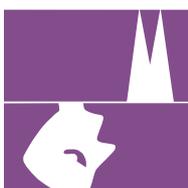


■ **Transformation Analysis at Kabazi II, Levels VI/11-14**

Thorsten Uthmeier & Jürgen Richter

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Chapter 14

Transformation Analysis at Kabazi II, Levels VI/11-14

Thorsten Uthmeier & Jürgen Richter

STRATIGRAPHICAL POSITION AND DISTRIBUTION OF FINDS

Within the long stratigraphical sequence of Kabazi II, levels VI/11-14 represent one of the lowermost archaeological levels. These deposits were embedded in geological Stratum 14B which, according to the results from the pollen analysis, have been dated to the end of the last Interglacial (OIS 5d, see Gerasimenko, Chapter 2, this volume). Due to the great depth of the trench, archaeological levels at the base of the profile were only excavated in an area covering 12 m². According to V. P. Chabai (Chapter 1, this volume), Stratum 14B represents a very early phase in the development of the site when sediments had just started to accumulate behind the block which had fallen to the surface of the 3rd terrace of the Alma river, i.e. before a more or less horizontal surface had formed there (compare Chabai, Chapter 1, Fig. 1-4, this volume). Since the surfaces of the lower part of Unit VI were not horizontal, but formed a slope running towards the Alma Valley with an angle of up to 35°, it is not clear if the artefacts found in levels VI/11-14 were encountered in their primary context (for more details see Chabai, Chapter 1, this volume, and Gerasimenko, Chapter 2, this volume). When mapped in their totality (Fig. 14-1), archaeological finds appear densely packed immediately behind the

huge limestone block. From sq. O/5 and O/6, with the highest frequencies of artefacts and faunal remains, the number of finds steadily decreases towards the northern edge of the trench. During excavations, the sloping of sediments presented problems in separating archaeological levels. It is assumed that the levels do not represent single events of artefact discard and sedimentation. Instead, archaeological remains are thought to originate from one or more concentrations, moved either from more elevated areas or from neighbouring parts of the same site by post-depositional processes down the pronounced slope. Judging from the preservation of archaeological finds, any movement must have been of a short distance only. Lithics are neither rolled nor patinated, and lateral edges look fresh and sharp. The same is true for faunal remains, which show an even better preservation than those deriving from the upper part of layer 14B (see Chabai, Chapter 1, this volume). Even fragile bones, such as “foetal bones, bones of very young individuals, [and] hyoid bones” (Patou-Mathis, Chapter 5, this volume, translation by the author), have survived. In addition, so called “coluvial artefacts”, which are a common component of most Kabazi II assemblages, and probably result

from long-time erosional processes that affected more distant parts of the *questa*, are missing (see Chabai, Chapter 1, this volume). This would point to periodically more stable conditions of the slope. If archaeological remains were transported, then it is most plausible that transportation was caused predominantly

by the angle of the surface, and came to a gentle stop in front of the limestone slab. Obviously, movements were restricted to short distances (according to the good preservation of lithics), and finds were quickly covered by colluvium afterwards (as implied by the good preservation of bones).

SOME METHODOLOGICAL REFLECTIONS ON THE TRANSFORMATION ANALYSIS OF INCOMPLETE ASSEMBLAGES

During the excavation the attempt was made to separate levels VI/11 to VI/14 by defining units according to the maximal thickness of the largest find. It is not clear if these excavation units represent several events of artefact discard and deposition, or consist of a mixed palimpsest after a single phase of slope instability. For this reason, artefacts are analysed within the units defined during excavations. Given the good preservation of both lithic and faunal remains, it appears highly unlikely that post-depositional processes cover a long period of time. Therefore, there is a good chance that the assemblages are not the result of a random selection of items (e.g. several concentrations eroding over a long time span), but of natural artefact transportation that affected only a limited area. However, it still cannot be ruled out that parts of each of the assemblages are to be found in other levels. Thus, in this situation it is debatable whether a transformation analysis of the material makes sense, and if applied, which restrictions must be considered in the interpretation of the results (for general information about this method see Uthmeier, Chapter 7, this volume). In other words: Are our methods insufficient, as J. P. Rigaud and J. F. Simek (1987) have resumed for (better preserved?) cases in the Dordogne, or is it possible to extract information from assemblages that underwent a selection of items due to post-depositional processes?

In our opinion, a detailed sortation into raw material units, combined with a transformation analysis of these units, represents an ideal solution. Given an appropriate quality of sortation, transformation analysis treats raw material as equivalents of refits. Even if there are no refits, it is assumed that several artefacts of the same nodule were manufactured on the site. Therefore, when compared to the time span covered by the entire assemblage, they represent a sequence of blows stretched over a short period of time. It follows that the question as to the contemporaneity of artefacts (in the sense of a single visit), is less problematic than in conventional approaches. Instead, every raw material unit is seen as a sub-assemblage, generally embedded in a context of flaking, discard and sedimentation. This context might

be strictly local, but can stretch over considerable distances, e.g. between the outcrop and the site, or between original discard and final sedimentation. As a consequence, raw material units analysed from a given assemblage might be – to varying extents – incomplete after N- and C-transformations. By using transformation analysis, it is possible to measure the degree of incompleteness. Therefore, the method provides important information with regard to the natural site formation process and, if artefacts are in their primary context, to the import and export of artefacts by human agents. However, even if the assemblage under study is known to have suffered from, for example, erosion, and artefacts were lost after N-transformations (M. Schiffer 1987), transformation analysis may help to reconstruct the following factors:

1. The minimal number of lithic items brought into the site, according to the frequency of raw material units. As two artefacts produced from the same raw material unit indicate the former presence of either a nodule, a preform or a core which was struck within the excavated area, a better estimation of minimal human transportation of lithics is possible.
2. The minimal number of working steps applied to every raw nodule that was flaked on the site. As an extreme example, a cortical flake combined with a lateral sharpening flake indicates a complete operational chain, starting with the decortication of a raw nodule, continued with the reduction of a core, and ending with resharpening of at least one formal tool. Thus, it is possible to estimate the minimal amount of flaking. At the same time, concepts and methods of the transformation of raw material units may show one pattern, or different, yet recurrent patterns that may help to identify the character of flaking processes. If, for example, a raw material unit combines a core and a surface shaped bifacial tool, it is concluded that flakes produced from cores served as blanks for surface shaped tools.

Or, if a raw material unit includes a bifacial tool and flakes from surface shaping that were modified, it is taken that blanks from the production of bifacial tools were subsequently used for the manufacture of unifacial formal tools. Finally, it has already been proposed that in Crimean assemblages failed or largely reduced bifacial tools were flaked like a core for the final extraction of small flakes and chips (Uthmeier 2004b). This detail has gained increased importance since L. Bourguignon, J.-Ph. Lailvre and A. Turq (2004) demonstrated that such “ramifications” of *chaînes opératoires* are an important feature of middle Palaeolithic blank production.

3. The number of missing artefacts. As demonstrated with the examples above, a transformation section might be long, although artefacts were only found that define the most initial and final phase of the formal *chaîne opératoire*. By comparing the length of the transformation sections with the number of artefacts in the raw

material units, a better estimation of the amount of missing lithics is possible.

On the other hand, while there is a good chance to formulate a hypothesis of minimal flaking activities occurring on-site, no safe assumptions can be made with respect to the import and export of lithics by humans. All such assumptions are hindered by the fact that short transformation sections may reflect nothing more than post-depositional alterations of artefacts originally discarded. In cases where single artefacts were isolated during the sortation of one archaeological level into raw material units, it cannot be excluded that parts of the same nodule were embedded in other levels. The same applies to artefacts missing from operational chains recognized as having taken place on the site: these might have been taken to other sites, but might also have been lost during natural site formation processes. Therefore, the description of the results of transformation analysis focuses mainly on long transformation sections.

LITHIC PRODUCTION AND LIMITED USE OF CURATED TOOLS: TRANSFORMATION ANALYSIS OF LEVEL VI/11

The assemblage of level VI/11 stem from only 12 excavated square metres (Fig. 14-2) and comprises 35 artefacts sorted into 14 raw material units (Fig. 14-3). Flat nodules from primary sources were preferred (Fig. 14-4 and Fig. 14-5). Some foliate points among the single objects were imported to the site

(Fig. 14-6, RMU 5, RMU 6, RMU 8). Two of these are attested solely on the basis of remnants of secondary modification, indicating their importance as curated tools. By contrast to level VI/10, levels VI/11 lacks any evidence for “migrating cores”, and instead comprises several imported nodules for the production of cores. In one case, the nodule was exploited on the site (Fig. 14-6, RMU 15). Exceptional for unit VI, level VI/11 is that it displays a very clear focus on raw material procurement from a nearby source and subsequent production of prepared nodules, preforms and cores for exportation.

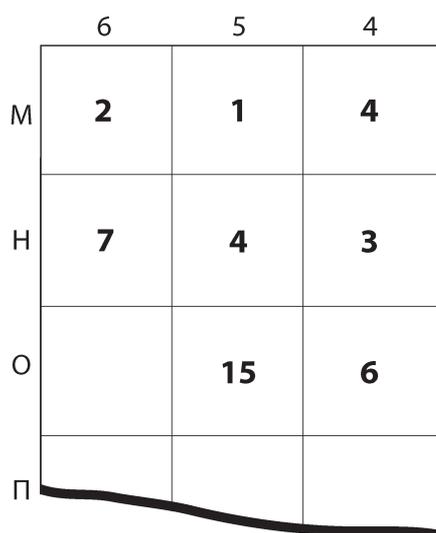


Fig. 14-2 Kabazi II, Level VI/11: artefact distribution (pieces > 2cm).

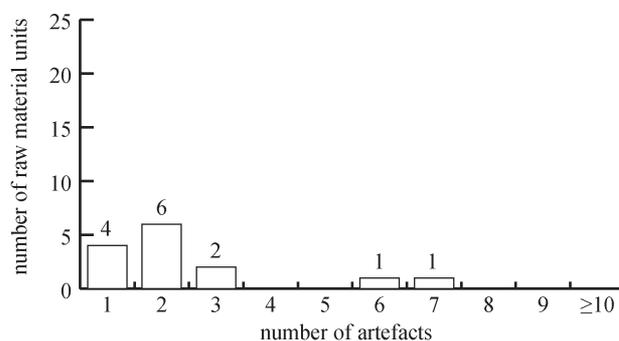


Fig. 14-3 Kabazi II, Level VI/11: Number of artefacts per workpiece.

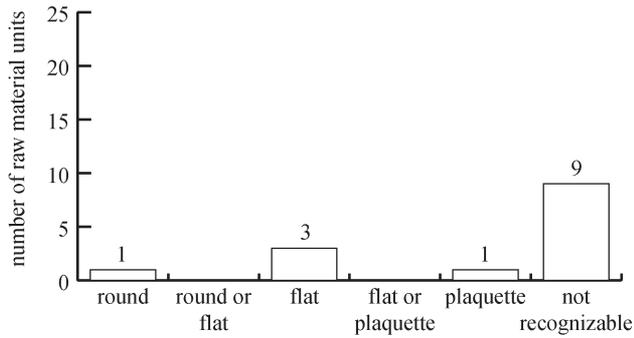


Fig. 14-4 Kabazi II, Level VI/11: Shapes of nodules.

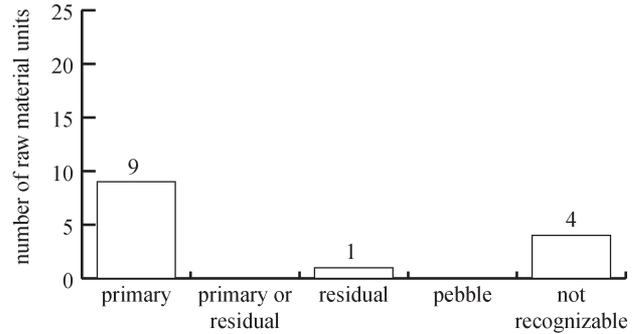


Fig. 14-5 Kabazi II, Level VI/11: Nature of raw materials.

SUPPLY FOR THE NEAR FUTURE: TRANSFORMATION ANALYSIS OF LEVEL VI/12

Finds from this level were made in the north-western corner of the excavated area (Fig.14-7). Raw material supply seems to have been random, with both round and flat nodules (Fig.14-8) and mainly residual sources (Fig. 14-9). Raw material units are quite small, comprising less than 10 artefacts. Only RMU 1 contains as many as 25 artefacts (Fig. 14-10). The latter displays a complete transformational sequence (Nm/f; Fig.14-11 and 14-12): A raw nodule was brought in and broken into large chunks. Two of these were discarded, and a further three were transformed into preforms for foliates. One preform underwent initial surface shaping only and was soon discarded. The remaining two were transformed into narrow, triangular leaf points, one of which was discarded as a whole after intensive use. The second of the points remained on the site, after medial fracture, as a basal fragment, the distal fragment having been exported. Leaf points were obviously designed for on-site use. Generally, there are three groups of operational chains (Fig. 14-13). Firstly, importation and discard of blanks (RMU 10, RMU 11). Secondly, importation of preforms, initial core-like exploita-

tion (few blanks are produced from surface shaping to be used and discarded on-site), and export of the same preforms (RMU 5, RMU 6, RMU 7, perhaps also RMU 4). Thirdly, importation of raw nodules, production and export of preforms. The operational chains are short and do not result in the production of completed leaf points as, for example, in level VI/6.

The second group (core-like pieces) repeats an observation made previously at other interglacial levels of Kabazi II. Preforms served not only as blanks for foliate pieces, but also as a source of some limited flake production. Thus, preforms were not entirely shaped at one time, but shaping was dispersed over a certain time range and was only carried out when flakes were needed. Only then were they transformed into leaf points. In this level, preforms replace cores. Were concepts for flake production unknown at this time?

To summarize, level VI/12 has extremely short operational sequences. The Kabazi II site must have been a short stop within a circulating settlement pattern. Production for export is very limited (RMU 1, RMU 10, RMU 11 only).

| | RMU | 8 | 16 | 9 | 18 | 5 | 6 | 10 | 3 | 11 | 14 | 7 |
|---------------------------|---------------------------|----------------------------|-----------------|---------------------|------------------------------|------------------------------|---------------------------|-------------------------|-------------------------|-----------------------------|-----------------------|------------------------|
| OFF-SITE | 0 Import ➔ | point (surface shaping) | side scraper | flake (fragment) | nodule (fragment) | tool (surface shaping) | tool (surface shaping) | decorticated piece | plaquette | flat round nodule | plaquette | preform |
| ON-SITE | 1 Preparation | | | | | | | fracture chunks | fracture chip | fracture chips chunks | decortication chip | |
| | 2A Blank Production | | | | | | | | | | | flake (surf. shap.) |
| | 2B Correction | | | | | | | | | | | chip |
| | 3 Modification | | | | | chips | | | | | | |
| Discard | ○ | ● | ○ | ● | ○ ○ | ○ ○ | ○ ○ | ○ ○ | ○ ○ | ○ ○ ○ ○ | ○ ○ | ○ ○ |
| Export ◀ | | | | | tool (surface shaping) | tool (surface shaping) | raw piece (fragment) | raw piece (fragment) | raw piece (fragment) | decorticated plaquette | preform | |
| Transformation Section | | Tw/f | Tw | Bw | Nw | Mi/f | Mi/f | Np | Np | Np | Np | Cb/f |

Fig. 14-6 (1)

| | | | |
|---|-----------|----------|----------|
| | 6 | 5 | 4 |
| M | | | 1 |
| H | 2 | 3 | |
| O | 14 | 3 | 3 |
| Π | 2 | 4 | |

Fig. 14-7 Kabazi II, Level VI/12: artefact distribution (pieces > 2cm).

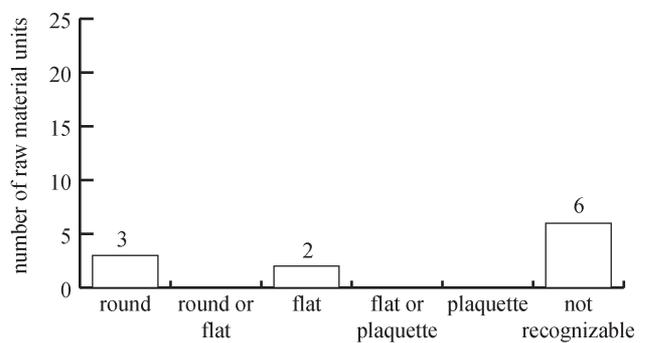


Fig. 14-8 Kabazi II, Level VI/12: Shapes of nodules.

| | RMU | 17 | 15 | 20 | |
|------------------------|------------------------|---------------|---------------|---------------|--|
| OFF-SITE | 0 Import ➔ | raw piece | raw piece | raw piece | |
| ON-SITE | 1 Preparation | | | | Remaining Pieces (containing RMU 1, 2, 4, 12, 13, 19) |
| | 2A Blank Production | | | | |
| | 2B Correction | | | | |
| | 3 Modification | | | | |
| | Discard | | | | |
| | Export ◀ | tool | | core | |
| Transformation Section | | Nb/f | Nm/f | Nm | |

Fig. 14-6 (2)

Fig. 14-6 Kabazi II, Level VI/11, transformation sections of workpieces: Bw = blank without debitage or modification; Tw = tool without debitage or modification; Nw = raw nodule without debitage; Mi = isolated pieces from modification; Np = preparation of a raw nodule; Cb = blank production from a core; Nb = blank production from a raw nodule; Nm = blank production with modification of blanks; /f = bifacial production or surface shaping (steps of the formal *chaîne opératoire* after Geneste 1985; 1988; 1990).

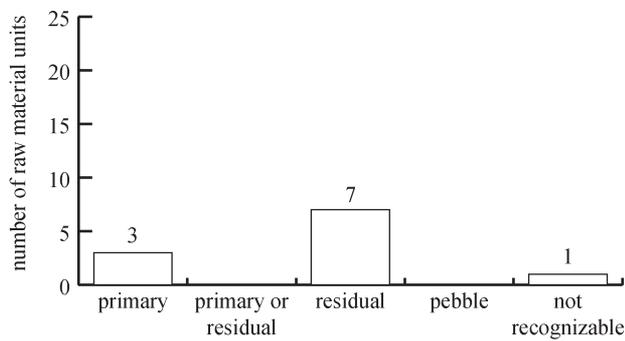


Fig. 14-9 Kabazi II, Level VI/12: Nature of raw materials.

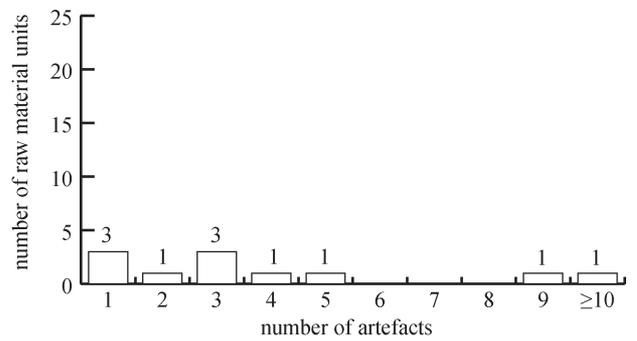


Fig. 14-10 Kabazi II, Level VI/12: Number of artefacts per workpiece.

RMU 1

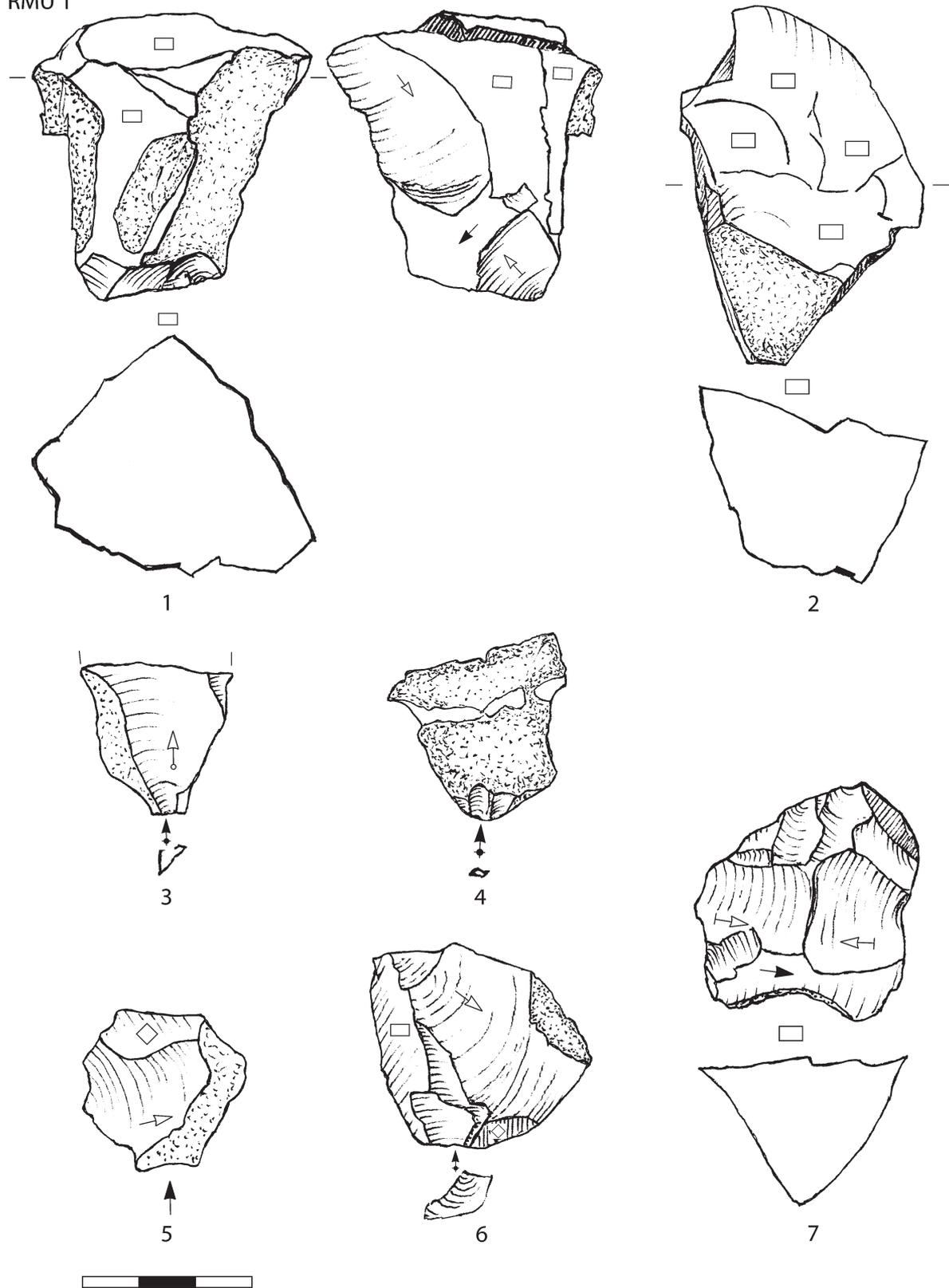


Fig. 14-11 Kabazi II, Level VI/12: workpiece RMU 1. Initial stages of a long operatory sequence. Chunks, cortical flakes and flakes from the preparation of a nodule.

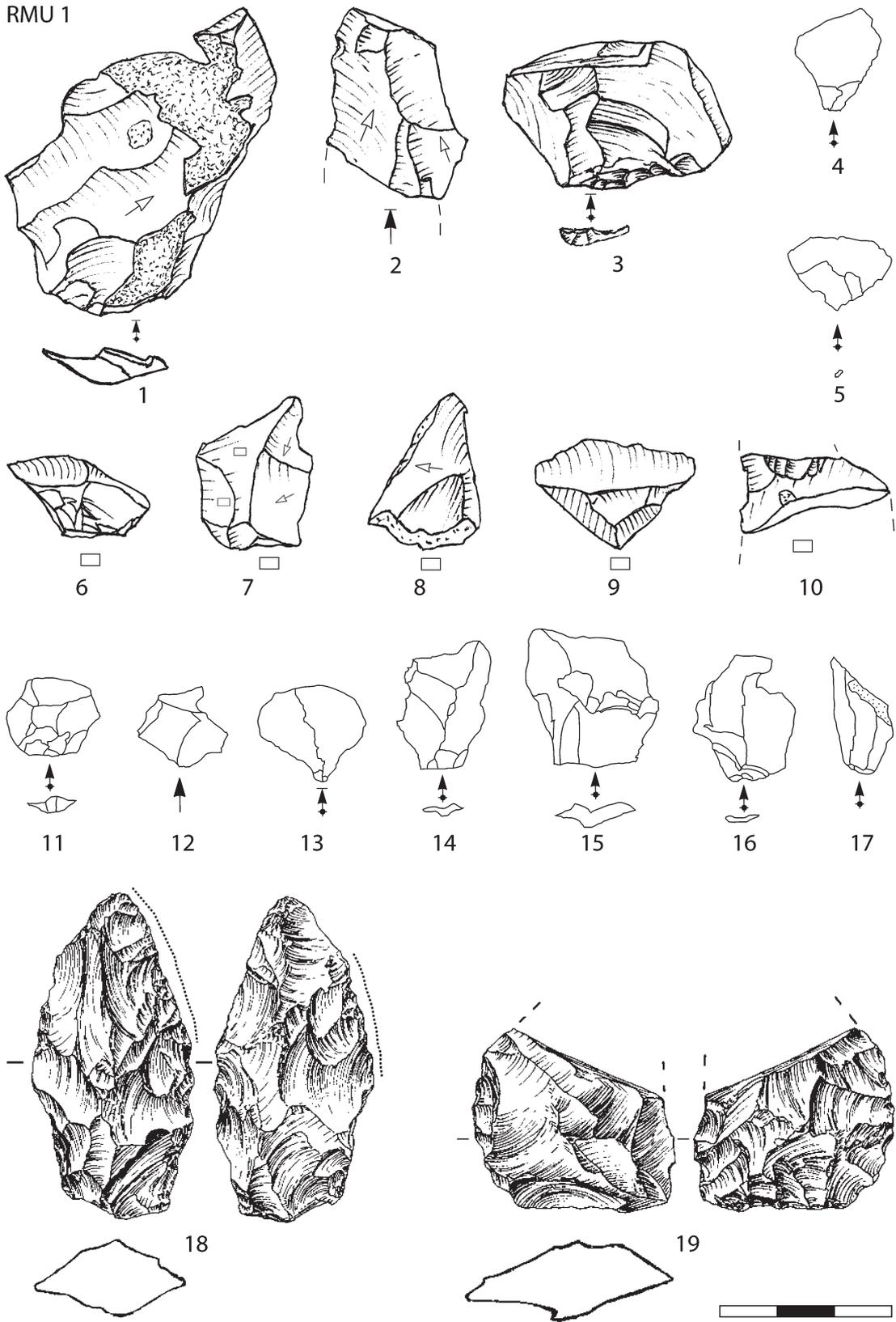


Fig. 14-12 Kabazi II, Level VI/12: workpiece RMU 1. Flakes from surface shaping and preparation of the working edges of a large foliate. Basal fragment (19) and rejuvenated foliate (18).

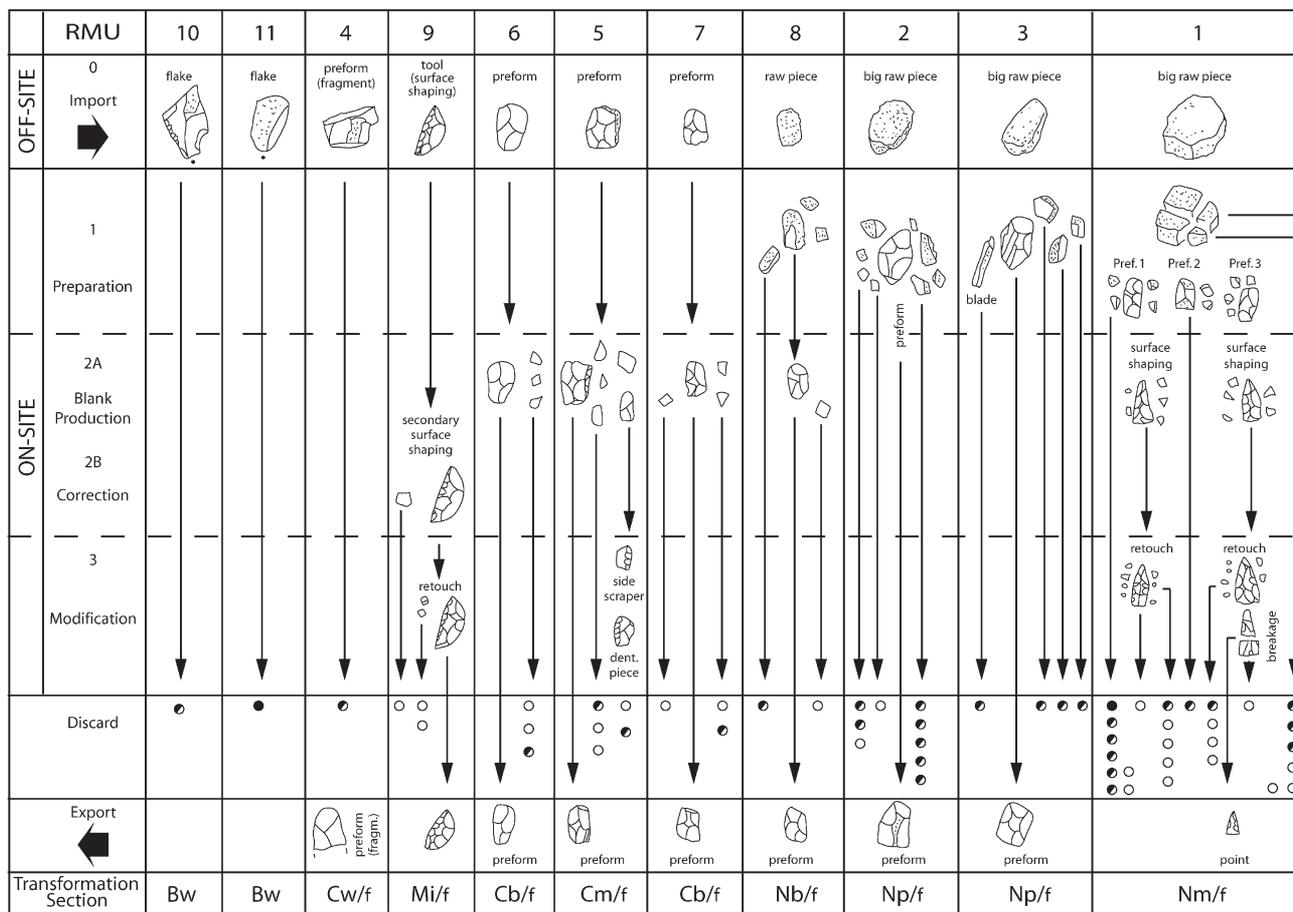


Fig. 14-13 Kabazi II, Level VI/12, transformation sections of workpieces: Bw = blank without debitage or modification; Cw = core without debitage; Mi = isolated pieces from modification; Np = preparation of a raw nodule; Cb = blank production from a core; Nb = blank production from a raw nodule; Nm = blank production from a nodule with modification of blanks; /f = bifacial production or surface shaping (steps of the formal *chaîne opératoire* after Geneste 1985; 1988; 1990).

REACTING TO IMMEDIATE DEMANDS: TRANSFORMATION ANALYSIS OF LEVEL VI/13

With 51 artefacts, the sample from Kabazi II, level VI/13 analysed here is the largest assemblage from levels VI/11-14. Therefore, it will be described in greater detail. Due to the fact that the excavated area was restricted to 12 m², little can be said about the spatial distribution of finds (Fig. 14-14). From sq. O/5 and O/6, in which the highest frequencies of artefacts and faunal remains were observed, the number of finds decreases towards the northern edge of the trench. A total of 9 formal tools were found. In six cases, the lateral edges of blanks were modified. Among these, 5 simple side scrapers dominate (Fig. 14-15, 6; 14-16, 5; 14-18, 2, 6) over one double side scraper (Fig. 14-18, 7). Occasionally, the retouch that led to the classification as a simple side scraper does

not cover the entire lateral edge of the blank (Fig. 14-18, 6). Nevertheless, negatives of the retouch are fine and regular, and they produce a straight working edge. In addition, there are three surface shaped tools (Fig. 14-16, 8; 14-19, 1, 5). Modifications were applied on blanks already altered by facial retouch on one or both sides (for more information about this way of classifying surface shaped tools, see Boëda, 1994; Richter, 2004). One of these, a bifacial scraper made on a blank with a ventral surface untouched by facial retouch, is remarkably large (Fig. 14-19, 1). In fact, with a maximal extension of 6,7 cm, it is one of the largest artefacts of the entire assemblage. Like the first, the second surface shaped tool – classified as a convergent scraper – was again made from a

flake, but is much smaller (Fig. 14-19, 5). The third surface shaped tool is a small but thick, plano-convex bifacial convergent scraper (Fig. 14-16, 8). All surface shaped tools show signs of reduction and/or resharpener. In two cases (Fig. 14-19, 1, 5) ventral thinning, as well as incomplete, large negatives of older work steps on the dorsal surfaces, speak for the rejuvenation of parts of the working edges. One piece, however, underwent a second, more or less complete facial shaping, and was rejuvenated by a lateral sharpening flake on its plan (lower) surface (Fig. 14-16, 8). With the presence of plano-convex surface shaped bifacial tools, the assemblage belongs both typologically and technologically to the Crimean Micoquian (Chabai 2004).

Sortation into raw material units

Among the 51 artefacts larger than 3 cm from level VI/13, a total of 23 raw material units (RMU) were recognized (Table 14-1). With the exception of one unit that consists of five patinated pieces not suitable for transformation analysis (Table 14-1: RMU 17), all raw material units show a unique combination of macroscopic attributes. In these 22 units, the number of artefacts ranges from between one (single pieces) and six pieces (Fig. 14-20). Most of them consist of single pieces (11 cases) or pairs of artefacts (6 cases). Only five raw material units reach numbers of artefacts of between four and six pieces. According to distinctive attributes of raw material, each of the 22 raw material units mentioned above represents the result of the flaking of a single nodule ("workpieces" in the sense of Uthmeier 2004a). Whereas single pieces point to considerable N- and/or C-transformations, others are more complete. Even if the total number of artefacts in these raw material units seems to be (too?) low, they allow a reconstruction of on-site flaking, blank production and, in some cases, tool use. In general, it is not so much the low frequency of artefacts in raw material units that is problematic: formerly, the same observation has been taken as a sign for only minor flaking of a stock of raw material taken from site to site (Uthmeier, Chapter 7, this volume), or as an indication for the transport of lithics out of the site by human agents (Uthmeier, Chapter 9, this volume). However, these assemblages were less affected by post-depositional processes (Kabazi II, level V/1), or they were found *in-situ* (Kabazi II, level V/3). Level VI/13, on the other hand, is assumed to be in a secondary position. Although artefacts were not transported over long distances, the assemblage might not contain all lithics originally discarded.

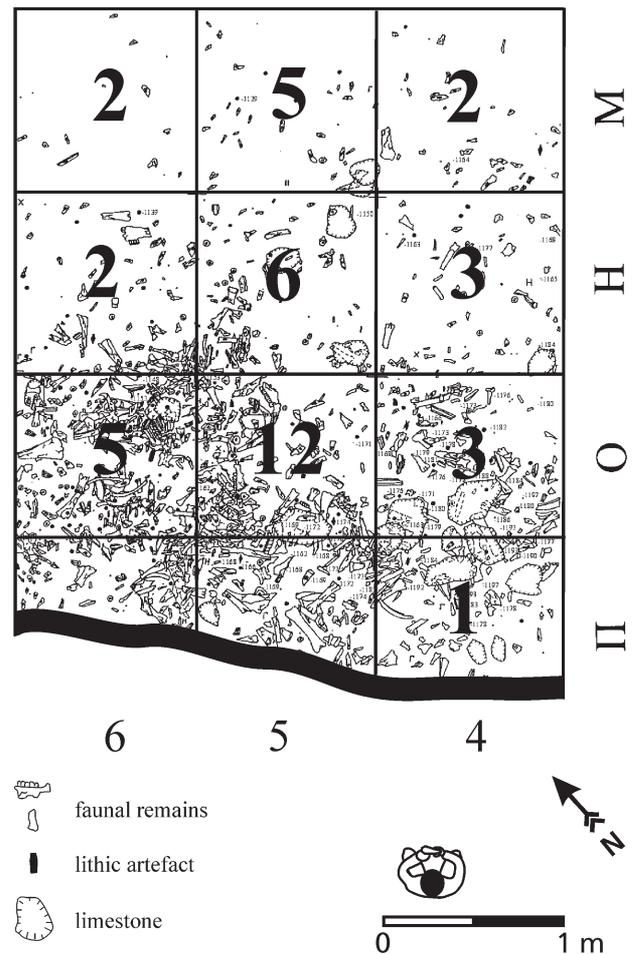


Fig. 14-14 Kabazi II, Level VI/13: distribution of artefacts used for raw material sortation and transformation analysis.

The many single pieces and small raw material units support this hypothesis. It seems highly likely that corresponding artefacts of some single pieces or small raw material units are to be found in levels VI/11, VI/12 and VI/14, respectively. On the other hand, the successful sortation of more than one half of all artefacts (larger than 3 cm) recovered from level VI/13, and the fact that all other levels bared much smaller amounts of artefacts, reveals two things:

1. The transportation down the slope did not lead to a total destruction of the original context. The existence of workpieces shows that artefacts were not moved randomly. It has to be assumed that post depositional processes were not continuously active over a long period, but were short, leaving behind at least remnants of the original context. Archaeological finds were

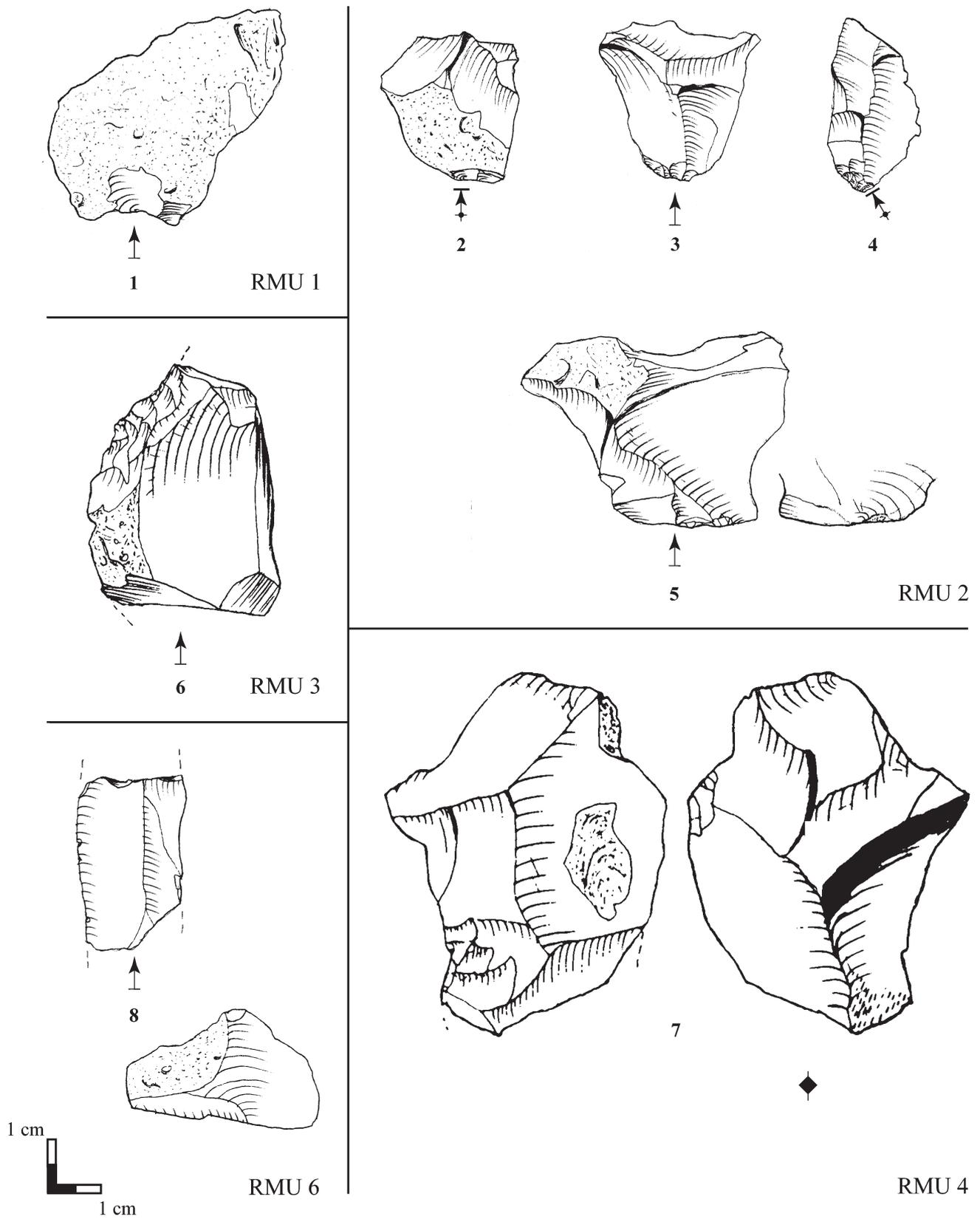


Fig. 14-15 Kabazi II, Level VI/13: artefacts in raw material units.

probably transported while embedded in sediment. On a slope like this, running water after heavy rainfall would have probably had too much energy to be responsible for a transportation that did not severely affect the finds.

2. The assemblage of level VI/13 represents either a short phase of down slope movement, whereas level VI/14 was transported earlier and levels VI/11 and VI/12 later, or consists of the main part of a concentration that was situated some metres above today's topographical position and transported as an entity.

As nearly one half of all flakes were completely (4 cases) or partly (19 cases) covered by cortex on their dorsal surfaces (Fig. 14-21), it is possible to reconstruct aspects of raw material procurement strategies. A total of 14 raw material units include artefacts that display the remains of a chalky cortex originally covering the nodules (Fig. 14-22). This points to primary sources, possibly situated in the Bodrak Valley some 6 km from the site. Local outcrops in the immediate vicinity of Kabazi Mountain which are known today were not accessible at the time level VI/13 accumulated: according to the elevation of the 3rd terrace of the Alma, which is situated some metres below the excavated area, they were covered by sediments until the river cut deeper in the landscape during OIS 3. Four raw material units had a thin, hard cortex before the flaking started, and were taken from secondary sources. As the cortex is not rolled, and therefore not transported by water, the material might have been collected near primary sources after raw material eroded out of the chalky limestone. Finally, there are two raw material units that show an opportunistic raw material procurement strategy. One (Fig. 14-18, 6) is a single piece that resulted from frost cracking of a thin plaquette. The other item (Fig. 14-16, 7) is a patinated flake reused by Neanderthals after it had been exposed to sunlight and weathering for some time. For most raw material units, the amount of cortex on the blanks was not sufficient to reconstruct the original shape of raw nodules (Fig. 14-23). For those that allowed hypothesis in this regard, the flaking started with round (1 case), round and flat (3 cases), and flat (2 cases) nodules, as well as with a plaquette. To summarize, no preferences for distinct shapes of raw pieces could be observed, possibly due to the low total number of artefacts in each raw material unit.

Results of transformation analysis: a critical discussion

The results of transformation analysis are presented in three ways: in a diagram showing the frequency of transformation sections (Fig. 14-24), in a table documenting the frequency of blanks in each raw material unit which were used as defining criteria for the classification of transformation sections (Table 14-1), and in a diagram that depicts the *chaîne opératoire* reconstructed for every raw material unit as a flow chart (Fig. 14-25 and 14-26). It has already been mentioned that 11 raw material units were single pieces. Of these, five are blanks (Table 14-1 and Fig. 14-25: RMUs 1, 12, 8, 22, 23 classified as "Bw"), and one is a core (RMU 4, classified as "Cw"). Four tools also proved to be single pieces ("Tw"). Two are simple side scrapers (Table 14-1 and Fig. 14-25: RMUs 3, 16), one is a double side scraper (Table 14-1 and Fig. 14-25: RMU 18), and one is a surface shaped bifacial scraper (Table 14-1 and Fig. 14-25: RMU 19). Another single piece (Table 14-1 and Fig. 14-25: RMU 11) is a ventral lateral sharpening flake that removed the basal part of the left working edge of a quite large unifacial tool. According to the definitions for classes of transformation sections (Uthmeier 2004a), it is the isolated end of a tool ("E1"), indicating that a modified piece was rejuvenated on the site and then taken out of the excavated area. Once again, it has to be stressed that incomplete raw material units might be the result of natural artefact transport, unsuccessful attempts to separate different archaeological levels, or transport by humans. Since the site formation process of level VI/13 was characterised by post-depositional movements of artefacts or sediments, none of these hypotheses can be excluded. As there is no clear pattern visible, but a mixture of cores, blanks, simple tools and surface shaped tools, the authors tend to believe that human transport of ready made tools or prepared cores played only a minor role in the presence of single pieces.

In total, 11 raw material units represent flaking activities conducted within the excavated area, and therefore on the site (Fig. 14-25; 14-26). However, there are still uncertainties to what extent the amount of flaking reconstructed by transformation analysis really correspond to prehistoric reality. This is especially relevant for two short transformation sections (Fig. 14-27) covering only one phase of the formal *chaîne opératoire*. They are suspicious because additional artefacts, probably hidden in other levels, might essentially change the classification of transformation sections. One unit (Table 14-1 and Fig. 14-26: RMU 24) consists of two chips that fulfil the definitions for the correction of a core (or preforms: "Cc").

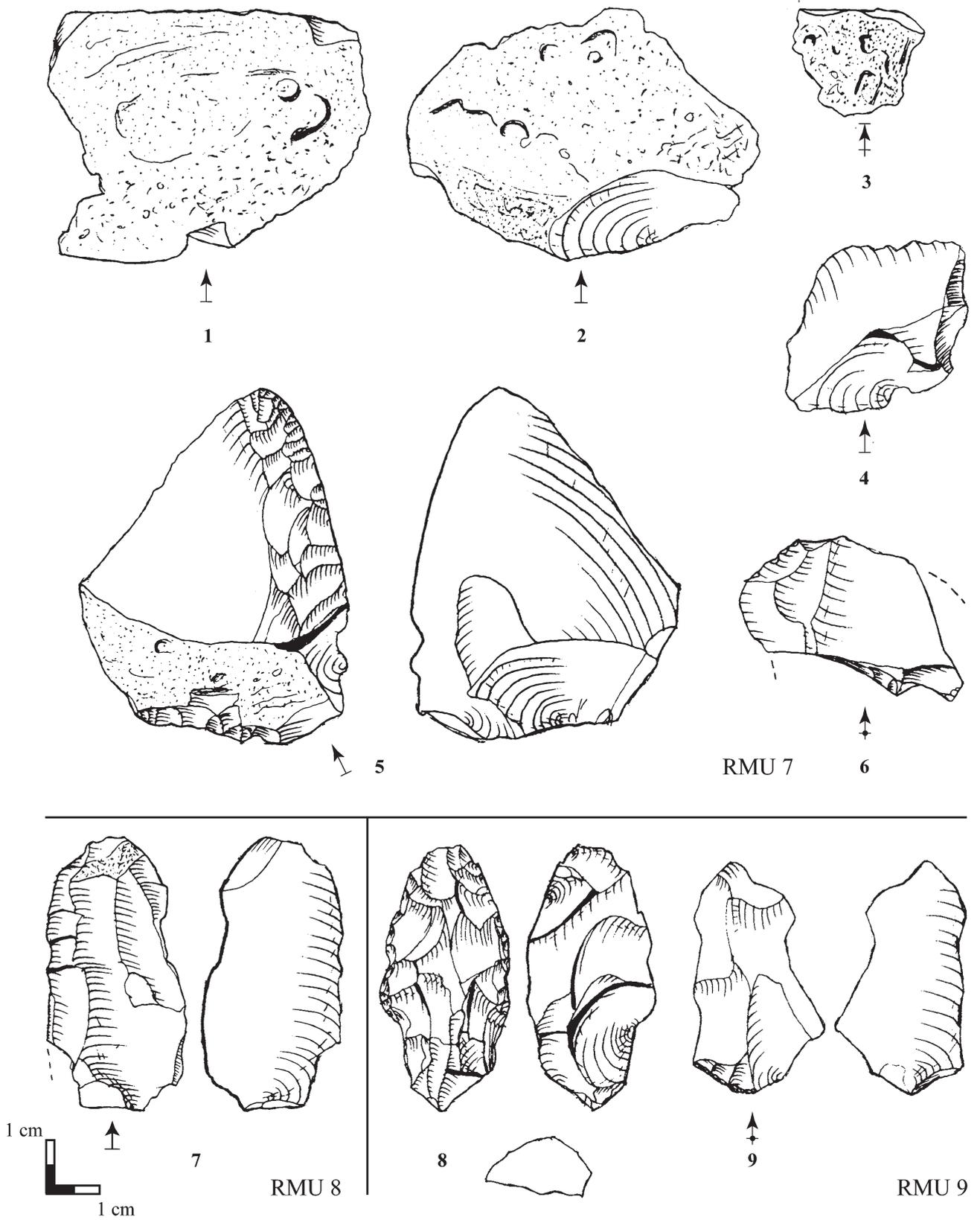


Fig. 14-16 Kabazi II, Level VI/13: artefacts in raw material units.

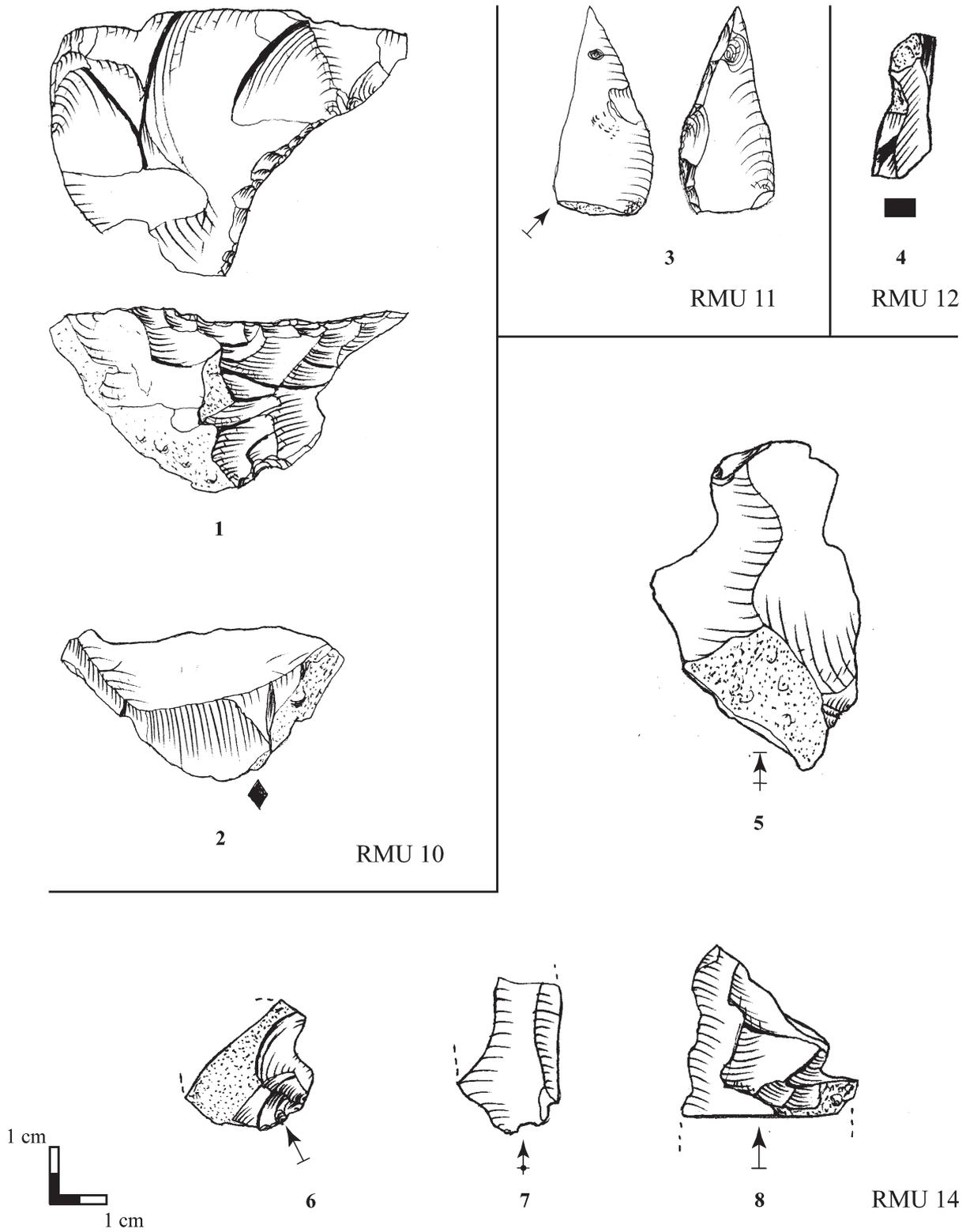


Fig. 14-17 Kabazi II, Level VI/13: artefacts in raw material units.

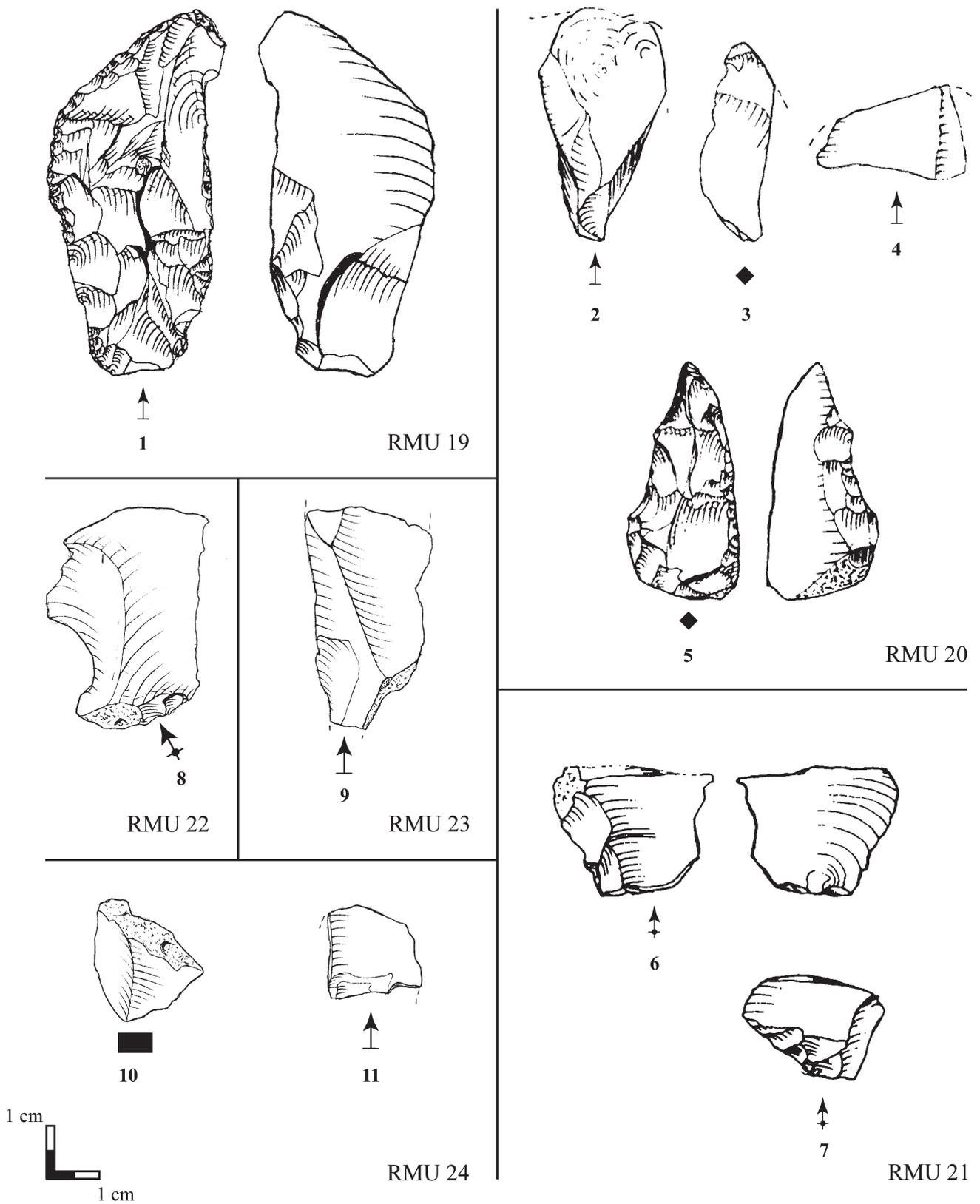


Fig. 14-18 Kabazi II, Level VI/13: artefacts in raw material units.

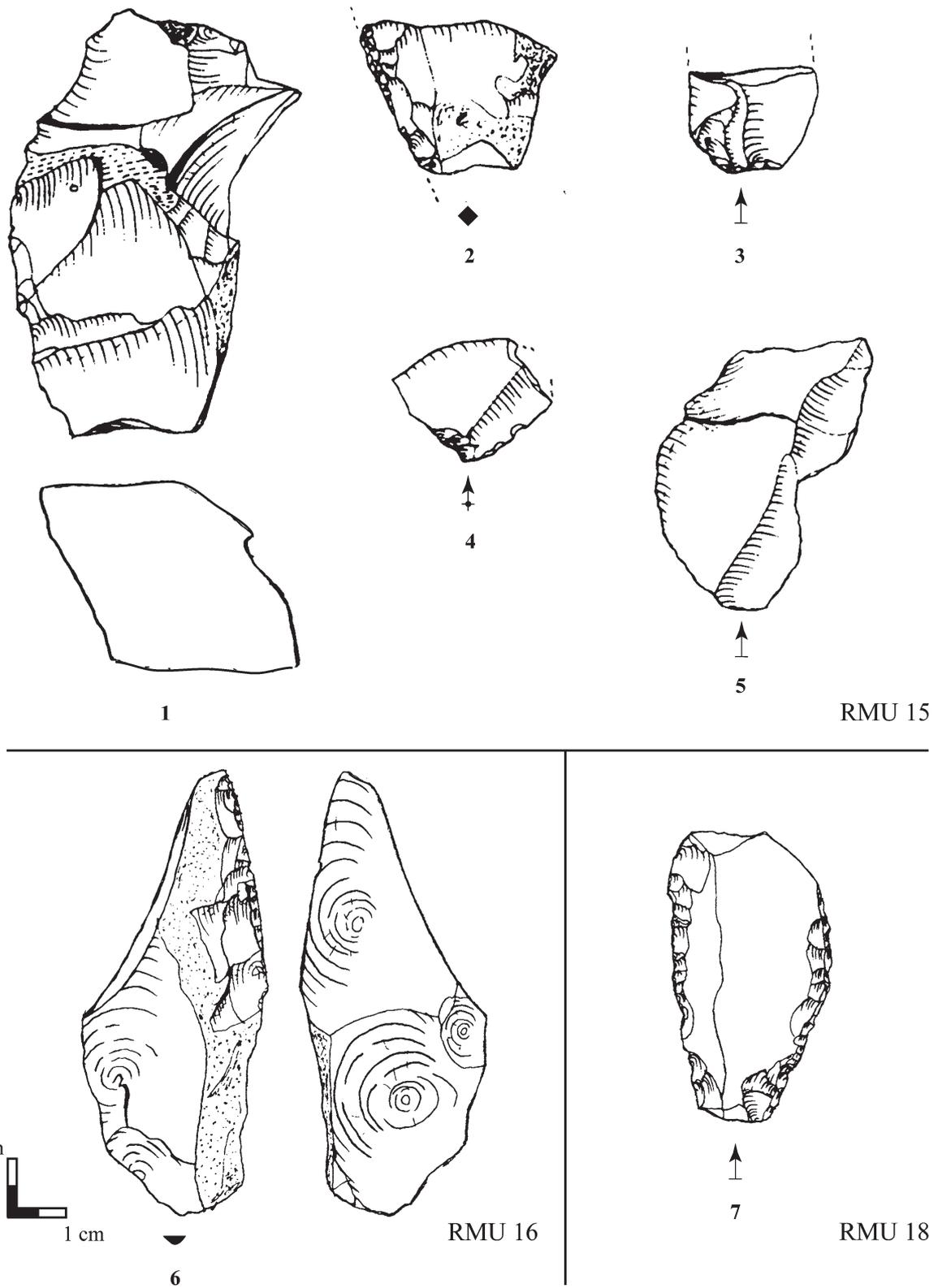


Fig. 14-19 Kabazi II, Level VI/13: artefacts in raw material units.

| assemblage | | | data related to identification of imported item | | | | imported item | on-site transformation and/or discard | | | | | transformation section | evacuation > 3 cm | | | | | | | | | |
|-----------------------------|----|---------------|---|---|----------------------------|---|---|---------------------------------------|-------|----------------|---|-------|------------------------|-------------------|---------------------|------------------------|--|-----------|------|---------|---|---|---|
| Kabazi II, Unit V, Level 13 | | | 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 | N | weight (in g) | raw piece or chunk | flake partly covered by cortex | flake without cortex | core/preform/initially surface shaped blank | unknown blank (bifacially surface shaped piece) | flake | blade | trimming flake | core/preform/initially surface shaped blank | chunk | chip | simple tool | surface shaped tool | chip from modification | flake from rejuvenation or broken tool tip | raw piece | | | | | |
| 24 | 2 | 3 | | 1 | 1 | | | | | | | | 2 | | | | | | Cc | core | | | |
| 2 | 4 | 20 | | 2 | 2 | | | 2 | | | | | 2 | | | | | | Cb/f | preform | | | |
| 5 | 2 | 7 | | | 2 | | | 2 | | | | | | | | | | | Cb/f | preform | | | |
| 21 | 2 | 3 | | 1 | 1 | | | | | | | | 2 | | | | | | Cb/f | core | | | |
| 14 | 4 | 15 | | 3 | 1 | | | 2 | | | | | 2 | | | | | | Cb/f | preform | | | |
| 6 | 2 | 11 | | 1 | 1 | | | 1 | 1 | | | | | | | | | | Cb | core | | | |
| 10 | 2 | 73 | | 1 | | 1 | | 1 | | 1 | | | | | | | | | Cb | | | | |
| 7 | 6 | 129 | 3 | 1 | 2 | | | 4 | | | | | 1 | 1 | | | | | Nm | core | | | |
| 15 | 5 | 119 | | 1 | 3 | 1 | | 1 | | 1 | | | 2 | 1 | | | | | Cm/f | | | | |
| 20 | 4 | 16 | | | 4 | | | 2 | | | | | 1 | 1 | | | | | Cm/f | | | | |
| 9 | 2 | 16 | | | 2 | | | 1 | | | | | | 1 | | | | | TM/f | | | | |
| 11 | 1 | 3 | | | 1 | | | 1 | | | | | | | | | | | Ei | tool | | | |
| 19 | 1 | 26 | | 1 | | | | | | | | | | 1 | | | | | Tw/f | | | | |
| 3 | 1 | 20 | | 1 | | | | | | | | | | 1 | | | | | Tw | | | | |
| 16 | 1 | 20 | | 1 | | | | | | | | | | 1 | | | | | Tw | | | | |
| 18 | 1 | 11 | | | 1 | | | | | | | | | 1 | | | | | Tw | | | | |
| 1 | 1 | 15 | 1 | | | | | 1 | | | | | | | | | | | Bw | | | | |
| 8 | 1 | 8 | | | 1 | | | 1 | | | | | | | | | | | Bw | | | | |
| 12 | 1 | 2 | 1 | | | | | | 1 | | | | | | | | | | Bw | | | | |
| 22 | 1 | 4 | | 1 | | | | 1 | | | | | | | | | | | Bw | | | | |
| 23 | 1 | 5 | | 1 | | | | 1 | | | | | | | | | | | Bw | | | | |
| 4 | 1 | 73 | | | | 1 | | | | 1 | | | | | | | | | Cw | | | | |
| 17 | 5 | 8 | | 3 | 2 | | | 1 | | | | | 3 | 1 | | | | | | | | | |
| Sum | 23 | 51 | 607 | 1 | 4 | 19 | 24 | 3 | 0 | | | | 21 | 2 | 0 | 3 | 1 | 15 | 6 | 3 | 0 | 0 | 0 |

Table 14-1 Kabazi II, Level VI/13: 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 piece of 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 formal chaîne opératoire, as highlighted by the artefacts, are used to define the boundaries of a transformation section (an explanation of the different classes of transformation sections can be found in Fig. 14-24).

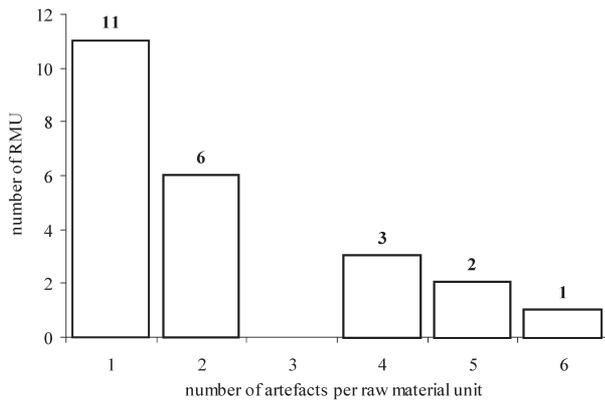


Fig. 14-20 Kabazi II, Level VI/13: number of artefacts in raw material units.

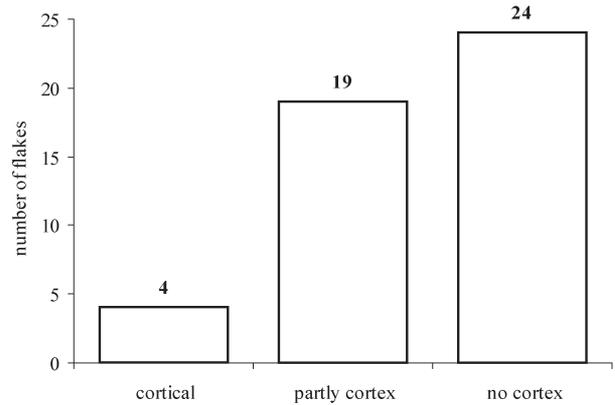


Fig. 14-21 Kabazi II, Level VI/13: frequency of cortex on the dorsal surfaces of flakes.

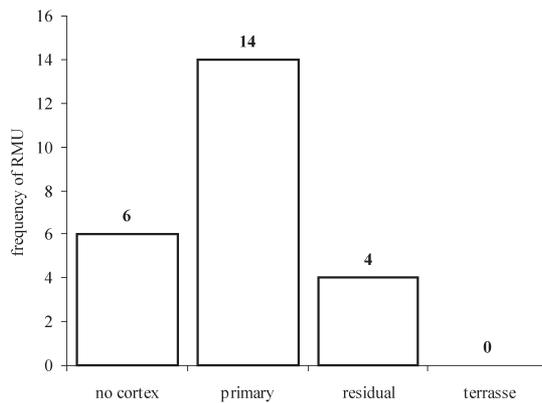


Fig. 14-22 Kabazi II, Level VI/13: geology of raw material units (without sorting rest).

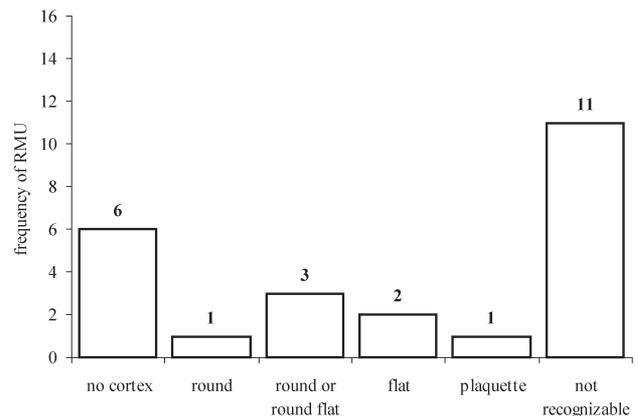


Fig. 14-23 Kabazi II, Level VI/13: original shape of raw pieces (without sorting rest).

The other one is a bifacial convergent scraper, combined with a resharpening flake (Table 14-1 and Fig. 14-25; RMU 9). This leads to a classification of the transformation section as "TM/f" (modification of a surface shaped tool).

The flaking of nine raw material units cover most, if not all, phases of the formal *chaîne opératoire*. Six of them saw the production of flakes (Table 14-1 and Fig. 14-25; 14-26: "Cb") or surface shaped blanks (Table 14-1 and Fig. 14-26: "Cb/f") from already decorticated raw pieces. Two were also dedicated to the production of surface shaped blanks from decorticated pieces, but included the modification of blanks (Table 14-1 and Fig. 14-26: "Cm/f"). Finally, one covers the entire *chaîne opératoire* from decortication to

modification (Table 14-1 and Fig. 14-26: "Nm").

To sum up, the reliability of data increases with the length of the transformation sections (Fig. 14-27). Due to the logics of transformation analysis, single pieces and short transformation sections might change essentially upon the addition of only one artefact. If, for example, a single lateral sharpening flake classified as "Ei" (import, rejuvenation and subsequent export of a tool) were combined with a cortical flake, then the transformation section would be classified as blank production from a raw nodule, followed by modification (and rejuvenation) of at least one blank ("Nm"). Therefore, the discussion of transformation sections will use different levels of reliability as a guide line.

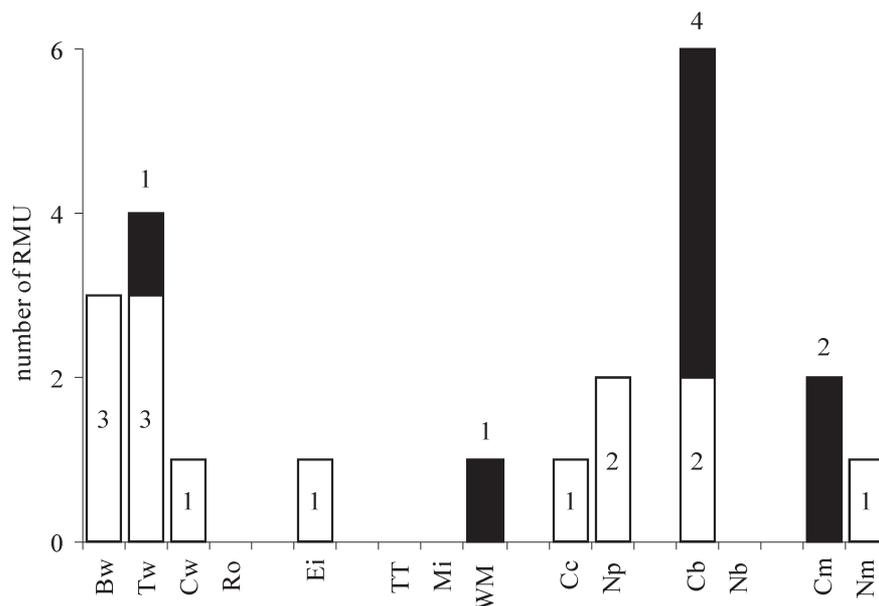


Fig. 14-24 Kabazi II, Level VI/13, frequency of transformation sections: Bw = blank without transformation (within the excavated area), Tw = tool without transformation, Cw = core without transformation, Nw = nodule without transformation, Ei = isolated functional part of a tool, including resharpening 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); black bars: surface shaping, identified by flakes from *façonnage* and/or surface shaped tools, is indicated by the connotation */f (steps of the formal *chaîne opératoire* after Geneste 1985; 1988; 1990).

Useful data: Long transformation sections

Production of flakes from cores ("Cb")

Judging from the artefacts discarded, the transformation of two raw material units, RMU 6 (Fig. 14-15, 8-9) and RMU 10 (Fig. 14-17, 1-2), started with partly decorticated raw pieces and was focused on the production of flakes. Due to the fact that each raw material unit consists of two artefacts only, nothing can be said about the concept or method of flaking. The core found in RMU 10 (Fig. 14-17, 1) has a striking platform formed by several radial flakes, most of them ending in a hinge lip. The platform edge was prepared with a line of small negatives, as was the edge of the flaking surface. Despite the cautious treatment of the platform, no control of distal or lateral convexities was observed on the flaking surface. As a consequence, most removals failed, ending in a hinge. Although no remnant of a ventral surface can be found on the striking platform, the cross section of the piece suggests that it was made from a large cortical flake.

Production of flakes from raw pieces with subsequent modification of blanks ("Nm")

The transformation section of RMU 7 (Fig. 14-16, 1-6) covers the longest sequence possible: a production of blanks from a raw nodule, with one flake modified. Looking at the size of flakes that removed cortex (Fig. 14-16, 1, 5), it becomes clear that the raw nodule was considerably large. In RMU 7, a simple side scraper was thinned at its base, possibly for hafting purposes (Fig. 14-16, 5).

Production of large surface shaped bifacial blanks ("Cb/f")

Three raw material units RMU 2, RMU 14 and RMU 21 consist of flakes that result from surface shaping. In RMU 2 (Fig. 14-15, 2-5), the largest flake (Fig. 14-15, 5) shows the remnants of a facial negative on its butt, near the bulb. Obviously, the flake belongs to a final phase of *façonnage* when the preform had already become quite thin, and lateral flaking angles were narrow. Thus, the point of percussion was directly on the lower surface of the bifacially surface shaped preform. The same applies to a flake from RMU 21 (Fig. 14-19, 6-7).

Production of surface shaped blanks with subsequent modification of simple blanks ("Cm/f")

In RMU 15 (Fig. 14-18, 1-5), a partly decorticated preform was surface shaped, but discarded after facial retouch ended in deep hinges. Three flakes (Fig. 14-18, 3-5) show the characteristic attributes of direct soft hammer percussion: no or less pronounced bulbs, no bulbar scars, and curved lateral profiles. One flake, possibly also struck by soft hammer percussion, is fragmented, but must have been much larger than other flakes from this raw material unit (Fig. 14-18, 2). Partly covered by cortex, it derives from an initial phase of the reduction process and was modified into a simple (?) side scraper.

Ramification of chaînes opératoires: flake production and surface shaping ("Cm/f")

Despite the fact that RMU 20 consists of only four artefacts, its transformation covers most steps of the formal chaîne opératoire (Fig. 14-19, 2-5). Three fragmented flakes go back to the flaking of a core (Fig. 14-19, 2-4). The fourth piece is a small convergent scraper (Fig. 14-19, 5). Its dorsal surface is completely covered by soft hammer facial retouch. The left lateral edge of the ventral surface shows a line of negatives classified as ventral thinning. Although the piece is small, it is a surface shaped blank (in the sense of Richter, 2004), modified on the dorsal surface with small, regular retouch of the converging lateral edges. There are different possibilities to explain the small size of the tool. It may have been that the blank was a broken part of a surface shaped tool, or a lateral sharpening flake. In both cases, it would indicate the re-use of a part of a larger tool. However, the fact that the ventral surface exhibits some cortex, as well as the observation that negatives from surface shaping are symmetrical and struck from striking platforms more or less identical to the existing lateral edges, speaks for the selection of a small flake for the manufacture of the surface shaped (bifacial) convergent scraper. RMU 20 clearly shows what L. Bourguignon, J.-Ph. Lailvre and A. Turq (2004) call „ramification of chaînes opératoires“: the flaked product of one chaîne opératoire (reduction of a core) is selected as a starting point for a second transformation process that, in this case, is conducted with a different concept (surface shaping), method (plano-convex cross section) and technique (soft hammer percussion).

**Problematic data:
Short transformation sections**

In cases where transformation sections are short, additional artefacts may essentially change the classification. Due to the site formation process of level VI/13, there is a good chance that blanks of the same raw material units are to be found in levels VI/11, VI/12 or VI/14.

Reduction of large surface shaped bifacial tools („WM“)

RMU 9 (Fig. 14-16, 8-9) contains two artefacts, a bifacial convergent scraper and a resharpening flake. A large, yet incomplete negative on the ventral surface of the bifacial convergent scraper (Fig. 14-16, 8) belongs to an initial work step of surface shaping. The negative of its bulb has been cut by negatives of younger work steps dedicated to a complete second facial retouch of the upper (dorsal) side, and by negatives of basal and terminal thinning. The second item of RMU 9 is a flake from surface shaping (Fig. 14-16, 9) that fits perfectly into the biography of the scraper reconstructed from the analysis of work steps (see Kurbjuhn, chapter 13, this volume). It is a resharpening flake, showing some splintering after use, which removed a small portion of a working edge. The dorsal scar pattern of the resharpening flake demonstrates that it was struck from the base of a large surface shaped tool. According to the logics of transformation analysis, the convergent bifacial scraper is the remnant of this formerly large surface shaped tool. The resharpening flake was removed in the course of one phase of more or less complete rejuvenation by facial shaping of its ventral and/or dorsal surface.

Correction of a core or a preform ("Cc")

Two chips from the same nodule in RMU 24 result from the preparation of a core or a preform (Fig. 14-19, 10-11).

Single pieces: Useless data?

Even if the interpretation of single pieces as being imported by humans into the excavated area is problematic after the assemblage was found in a secondary context, they still give relevant information for the understanding of activities connected with the transformation of raw material. In fact, most single pieces discussed below indicate missing sub-assemblages, or shed light on special patterns of raw material use. Single pieces fall into five broad categories: simple flakes (Table 14-1: RMU 1, RMU 8, RMU 12,

| RMU | 18 | 3 | 16 | 19 | 4 | 1 | 8 | 23 | 22 | 11 | 9 | 12 | 2 |
|------------------------------|----|----|----|------|----|----|----|----|----|----|------|----|----|
| OFF-SITE 0 Import ➔ | | | | | | | | | | | | | |
| ON-SITE 1 Preparation | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2A Blank Production | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 2B Correction | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| 3 Modification | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
| Discard | ○ | ● | ● | ○ | ● | ● | ○ | ● | ● | ○ | ○ | ● | ○ |
| Export ← | | | | | | | | | | | | | |
| Transformation Section | Tw | Tw | Tw | Tw/f | Cw | Bw | Bw | Bw | Bw | Ei | TM/f | Bw | Cb |

Fig. 14-25 Kabazi II, Level VI/13, flow chart of the transformation of raw material units: 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, identified by flakes from *façonnage* and/or surface shaped tools, is indicated by the connotation */f (steps of the formal *chaîne opératoire* after Geneste 1985; 1988; 1990).

RMU 22, RMU 23), simple tools (Table 14-1: RMU 2, RMU 16, RMU 18), surface shaped tools (Table 14-1: RMU 19), resharpening flakes (Table 14-1: RMU 11), and cores (Table 14-1: RMU 4).

With the exception of a lateral sharpening flake (Fig. 14-17, 3), all blanks among single pieces most probably do not come from surface shaping, but from the reduction of cores. Arguments for this are not only their length, width and thickness, but also the unidirectional scar patterns on their dorsal surfaces (Fig. 14-15, 1; 14-16, 7; 14-19, 8-9). Probably, they were flaked from simple cores like the one that was sorted into RMU 4 (Fig. 14-15, 4). It was made from a large, thick cortical flake. A good portion of the ven-

tral surface is still visible on the striking platform, which was prepared by several blows that removed Kombewa-flakes. Blanks were removed without any control of distal and lateral convexities.

Isolated simple tools were produced from relatively large, voluminous flakes. According to remnants of cortex on their dorsal surfaces, most of them come from an initial phase of raw material treatment (Fig. 14-15, 6; 14-19, 1). However, there are two exceptions. In RMU 16 (Fig. 14-18, 6), a blank resulting from frost splitting of a thin plaquette was modified into a simple scraper, and in RMU 18 (Fig. 14-18, 7) a patinated flake with regular unidirectional dorsal negatives was reused for the manufacture of a double

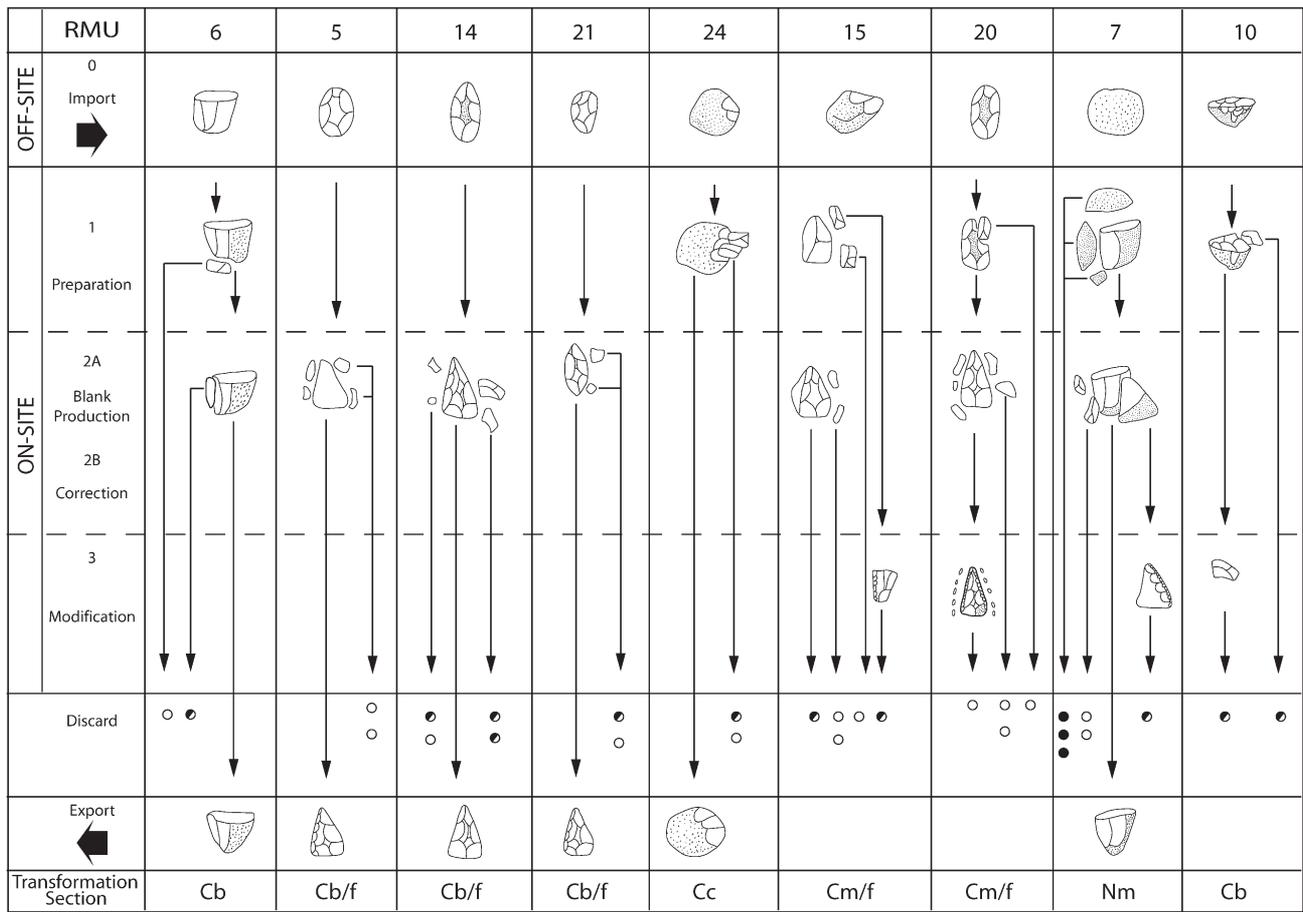


Fig. 14-26 Kabazi II, Level VI/13, flow chart of the transformation of raw material units (continued from Fig. 14-25).

scraper. Because they were not taken out of a reduction sequence, but retouched directly after collection from the Pleistocene surface, these two pieces most probably go back to human transportation, e.g. import to the site. When compared to the dimensions of flakes from workpieces, which were mainly discarded without being retouched, tools among single pieces point to size as the main criteria for the selection of blanks for modifications. The fact that frost cracks and patinated artefacts were used might be seen as a sign for a shortage of blanks of appropriate size and shape. This is in accordance with the fact that no special concept for the production of regular flakes was recognized.

Together with a lateral sharpening flake (RMU 11: Fig. 14-17, 3) and a single surface shaped tool in RMU 19 (Fig. 14-19, 1), again made from a large cortical flake, single pieces add the following characteristics to the assemblage of level VI/13: large flakes with straight lateral profiles, often partly covered by

cortex on their dorsal surfaces, as well as a core made from a cortical flake, are the result of the reduction of simple cores. In some cases, the flaking did not start with a raw nodule or a roughly decorticated preform, but with a large cortical flake. This means that large nodules were, at least in some cases, broken or flaked into smaller portions before the reduction of cores began. Most probably, the corresponding cores or flakes of this reduction sequences were lost by natural site formation process. In addition, size seems to have been the most important criteria for the selection of blanks for use. Perhaps because no advanced concept or method of core reduction was applied, most blanks for tools were taken out of initial phases of the *chaîne opératoire*, when raw pieces were still covered by some cortex. In addition, there seems to have been a shortage of large flakes, indicated by collected frost cracks or patinated flakes. And, finally, Neanderthals of level VI/13 had the knowledge of rejuvenation by lateral sharpening flakes.

REACTING TO IMMEDIATE DEMANDS? INFORMATION ON ACTIVITIES OF NEANDERTHALS DURING THE FORMATION OF LEVEL VI/13

In the course of excavation it was not possible to separate levels VI/11-V/14. However, it still cannot be ruled out that the movement of artefacts occurred within short periods, but several times. The assemblage from level VI/13 includes not only most artefacts, but also consists of a number of raw material units that represent distinct nodules flaked on the site. If only flaking activities are considered, part of the material was preserved in its essential context, as indicated by the presence of long transformation sections. The results of transformation analysis give at least some answers for the questions posed in the introductory part of this article:

1. The minimal number of lithic items brought into the site. For the manufacture of the assemblage a minimum of 22 raw pieces was used. At least two formal tools seem to have been produced elsewhere and brought to Kabazi II by Neanderthals.
2. The minimal number of working steps applied on every raw nodule that was flaked on the site. Taken altogether, all phases of the formal *chaîne opératoire* are present: flaking of raw pieces, reduction of decorticated preforms or cores as well as resharpening or modification of existing tools. In cases where more numerous artefacts were sorted into raw material units, blank production without modification dominates.
3. Concepts and methods of transformation. In level VI/13 two concepts of transformation were observed: plano-convex surface shaping, and the reduction of simple cores sometimes made from large flakes. If single pieces are also considered the production of simple but large flakes clearly dominates over the manufacture of surface shaped tools. However, in some cases a ramification of *chaînes opératoires* was

observed when flakes (from cores on flakes?) were used as starting point for surface shaping. In addition, the authors had the impression that blank production did not always meet the criteria of large size for the selection of blanks for tools.

4. The number of missing artefacts. The composition of single pieces seems to be random, leading to the assumption that they, as most of the raw nodules with short transformation sections, were originally flaked on site. In this case incompleteness is not caused by C-transformations, but by post-depositional N-transformations.

The high amount of flakes with cortex, and some cortical flakes, suggests that most pieces from level VI/13 brought to Kabazi II were either not prepared at all, or only roughly initialised. In some cases, the reduction started with large cortical flakes, pointing to a flaking of raw nodules (at the outcrops?) into smaller portions (for more convenient transportation?). In contrast to many other assemblages with surface shaped tools from Kabazi II, most reduction sequences reconstructed by transformation analysis were dedicated to the manufacture of flakes from simple cores. However, the flaking neither went deeply into the raw nodules, nor did it follow a distinct concept or method that would have prevented an early discard of cores by controlling distal or lateral convexities. As a consequence, many large flakes were modified, and two tools were made from blanks picked up directly from the Pleistocene surface. Indeed, one has the impression that the visits to Kabazi II were not carefully planned – possibly as stays were short, incidental or not in a chain of macro moves, but in the course of micro moves within a logistical territory. Raw material procurement and reduction sequences seem to be a reflection of immediate demands only.

Fig. 14-27 Kabazi II, Level VI/13, overview over the frequency of artefacts in raw material units with transformation sections indicating on-site flaking ($N \geq 2$): TM = tool with corresponding chips from its modification, Cc = correction of a core, Cb = blank production from a core, 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, identified by flakes from *façonnage* and/or surface shaped tools, is indicated by the connotation */f. ►

COMMENT ON THE TRANSFORMATION OF RAW MATERIAL IN LEVEL VI/14

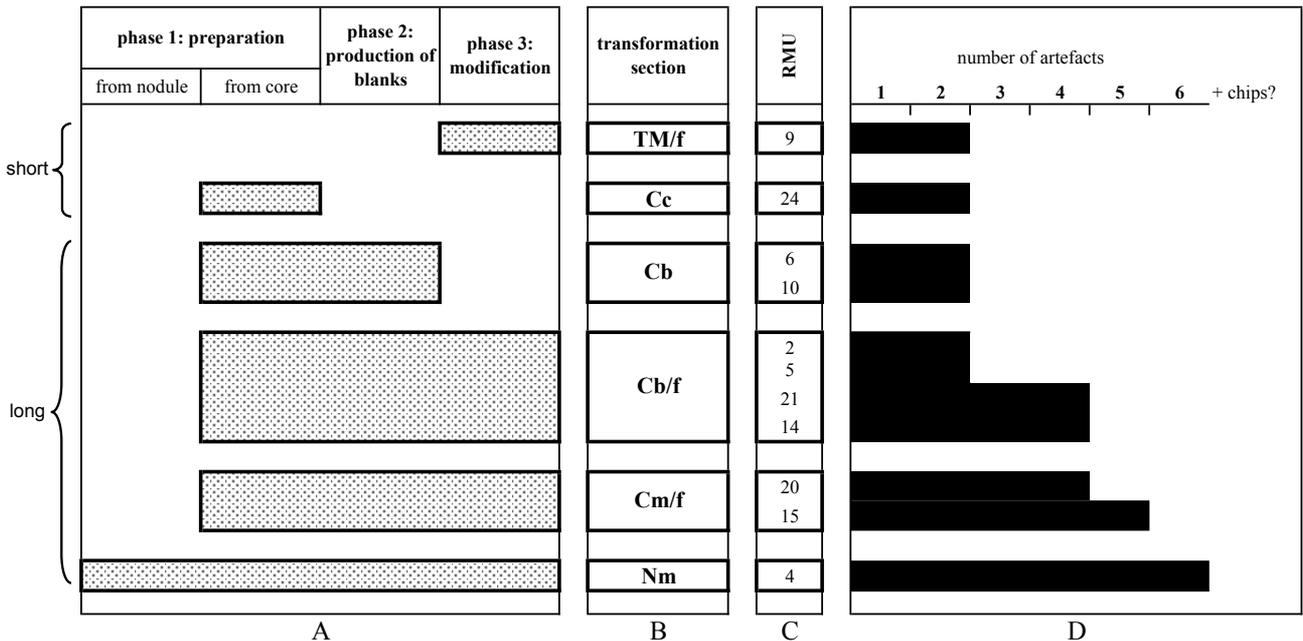
The total number of artefacts considered in raw material sortation from level VI/14 accounts for 23 pieces. Among these, 11 raw material units with artefact frequencies between one and five pieces were recognized (Fig. 14-28). As in levels VI/11, VI/12 and VI/13, single pieces are numerous. Seeing as four of these (Fig. 14-28: RMU 6, RMU 7, RMU 10, RMU 11) are blanks without retouch, and two are chunks (Fig. 14-28: RMU 6, RMU 8), it seems unlikely that they were brought into the excavated area as manuports by human agents. Given the problematic character of the site formation during the sedimentation of levels VI/11-13 this would be expected for tools or preforms but not for simple blanks. Instead, it has to be assumed that they derive from reduction sequences originally conducted on the site and altered by post-depositional processes. In two units the transformation was dedicated to the production of flakes from raw pieces already decorticated. While one unit includes two modified

tools (Fig. 14-28: RMU 3) the other consists of simple flakes only (Fig. 14-28: RMU 5). Both units lack a core. In three units partly decorticated nodules were surface shaped (Fig. 14-28: RMU 1, RMU 2, RMU 4). Judging from the size of the flakes that includes both large and small items, surface shaping resulted in the production of surface shaped blanks. In two units (Fig. 14-28: RMU 2, RMU 4), however, the surface shaped tool itself is missing, leading to a classification as "Cb/f" (production of surface shaped blanks). Only one unit (Fig. 14-28: RMU 1) includes the surface shaped tool. All in all, the transformation analysis of level VI/14 repeats the results obtained for level VI/13: single pieces as remnants of sub-assemblages lost after N-transforms, flake production from simple cores, and surface shaping of decorticated raw pieces. Again, the presence of raw material units as small as distinct nodules points to minor alterations of the original assemblage after N-transforms.

CONCLUSION

For the purpose of faunal analysis, levels VI/11-14 were treated as an entity (Patou-Mathis, Chapter 5, this volume). With a minimal number of 17 individuals, *Equus hydruntinus* by far dominate the faunal assemblage. Cut marks and the breakage of long bones by percussion, prove that humans were

responsible for most part of the disarticulation of *Equus hydruntinus* carcasses on the site. However, the composition of body parts, as well as age profiles at death and some bite marks, suggest that only a part of the *Equus hydruntinus* killed at Kabazi II was securely hunted by Neanderthals. This accounts



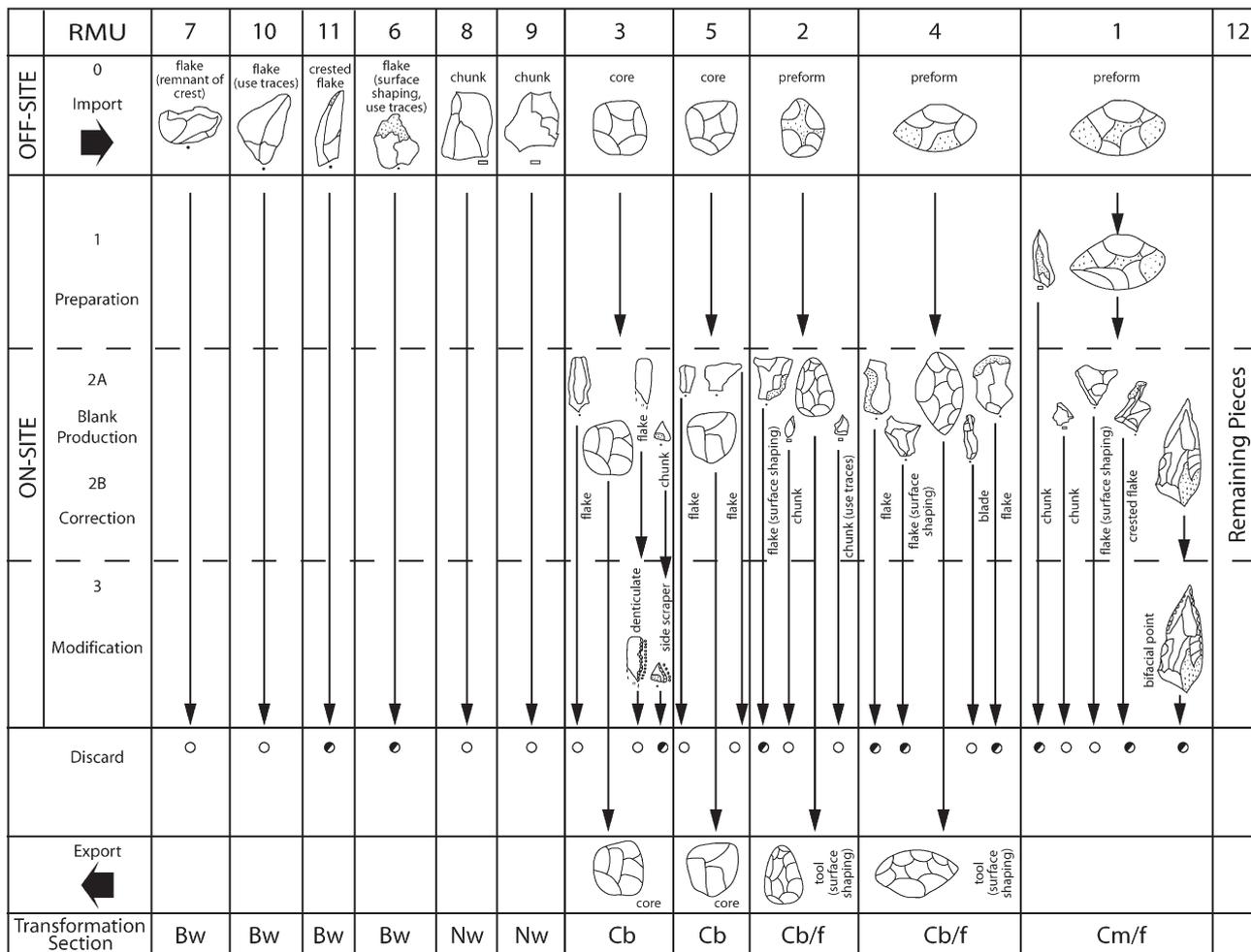


Fig. 14-28 Kabazi II, Level VI/14, flow chart of the transformation of raw material units: Bw = blank without transformation (within the excavated area), Tw = tool without transformation, Cw = core without transformation, Nw = nodule without transformation, Ei = isolated functional part of a tool, including 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, identified by flakes from *façonnage* and/or surface shaped tools, is indicated by the connotation */f (steps of the formal *chaîne opératoire* after Geneste 1985; 1988; 1990).

mainly for adults, whereas young *Equus hydruntinus* may have been killed by carnivores and, in part, scavenged by humans. The age of young *Equus hydruntinus*, as well as the presence of a pregnant female, shows that the animals died during two seasons, spring and autumn. It is during these periods of the year that herds up to 50 individuals migrate between summer and winter ranges. Obviously, Neanderthals layed in wait of them, and hunted especially females accompanied by their foals. There are no animals younger than 3 months, but many adults between 4 and 8 years of age, indicating that

hunting was selective during periods of nutritional abundance.

The lack of nutritional stress might also explain the low amount of planning depth recognized in most levels analysed by transformation analysis. In general, the exploitation of raw material was seldomly exhaustive. Instead, it seems that most raw material units were flaked “on demand”. In many cases one has the impression that there was no “gearing up” to be prepared for anticipated periods (e.g. the hunt). Raw material procurement and blank production often seem to be incidental. In this regard the

observation that the production of flakes from simple cores plays an important role in most levels fits to the hypothesis stated above. The production and use of surface shaped tools, to the contrary, is less important, again pointing to less intensively planned and prepared activities. In other assemblages of the Crimean Middle Palaeolithic, e.g. Buran Kaya III, level B (Demidenko 2004; Richter 2004; Uthmeier 2004), surface shaped tools were identified as long lasting tools, especially produced beforehand for deeply planned activities. In levels VI/11-14, surface shaped tools must be seen as a part of a basic equipment, not dedicated to special tasks, but carried around on a daily basis and curated (or rehafted) if necessary.

In levels VI/11-14 both faunal and lithic analysis speak for repeated short term stays at Kabazi II that should probably be seen in a context of longer

stays in the region during times of abundance. At Kabazi II Neanderthals were only consuming less perishable parts like brain, tongue, and some marrow (Patou-Mathis, Chapter 5, this volume). Meat bearing parts of the carcasses were carried out of the excavated area, possibly to a camp less exposed to sun, the weather and carnivores. The function of this corresponding camp might have been that of a base camp for a circulating procurement of resources. Many micro moves that pass raw material outcrops, as well as hunting stands, would explain best the lack of planning depth in the acquisition of raw material and the production of blanks. All in all, the transformation of raw material as well as the scavenging of some carcasses, side by side with the hunting of *Equus hydruntinus*, points to a (periodically?) opportunistic exploitation of resources.

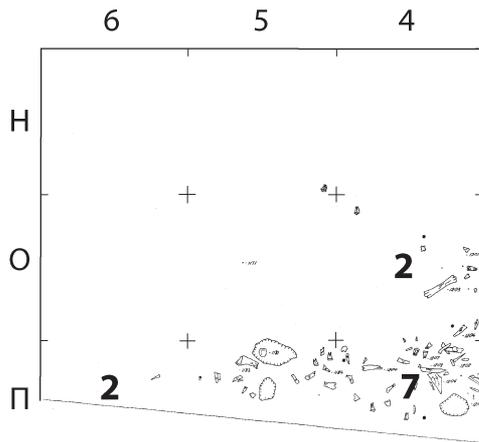


Fig.14-29 Kabazi II, level VI/15: Artefact distribution (pieces > 2cm).

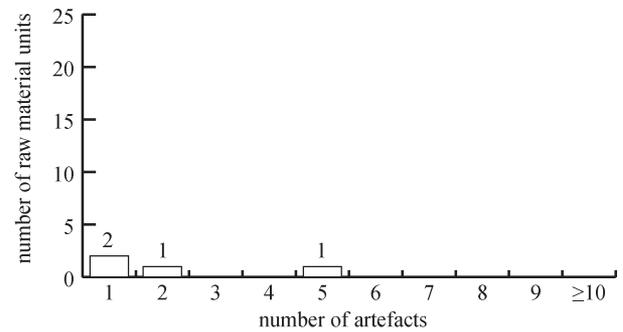


Fig.14-30 Kabazi II, level VI/15: Number of artefacts per workpiece.

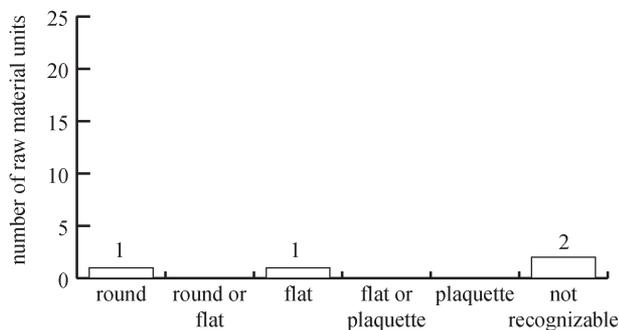


Fig.14-31 Kabazi II, level VI/15: Shapes of nodules.

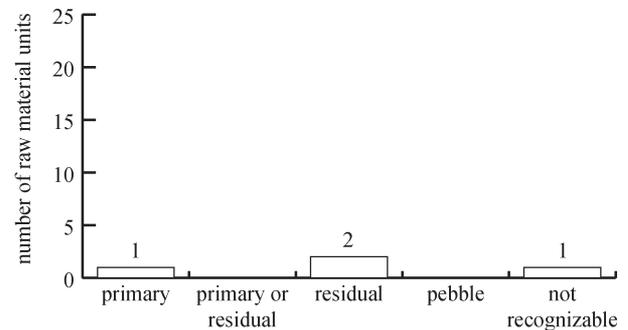


Fig.14-32 Kabazi II, level VI/15: Nature of raw materials.

| | RMU | 3 | 4 | 2 | 1 | 5 | 6 |
|------------------------|------------------------|--|---|--|--|-------------|-----------------|
| OFF-SITE | 0 Import ➔ |  simple side scraper |  flake (use traces) |  nodule |  decorated fragment of a raw piece | | |
| ON-SITE | 1 Preparation | | | initialisation of a preform  | formatting  scraperlike usage of one edge | | |
| | 2A Blank Production | | | flake | discarded | Burnt Piece | Patinated Piece |
| | 2B Correction | | | flake | | | |
| 3 Modification | | | | notched piece | | | |
| Discard | | ● | ○ | ● ○ ● ○ ● ○ | ● ● | | |
| Export ← | | | |  preform | | | |
| Transformation Section | | Tw | Bw | Np/f | Np/f | | |

Fig.14-33 Kabazi II, level VI/15: Transformation sections of workpieces. Bw = blank without debitage or modification; Tw = tool without debitage or modification; Np = Preparation of a raw nodule; /f = bifacial production or surface shaping (steps of the formal chaîne opératoire after Geneste 1985; 1988; 1990).

SOME REMARKS ON KABAZI II, UNIT VI, LAYERS 15, 16 AND 17

Upon reaching the bottom of the geological sequence at about 14 m under the surface, the excavated area became very small and was, at the end, confined to an extension of about 4 m² (Fig. 14-29, 14-34 and 14-38). The lowermost layers VI/15-17 yielded only 19 artefacts (including 2 tools, VI/15), 8 artefacts (no tool, VI/16) and 5 artefacts (including one tool, VI/17).

Work pieces consisted of single elements or were very small (Fig. 14-30, 14-35 and 14-39). Raw material

procurement was from primary and residual sources (Fig. 14-32, 14-37 and 14-41) and nodules were round and flat (Fig.14-31, Fig.14-36, Fig. 14-40). In layer VI/15, the discard of two single pieces is attested, along with preparation of two raw nodules for foliate production (Fig. 14-33).

The artefacts from the lowermost levels of Kabazi II must be looked upon as the oldest dated archaeological objects thus far found in the Crimea.

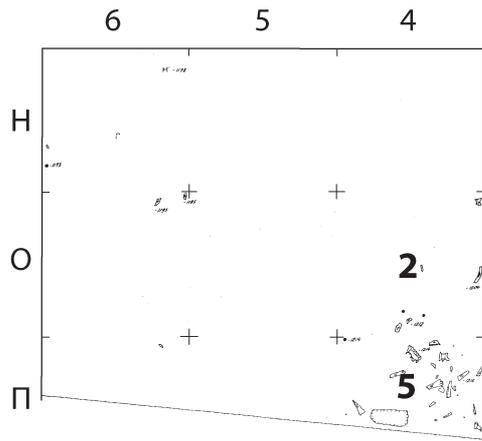


Fig. 14-34 Kabazi II, level VI/16: Artefact distribution (pieces > 2cm).

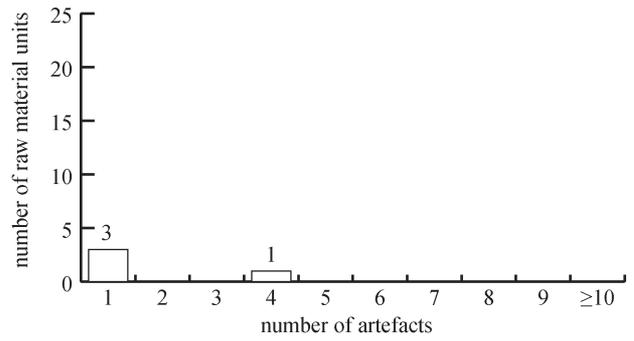


Fig. 14-35 Kabazi II, level VI/16: Number of artefacts per workpiece.

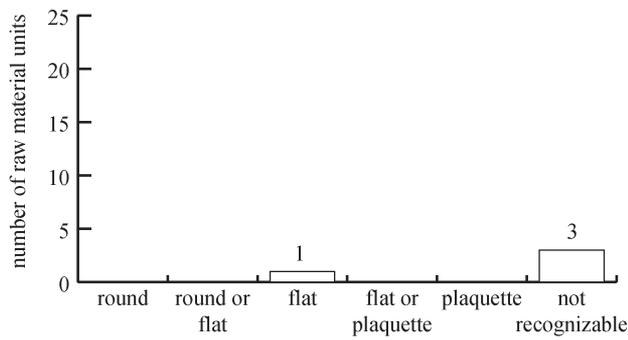


Fig. 14-36 Kabazi II, level VI/16: Shapes of nodules.

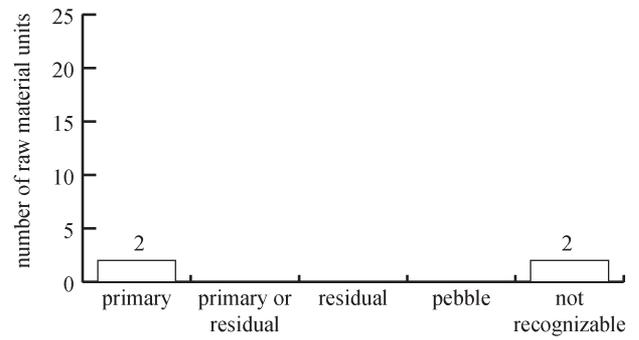


Fig. 14-37 Kabazi II, level VI/16: Nature of raw materials.

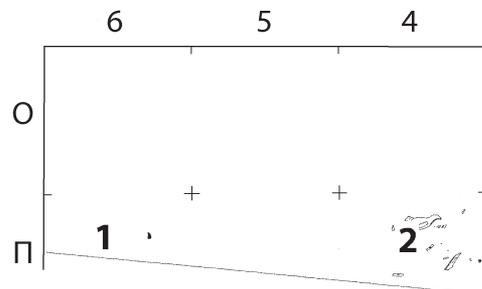


Fig. 14-38 Kabazi II, level VI/17: Artefact distribution (pieces > 2cm).

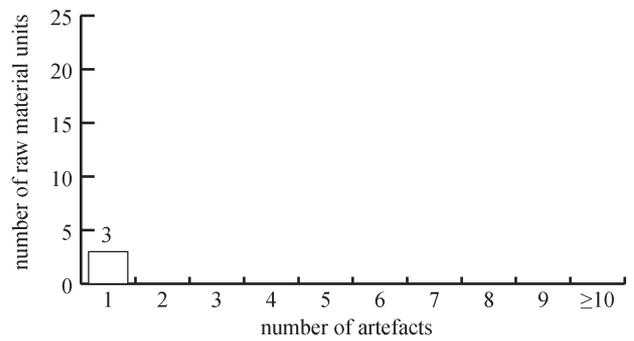


Fig. 14-39 Kabazi II, level VI/17: Number of artefacts per workpiece.

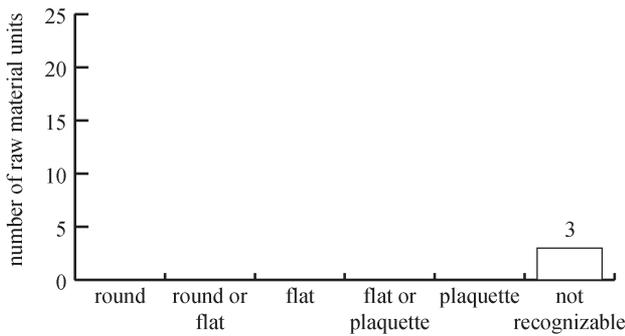


Fig.14-40 Kabazi II, level VI/17: Shapes of nodules.

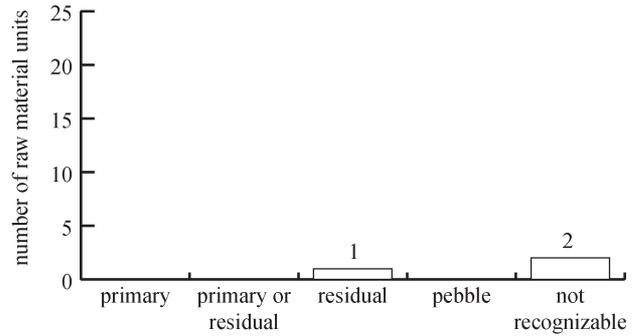


Fig.14-41 Kabazi II, level VI/17: Nature of raw materials.

ABSTRACT

КАБАЗИ II, ГОРИЗОНТ VI/11-14: ТРАНСФОРМАЦИОННЫЙ АНАЛИЗ АРТЕФАКТОВ

T. УТМАЙЕР, Ю. РИХТЕР

Горизонт VI/11-14 был обнаружен в отложениях 14В геологического слоя, образовавшихся во время последнего интергляциала *sensu lato* (OIS 5d), и является одним из самых ранних в стратиграфической последовательности Кабазы II. Скопление фауны и артефактов, составившее данный горизонт, исследовано на площади 12 квадратных метров. В ходе полевых исследований было установлено, что фаунистический материал и кремневые артефакты залегают во вторичном положении, так как претерпели некоторое перемещение по склону. С другой стороны, кремневые артефакты не патинированы, их края и межфасеточные грани не демонстрируют естественных повреждений. Сохранность фаунистического материала – отличная. Данные характеристики свидетельствуют о том, что артефакты и фауна данного горизонта были перемещены по склону на относительно незначительное расстояние по отношению к их первичному залеганию и относительно быстро были погребены в отложениях 14В геологического слоя. Более того, еще одним подтверждением высокой степени гомогенности данной коллекции является подразделение артефактов на сырьевые группы, соотносящиеся с расщеплением нескольких желваков. Как правило, артефакты каждой отдельной сырьевой группы отражают длинные цепи трансформаций. Не исключено, что остатки нескольких кратковременных поселений были снесены и вторично погребены невдалеке от первичного залегания.

Исходя из используемой модели эксплуатации фаунистических ресурсов, функциональный тип поселений данного горизонта – стоянка по разделке охотничьей добычи и / или собранной падали. Данная стоянка связана с последующей транспортировкой частей туш лошадей на территорию охотничьего лагеря, где вероятно, происходило их потребление.