

1. What part of the formal operational chain was conducted in the excavated area?
2. In which stage of the reduction process did flaking end within the excavated area; and
3. Were blanks, tools, cores or preforms taken from the excavated area?

In level II/8C nine raw material units contained no cortical flakes. According to transformation analysis these units represent pieces which were brought into the trench after initial preparation. Conversely, another seven raw material units were imported as raw pieces. Flaking ended mainly after the detachment of flakes, some of which are Levallois target flakes or regular blades, but only seldom leading to modification. In every case, the inner part of the raw piece was removed from the excavated area.

It has already been stated that in cases where typical blanks indicate specific working steps of core reduction, it is possible to formulate hypotheses relating to the methods of blank production applied. In this context, the identification of Levallois and volumetric blade cores seems to be the most reliable (Table 10-3). Volumetric blade cores were taken out of the excavated area in three cases, and in two cases discarded target flakes speak for the export of Levallois cores. In another two raw material units, blanks with prepared crests are missing, and it is more likely that these were volumetric blade cores rather than Levallois cores. For six raw material units, little more can be said than that they lacked cores. In one case, however, it is uncertain whether the missing piece was a simple core, or a surface

raw material unit	blanks indicating prepared cores	probable method	number of preforms/ cores exported
RMU 2 RMU 7 RMU 14	regular blades, crested flakes	volumetric	3
RMU 11	Levallois flakes	Levallois, preferential	1
RMU 5	Levallois blades	Levallois, Biache method	1
RMU 4 RMU 6	core tablets	volumetric (?)	2
RMU 1, RMU 3 RMU 8, RMU 9, RMU 13, RMU 15	simple flakes	?	6
RMU 16	flakes struck with soft hammer percussion	surface shaping?	1
Total			**14**

Table 10-3 Kabazi II, level 8C: technological marker pieces indicative of concept and method of blank production in raw material units.

shaped preform. In general, transformation analysis classifies the total length of operational chains for each workpiece conducted in the excavated area. In a second step, hypotheses are sought which might explain incomplete reduction sequences (e.g. short transformation sections) and / or artefacts which, due to the logics of flaking, must have been present at the site because they were flaked, but were not found amongst the excavated assemblage. The export accounts for two initially prepared raw pieces and 14 cores or preforms. Because one rejuvenation flake was discarded, but the corresponding tool was missing, one formal tool has to be added to the export of lithic items (Table 14-5).

The crucial question is whether the finds from level II/8C are representative. This is essential for the interpretation of transformation sections, and is a matter to be discussed in greater detail. In doing so, two aspects – one related to the site formation process, the other connected with the size of the excavated area – are of major significance:

1. The preservation of archaeological remains, and
2. An estimation of the total area occupied.

Theoretically, the fact that the site is located on a slope, and the paleo-surface inclines slightly towards the limestone block, would probably have favoured the erosional processes during site formation. In addition, some faunal remains show signs of weathering (Patou-Mathis 1999), which means that, apart from the colluvial genesis of the embedding sediments itself, there was enough time for a movement of objects owing to their exposure to running water after rain or snowfall. Furthermore, at first glance, the accumulation of finds near the limestone block might be taken as an argument to support the assumption that erosion indeed altered the spatial distribution of archaeological objects. Nevertheless, there are good reasons to suggest that erosion (as well as other post-depositional processes) played only a minor role during site formation:

1. Lithic artefacts show no sign of movement. They are unpatinated, not rolled, and their lateral edges are sharp. In addition, in most cases their orientation is horizontal.
2. Most of the artefacts found in level II/8C are chips. These are less resistant to erosional dynamics and, if erosional processes had been

assemblage			data related to identification of imported item							on-site transformation (as indicated by discard)												
Kabazi II, Unit II, Level 8C			raw piece: phase 0		initially prepared or flaked piece: phases 1 or 2		inner part of flaked piece			production of blanks: phases 1 and 2					indifferent	modification and usage: phase 3				early discard		
raw material unit	weight (in g)	N	raw piece or chunk	cortical flake	flake partly covered by cortex	flake without cortex	core/preform	unknown blank (bifacially surface shaped piece)	imported item	flake	blade	trimming flake	core/preform	chunk	chip	simple tool	surface shaped tool	chip from modification	flake from rejuvenation or broken tool tip	raw piece	transformation section	evacuation > 3 cm
12	79	7	5			2			raw piece	1				5	1						Np	prepared nodule
17	16	2			2				raw piece	2											Np	prepared nodule
2	62	10		1	2	7			raw piece	4	3	1			2						Nb	core
6	75	5		1	2	2			raw piece	4		1									Nb	core
8	34	6		1	2	3			raw piece	3					3						Nb	core
9	39	6		2	3	1			raw piece	6											Nb	core
4	105	9			1	8			core	3		3			3						Cb	core
11	14	3				3			core	2					1						Cb	core
13	42	7				7			core	6					1						Cb	core
14	54	11	2		4	5			core	4	4			2	1						Cb	core
15	22	6			1	5			core	3					3						Cb	core
1	13	7			1	6			core						6	1					Cm	core
3	17	7			3	4			core	1					5	1					Cm	core
5	20	5				5			flake		3	1				1					Cm	core
7	53	24		1	5	18			flake	15	4				4				1		Cm	core + tool
16	84	20		4	9	7			raw piece	13	2				5						Cb	core
18	27	12			6	6			sorting rest	2	1				9							
Total 17	756	147	7	10	41	89	0	0		69	17	6	0	7	44	3	0	0	1	0		

Table 10-4 Kabazi II, level 8C: Data relevant for transformation analysis. The classification of transformation sections is conducted on the "workpiece-level". As workpieces are considered as refits, two or more artefacts made on the same raw material and recovered from the excavated area are taken to represent the transformation of this raw material on site. For each raw material unit the most initial and the most final work step in the *chaîne opératoire*, as highlighted by the artefacts, are used to define the boundaries of a transformation section (explanation of the different classes of transformation sections can be found in Fig. 10-19).

pronounced, one would expect lower frequencies of such pieces.

3. Faunal remains and artefacts show a different spatial pattern with highest concentrations in neighbouring, but not identical squares.

Functionally, a different spatial pattern of faunal remains and artefacts makes sense. If erosion had led to the distribution of artefacts observed, all materials should have accumulated near the limestone block – and not only faunal remains. In the past, it has been argued that level II/8C, among others, represents only a "[...] peripheral part of an occupation [...] proven by the extremely low density of artefacts per square meter [...]" (Chabai 1998c, p. 251). As a consequence, "[...] core reduction processes could have taken place somewhere in the unexcavated parts of the occupational surfaces of levels II/8C and IIA/1" (Chabai 1998c, p. 251). This interpretation is based mainly upon comparisons with other archaeological

	import	on-site discard	export
simple blank	-	144	-
simple tool	-	3	1
surface shaped tool	-	-	-
preform or core	9	-	15
surface shaped blank	-	-	-
raw piece	7	-	-
Total	**16**	**147**	**16**

Table 10-5 Kabazi II, level 8C: As a result of transformation analysis, items are supposed to have been imported into, produced in, and exported from the excavated area. The table shows the frequencies of these objects, differentiated in broad classes.

type	level	artefacts per sq.m.	description	remarks
pattern A: northern part of excavated area (Chabai 1998, p.181)				
type 1	II/7	52.5	„unusual“	low percentage of tools
pattern B: Southern part of excavated area (Chabai 1998, p.182)				
type 2	II/7AB, II/7C, II/7D, II/7F8	80.4 to 145	„normal“	normal artefact petterning
type 3	II//E	101.7	„unusual“	unusually high percentage of blades
type 4	II/8C	43.8	„unusual“	absence of cores and pre-cores

Table 10-6 Kabazi II, Level 8C: Types of assemblages from Unit II (according to Chabai 1988, table 9-18).

levels of Unit II at Kabazi II. Whereas the distribution of archaeological remains in the upper levels of Unit II is concentrated in the northern part of the excavated area, levels II/7AB to level II/8C are concentrated in the southwestern part of the trench. It is in this stratigraphical part that two patterns were distinguished (Chabai 1998, p. 251, Table 9-18). One group (Table 10-6) is considered to represent "normal" assemblages with medium to high frequencies of artefacts per square metre, a considerable number of tools per core, and high amounts of blanks per core, indicating core reduction and blank use (levels II/7AB, II/7C, II/7D, II/7F8, and, according to the data published recently in Patou-Mathis, Chabai 2003, II/8). It is concluded that almost all discard was found within the excavated concentrations that each had a size of approximately 20-30 m^2 and were situated in the middle of the trench. The concentrations themselves are described by a central part densely covered by artefacts, surrounded by a peripheral zone with low numbers of archaeological finds (Fig. 10-22: "normal assemblages"). The second group comprises assemblages that show "unusual" frequencies of artefacts (Table 10-6, Fig. 10-22: "unusual assemblages"). If compared to the assemblages mentioned above, the percentage of tools is low (level II/7), the percentage of blades is high (level II/7E), or cores are completely absent (level II/8C). At the same time, the frequency of artefacts per square metre tends to be lower. However, in contrast to the differences in the structure of lithic assemblages that indeed seem to indicate that sometimes only the periphery of the original concentration has been excavated, the principal spatial

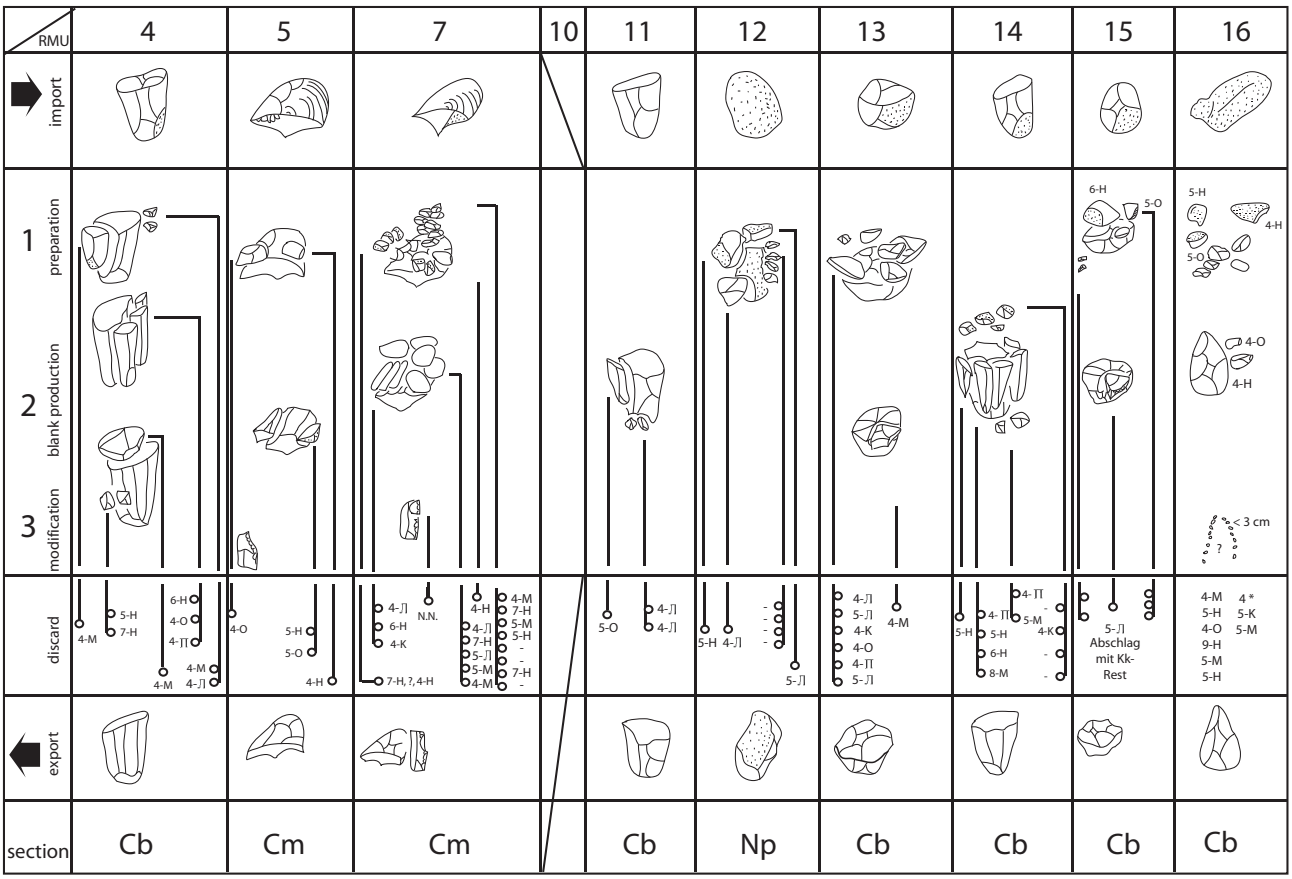

Fig. 10-20 Kabazi II, level 8C: Flow chart of the results of the transformation analysis. For each raw material unit, the part of the *chaîne opératoire* reconstructed with the help of the discarded artefacts (transformation section) is depicted as conducted within the excavated area. Import and export refer to phases of the lithic reduction which left no traces among the lithic discard, or to artefacts missing in between the transformation section (abbreviations of classes of transformation sections are explained in Fig. 10-19).

distribution of faunal remains in these levels is the same, irrelevant of wether assemblages have been classified as "normal" or "unusual". This is especially true for the faunal remains of *Equus hydruntinus*, which was the main game throughout archaeological Unit II. In all levels studied so far, the principal discard of bones occurred in the southwestern part of the trench, immediately behind the limestone block. At the same time – and again in contrast to the lithic assemblages – archaeo-zoological analysis (Patou-Mathis 1999) has revealed that faunal remains are far from being incomplete, but include all anatomical parts of the carcasses needed to reconstruct a complete operational chain of dismembering, disarticulation, defleshing and, in some cases, breakage of bones for marrow. If differences between the structures of lithic assemblages in Unit II were only influenced by the size of the trench, one has to assume that the pattern of site use remained stable for the faunal remains, whereas it changed for the knapping, use, and discard of lithics. However, aside the question whether the slope at both sides of the limestone block would have been even enough for additional knapping zones, there are further considerations which may suggest that incompletely excavated concentrations are not the only source for the loss of artefacts.

Given the character of a short-term camp, major activities other than butchering seem highly unlikely for Kabazi II. Thus, one would expect neither a wide spread of artefacts, nor a diverse distribution of lithics with more than one zone of activity. Instead, it is more plausible that artefacts were manufactured and discarded where and when they were required, e.g. near the dismembered carcasses (Fig. 10-22). This is supported by numerous chips found

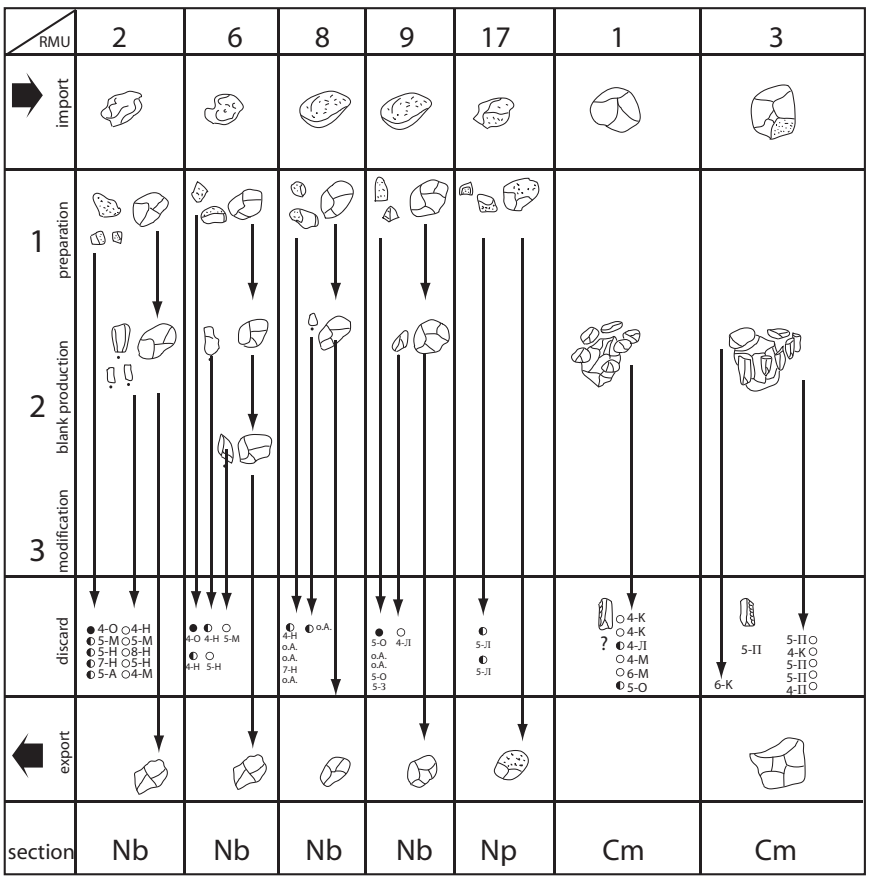

Fig. 10-21 Kabazi II, level 8C (Fig. 10-20, continued): Flow chart of the results of the transformation analysis (abbreviations of classes of transformation sections are explained in Fig. 10-19).

in the excavated area. Owing to their small dimensions, most chips must be considered as the static waste from the preparation of striking platforms, dropped at the spot where knapping (of cores) took place. Detailed studies of the faunal remains conducted so far come mainly from levels with an "unusual" assemblage structure. Here, catastrophic mortality patterns and comparably low numbers of *Equus hydruntinus* suggest that each concentration on the palaeo-surfaces excavated in the different levels correlates with one single event only. The number of horses killed (Table 10-7) varies between 7 individuals in level II/8C, and 18 individuals in level II/7E, respectively. Conversely, in level II/8, with a "normal" assemblage structure, all in all 38 horses where killed. Age profiles again point to the hunting of family groups, but it is assumed that the high number of individuals is the result of 3 to 4 successive hunts. The structure of the lithic assemblage of level II/8 (Patou-Mathis, Chabai 2003, p. 232) is very similar to other "normal" assemblages of Unit II, with high numbers of blanks per core (16:1), many tools per core (2.12:1), as well as a moderate relation between blanks and tools (6.3:1). This permits an alternative interpretation of the differences in lithic assemblage structures. It cannot be ruled out that not only level II/8C, but all archaeological levels of Unit II with "normal" assemblage structure result from a palimpsest of several visits, while "unusual" percentages and relations in lithics instead accumulated during single stays of Neanderthal groups. Small numbers of artefacts, and a lack of cores or tools, would then not result from the excavation of peripheral parts of original concentrations, but mainly due to functional reasons. For the interpretation of the short transformation sections in level II/8C, this has the following implications:

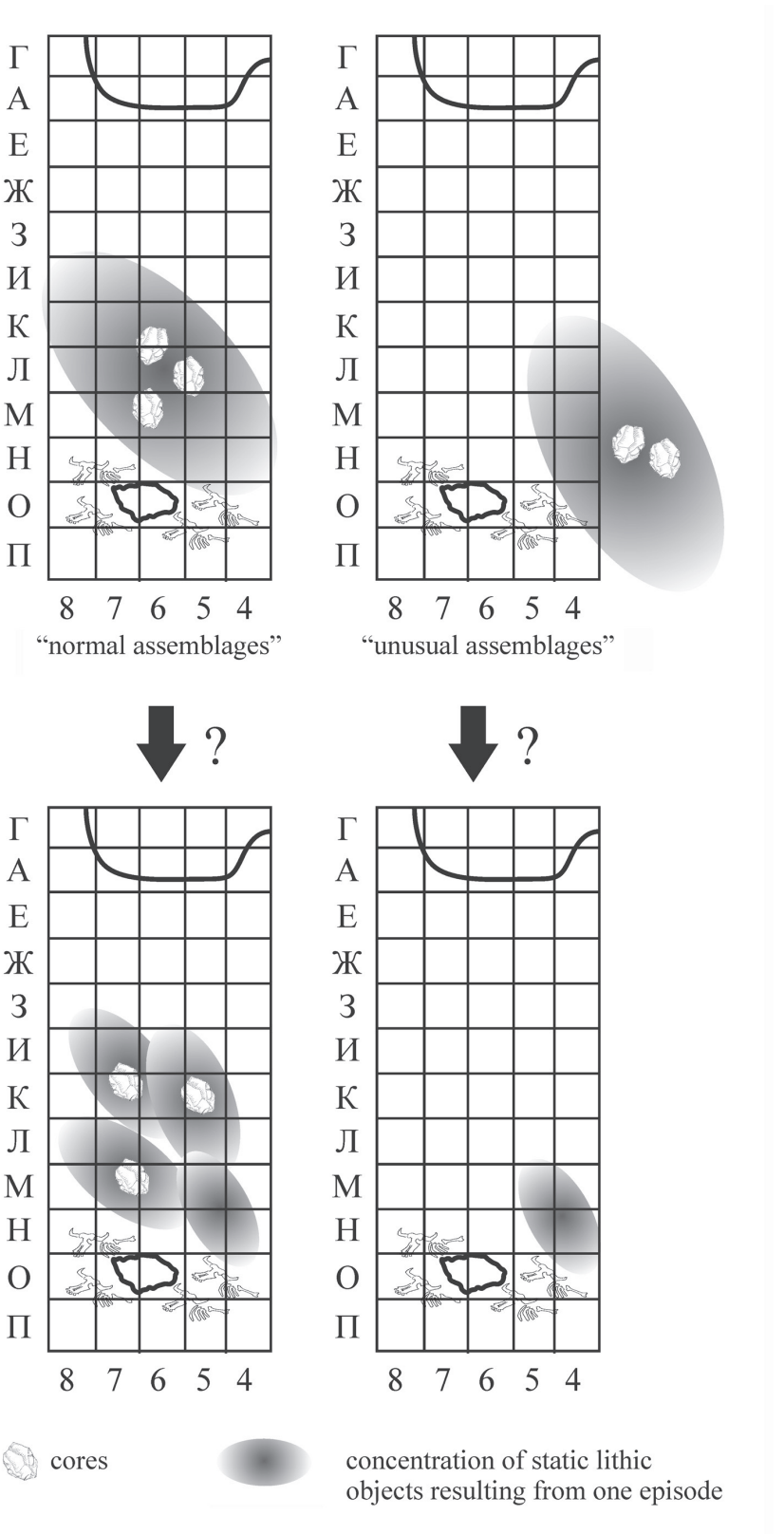

Fig. 10-22 Kabazi II, level 8C: Comparison of interpretations concerning the destribution of artefacts in levels of Unit II (above: "normal" and "unusual" assemblages according to Chabai 1988c, p. 251, below: interpretation of "normal" assemblages as palimpsest, and of "unusual" assemblages as distinct short-term events).

1. It is uncertain whether the discarded artefacts are indicative of an ephemeral area,
2. It is improbable that the knapping of lithics was conducted in areas distant from the place where carcasses where dismembered, and
3. In cases where flakes and core trimming elements indicate the flaking of cores, it is more probable that missing cores were removed and exported to other sites.

This does not mean that core discard outside the trench can be ruled out entirely, but it may be assumed that this would be an exception to the rule of export to other sites.

assemblage	*Equus hydruntinus* (MNIc)	N Lithics	excavated area
Level II/7E	18*	1050	60 m^2
Level II/8	38**	3981	60 m^2
Level II/8C	7*	339	60 m^2
Level IIA/1	8*	312	60 m^2
Level IIA/2	16*	131	60 m^2

* "single kill and butchering episode" (Patou-Mathis 1999, 73)
** "chasses successives de [...] 3 ou 4 petits groupes familiaux" (Patou-Mathis, Chabai 2003, p. 247),

Table 10-7 Kabazi II, Level 8C: Number of horses (Equus hydruntinus) killed in different levels of Unit II (data taken from Patou-Mathis 1999, Patou-Mathis, Chabai 2003) compared to number of stone artefacts.

Reconstruction of Moves

According to M. Patou-Mathis (1999, p. 50), there is "[...] *no evidence for carnivores in the faunal material; they play no role in the origin and history of the level II/8C assemblage*." A total 97,3 % of all identifiable faunal remains belong to one species, Equus hydruntinus. The mortality profile and the calculation of the minimal number of individuals speak for the successful hunting of a family group which consisted of four adult females and two juvenile individuals and which was led by an old female. At the time of death, one of the juvenile horses was between 4 and 9 months old, pointing to a hunting event in autumn (or early winter?). Therefore, level II/8C may mark the end of the summer hunting season at Kabazi Mountain, shortly before the animals moved down to lower altitudes less exposed to wind and snowfall during the winter months. This would best explain the fact that, although a family group was killed, humans felt some nutritious stress. Owing to most of the axial skeletons being missing, it is assumed that the Neanderthals were following a "reverse bulk strategy" when dealing with the carcasses, i.e. they were taken as many meat bearing parts to other sites as possible, rather than looking for high quality parts of the carcasses only ("reverse gourmet strategy").

The fact that the raw material for lithic artefacts is local can be interpreted in two different ways:

1. Neanderthals were coming from distant areas (possibly from the second range of the Crimean Mountains) directly to Kabazi II, where they hunted near the outcrop at Mount Milnaya, taking a number of raw pieces and cores with them that they procured and flaked on an encounter basis, or
2. Neanderthals were coming from a camp in the vicinity of Kabazi II, bringing prepared cores with them, or visiting the well known local outcrop in the logistical territory of that site before or shortly after the kill, and therefore following a more logistical strategy for raw material procurement.

As no formal tools were brought to the site, the second hypothesis seems the more plausible. Whatever the processes involved in the procurement of raw material may have been, it was clearly embedded within other activities, as was the subsequent preparation of cores at the butchering site. Whereas the low number of tools speaks for a production of blanks not exceeding the immediate needs, the high amount of cores, made from local raw material and exported afterwards, suggests a preparation for future, anticipated activities. Clearly, Kabazi II was a site where resources were mainly procured, and not

number of horses (MNI)	7
weight of adult horse	200 kg
consumable parts (~ 50 %)	100 kg
total amount of meat at Level II/8C	700 kg
demand on meat for adult male Neanderthal per day	4 kg
days with meat supply for male Neanderthal	175
days with meat supply for Neanderthal family group (5 persons)	35

Table 10-8 Kabazi II, level 8C: Calculation of time of activity according to consumable meat from horses (*Equus hydruntinus*).

consumed. There are no signs of a longer stay, for example, there are no pits or numerous fireplaces, and the structure of the lithic assemblages, with only few retouched pieces, indicates no activities other than the butchering of the carcasses and the preparation and flaking of lithics. It has even to be questioned whether hide, bone or wood were processed at the site. If this was the case, one might expect more formal tools, especially side scrapers and / or denticulates (Beyries 1987).

If the average amount of meat that could have been extracted from each carcass is calculated with 50 % of the minimal weight of 200 kg published for adult individuals, then the total weight of meat available from the killing of seven horses at level II/8C would account for approximately 700 kg (Table 10-8). This calculation does not take into consideration the different ages of horses within the family group killed at Kabazi II, or the possibility that the weight may have differed due to the season of the year. On the other hand, mistakes should be minimised in this calculation owing to the consideration of minimal weights despite the fact that in autumn adults tend to be well fed, with fat reserves for the winter. Recently, it has been suggested that adult male Neanderthals required 4500 to 5040 kilocalories per day, which is the equivalent of 4 kg of meat per day (Culotta 2005). With these data at hand, and assuming that the killing and butchering of all seven horses occurred contemporaneously, it is obvious that more than just one or two Neanderthal individuals intended to consume the meat exported from Kabazi II, level II/8C. In fact, the amounts in question are more suggestive of at least a family group being responsible for the kill. For a group of five individuals, the calculated amount of meat would have covered the demand of 35 days, a value which has to be reduced slightly because not all consumable parts were exported. Under cold conditions, especially during winter, the meat would probably have kept for several weeks. To conclude, the following picture of human activities seems to best explain the accumulation of lithics and faunal remains in level II/8C: at the end of autumn, a family group of Neanderthals came to Kabazi Mountain to hunt wild horses. From an unknown campsite occupied for a longer period (of some weeks?), they came to Kabazi II, and killed a small family group of female *Equus hydruntinus*. At the same time, they procured and, in part, prepared raw material at the outcrop of Mount Milnaya. At the site itself the carcasses were butchered, and raw pieces and cores flaked, producing mainly volumetric and Levallois cores and blanks. Upon leaving the site, they took with them as much meat as they could carry, this activity being an important part in their preparation for the pending winter months. In addition, they exported most (if not all) of the cores. It is highly likely that the group returned to the (base-) camp nearby, which had also been the starting point of their expedition.

Abstract

КАБАЗИ II, ГОРИЗОНТ II/8C: ТРАНСФОРМАЦИОННЫЙ АНАЛИЗ АРТЕФАКТОВ СО СРЕДНЕПАЛЕОЛИТИЧЕСКОЙ СТОЯНКИ ПО ЗАГОНУ И РАЗДЕЛКЕ ГИДРУНТИНОВЫХ ЛОШАДЕЙ

Т. УТМАЙЕР

В отложениях горизонта II/8C, образовавшихся в условиях интерстадиала Хенгело, было обнаружено 339 кремневых артефактов и 891 фрагмент костей. 147 артефактов, подходящих для трансформационного анализа, были распределены на 17 сырьевых групп. Каждая сырьевая группа представлена 2 – 24 кремневыми изделиями. Сырьевые группы представленные единичными изделиями отсутствуют. За единственным исключением все сырьевые группы представлены местным меловым кремневым серых оттенков. Основной чертой трансформации сырья является производство сколов на основе расщепления принесенных на стоянку кремневых конкреций. В то же время, все нуклеусы и значительное число сколов были унесены с территории стоянки. То есть, стоянка горизонта II/8C была местом, где, в основном, ресурсы создавались, а не потреблялись. Таким образом, хозяйственную деятельность гоминид на стоянке горизонта II/8C можно реконструировать следующим образом. В конце осени группа гоминид загнала, как минимум, 7 гидрунтиновых лошадей с обрывов куэсты Кабази (Пату-Матис, Глава 2). Разделка туш лошадей обеспечивалась артефактами, изготовленными из принесенного на стоянку местного кремня. Причем, полученное в результате расщепления нуклеусов количество орудий, превосходило потребности для разделки 7 гидрунтинусов. После разделки животных, наиболее ценные в питательном отношении части туш, а также значительное количество кремневых изделий (нуклеусов, сколов и орудий) были унесены с территории стоянки. Данная модель использования кремня отражает предвидение и определенную глубину планирования гоминидами своих дальнейших действий.