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LEAF POINTS OF THE UPPER PALAEOLITHIC INDUSTRY FROM THE 2ND COMPLEX OF KOROLEVO II AND CERTAIN METHODICAL PROBLEMS IN DESCRIPTION AND INTERPRETATION OF THE CATEGORY OF PALAEOLITHIC TOOLS.

Y.E. DEMIDENKO, V.I. USIK

In central and Eastern Europe, both Middle and Upper Palaeolithic industries often include a clear bifacial technology which produced leaf-shaped points. While these have been studied intensively typologically (e.g., Allsworth-Jones, 1986), little attention has been given to the problems of recognizing the loci of their production and rejuvenation. Specifically, this paper will consider a methodology for determining whether leaf points were produced on site or whether they were brought to sites from other sites - presumably from specialized workshops. Dependent on a solution of this question is the classification of leaf points themselves, as either finished forms or preforms, the interpretation of sites as workshops, hunters' shelters or long-term settlements, and even the cultural attribution of industries, e.g. "Bohunicien" in Southern Moravia (see, Valoch, 1990; Oliva, 1984; Svoboda, 1988; Kozlowski, 1990). In the present article, an attempt is made to work out general criterias for determing the place of leaf points production. Such an investigation can be based on the thorough morphological analysis of leaf points from any one Palaeolithic site.

For this purpose, we have chosen the assemblage of leaf points from the 2nd complex of Korolevo II. This Early Upper Palaeolithic "Szeletien" industry in the Ukrainian Transcarpathians was studed under the direction of V.N. Gladilin in 1978-80. This industry (over 7 thousand stone artefacts) may already be considered as a clear Upper Palaeolithic one technologically. However, it retains certain apparent Middle Palaeolithic traditions in its typology and, therefore, it might be defined as transitional from the Middle to the Upper Palaeolithic (Gladilin and Demidenko, 1989). By their number, leaf points are one of the more common tools of this assemblage, i.e. 20.9% , although the total tool sample is small, 134 examples. 26 out of all 28 leaf points (92.8%) were produced on a widespread local volcanic rock, andesite, while only 2 (7.2%) are made of flint which is a rare raw material in this area. Because of intense bifacial processing, original blank type can be only determined for 6 pieces : 4 were made on flakes much wider than long; one was made on a longitudinal flake, and another one was made on a frgment of an andesite nodule. In this connection, it is difficult to see any preference in the choice of blank types. And it is very interesting that there are not any blades among blank types seen. It should be noted that the objective morphological analysis of leaf point's appearence has only become possible following the refitting of these points, because only one leaf point from the 2nd complex of korolevo II has a regular laurel leaf shape and has sufficiently good secondary treatmeant (Fig. 1, 1). The rest of the objects are fragments or unfinished points. By using refitting, we have restored 4 leaf points almost completely (Fig. 1, 2-3; 2, 1; 3,1). Each of them deserves detailed description because of differences in their fragmentation.

1. A willow leaf, bifacial, basaly-thinnened point was restored from proximal and distal fragments (Fig. 1, 2). Before it broke, this point was perfectly shaped and had secondary finishing. By the way, such an assessment is only justified in comparison with other leaf points from this assemblage.

Since this point was characterized by a rather thick profile, the flint knapper, naturally, had attempted to reduce it, which resulted in the point's being broken.

2. The distal part and a portion of the proximal part of a laurel leaf bifacial, basally-thinnened point were restored using refitting (Fig. 1, 3). One face is characterized by fully complete, secondary retouch which is flat and invasive (Fig. 1, 3a). The other face has only one lateral edge finished by thorough retouch, whereas the other edge retains a considerable area of cortex (Fig. 1, 3b). The results of refitting indicate that this point had broken into three fragments (two of which were refitted) during the course of processing this lateral edge. Most likely, the piece broke of being mistruck on the already shaped areas, rather than only on the cortex edge.

3. A leaf point with a sublaurel leaf shape was restored by means of connecting the medial and proximal parts (Fig. 2. 1). Only the stage of preliminary rough treatment can be traced in this piece which had been made on a cortical flake wider than long. Seen in fig. 2, 1a, is an area of the ventral surface with portions of the bulb of percusion. In addition, the abrupt platforms used for bifacial flaking are seen at its. Evidently, a bloc delivered onto one of these platforms resulted in this point fragmentation (Fig. 2, 1c).

4. This leaf point was restored incompletely from two longitudinal fragments (Fig. 3, 1a). Before it broke, its faces had been treated by rough retouch, as well as by flat retouch along the lateral edges. Thus, this blank had acquired the regular sublaurel leaf shape with a thin profile and proximal thinning by means of secondary retouch processing. Evidently, during the course of this processing, the distal tip of this point was broken. It appears that an attempt to correct the broken part, to make the tool pointed, took place immediately following the fragmentation. As seen from the refitting, this attempt was wholly unsuccessful, as the first blow resulted in a burin-like spall which cut this tool first along its and then curved to the other edge, removing the whole base (Fig. 3, 1a). We have also succeded in fitting two wide, semi-oval flakes to the side surfaces of this leaf point (Fig. 3, 1b). One of them possesses such characteristic features as a curved profile, a striking platform stongly sloped towards its ventral surface, a radial dorsal scar pattern, all of which may be considered as diagnostic features for the morphology of flakes formed in the course of leaf point production.

Aside from the four restored points described above, another two characteristic examples of techniques used for leaf point production were found. In one case, a flake of secondary processing was fitted to a sublaurel leaf, partly-bifacial point made on a transverse flake (Fig. 2, 2). Natural thickness of this flake at the location of the striking platform required its thinning from both the dorsal and ventral surfaces. The lacking proximal portion of this tool was likely broken off during the course of this thinning, but not earlier during the removal of the flake mentioned above.

In another case, a small flake was fitted to the distal part of a leaf point (Fig. 4, 1). Morphologically, this tool is characterized only by the very initial degree of its bifacial finishing; the thinning of the base was not completed (which is shown by the striking platform present), as was its distal tip. The flake fitted to the leaf point, demonstrates the process of forming the distal tip. It should be noted that this leaf point was not broken in the course of production. The degree of processing on this bifacial tools allows one to consider it as a half-finished leaf point whose secondary treatment was suspended, owing to the impossibility of finishing the tip.

Thus, the detailed analysis of the refitting results has revealed the causes of and, respectively, the varieties of leaf point breakage. It appears that major causes of this breakage were poorly directed blows by the

ancient flint knappers, as well as the natural brittleness of andesite which was widely used in the manufacturing leaf points from the 2nd complex of Korolevo II. In each case, a particular variety of breakage depended upon the point of striking when (i) the profile massiveness was being reduced, (ii) the edges and surfaces were being finished, and (iii) the proximal and distal tips of the leaf points were being shaped and reshaped. By studying the morphological features of the refitted leaf points, one may judge objectively about the remaining leaf points in this assemblage and divide them into four groups.

The *first group* is represented by just one point, characterized by a thin cross-section, a straight profile, and with the distal tip and lateral edges both processed by regular, flat retouch (Fig. 4, 2). Its shape may be defined as laurel leaf despite the absence of the lower part of its base. By the techniques of manufacturing, this tool is close to the leaf point illustrated in fig. 2,2. It seems that it was broken at the very end of its production; i.e., when its proximal end was formed.

Included in the *second group* are four bifacial pieces which can be considered as half-finished points. Two of them were made on transverse flakes, another one on a fragment of an andesite nodule, and still another cannot be identified in respect to its blank. Despite the differences in their blanks, however, all the pieces are characterized by considerable thickness of profile, which necessitated their bifacial thinning. Because of differences in the success of this operation, the degree of their completion differs. Both the pieces made on transverse flakes (Fig. 5, 1-2) are only characterized by rough treatment of the areas adjacent to their striking platforms, especially on their ventral surfaces. The dorsal surfaces only possess several small negatives of secondary processing, whereas the areas of primary cortex and the traces of preceeding core reduction occupy their major part. Such a way of thinning the very thick part of the flakes in the region of striking platforms can be traced in the refitted points. This operation, however, may take place at different stages during the leaf point production. Likely, this depended upon the configuration of the blank. Sometimes, the modification of the transverse flakes began with thinning their striking platforms. In other cases (Fig. 2, 1-2), this process proceeded in parallel with the leaf point shaping. The piece made on a fragment of andesite nodule exhibits more advanced treatment (Fig. 6, 2). In this case, the main purpose of processing consisted of reducing the "dorsal" thickness of the artefact. Despite the fact that the blank was processed up to the stage when it already possessed the regular leaf-like outline in plane, distal tip pointed bifacially, flattened base, both lateral edges retouched, a prominence at the centre of its "dorsal" surface had not allow the ancient flint kanpper to finish this tool up to the stage of shaping a leaf point. The last, fourth piece may be considered as an unfinished tool (Fig. 6, 1), as well. First of all, its crescent shape is unusual, being an apparent deviation from the "leaf-like" standard. An asymmetry of this tool resulted from the rough "pseuduo-denticulated retouch" of one lateral edge. The other lateral edge, in addition, has a broad platform designed for reducing the tool surfaces down to the regular leaf shape. This was not done, however, and the tool was left at the stage of a half-finished product. Thus, the four tools described allow one to follow the process of leaf point manufacturing stage by stage.

The *third group* includes 10 distal parts of leaf points. Both their morphological appearance and the findings of refitting allow one to consider that these parts were broken in the course of thinning thick profiles and/or retouching lateral edges (Fig. 7, 2-4).

The *fourth group* consists of 6 proximal fragments of leaf points. All were fractured in the course of shaping the lower part of tools, judged from their proportions, unfinished retouching of their surfaces and edges, and fracture localisations (Fig. 7, 5-6; 8, 1-2). A long with this, four of them have rounded, basally-thinned bases, while the remaining two have a notch at the centre of base (Fig. 8,3-4). As for the latter two pieces, it should be noted that such a type of treatment is not encountered in other leaf points from this assemblage. It is only seen in fragments of the basal parts of leaf points, and can be classified as a separate type of treatment, basally concave. The leaf, bifacial, basally concave points from the 2nd complex of Korolevo II, however, do not seem to be of too great a signifiance, since they are known from different European Palaeolithic complexes. The creation of a notch in the base of a leaf point represents one of the wide-spread techniques of basal treatment.

The present review of bifacial leaf points and of their fragments would not be complete if we do not touch the problem of flake classification, which has attracted the attention of numerous workers studying technology of manufacturing similar tools.

The thorough analysis of morphological features of the flakes (4 specimens) fitted to three leaf points allowed us to identify reasonably another 34 flakes which resulted from leaf point manufacture. As was noted earlier, the major criteria were as follows : incurvate profile, frequently seen dorsal radial scar pattern, and striking platforms sloped towards the ventral surfaces, not infrequently having traces of retouch. A major part of the flakes identified as this secondary processing resulted from the flat invasive retouching of the side surfaces of leaf points (fig. 9, 1-3), where as few represent mistakes in treatment of the proximal and distal parts of leaf points (fig. 9, 4).

Thus, the study performed showed that leaf point manufacture did occur at certain places at the Early Upper Palaeolithic site of Korolevo II, excavated on the area of 164 sq.m. Listed below is the evidence gathered in favor of this conclusion.

1. The great majority (92.8 %) of leaf points from this assemblage are made of local raw material, andesite.

2. Among all leaf points from this assemblage, only one may be considered as a finished tool (fig. 1, 1).

3. By their morphology, numerous pieces may be defined as spoiled half-products (fig. 4, 1; 5, 1-2; 6, 1-2).

4. The remaining pieces are represented by their distal, proximal, and much more rarely median parts (fig. 7, 1-6; 8, 1, 4).

5. This assemblage also contains numerous flakes of the leaf point secondary processing (fig. 9, 1-4). Also a majority of these flakes were concentrated in the same areas where many of leaf points, half-products and fragments were found.

Even having all these evidences, however, one cannot consider Korolevo II as a specialized workshop for leaf point manufacture. The manufacture of leaf points only represented a part of the flint knapping activities at this site. Proceeding from the composition of this stone assemblage (over 7 thousand pieces and among them 134 tools), one may conclude that the full process of primary stone flaking took place at this site, beginning from the preparation and reduction of precores and cores, through the production of numerous blanks, largely elongated, as well as the full process of secondary tool retouching : end-scrapers (6,72 %), en-scrapers-knives (2,24 %), burins (3,73 %), flat burins (5,22 %), perforators (I.49 %), pointed blades (9,7 %), retouched blades (8,96 %), points "chattelperron" types (1,49 %), side-

scrapers (17,16 %), pieces à mâchure (6,72 %), denticulates and notches pieces (15,67 %). The production of leaf points in this case, therefore, was simply a part of more varied tool production.

Such a detailed study of leaf points from the 2nd complex of Korolevo II and the techniques involved in their production allow us to formulate criteria for establishing the local nature of leaf points from Palaeaolithic sites as follows : 1/using mainly an accessible local raw material; 2/ finding numerous unfinished pieces lacking thorough secondary retouch; 3/ the presence of half-products; 4/ the presence of numerous leaf point fragments (distal, proximal and median); and 5/ finding secondary processing flakes.

In conclusion, we should like to emphasize the fact that reasonable grounds are lacking to identify the principal or specific types of leaf points at Korolevo II, which might serve as culture-determining for this Upper Palaeolithic industry. The present study allow us only to speak about this industry's actual quantity of leaf points, their shapes (mostly laurel leaf and willow leaf), the predominance of convex bases and the existance of individual concave basally-thinned bases among these leaf points. Therefore, the Palaeolithic complex's "appearence" could be only determined by means of the technical typological analysis of other tools with additional adjustments. Thus, a comparison between Palaeolithic industries by major types of leaf points has to be performed very carefully, with an account for their "nature of origin" for each particular case.

Still another conclusion arises from our study : industries with leaf points are to be compared typologically firstly by structure of all remaining tools and only then by series of leaf points.

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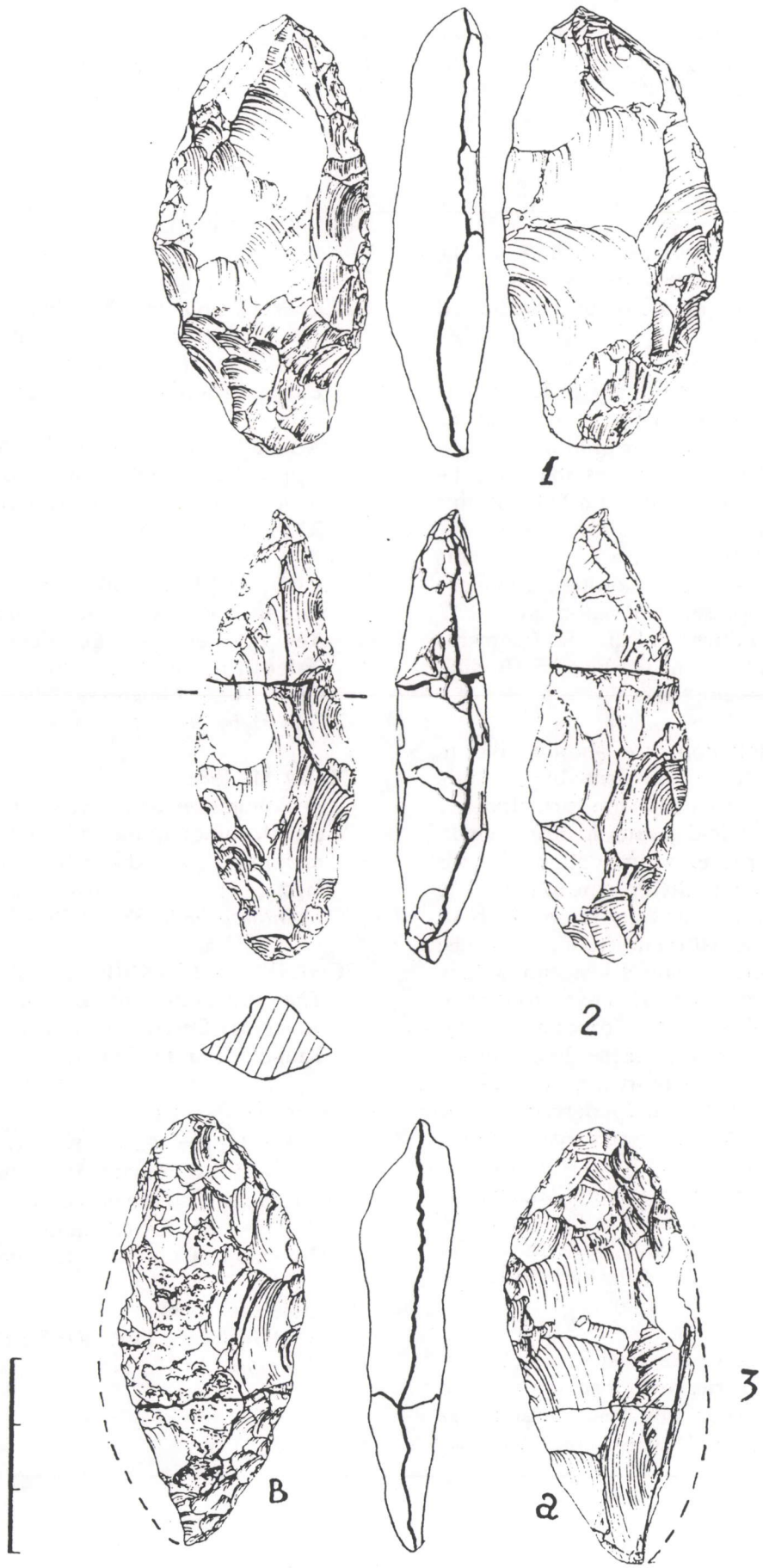

Fig. 1, 1-3. Leaf points from the 2nd complex of Korolevo II.

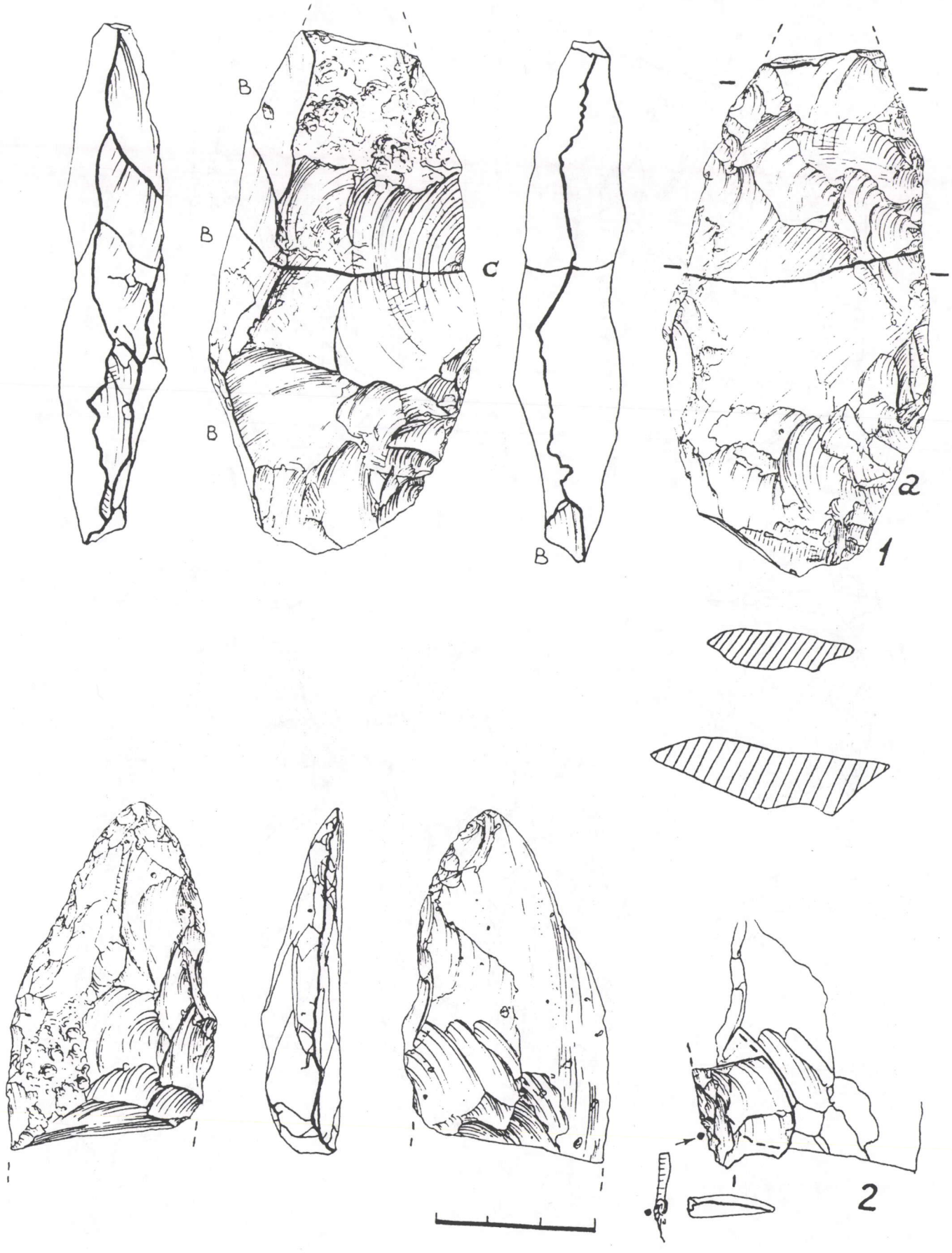

Fig. 2, 1-2. Leaf points from the 2nd complex of Korolevo II.

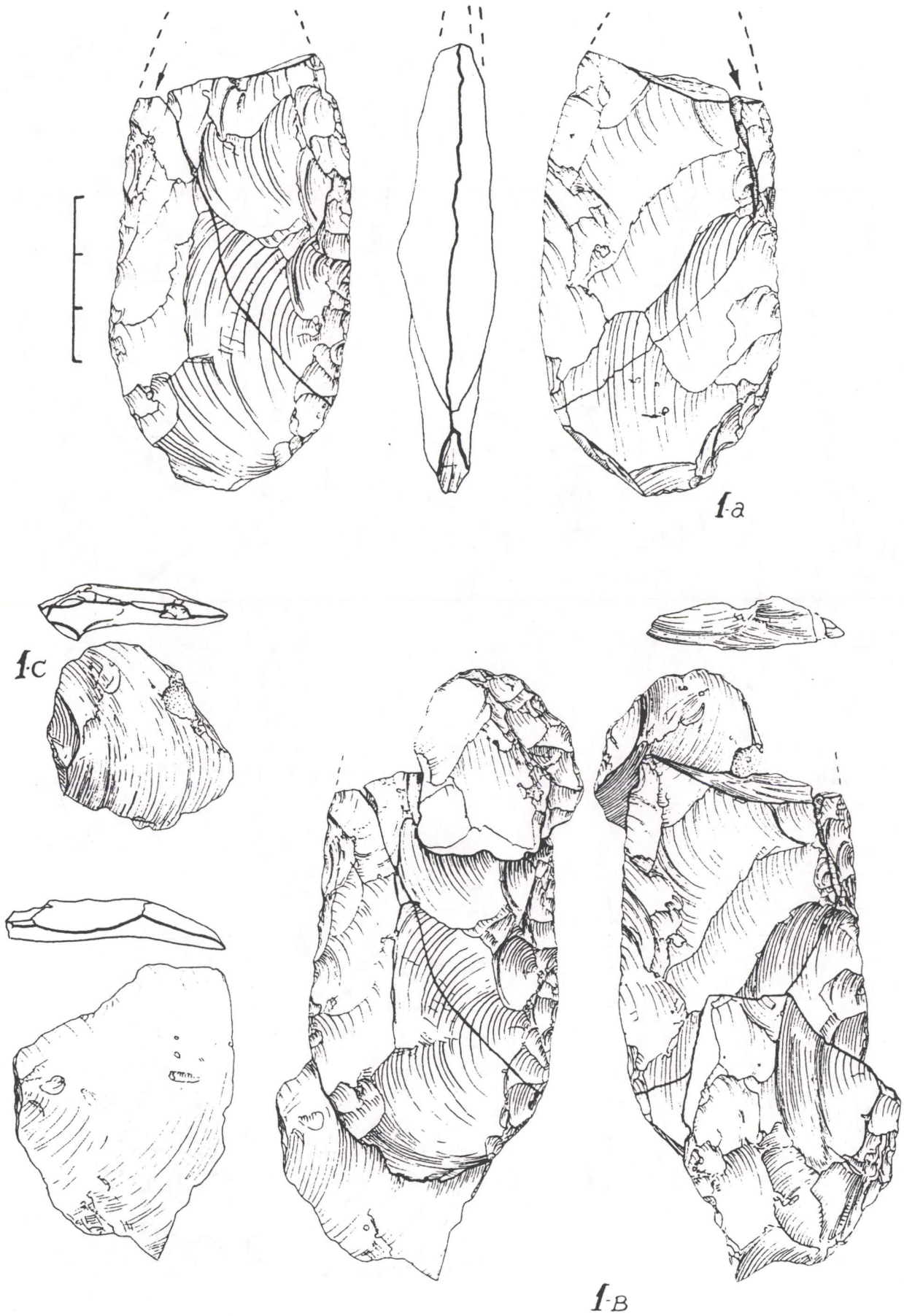

Fig. 3, 1. Leaf points from the 2nd complex of Korolevo II.

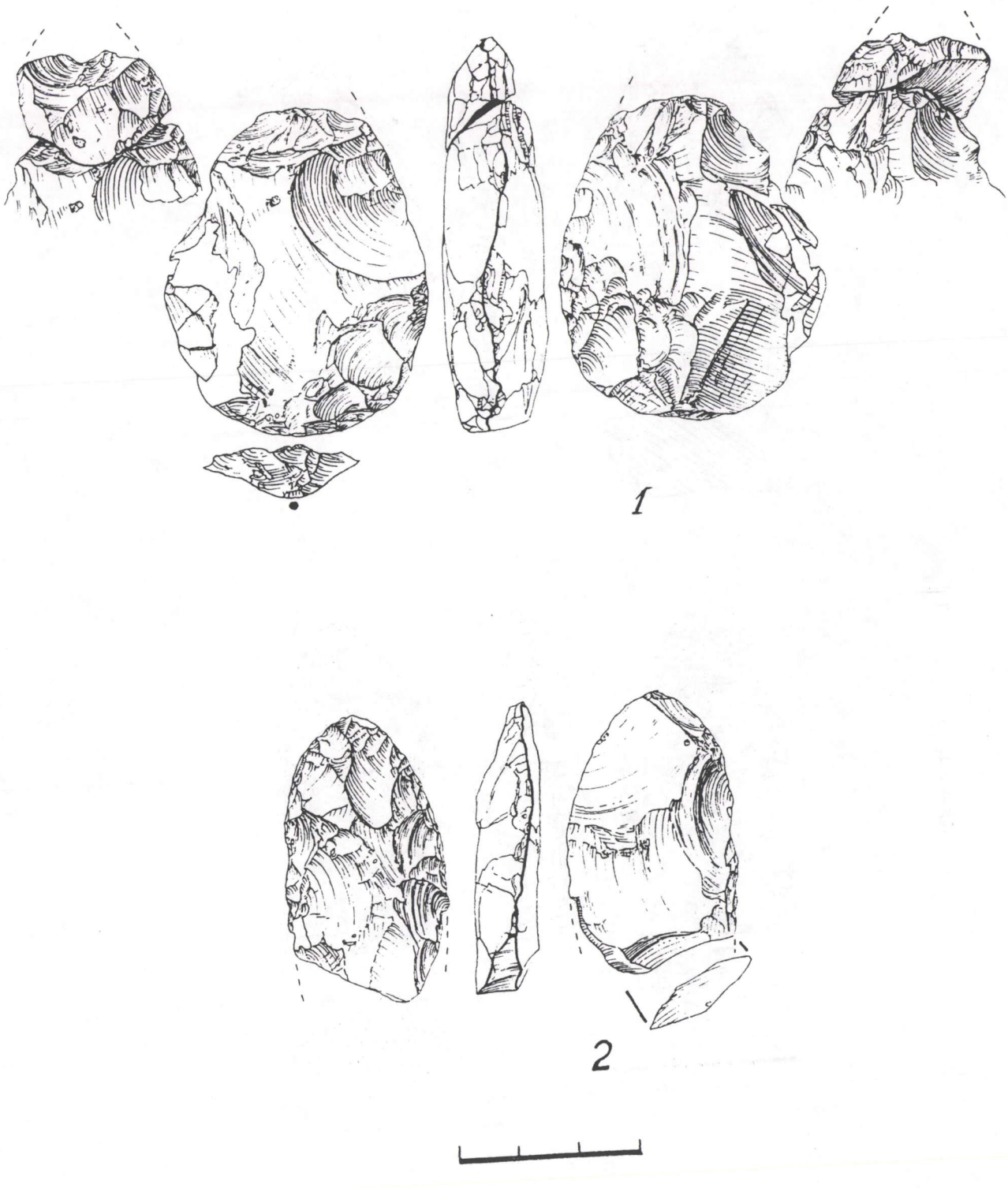

Fig. 4, 1-2. Leaf points from the 2nd complex of Korolevo II.

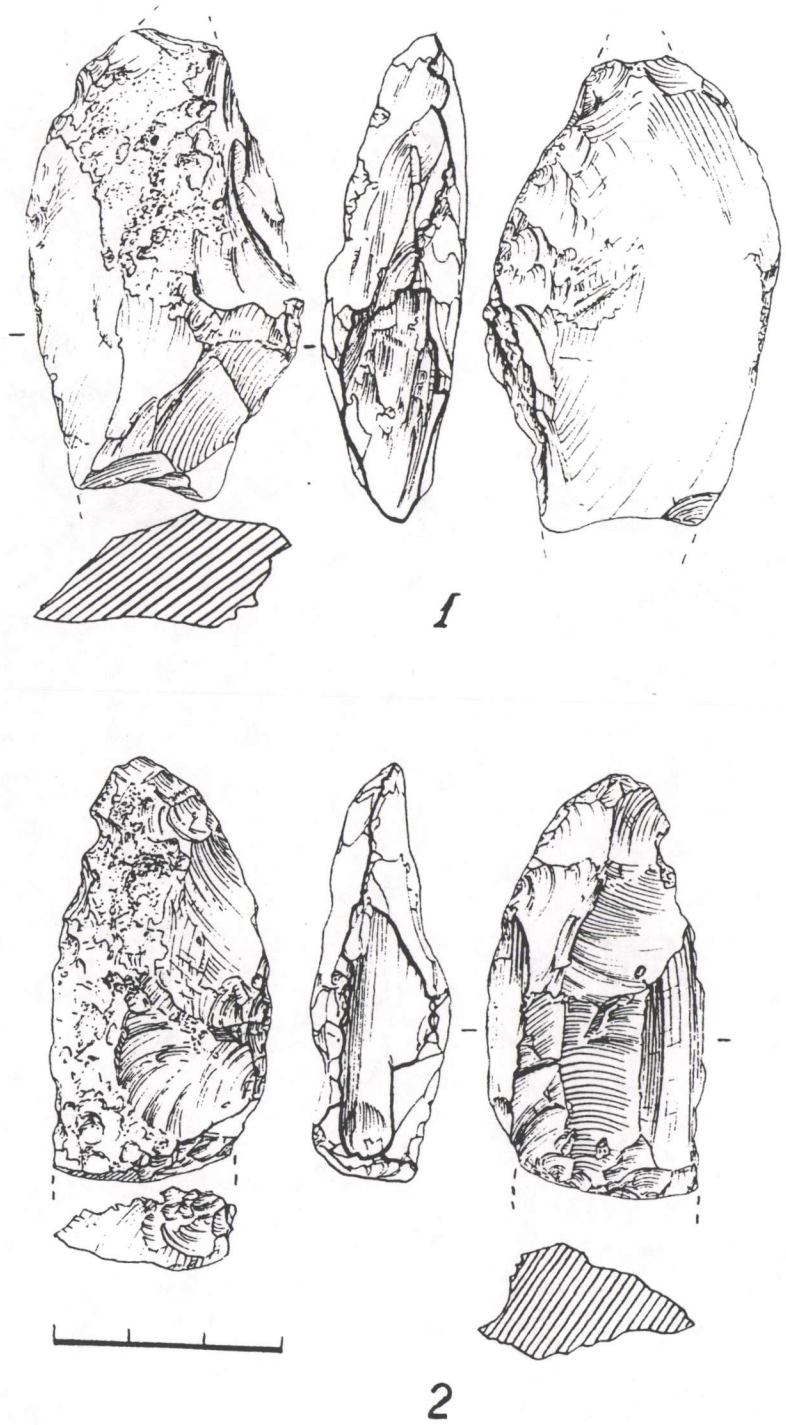

Fig. 5, 1-2. Spoiled half-products of the leaf points from the 2nd complex of Korolevo II.

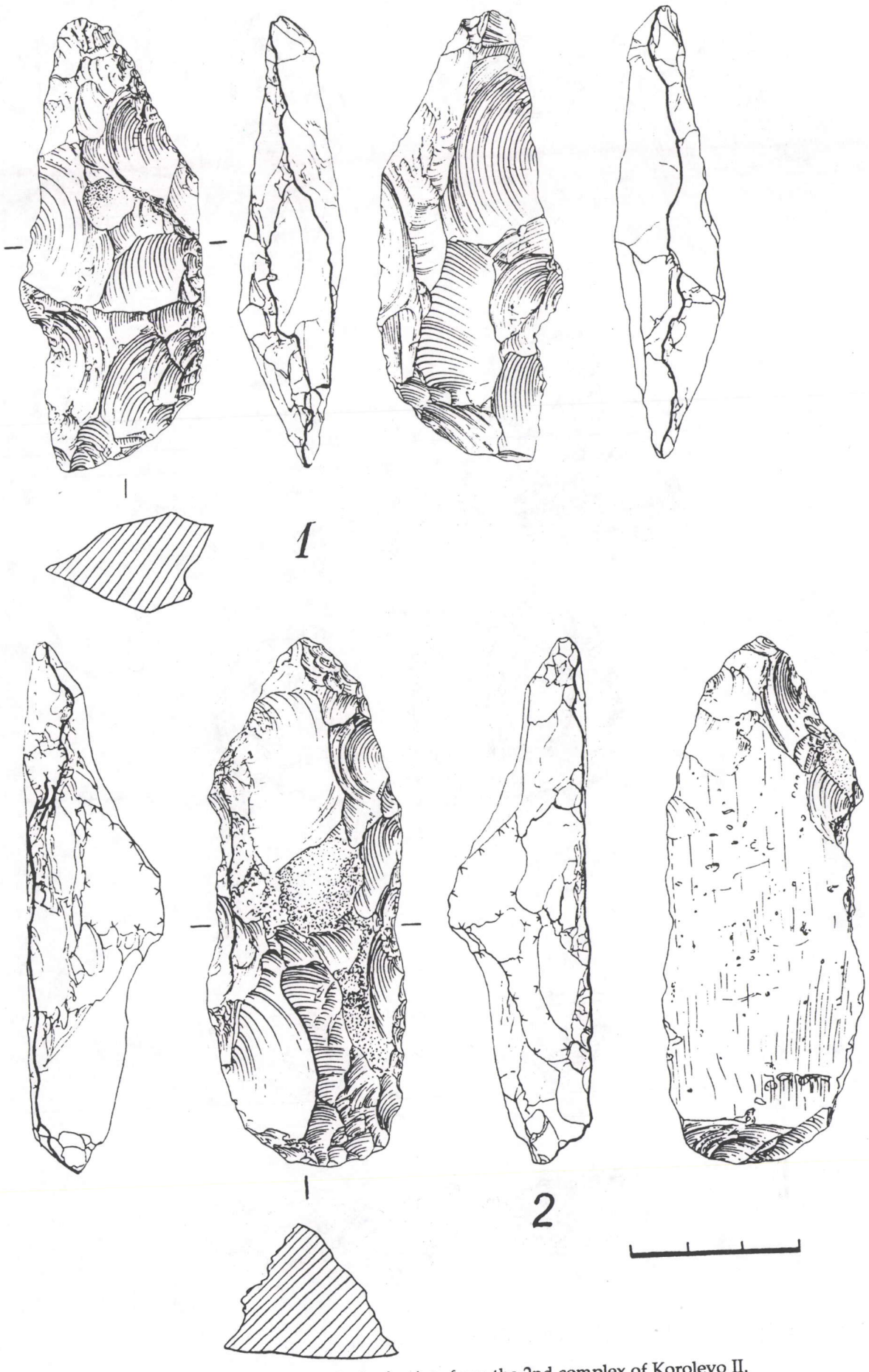

Fig. 6, 1-2. Spoiled half-products of the leaf points from the 2nd complex of Korolevo II.

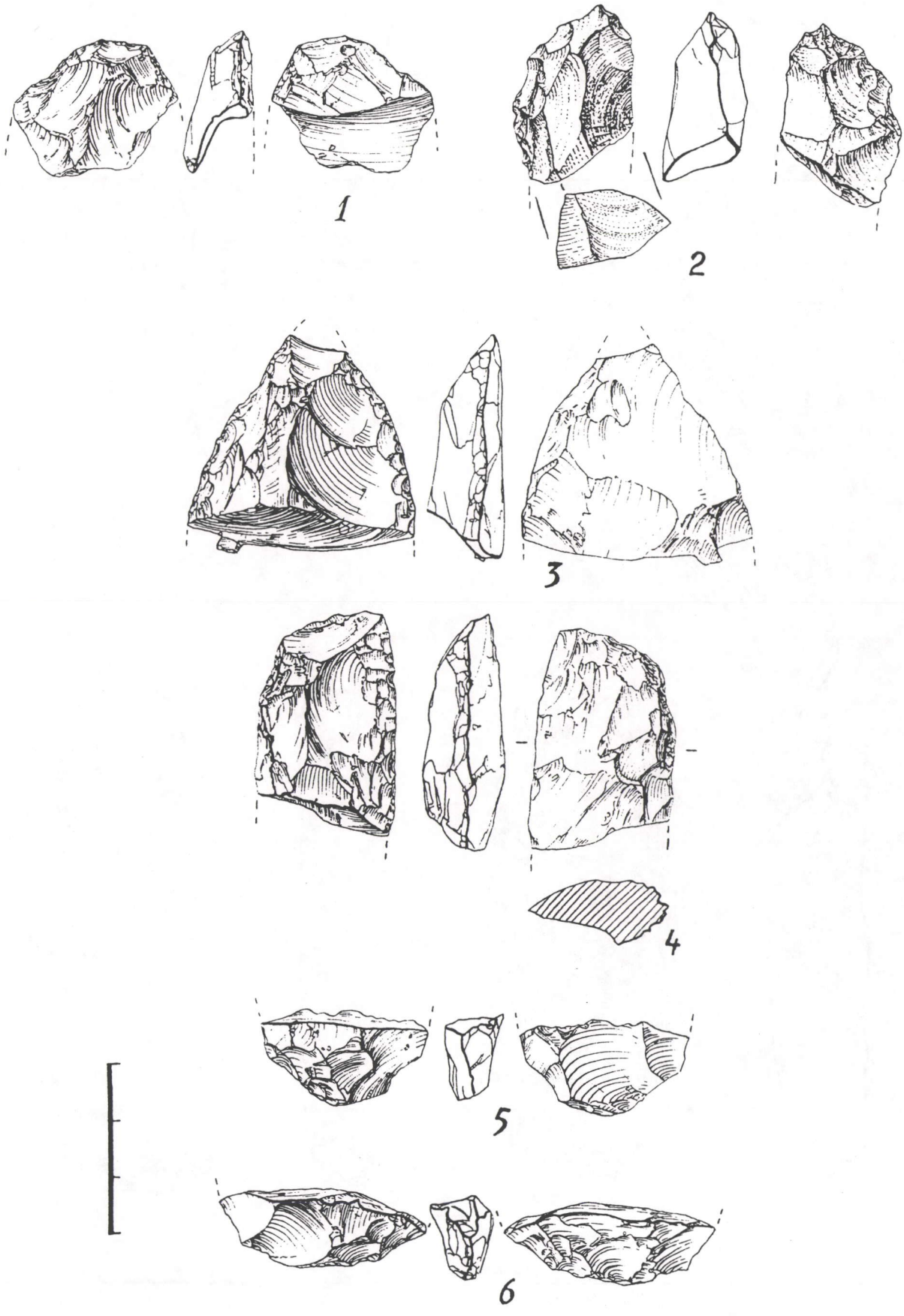

Fig. 7, 1-6. Fragments of leaf points from the 2nd complex of Korolevo II.

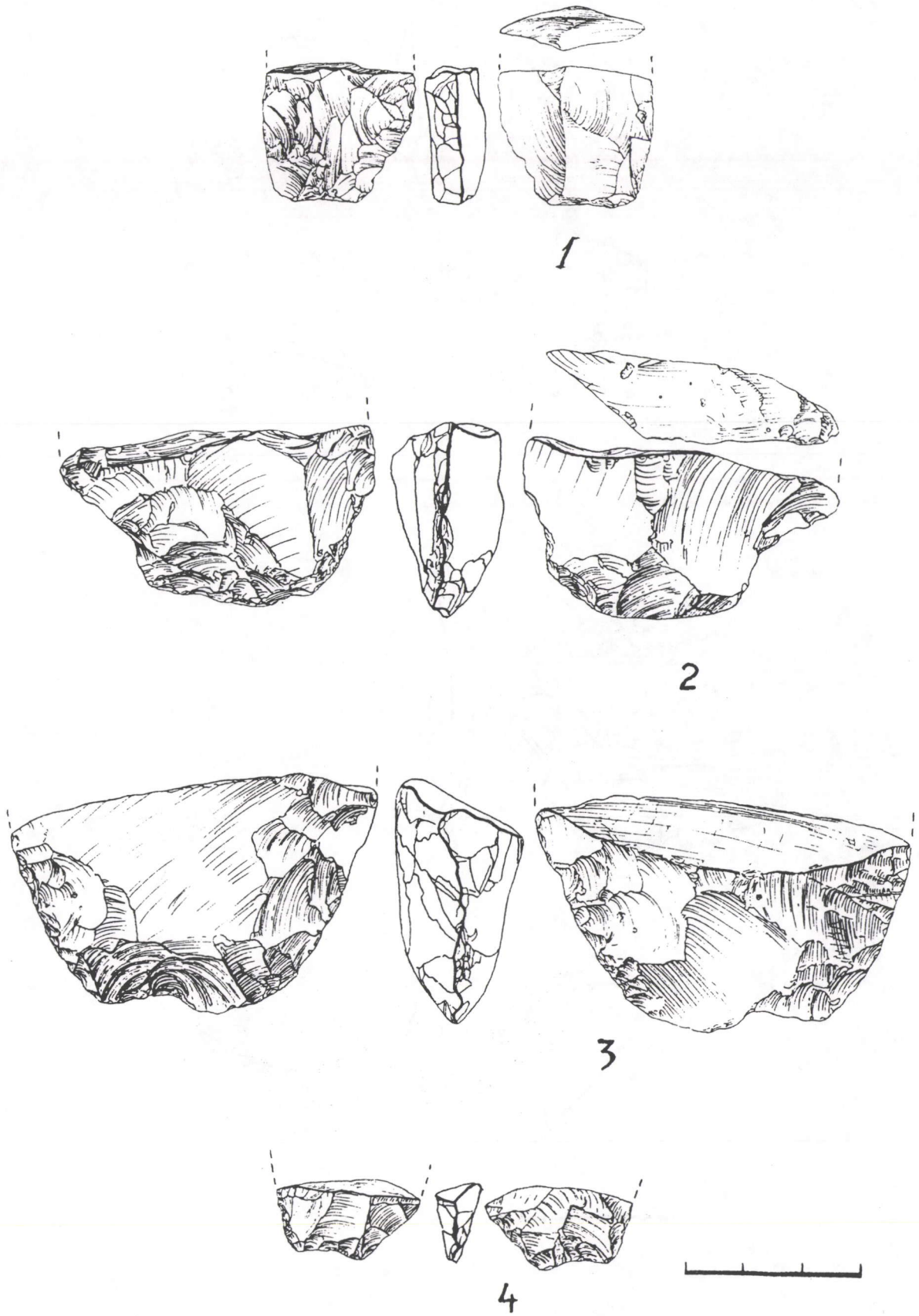

Fig. 8, 1-4. Fragments of leaf points from the 2nd complex of Korolevo II.

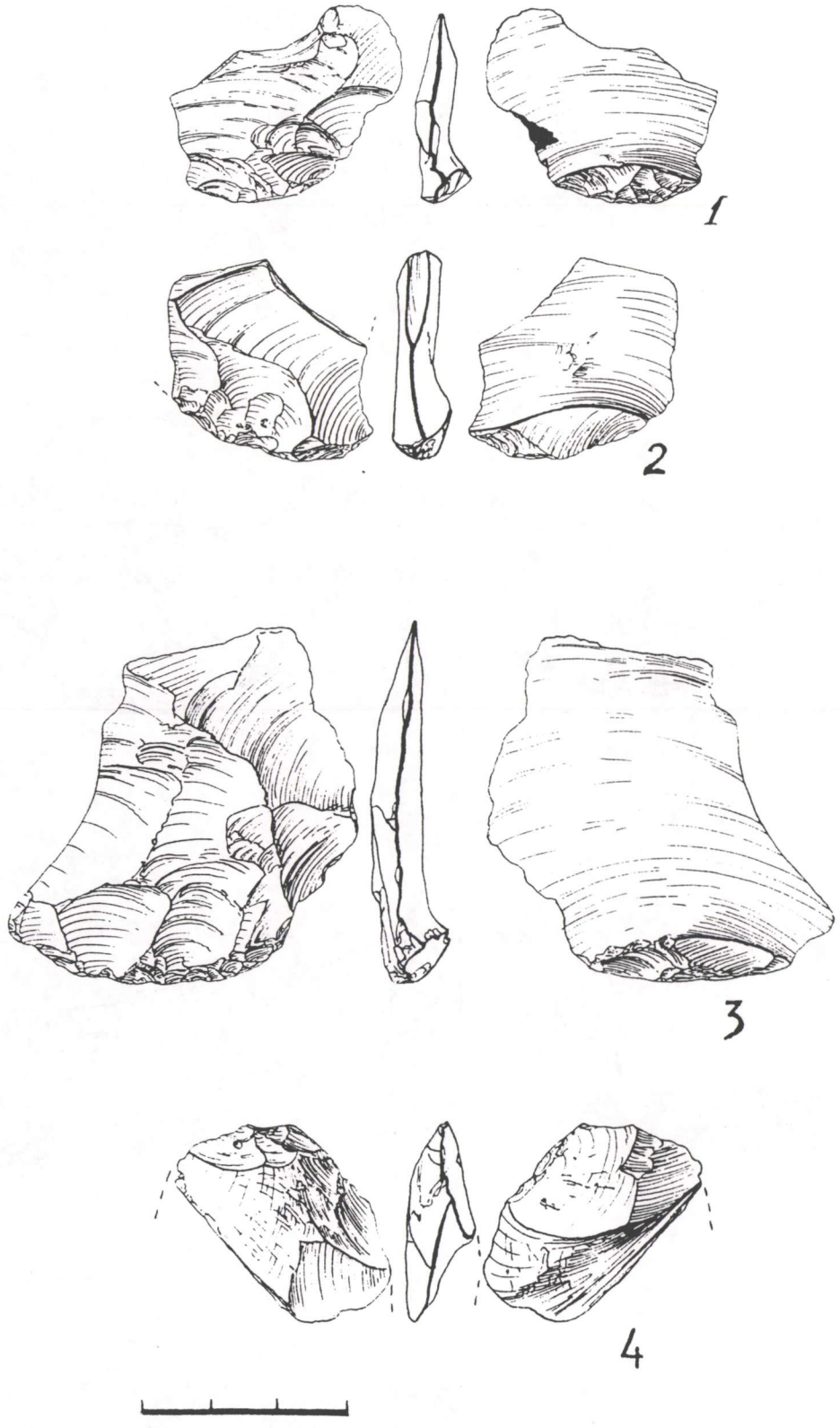

Fig. 9, 1-4. Flakes of the leaf point secondary processing from the 2nd complex of Korolevo II.