



V. N. GLADILIN, YU. E. DEMIDENKO

UPPER PALAEOLITHIC STONE TOOL COMPLEXES FROM KOROLEVO

SUMMARY — In the years 1978—1980, two Upper Palaeolithic complexes were discovered and researched in the multilayered Early Palaeolithic sites Korolevo II (cultural-chronological complex II) and Korolevo I (cultural-chronological complex I—a). The unique case of these discoveries has been in their stratigraphical position between industries of distinctly Mousterian character. According to a complex of natural science data these Upper Palaeolithic Korolevo complexes belong to various phases of the pre-Brörup Stadial of Würm (to Würm I according to the Alpine scheme).

The technique of primary flaking in both Upper Palaeolithic Korolevo industries is of Upper Palaeolithic character — it is parallel blade-like. There are basic differences in the tool collections. The chronologically earlier complex of the two — Korolevo II typologically forms a transition from Mousterian to Upper Palaeolithic, with strong archaic traditions in tool morphology.

In the chronologically somewhat later Korolevo Ia complex prevail already Upper Palaeolithic end scrapers. The two Upper Palaeolithic Korolevo complexes are genetically linked, illustrating the development of a single cultural phenomenon in time, and put the beginnings on the Upper Palaeolithic in Eurasia to a much earlier time (more than 60 thousand years B.P.).

KEY WORDS: USSR — Transcarpathia — Early Upper Palaeolithic — Stratigraphy — Chronology — Typology.

Korolevo appeared in palaeolithic studies as a multi-layered Early Palaeolithic site. The earliest cultural-chronological complexes of the site, namely Acheulian and Mousterian, arose considerable interest in the scientific circles. A new impulse had been added to this interest by the discovery of Upper Palaeolithic cultural horizons in the late nineteen seventies.

The 1978—1980 field research was realized by a Palaeolithic Expedition of the Archaeological Museum of the Zoological Institute of the Academy of Sciences of the Ukrainian SSR headed by V. N. Gladilin and discovered two Upper Palaeolithic cultural complexes at multi-layered Acheulian—Mousterian sites in Korolevo I (layer Ia) and in Ko-

rolevo II (layer II) (Gladilin 1980; 1982; 1985). The discovery of these Upper Palaeolithic assemblages occurred in the course of a systematic research of Korolevo I and Korolevo II sites that started with the discovery of Korolevo I site by V. N. Gladilin in 1974.

THE UPPER PALAEOLITHIC COMPLEX II IN KOROLEVO II

Location. Korolevo II site is situated on a 20 m high terrace 300 m to south-west of Korolevo I site called "Beyvar", below the "Vinichki" hill.

The history of research. The first Palaeolithic tools were collected here back in the year 1975.

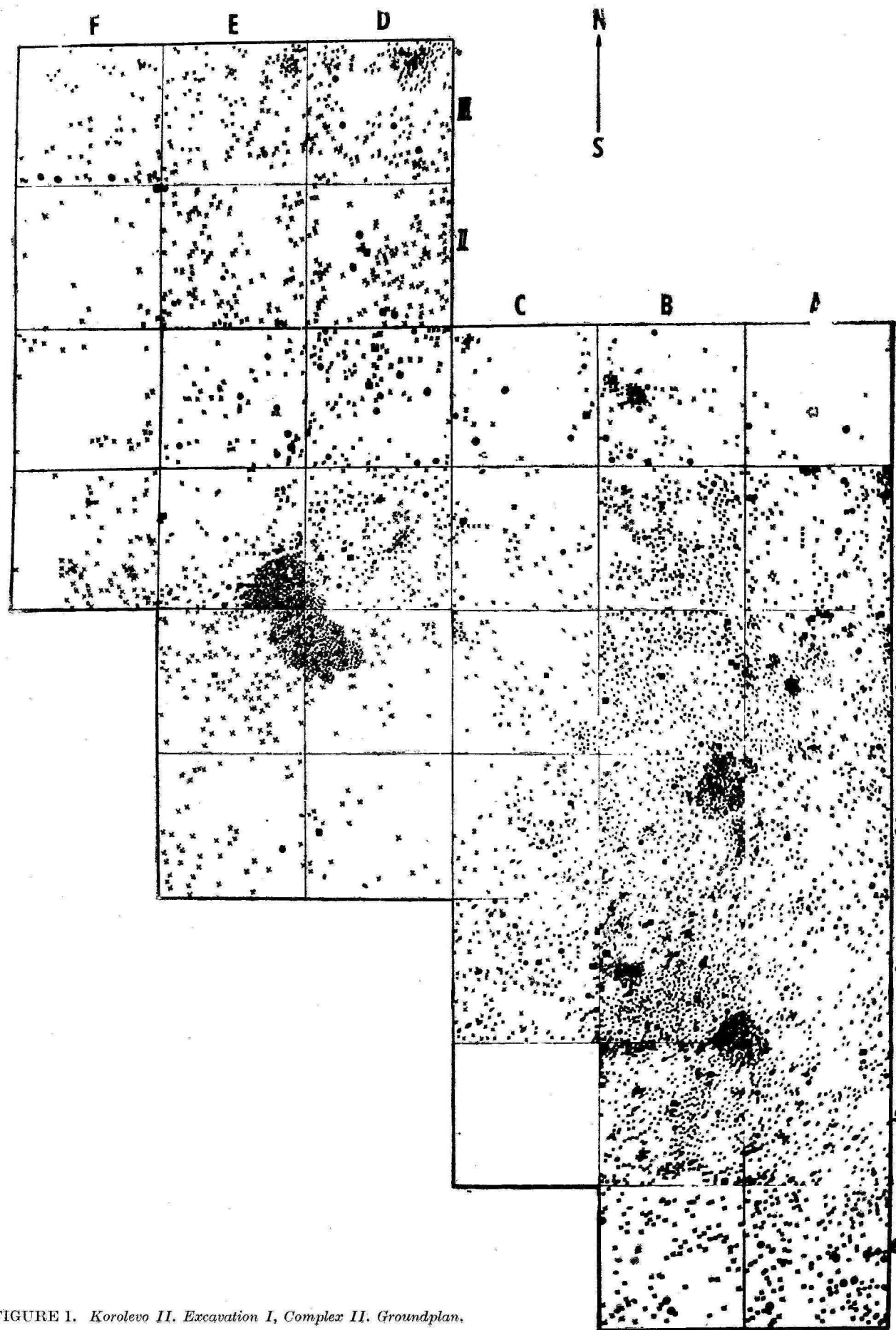


FIGURE 1. Korolevo II. Excavation I, Complex II. Groundplan.

The test pits were opened in 1978. In the trenches appeared deposits containing stone industries of three cultural horizons: The 1st corresponding to layer I from Korolevo I; the IInd was once mistakenly regarded as analogous with layer II from Korolevo I, due to the small number and unexpressive character of the implements, and the IIIrd yielded artifacts identical with layer III in Korolevo I, appearing in analogous stratigraphic conditions.

In 1979 during construction activities a bulldozer damaged a small area of the Korolevo II site with surface deposits. The abundant materials collected here differed from any of the earlier known Korolevo industries. Most interesting were the large numbers of long parallel blades and typical Upper Palaeolithic prismatic cores. In order to explain the stratigraphic conditions and the character of this new complex of tools in Korolevo II the excavation No. 1 started in the same year of 1979. The squares of 2x2 m oriented in the cardinal directions were labelled from east to west with letters (A—D), and from north to south with numerals (I, 1—5). Excavated area I represented 84 m². In the east the excavation I closely adjoined a thick dump of rocks. It is impossible to extend it in this direction. Neither can it be substantially extended to the north: there are Quaternary deposits with Palaeolithic artifacts disturbed during the construction of an illumination tower. In total, the deposits in excavation I reach to the depth of paleosol IV, only square B5 has been dug to to the depth of 9.35 m, practically to the base of Quaternary deposits. In the lower part of the loam, dividing the Korolevo III and

IV fossil soils appears a cultural horizon with numerous stone implements, of the same character as the implements collected here in the area bulldozed beforehand (IInd Cultural layer from Korolevo II).

In 1980 further 14 squares of a total surface area of 56 sq. metres were added. These excavations included squares A, B6; G, D2, 3, II, III; E1, I—III, where there were also numerous artifacts of the II. complex in situ (Fig. 1).

During the following research in Korolevo II (1982—1985) west of excavation I we continued in excavation 2 (12 sq.m.) and excavation 3 (12 sq. m.), where further artifacts of the IInd complex appeared. The finds are sporadic and document the end of the extension of the cultural horizon to the west from excavation I.

Stratigraphy. The following section appears at the southeastern corner of square A—6 of excavation I (Fig. 2):

	Thickness
1. Loess-loam, whitish with small dispersed iron-manganese concentrations, quantitatively growing downwards (layer 3 of general section of Korolevo 1)	0.00—0.20 m
2. Loam of light-brown hue combined with ochre-red hue and with numerous bean-shaped concretions of iron and manganese, quantitatively growing towards the top — III paleosol (Brörup + likely, Odderade and Moershoofd) (layer 4 of general Korolevo section)	0.00—0.20 m
3. Pale-yellow porous loam (layer 5 of the Korolevo general section)	0—20—0.70
	0.70—1.00

1) See description of general stratigraphic section of Korolevo in the preceding paper by V. N. Gladilin in this issue.

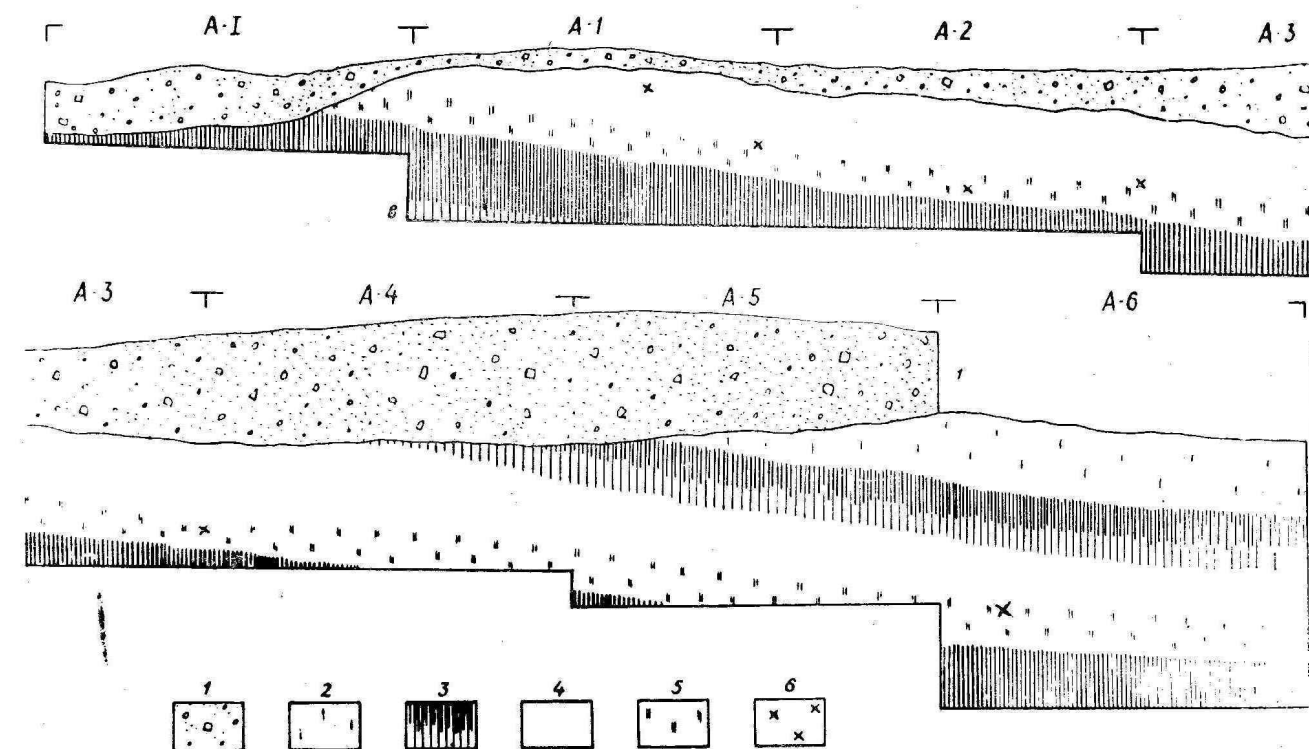


FIGURE 2. Korolevo II. Excavation I, Stratigraphic section: 1. Quarry dump; 2. Loess-loam, whitish, with small iron-manganese concretions, quantitatively growing downwards; 3. paleosols; 4. porous yellow-brown loam; 5. the same loam with dots of blotched iron-manganese concretions; 6. stone implements.

4. The same loam with dot- and plate-like iron-manganese concretions (layer 6 of the Korolevo general section) 1.00—1.20
5. Brown loam with ochre-red hue and with numerous bean-shaped concentrations of nut-shaped structure, aggregated — upper horizon of the IV. paleosol (Riss-Würm +, likely, Amersfoort) (level 7 of the Korolevo general section) 1.20—1.45

The lower part of the loam of layer No. 1 yielded sporadic Mousterian tools, analogous to the 1st complex from Korolevo I.

In the slightly manganese loam of the 4th layer appears the II-nd cultural horizon containing Upper Palaeolithic implements.

In the upper horizon of the IV. paleosol (layer 5) not too numerous Mousterian artifacts were discovered — identical with the III complex of Korolevo I.

Planigraphy. The dispersion of finds of the II-nd complex in Korolevo II is indicated in the ground plan of excavation I. The total surface of the excavation (1979—1980) covers 140 sq. metres. In the plan we can see three sections with considerable concentrations of finds: in squares A, B — 1—2, A, B — 4—6, G, D — I, 1. At the same time appear also several limited accumulations of artifacts; the waste produced during the stone flaking: squares B — 1; G, D — I; B — Z. The reconstructions of cores realized by V. I. Usik will enable us in the future to explain new aspects of the planigraphy of settlement II of Korolevo II. Together with it we can already say on the basis of V. I. Usik's work that in those parts of the settlement where the primary flaking was done, these or other tools were made and used in various working operations.

In the southern part of excavation I in squares A, B 4—6 appeared also charcoal, forming small concentrations, but no evident fireplaces were discovered.

Dating. The II-nd complex of Korolevo II occur in slightly manganese loam below the Brörup fossil soil. We should date it into the pre-Brörup section of Würm I²).

Only the C¹⁴ data are in contradiction to morphological, litho-mineralogical, palaeopedological, palynological, palaeomagnetic and thermoluminescent data on the age of Korolevo III fossil soil. Absolute dating has been obtained from charcoal from the II. cultural horizon of Korolevo II in the laboratories of the Geological Institute of the Academy of Sciences of the U.S.S.R. in Moscow, namely $38\,500 \pm 1\,000$ years (GIN — 2774) (Sulerzhitskiy and others 1984 p. 168). The dating has been very probably underestimated because the samples contained probably remains of decomposed roots of contemporary plants that practically cannot be distinguished from the dispersed original charcoals. The obtained absolute data are perhaps lower also due to the limited possibilities of the radiocarbon method, practically not allowing reliable dating of the Palaeolithic industries, whose age exceeds 40 thousand years.

²) See the extensive discussion of the dating of fossil soil III in Korolevo in the paper by V. N. Gladilin appearing in this issue.

Stone industries. The collection of the II. complex of Korolevo II has been obtained from the excavations and trenches yielding 7312 stone implements. This inventory is characterized according to the classification by V. N. Gladilin (1976 p. 5—91), based on the principle of multigraded subdivision. Thus the core-shaped implements will be divided to classes according to their degree of use (cores, pre-cores); to sections according to the method of flaking (primitive systemless and radial, Levalloisian, parallel); to groups according to the direction of flaking, number and position of the working surfaces; to types according to the form and character of shaping of the rear parts; to sub-types according to specific features of the striking platforms; to kinds according to the final products used. The flakes are divided into classes according to their proportions (flakes, blades); to divisions according to the used method of flaking, to groups, according to the character of the edges of the back; to types according to the shape; to sub-types according to special features of the striking platforms. The tools are divided into classes according to their typological indices and to their likely function (points, side-scrapers, knives, end-scrapers); to sections according to their forms, amount and situation of the functional parts; to groups according to the character of the working (dorsal, ventral, bifacial, etc.); to types according to the trimming facilitating the holding of the tool in the hand or its accommodation into the handle, to subtypes according to the use of the tools; to kinds according to secondary trimming (retouching). This classification by V. N. Gladilin has been worked out in Early Palaeolithic materials and for this reason in places, where it was necessary, slight changes and more precise definitions were made.

Raw materials. Prevailing local andesite was used (93.8 %). The surface of andesite is of light-grey colour, slightly leached, with relatively frequent small cells of leaching. As regards the degree of their leaching the andesite industries of the II. complex of Korolevo II visually almost do not differ from the artifacts of the IIa complex of Korolevo I (Mousterian). There appear also not too numerous implements made of flint, quartzite, slate, sandstone, quartz (6.2 %).

Primary flaking. Characteristic features of primary flaking appear on cores — 57 pieces (0.78 %³) on precores — 9 pcs. (0.12 %), on flakes — 2 678 pcs. (36.63 %), on blades — 1 426 pcs. (19.50 %), on scale, debris — 84 pcs. (1.15 %).

CORES — 57/0.78

A/ Parallel cores — 50/87.72⁵)

a) Unipolar longitudinal cores 22/48.89⁶)

- ³) Percentage with regards to the total of the artifacts
⁴) Here, and lower in the numeral — the quantity, in the denominator the percentage
⁵) Percentage with regards to all cores
⁶) Percentage with regards to all parallel cores definable on the level of group and type.

- triangular flat — 2/4.45
 subquadrangular — 3/6.67
 quadrangular-convex — 1/2.22
 quadrangular-flattened — 1/2.22
 subpyramidal — 1/2.22
 pyramidal — 2/4.45
 subpyramidal - flat — 1/2.22
 subcylindrical — 2/4.45
 cylindrical — 1/2.22
 block-like — 3/6.67
 sub-wedge-shaped — 1/2.22
 wedge-shaped — 4/8.90
- b) Unipolar alternative cores — 1/2.22:
 sub-cylindrical — 1/2.22
- c) Bipolar longitudinal cores — 16/35.55:
 sub-quadrangular — 2/4.45
 quadrangular-flattened — 2/4.45
 quadrangular-flat — 1/2.22
 sub-pyramidal — 1/2.22
 sub-cylindrical-convex — 1/2.22
 sub-cylindrical-flattened — 1/2.22
 sub-cylindrical-flat — 1/2.22
 sub-cylindrical — 1/2.22
 cylindrical — 2/4.45
 block-like — 4/8.90
- d) Bipolar contiguous cores — 2/4.45:
 sub-pyramidal flat 1/2.22
 sub-cylindrical 1/2.22
- e) Transversal — 1/2.22:
 quadrangular-flattened — 1/2.22
- f) Orthogonal — 2/4.45:
 quadrangular — 1/2.22
 sub-cylindrical — 1/2.22
- g) Sub-crosswise: — 1/2.22:
 quadrangular-flattened — 1/2.22
- h) Indefinable — 57)

B/ Indefinable cores — 7

As we can see, out of the 57 cores — 50 were flaked according to the parallel method, 7 — flaked in indefinable way. It seems that all nuclei belong to the same parallel way of flaking. The parallel cores can be divided into definable (45 pcs) on the level of group, according to the flaking, number and place of working surfaces of the cores and of type (according to the shape of cores and the shaping of their rear sides), and also undefinable (5 pcs.) on these taxonomic levels of classification, due to their fragmentary, not enough evident character and of extreme degree of use. In its consequence the summary characteristics of the cores of the II-nd layer of Korolevo II appear only as parallel definable cores on the level of groups and types.

On group level prevail single-platform cores of oblong proportions — longitudinal unipolar cores (48.89 %). Transversal — single-platform, shortened cores (their length is smaller than their width) are represented by one piece only (2.22 %). Numerous are also two-platform cores. Most evident among them are the bipolar cores (35.55 %). Rare are the bifacial cores of variable flaking orientation (4.45 %), orthogonal (4.45 %), longitudinal-alternative ones (2.22 %). There is also a three-faces core with a single sub-transversal working surface (2.22 %).

On type level the parallel cores can be eventually subdivided according to volume modification — to the so-called prismatic cores (sub-prismatic, pyramidal, sub-cylindrical,

⁷) Here and below the percentage of the undefinable forms is not presented

cylindrical) — 39.99 %, flat both in ground plan and in profile (triangular, sub-quadrangular, quadrangular) — 33.34 % and those occupying an intermediate position between the first two modifications, cores flaked from blocks (block-type, sub-wedge and wedge-shaped) — 26.69 %. Many cores have their rear sides processed with flakes: convexes — 2/4.45 %, flattened 8/17.80 % or flat (their flatness evidently has not been caused by special processing of core but has been conditioned by the form of the raw material and by the specific conditions of their use) — 4/8.90 %. The wedge-shaped cores have specially flaked back — 4/8.90 %.

The above mentioned parallel cores (45 pcs.) have been made of andesite — 28/62.2 %, flint — 11/24.4 %, slate — 3/6.7 % and quartzite — 3/6.7 %.

According to the use of blanks we can divide them as follows: on fragments and nodules — 31/68.9 %, on flakes — 12/26.7 %, on blades — 2/4.4 %.

The striking platforms of these cores can be divided into: plain — 15/33.3 %, simply faceted — 26/57.8 %, faceted — 4/8.9 %.

The metrical data of the parallel nuclei are indicated separately, according to their length, width and thickness.

Length: 4—5 cm — 4/8.9 %, 5—6 cm — 14/31.1 %, 6—7 cm — 11/24.4 %, 7—8 cm — 4/8.9 %, 8—9 cm — 3/6.7 %, 9—10 cm — 4/8.9 %, 10—11 cm — 4/8.9 %, 13—14 cm — 1/2.2 %.

Width: 1—2 cm — 3/6.7 %, 2—3 cm — 8/17.8 %, 3—4 cm — 9/20.0 %, 4—5 cm — 14/31.1 %, 5—6 cm — 4/8.9 %, 6—7 cm — 5/11.1 %, 7—8 cm — 2/4.4 %.

Thickness: 1—2 cm — 3/6.7 %, 2—3 cm — 15/33.3 %, 3—4 cm — 10/22.2 %, 4—5 cm — 8/17.8 %, 5—6 cm — 4/8.9 %, 6—7 cm — 3/6.7 %, 7—8 cm — 2/4.4 %.

The above metric indicators demonstrate that the mean length of the cores is between 5—7 cm (55.5 %), their mean width is between 2—5 cm (68.9 %), and their mean thickness is between 2—5 cm (73.3 %). Evidently there are no cores shorter than 4 cm, and only 11.1 % exceed the length of 10 cm, i.e. in the final stage of their use practically all cores have approximately the same parameters.

The parallel undefinable cores and the undefinable cores are made mainly of andesite — 9/75.0 %, much rarely of flint — 1/8.3 % and quartzite — 2/16.7 %.

PRECORES — 9/0.12 %.

As to the method of flaking and preparation of the working surfaces all cores are parallel. They are divided into two variants. The clear-cut cores occurring in series and with shaped working surfaces, without the negatives of flakes. According to their morphological characteristics these cores can be regarded as semi-finished wedge-shaped cores (5 pcs). The rest of precores (4 pcs) show only traces of initial stage of their exploitation with parallel flakes. Precores are made of andesite — 7/77.8 %, flint — 1/11.1 % and slate — 1/11.1 %.

As there are no conspicuous flaked surfaces, we can measure only the length of the longitudinal axis. They are all within the 5—17 cm bracket. To the group of products of primary flaking and of industry waste of the II layer of Korolevo II belong: flakes — 2 678/36.63 %, blades — 1 426/19.5 % chips — 2 910/39.80 %, fragments — 84/1.15 %.

FLAKES — 2 678/36.63 %:

primitive — 1 108/63.5 %⁸),
 Levallois — 22/1.3 %,
 parallel — 615/35.2 %,
 undefinable — 933.

BLADES — 1 426/19.5 %:

⁸) Percentage concerning the relation to all flakes definable on the group level

primitive — 316/22.8 %),
parallel — 1-071/77.2 %,
indefinable — 39.

CHIPS — 2 910/39.80 %.

FRAGMENTS — 84/1.15 %.

Flakes (36.63 %) are numerous and prevail among the waste of primary flaking. Definable flakes are dominated by the primitive ones (63.5 %). Their prevalence among flakes in the absence of systemless, radial and Levallois cores can be explained by the constant production of the big fragments and nodules of the raw material (andesite) during the preliminary working of cores, their preparation during the process of primary flaking — flaking of flake artifacts. It should be also remembered that in selecting primitive flakes prevail the primary ones (fully covered with cortex), systemless-marginal, systemless and dorsally-smooth marginal flakes, while radial and radially-marginal ones are rare and inexpressive. There appear also core-edges — 72 pcs (15.5 %) of all primitive flakes, prepared edges of the pre-cores, and rarely flakes obtained in the process of renewing the striking platforms ("tablette d'avivage").

The flakes of parallel outline (35.2 %) are in subordinated position to the primitive ones. Among them there are numerous flakes with cortex remains.

The Levallois atypical radial ("tortoise-shaped") flakes — 22 pcs/1.3 % are conventionally selected; they are evidently accidental in the standard parallel system of primary flaking. The Levallois flakes with convergent edges (Levallois point) are fully absent.

The most evident group of flakes are the blades (1 426/19.5 %). There are few primitive blades (22.8 %), namely if we realize that 183 pcs (57.9 % of all primitive blades) are crested blades ("lames à crête").

It is evident that there are relatively very few blades with cortex remains. The structure of blades basically differs from the structure of flakes. If primitive flakes prevail over the parallel ones, the evident majority of blades are parallel.

In this way the description of the general shape of all flakes of the IInd layer of Korolevo II well demonstrates that the purpose of primary flaking in this stone industry was to obtain blades with parallel edges of regular shape, both in ground-plan and also in profile. The flakes were obtained as a result of shaping or reshaping of the striking platforms and working surfaces of the cores. Parallel flakes without cortex can be regarded, to a considerable extent, as waster blades.

Typological features. In the composition of stone industries of the II. layer of Korolevo II there are tools (2.02 %), among them 14 hammer-stones made of sandstone (9), flint (2) and quartzite (3) pebbles and of their fragments. In addition to these tools there appeared also a series of undefinable and doubtful tools — 152 pcs. The industry is characterized

⁹⁾ Percentage as regards their relation to all blades, definable on group level

by implements with secondary trimming and with numerous traces of use — 134 pcs./1.83 % of the total stone industry.

The tools have been divided into three groups. Upper Palaeolithic, Mousterian and neutral. To the Upper Palaeolithic group belong: end-scrapers, end-scrapers-knives, burins, perforators, blade-points, blade-knives, Châtelperron knives; to the Mousterian group: side-scrapers, flakes-knives, cutting tools. As we can see the classification of tools as Mousterian or Upper Palaeolithic was realized according to their most characteristic features, typical features of one or other class of tools, or according to the Mousterian or Upper Palaeolithic periods.

Here we express our reservations to the fact that what is usually called "side-scrapers" in the archaeological literature has been divided into side-scrapers proper, knives on flakes and knives on blades.

The term "side-scaper" has its origin in G. de Mortillet's classification of palaeolithic tools. The term implies that these tools serve for scraping, scratching. But it has become evident that most tools called "side-scrapers" were not used for scraping only, but also for cutting operations. It would be logical to separate the side-scrapers proper, serving for scraping only, and the knives, serving for cutting. Nevertheless, due to inertia the original term "side-scaper" has been preserved up to now for tools on flakes, with one or more working edges retouched in various ways. The knives have been separated, but French scholars considered them only artifacts with natural or artificial back. The group of knives has been extended by the German and Polish scholars by introducing a number of new names: Bockstein, Klausennische, Königs-aue- and Prondnik-type knives. The main character — similarly as with the French archaeologists was the presence of the surface for support — of the back, no matter whether shaped in a different way than in the French Palaeolithic collections. I wonder why isn't used the most characteristic and determining character of the scrapers and knives, the angle of the cutting edge. From functional viewpoint the term "side-scaper" has become an anachronism. Following the classification of tools according to their morphological features, documenting their probable function, V. N. Gladilin proposed to replace the name "side-scaper" by the name "scraper-knife".

It would be desirable to divide the scrapers and knives into side-scrapers proper and knives proper, and as criteria could serve the angle of sharpness and of massiveness of the working edge (Gladilin 1976, p. 66). But namely what angle of edge and what degree of massiveness? The research by V. I. Sitliviya answered this question. By measuring the angles of the working parts of the end-scrapers from a number of Upper Palaeolithic sites (Mezin, Dobranichevka, Klyusi, Korolevo I, layer Ia), V. I. Sitliviya received optimal indicators for these evidently scraping tools: the angle of the working edge was between 60°—90°. These observations agree with the results of experimental analysis: most suitable for processing the animal hides were end-scrapers with an angle of the working edge above 65—70° (Korobkova 1983, p. 135—190). To this observation we can add the results of an experiment with cutting tools made by A. E. Matyukhin (1984, p. 5—25). On the basis of these facts it was proposed to divide the side-scrapers to side-scrapers proper and to knives: the artifacts with a degree of working edge up to 60° are knives, above 60° side-scrapers.

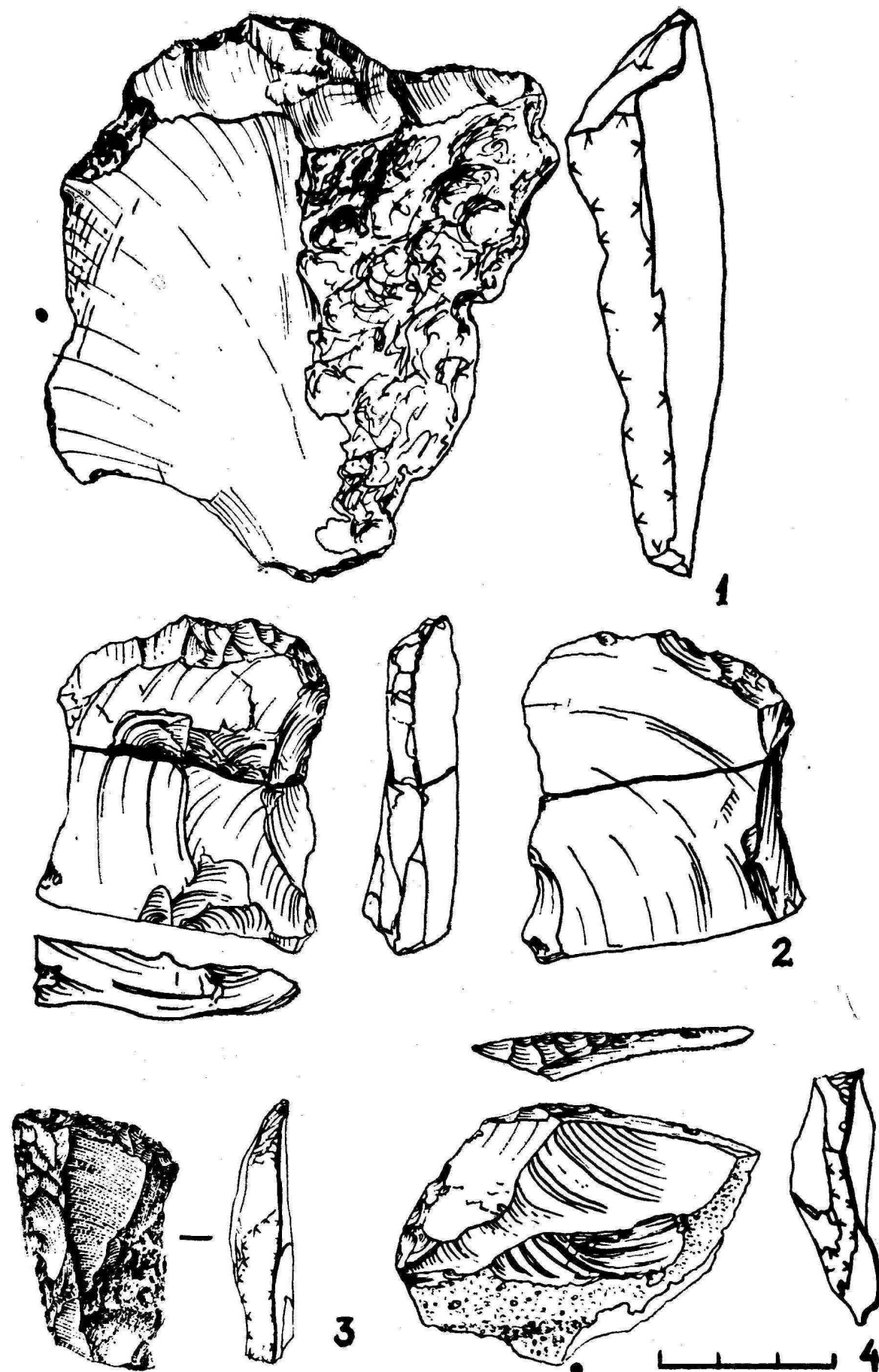


FIGURE 3. Korolevo II. Complex II. Tools.

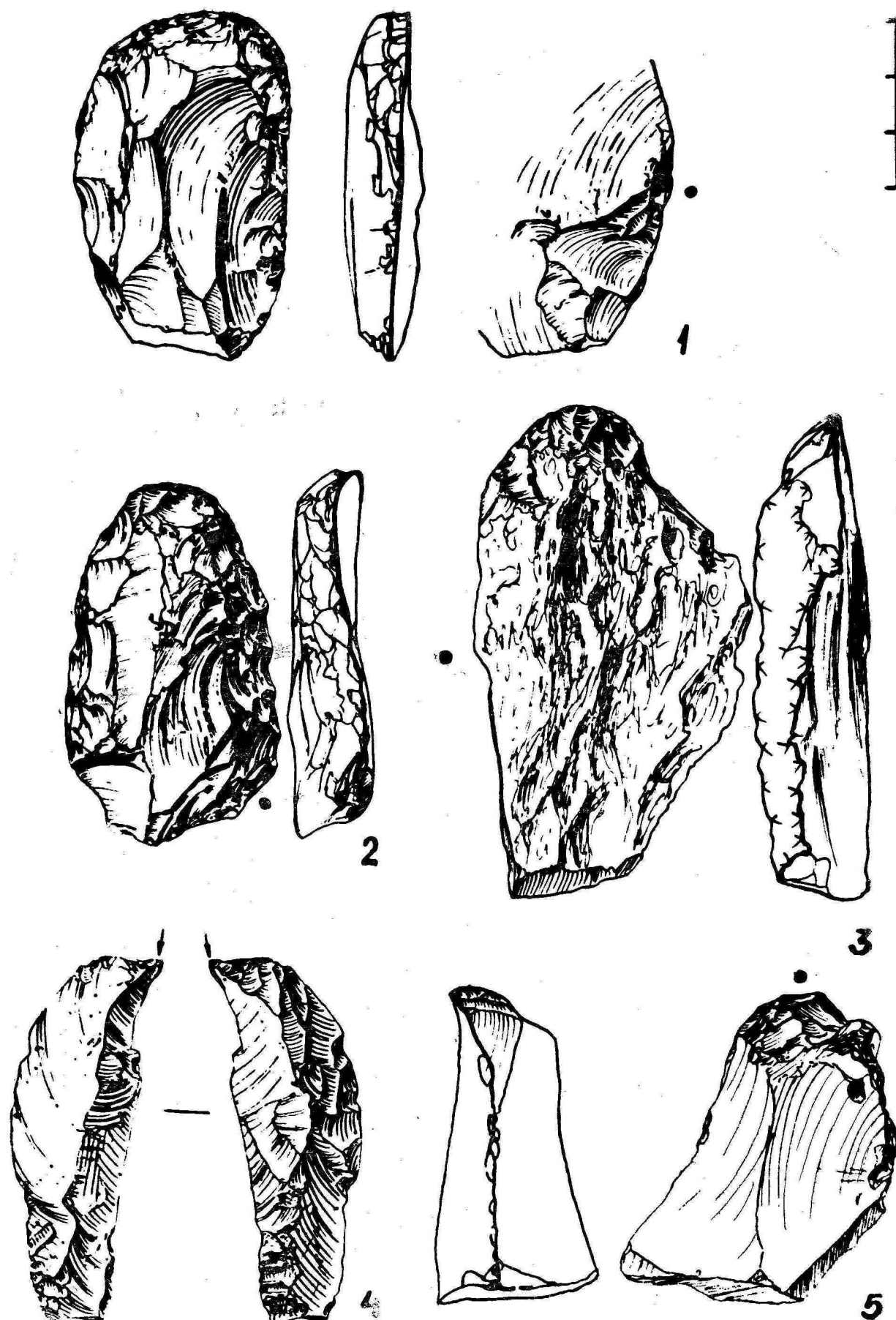


FIGURE 4. Korolevo II. Complex II. Tools.

This criterion is conventional the same as all typological criteria accepted in the classification of stone tools. Nevertheless this is fully acceptable in artificial classifications, to which belong also the classifications of the Palaeolithic stone artifacts. At the same time according to the blanks used for their manufacture they can be divided into knives on blades, and on flakes. It is so considering the knives on blades are retouched blades typical of the Upper Palaeolithic, and the knives on flakes, close to side-scrapers, are typical of the Lower Palaeolithic.

The group of "neutral" tools has also been determined. Here belong the denticulated, notched, and bifacial or partly bifacial leaf-points.

These tools are common both in the Lower Palaeolithic and Upper Palaeolithic industries. Some scholars are inclined to consider the bifacial and partly bifacial leaf-points as Lower Palaeolithic elements in Upper Palaeolithic assemblages, but this contradicts the general picture of development of the Upper Palaeolithic in Central Europe. The bifacial and partly bifacial leaf-points are a special feature of many sites of the region, appearing with Late Acheulian (e.g. some Riss complexes in the Federal Republic of Germany and in Korolevo I) and ended by the final period of the Upper Palaeolithic. For these reasons they belong to the neutral group of tools.

The characteristic features of the assemblage of the II. cultural-chronological complex of Korolevo II belong to three groups of stone tools.

Upper Palaeolithic group of tools — 53 pcs.
39.55 %.

ENDS-SCRAPERS — 9 pcs/6.72 %

Terminally-convex, dorsally usual — 1/11.1¹⁰⁾
Terminally-convex, dorsally bilaterally retouched — 1/11.1
Oblique-convex, dorsally lateral retouched — 1/11.1
(Fig. 3:3)
Angular-convex dorsally basal narrowing — 1/11.1 (Fig. 3:2)
Basal-convex, dorsally usual — 1/11.1 (Fig. 4:5)
Laterally-convex, dorsally usual — 1/11.1 (Fig. 3:1)
Laterally-convex, dorsally backed — 1/11.1 (Fig. 4:3)
Transversally-convex, dorsally usual — 2/22.3 (Fig. 3:4)

According to the raw material used the endscrapers can be divided to andesite — 7/77.8 %, flint — 1/11.1 and quartzite tools — 1/11.1 %. As to the quality of blanks for endscrapers mostly primitive irregular flakes, and also a core-type fragment and a blade (1/11.15 %) were used. We can recognize the following types of retouch on the endscrapers: scalariform 4/44.4 %, sub-parallel — 4/44.4 %, parallel — 1/11.2 %.

It follows from the above list that these endscrapers are quite primitive. There are practically no genuine, typically Upper Palaeolithic terminally-convex endscrapers on blades and on oblong flakes, with the exception of a single terminally-convex dorsal bilaterally-retouched piece (the two longitudinal edges of the blade are retouched) and of an oblique-convex with dorsal-lateral retouch, with the retouch of one of the longitudinal edges. In general the endscrapers are varied, non-standard and non-serial. The archaic character of the endscrapers is well perceptible on the shape of their angular, basal, transverse and lateral working edges. The absence of convergent

¹⁰⁾ Here and below we indicate the percentage with regards to all tools of the given class of artifacts

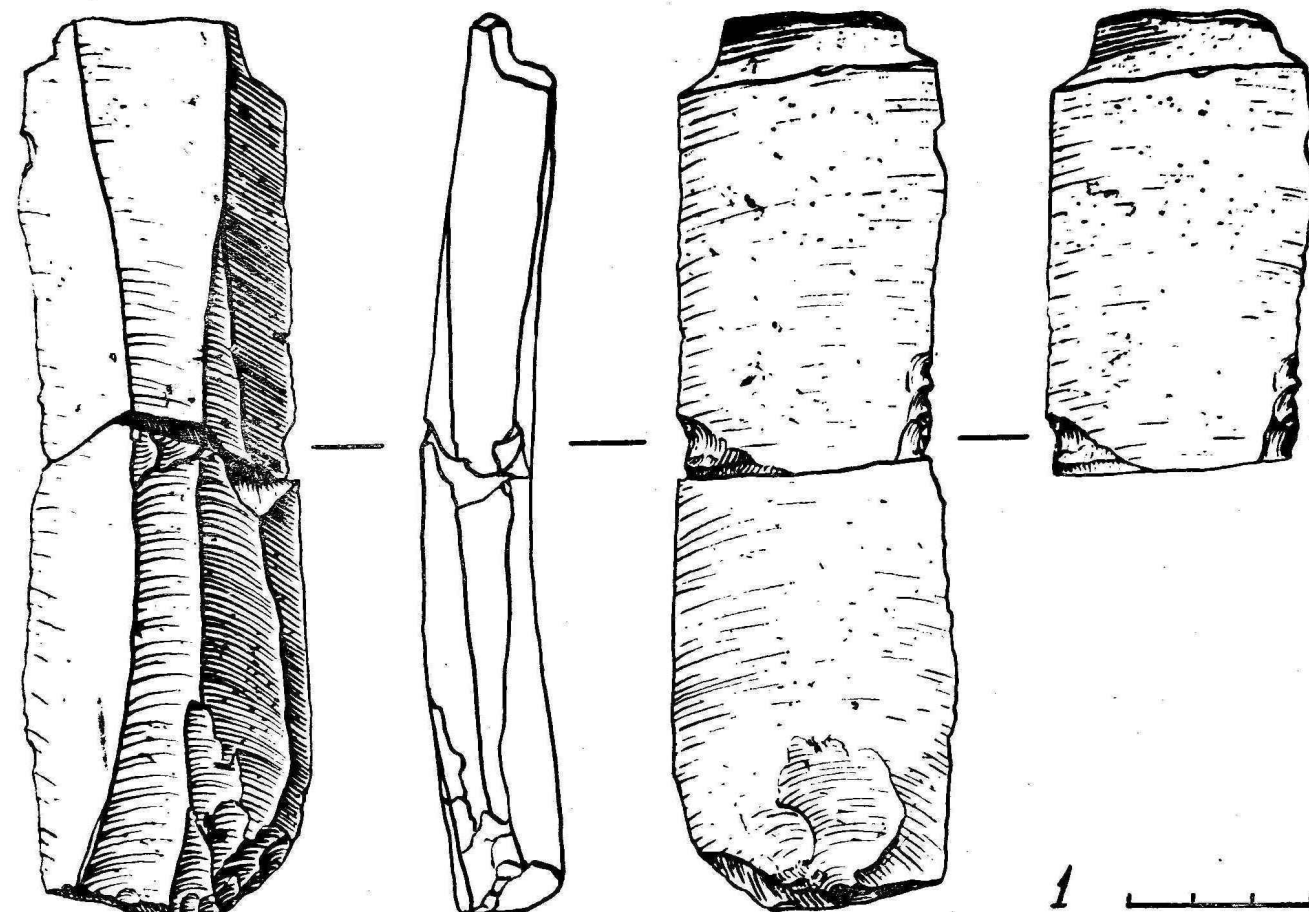


FIGURE 5. Korolevo II. Complex II. Tools.

retouch on the end-scrapers also documents their primitive character. Exact measuring of the flakes is not expedient, if we take into account their amorphous and atypical character. The mean length of end-scrapers along the longitudinal axis is at about 5 cm.

END-SCRAPER-KNIVES — 3 pcs/2.24 %

In the collection there are three artifacts that are in intermediate position somewhere between endscrapers-knives and end-scrapers (Fig. 4: 1-2). All three are made of andesite and are roughly of the same parameters. Their length is within the bracket of 3.5—4.0 cm and the width between 5.5—6.5 cm with regards to the axis of blanks. They have been made of short broad flakes (the length is smaller than the width), and they are very close to angular concave-straight or bow-shaped side scrapers-knives. One of these artifacts has a thinned back seen from the ventral side. Together with this feature they differ also by the fact that one of the short edges at the angle of the blank is converted into an end-scraper with a marked sub-parallel retouch. Nevertheless, such tools, as it seems, can also be regarded as scrapers as the transversal edge of the blank has been processed so that it has a sharpening retouch that form a cutting edge typical of the knives. It is possible that these artifacts really mark some intermediate stadium between sidescrapers-knives and end-scrapers, and in order to define this transitional form, these artifacts are called end-scrapers-knives.

GRAVER (BURIN) — 5 pcs/3.73 %:

Rectangular, faceted usual — 2/40.0
Rectangular multifaceted usual — 1/20.0
Beak-shaped faceted usual — 1/20.0 (Fig. 4: 4)
Oblique-angled transverse-multifaceted laterally-retouched — 1/20.0 (Fig. 7: 2).

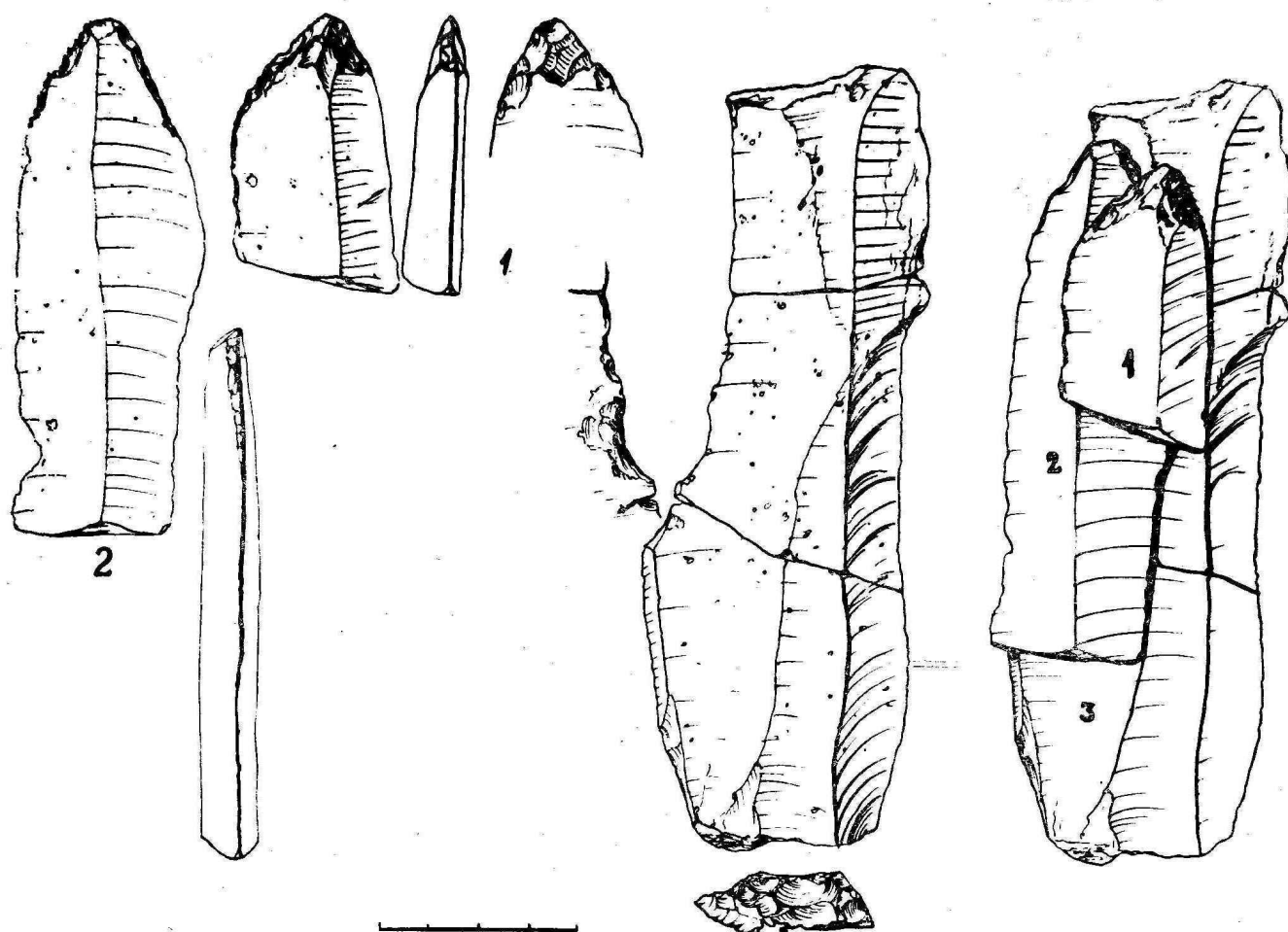


FIGURE 6. Korolevo II. Complex II. Tools.

They are made on parallel andesite blades (2 pcs) and flakes (3 pcs). Their length varies between 5—8.5 cm, and the width between 2.0—8.0 cm. The gravers are of simple shape — rectangular (3 pcs) and beak-shaped (1 pc).

This classification of the gravers took place according to the form of the working parts and with regards to the axis of flaking of the blanks. Interesting is the oblique-angled transverse graver. Several burin spalls had been taken transversal to the axis from the lateral retouched edge of the blade. In the Soviet archaeological literature we call gravers of this type "Suponevo-type" gravers. In such a case we cannot exclude reshaping with burin spalls of dorsal terminal-triangular point on the blade represented by a significant series in the considered collection. In this way the gravers are of various types, they are not developed (e.g. typical examples with terminal retouche), they are not numerous and cannot be regarded as one of the main groups of the assemblage of the IInd complex of Korolevo II.

REZCHIKS — 7 items/5.22 %:

Rectangular ventrally-faceted usual — 2/28.5 (Fig. 7: 1)
Rectangular ventrally-faceted natural backed tool — 1/14.3
Oblique-angular ventrally-faceted crested backed tools — 1/14.3
Rectangular ventrally-retouched usual — 1/14.5
Bi-rectangular ventrally-retouched usual — 1/14.3 (Fig. 5: 1)
Oblique-angular ventrally-retouched blunt terminal — 1/14.3

Made on blades — 3 pcs, on flakes — 3 pcs, and on clove — 1 pc. According to the raw materials used for their manufacture the rezchiks can be

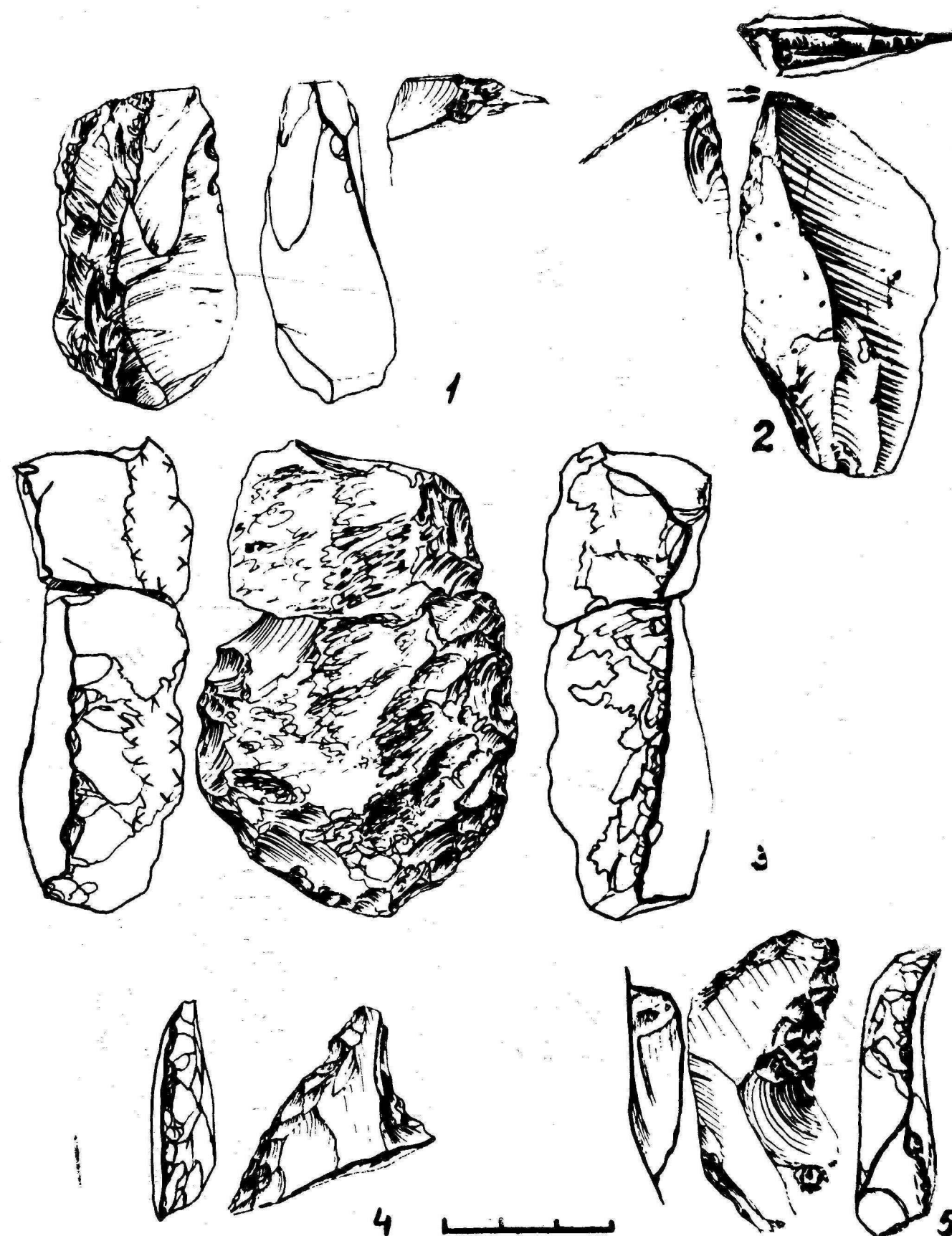


FIGURE 7. Korolevo II. Complex II. Tools.

divided as follows: of andesite (5 pcs), quartzite (1 pc), slate (1 pc). Their length varies between 5.0—10.5 cm and the width between 3.0—8.5 cm.

The rezchiks are classified according to the same principle as the graters — according to the shape of the working parts, with regards to the axis of flaking the blanks. According to the character of processing their working parts the rezchiks can be divided into: faceted (4 pcs) and retouched (3 pcs). The working edges of the faceted rezchiks have been shaped by flat burin spalls at the angles of blanks from their ventral side. These faceted rezchiks are usually called "flat graters" in the archaeological literature. According to their function

they are close to the cutting points and cutters (Yefimenko 1958, p. 271). On the level of type (accommodation) appears a single backed crested tool (from the natural platform-edge of such flake) several chips have been taken, with the purpose of shaping this side into a back and a single naturally backed tool on the level of rezchiky-type. The retouched rezchiks are characterized by a not too large section of sloping scalariform retouch, with its morphological features and functional purpose close to faceted rezchiks. Among them appears a bi-rectangular rezchik whose working edges are on the angles of a fragmented parallel blade. As a separate type is also a rezchik with blunted end. In total the rezchiks represent not too big expressive group of the assemblage and can be regarded as one of its characteristic features.

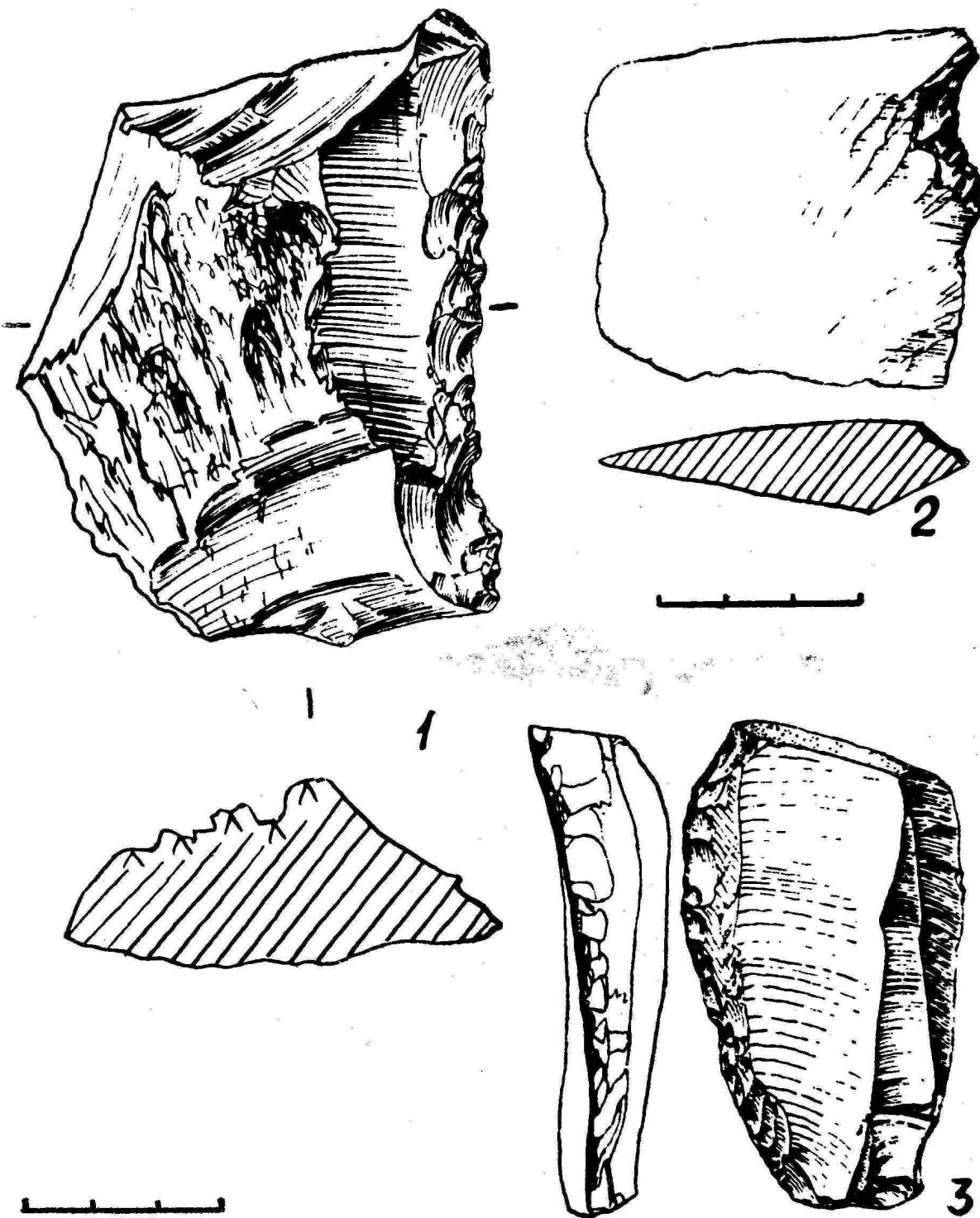


FIGURE 8. Korolevo II, Complex II, Tools.

AWLS — 2 pcs/1.49 %:

Pointed dorsal usual — 2/100 (Fig. 7:4)

Made on the angle of fragmented flakes of short proportions. Their length is between 3.5—4.0 cm, the width also 3.5—4.0 cm.

At the angles of these fragmented flakes there is an awl-like trimmed part shaped with the help of scalar retouch. Purely morphologically it can be defined as piercing tool and can be regarded as an awl. These awls are unique and they evidently appear by chance in the collection of the II, cultural-chronological complex of Korolevo II. They can be attached to the category of common and conventionally called "Mousterian" awls.

POINTS — 13 pcs/9.70 %:

Terminally triangular dorsal usual — 5/71 (Fig. 6:2)

Terminal-triangular partly bifacial indefinable — 1/15.3 (Fig. 6:1)

Willow-leaf shaped dorsal indefinable — 1/14.3

Indefinable — 6.

They are made on fragments of parallel blades (their length is within 3—11 cm, the width between 1—5 cm). With the exception of one made of flint all have been made of andesite. The main form are the terminal-triangular points (6 pcs).

In these points only the terminal parts have been worked so as to slope, mostly with the use of scale retouch, and the retouch did not continue further to the lower part of the artifacts. Only one point has its terminal part retouched not only from the dorsal, but also from the ventral side, i.e. it was partly bifacial trimmed. There is also a point of different form — a willow-leaf shaped dorsal one, standing separately as compared with the above-described series of points. There are also 6 terminal point fragments. They are unifacial dorsal artifacts of undefinable form, thus they cannot be clearly identified neither as terminally-triangular, nor as points of willow-leaf shape. As we can see there are numerous points representing an expressive selection of tool assemblages. The terminal-triangular points are characteristic of this complex and they represent a specific feature of the Upper Palaeolithic component of the stone industry of the II, layer of Korolevo II.

KNIVES ON BLADES 12 pcs/8.95 %:

Longitudinal - straight dorsal usual — 1/8.3

Longitudinal-convex dorsal usual — 6/50.0

Longitudinal-convex dorsal naturally backed — 1/8.3

Longitudinal-convex ventral regular — 1/8.3 (Fig. 9:4)

Longitudinal-convex partly bifacial, usual — 1/8.3

Longitudinal-convex dorsal usual — 2/16.8 (Fig. 9:2)

They are made on parallel andesite (10 pcs) and slate (2 pcs) blades and on their fragments. The length of the artifacts is between 5—15 cm, the width between 1—5 cm. There are three different types of retouch on these knives: pearl-like — 8 subparallel — 3, scalariform — 1. From the typological point of view they are simple knives on blades.

It means that they are longitudinal and in principle dorsal (10 pcs), single ventral (1 pc) and partly bilateral (1 pc) varieties with straight (1), convex (9) and concave (2) working edges. It is not excluded that the pearl-like retouch appearing on these artifacts is the consequence of working activities. The typical Aurignac blades with scalariform abrupt and parallel retouch, extended in the Upper Palaeolithic complexes of Europe are absent here. Basically they are simply blades with flat retouch on various parts.

KNIVES OF CHATELPERRON TYPE — 2 pcs/1.49 %¹¹:

Subtriangular non-retouched and backed — 2/100

In the group of knives on blades and flakes we can distinguish two artifacts. They are on parallel andesite blades 6.9 cm long, — 2.8 cm wide) and on flakes (length 7.9 cm, width 4.8 cm).

On the terminal parts of these artifacts one of the longitudinal margins had been worked dull to 80° with coarse retouch, while the other edge does not show traces of secondary processing. The form of these tools is sub-triangular, slightly asymmetrical. These characters bring these tools close to Châtelperron knives, in which the bluntly worked edge served as back, while the opposite non-retouched one served as working edge. These artifacts, although not too numerous, are typologically rather expressive and clearly illustrate the presence of evident Upper Palaeolithic elements in the II complex of Korolevo II.

Mousterian group of tools — 32 pcs/23.88 %.

SIDE-SCRAPERS — 4 pcs/2.98 %:

Longitudinally-convex dorsal, usual — 1/25

Longitudinally-convex dorsal, natural-backed — 1/25 (Fig. 8:3)

Double-convex dorsal, usual 1/25 (Fig. 7:3)

Transversally-convex dorsal, usual 1/25.

Made on parallel flakes (3 pcs), 1 pc on primary flake, three on andesite and one of quartzite. The retouch on side-scrappers (3) is scalariform, and sub-parallel (1). Their length varies between 4.5—7.5 cm, the width is between 4.0—10.5 cm.

All side-scrappers are of simple shapes — they are longitudinally-convex (2), double-convex (1) or transversally-convex (1). All of them are typically dorsal and only one of the side-scrappers has opposite to the working edge a longitudinal steep edge that can be regarded as a natural back.

There are no complicated side-scraper forms, nor artificial adjusting features.

KNIVES ON FLAKES — 19 pcs/14.18 %:

Longitudinally-direct dorsal, usual — 4/21.0

Longitudinally-direct ventral, usual — 1/5.3

Longitudinally-convex dorsal, usual — 4/21.0

Longitudinally-concave ventral, usual — 2/10.45

Longitudinally-curved dorsal, naturally backed 1/5.3

Transversally-convex dorsal, usual — 1/5.3

Double-convex dorsal usual — 2/10.45

Double-convex partly-bifacial, usual — 1/5.3

Double-concave alternate, usual — 1/5.3

Sub-triangular dorsal naturally-backed — 1/5.3

Oblique-angled dorsal, backed — 1/5.3 (Fig. 7:5)

They are made on parallel (14 pcs), Levallois radial (1 pc) and non-identifiable (2 pcs) flakes, on clove-like piece (1 pc) and non-identifiable (2 pcs). According to the raw material used they are of andesite (12), flint (3), quartzite (2), and slate (2). The retouch of the knives on flakes is scalariform (8), pearly (8), sub-parallel (2) and parallel (1). Their length is between 5—15 cm, their width varies between 2—12 cm.

¹¹ See the article by V. I. Usik in this issue (Fig. 12:4).

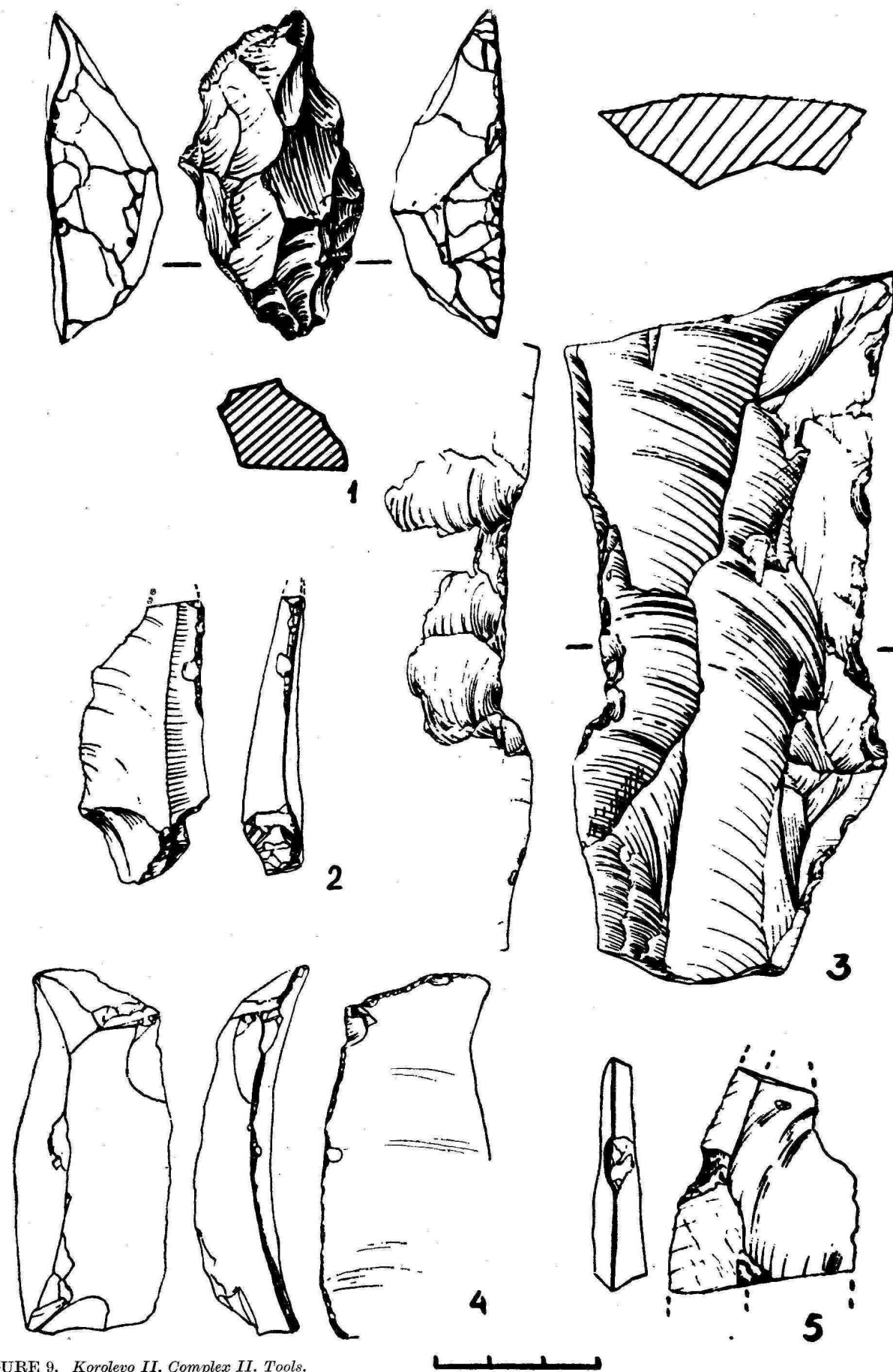


FIGURE 9. Korolevo II, Complex II. Tools.

The shape of the knives on flakes, and of side-scrapers of this complex is not too varied. The longitudinal straight (5), convex (4), concave (2) and bend (1) knives prevail. There is an isolated transversally-convex knife. We find in the complex also double-convex (2) and double-concave (1) pieces. More developed are the knives of sub-triangular and oblique angled shape meeting at one point with the retouched edge and with the natural or artificial back. According to the character of processing the working edges the knives of flakes can be dorsal (14), ventral (3), alternate (1) or partly bifacial (1). In this type there are only two naturally-backed knives (the back-edge is formed by the cortex on the artifacts) and one knife is backed — with a special fracture to produce a platform facet.

The considerable share of the Mousterian characters in the collection (of side-scrapers and knives on flakes) underlines the archaic character of the industry of the II complex of Korolevo II.

CHOPPING-TOOLS ON FLAKES — 8 pcs/5.97 %:

- Longitudinal-straight partly-bilateral backed-crested — 1/12.5 (Fig. 10:1)
- Longitudinally-convex non retouched, usual — 1/12.5
- Longitudinally-concave non-retouched, usual — 2/25 (Fig. 9:3)
- Longitudinal sinuous partly bilateral, naturally backed — 1/12.5 (Figs. 11:1)
- Transversally-convex non-retouched, usual — 1/12.5
- Transversally-convex non-retouched, naturally-backed — 1/12.5
- Bow-shaped partly-bilateral, backed-crested — 1/12.5

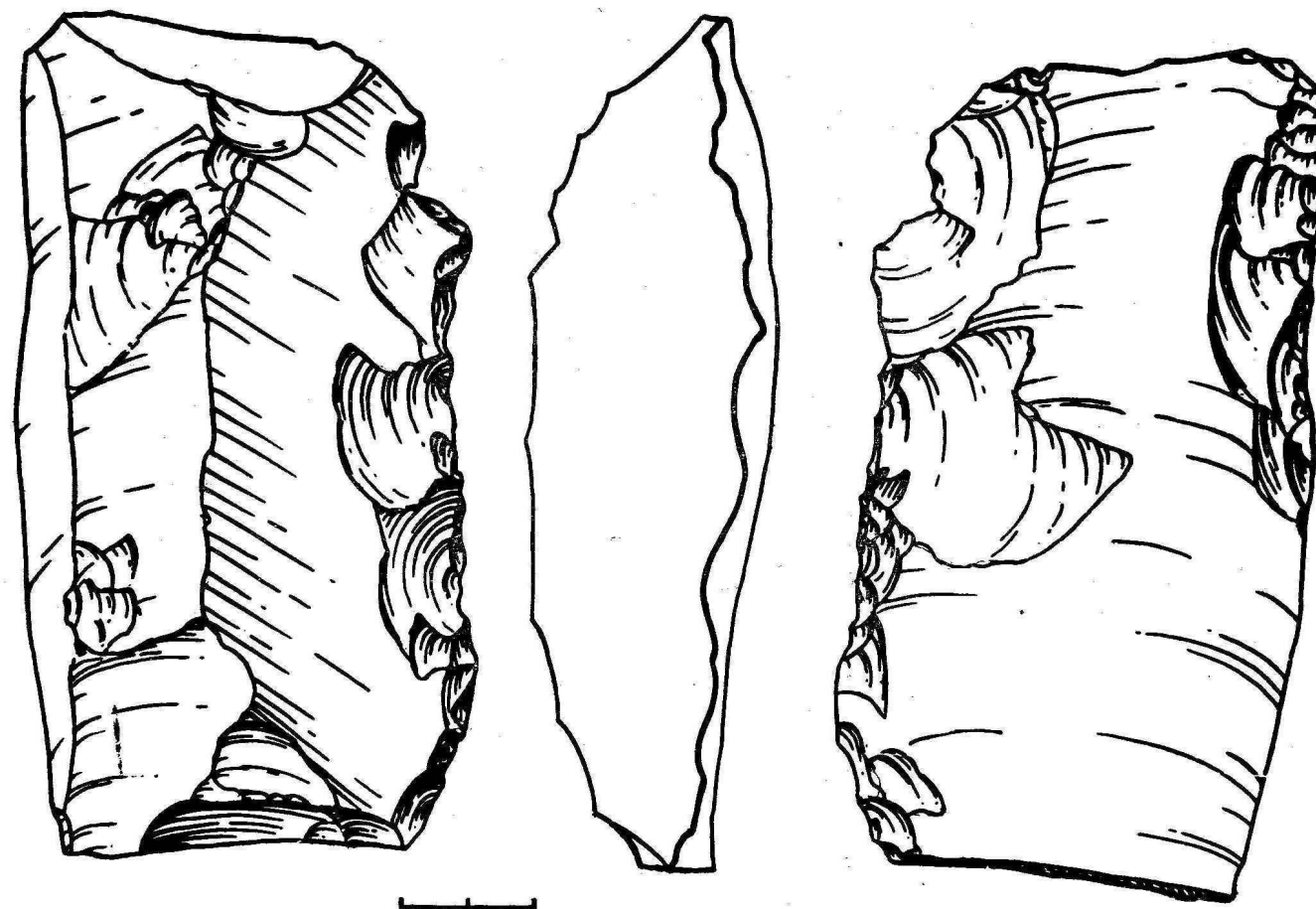


FIGURE 10. Korolevo II, Complex II. Tools.

Chopping-tools on flakes first appeared here in the Lower Palaeolithic materials. They are coarse chopping tools with a single lengthwise working edge (worked or not, but with traces of use) and situated opposite to the natural or artificial platform for the palm, sometimes with a transition to a handle. In assemblage II from Korolevo II they are made of andesite. According to the blanks 4 of these chopping-tools are on blades and 4 on flakes.

The tools on blades have working edges on one of the longitudinal sides. The dimensions of these tools are considerable — the length is between 12.5—27.0 cm, the width between 5.5—7.5 cm. The chopping-tools on flakes have also working edges longitudinal or transversal depending on the axes of the blanks. One implement is bow-shaped, it is made on a shortened primary flake with bow-shaped short working edge. These chopping-tools have also considerable dimensions. The length of their working edge often exceeds 12 cm. The working edges are formed with the help of partly-bifacial secondary working (3), or show well perceptible traces of chopping (5), reaching both to the dorsal and ventral sides of these artifacts. In the result of their use the shape of their working edge differs. It can be straight (1), convex (3), concave (2) or sinuous (1). Other types we find here are naturally backed (2) and backed-crested (2). The latter are rather special. To make the back thinner and easier to grip with the hand, the ventral side of the blanks was chopped. The interesting thing is that the chopping-tools on blades of the II assemblage of Korolevo II with their morphological characteristics are very close to the Acheulian chopping tools called "tsalda" in the Tsonga Cave in the Caucasus, described by A. N. Kalandadze (1969, p. 21).

CLEAVER — 1 pc/0.75 %

Trapeziform dorsal, laterally blunted — 1/100

This type of tools, similarly as the chopping-tools on flakes for the first time appeared in Korolevo in the Lower-Palaeolithic. The cleavers differ from classical cleavers by their not being fully worked, the negatives do not cover the entire surface of these tools and as a rule the working edge was not worked (it always showed traces of use) it was either retouched, or more often several flakes had been chopped off. The lateral edges as a rule show no traces of use, but they are cut off, often flat flaked to obtain better grip.

In the collection of the II complex of Korolevo II there is only a single cleaver made on a parallel andesite flake (the length is 12.0 cm, the width 6.3 cm). The transversal concave working edge of the artifact was worked with coarse scalariform retouch. The cleaver is trapezoidal, one lateral edge had been blunted with retouch, the other is the natural back. The chopping tools (chopping-tool on flakes, cleavers) of complex II of Korolevo II represent an expressive series of Lower Palaeolithic artifacts, pointing to a possible link with early Upper Palaeolithic complexes having similar chopping forms in their stone tool assemblages.

"Neutral" tools — 49 pcs/36.57 %.

DENTICULATES — 9 pcs/6.72 %:

Longitudinally-convex dorsal, usual — 1/11.1
Longitudinally-concave dorsal, usual — 3/33.4 (Fig. 8:1)
Longitudinally-concave dorsal, naturally backed — 1/11.1
Transversally-concave dorsal, usual — 1/11.1
Bow-shaped dorsal, usual — 1/11.1
Laurel-leaf-shaped dorsal with oblique platform — 1/11.1 (Fig. 9:1)
Thorn-shaped alternative, backed — 1/11.1

Made exclusively on andesite raw materials — 8 on flakes and one on blade. Denticulate working edges formed with scalariform (8) and pearly (1) retouch. The length of denticulates is 5 cm and more. Prevail simple shapes — longitudinal convex (1) and concave (4). There is also a transversally-concave denticulate.

All they are dorsal — in the whole group is a single backed piece, the rest is usual. There are also more complicated forms: bow-formed, dorsal usual, thorn-shaped alternative backed, laurel-leaf shaped with oblique dorsal platform. The latter is rather specific type. It is made on a short flake. Formally typologically it is a limace, but with denticulate working edges, one flake has been taken off its basal part, resulting in a platform oblique to the longitudinal axis of the artifact.

NOTCHED — 12 pcs/8.95 %:

Longitudinal dorsal, usual — 5/41.7 (Figs. 9.5)
Longitudinal dorsal, naturally backed — 1/8.3
Longitudinal ventral, usual — 4/33.4 (Figs. 8.2)
Transversal dorsal, usual — 1/8.3
Transversal ventral, usual — 1/8.3

The notched artifacts were made of andesite (11) and slate (1). According to the blanks they can be divided into those made on blades (5) and on flakes (7).

The forming of notches: scalariform (7), pearly (4) and stepped (1). The length of the notched tools is in excess of 5 cm. Prevail longitudinal tools (10 pcs), transversal ones are rare (2 pcs). Prevail the dorsal tools (7 pcs), but there are also numerous ventral ones (5 pcs). One notched tool has a natural back, while the others are normal.

As a whole the denticulate and notched tools are most numerous (16.67 %) of all tools of the assemblage. They provide the stone industry of the II complex of Korolevo II with specific features.

LEAF-POINTS — 28 pcs/20.9 %:

The bifacial and partly-bifacial leaf-points of complex II can be divided into the following 4 categories:

I. Carefully retouched leaf-points in which the form and mostly also the type of working can be established — 6 pcs/21.4 %:

Subwillowleaved partly bifacial, basal-narrowing — 1 (Fig. 13:2)
Willowleaved bifacial, basal narrowing — 1 (Fig. 14:4)
Sublaurelleaved partly bifacial undefinable — 1 (Fig. 12:1)
Sublaurelleaved bifacial, basal narrowing — 1
Laurelleaved bifacial, basal narrowing — 1 (Fig. 12:3)
Laurelleaved partly bifacial, unidentifiable — 1

Made of andesite exclusively, on unidentifiable blanks (hard to tell whether on nodule, fragment or flake) — 4 pcs and on flakes of short proportions — 2 pcs. Secondary working — wide-spread scalariform retouch. The metric data have been obtained from two complete points and from a damaged point reconstructed of fragments by V. I. Usik. Their length is within 6.5—7.0 cm and the width is between 2.5—3.5 cm. They are 0.9—2.3 cm thick.

According to their shape we distinguish willowleaved and laurelleaved points, and in connection with the outline of the basal part (e.g. rounded base) they can be divided into subwillowleaved and sublaurelleaved. According to the character of surface working we distinguish between bifacial (3) and partly bifacial (3) leaf points. According to the working of their basal part (serving for their attaching to the wooden shaft the leaf points are basally narrowed (4). Two of them are unidentifiable, fragmentary. Only two of the 6 described artifacts are intact, the rest is more or less fragmentary, and the composition of these fragments allows us to have some objective view regarding their form, character of working and elements of adjustment. The leaf points evidently broke into fragments in the process of their working. This conclusion is supported also by the other three categories of leaf points.

II. Bifacial and partly bifacial unfinished points, or in other words spoiled leaf-points — 6 pcs/21.4 %.

All made of andesite, including those made on unidentifiable blanks — 4 pcs and on shortened flakes — 2 pcs. Their length varies between 5—10 cm. Characteristic features of the bifacial and partly bifacial secondary working is the absence of more careful retouch.

The form is unstable and non-standardized — amygdaloid (1), segmented (1) (Fig. 13:1), sublaurelleaved (14:1, 3), and certain asymmetries appear in the ground plan and in profile. The basal narrowing of 3 artifacts is rounded, and one has pointed base as seen in ground plan (Fig. 12:2). In 5 artifacts we can see attempts to narrow rear, so as to obtain lentil-sha-

ped sections and two artifacts broke up on applying the above workmanship.

Finally we sum up the morphological characteristics of these artifacts (the failure of rear-ventral narrowing, the preservation of the massive lateral platform on three artifacts, the fracture of two pieces, coarse preliminary working) lead us the conclusion that they are not "rejects", i.e. points spoiled in the process of working.

III. Terminal parts of bifacial and partly bifacial leaf-points — 10 pcs/35.8 %.

IV. Basal parts of bifacial and partly bifacial leaf-points — 6 pcs/21.4 %.

Due to their fragmentary character these leaf-points cannot be divided reliably into bifacial and partly bifacial ones. Many of these artifacts were fragmented during their secondary processing and flat surface retouch. This can be explained both by the brittle character of the raw material (andesite) and by the shortcomings of the working methods. Nine of the terminal parts found were of andesite, one of flint, 5 basal parts were of andesite and one of flint. Among the

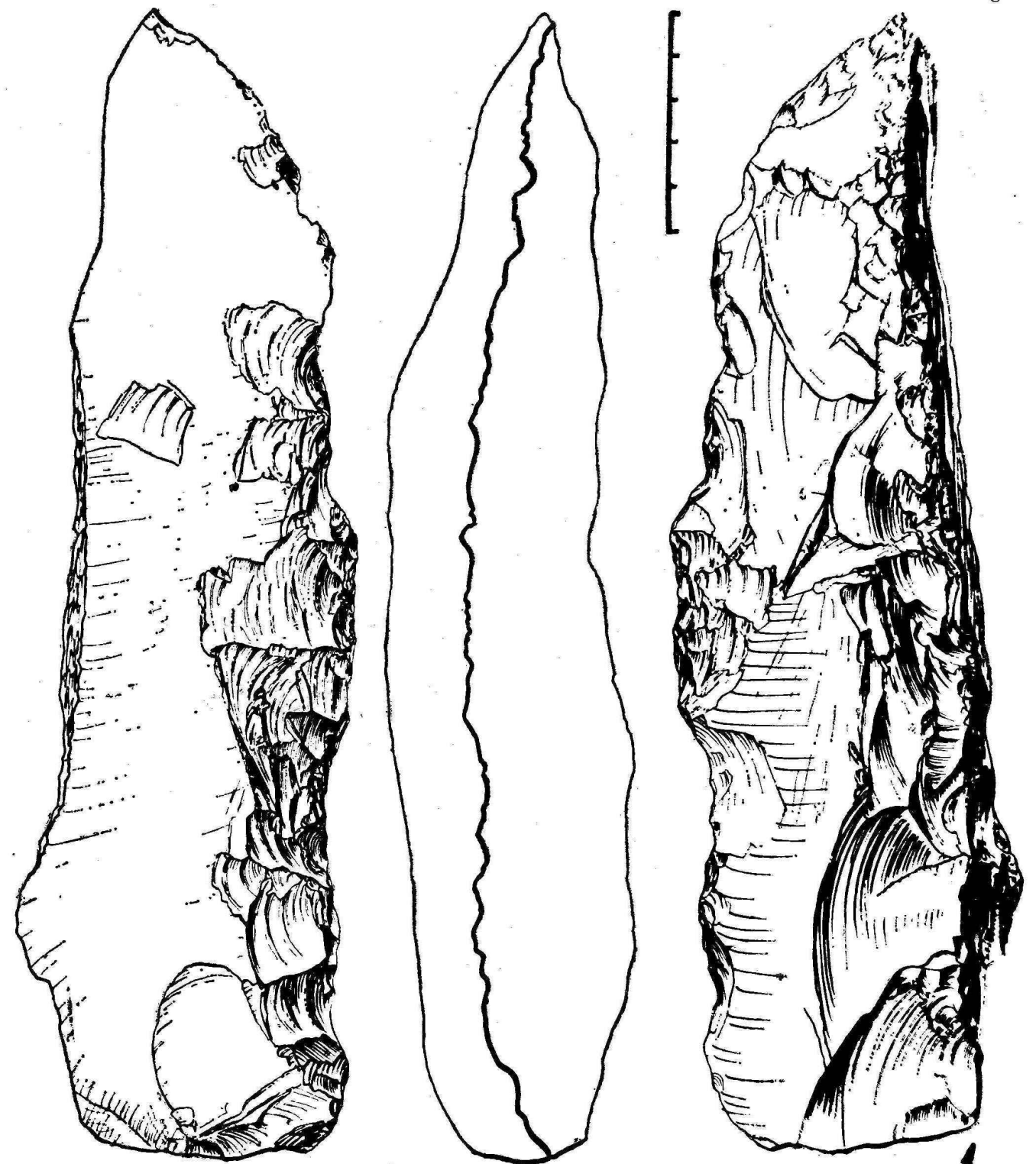
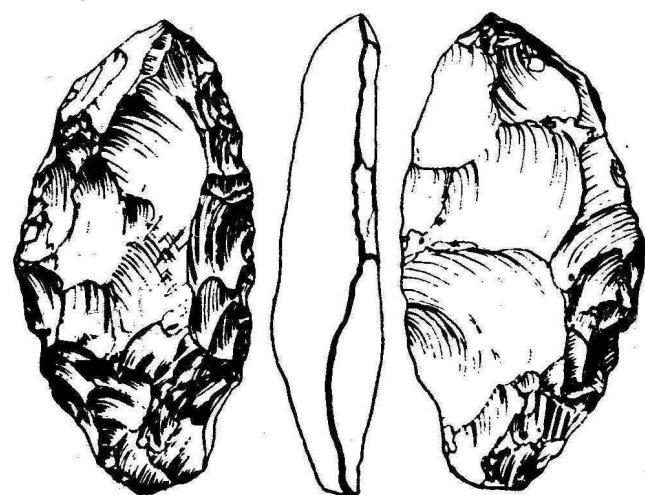
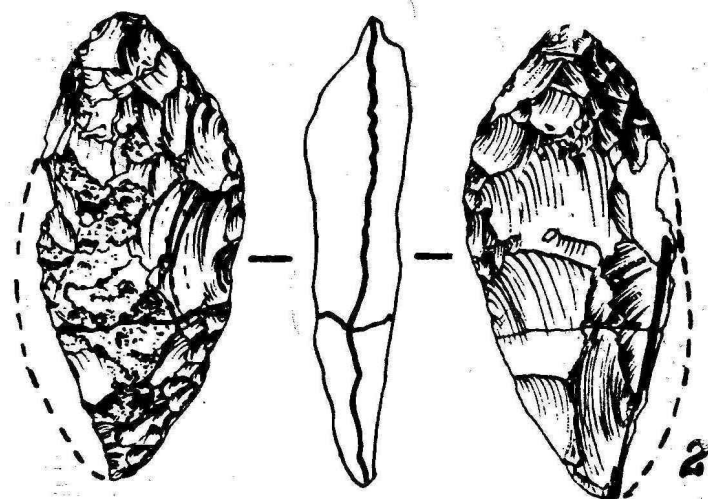
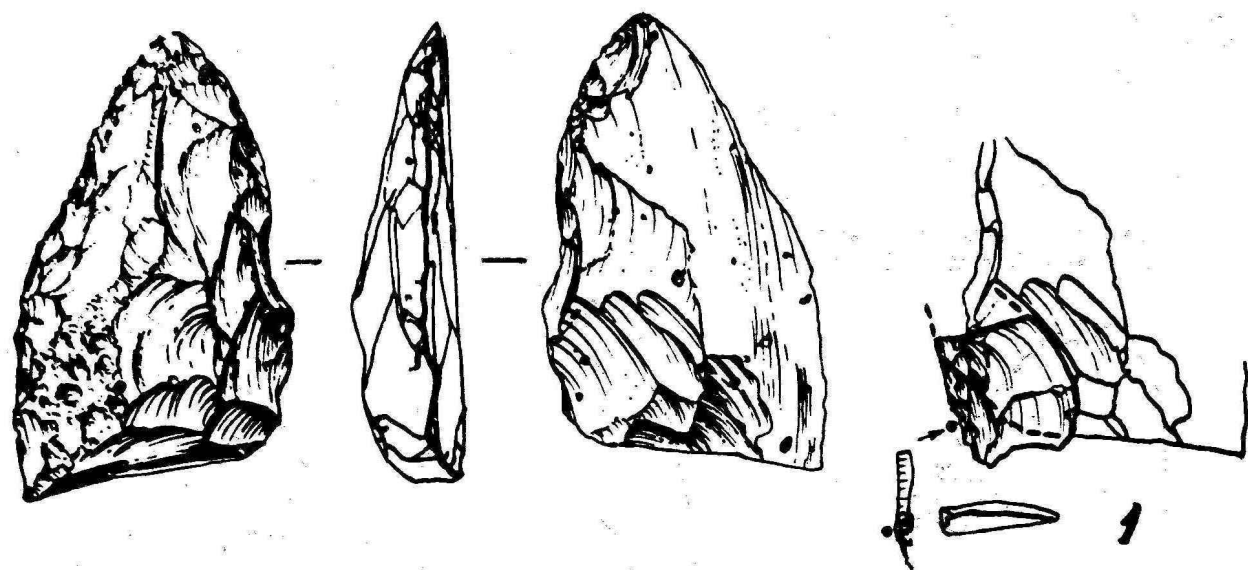


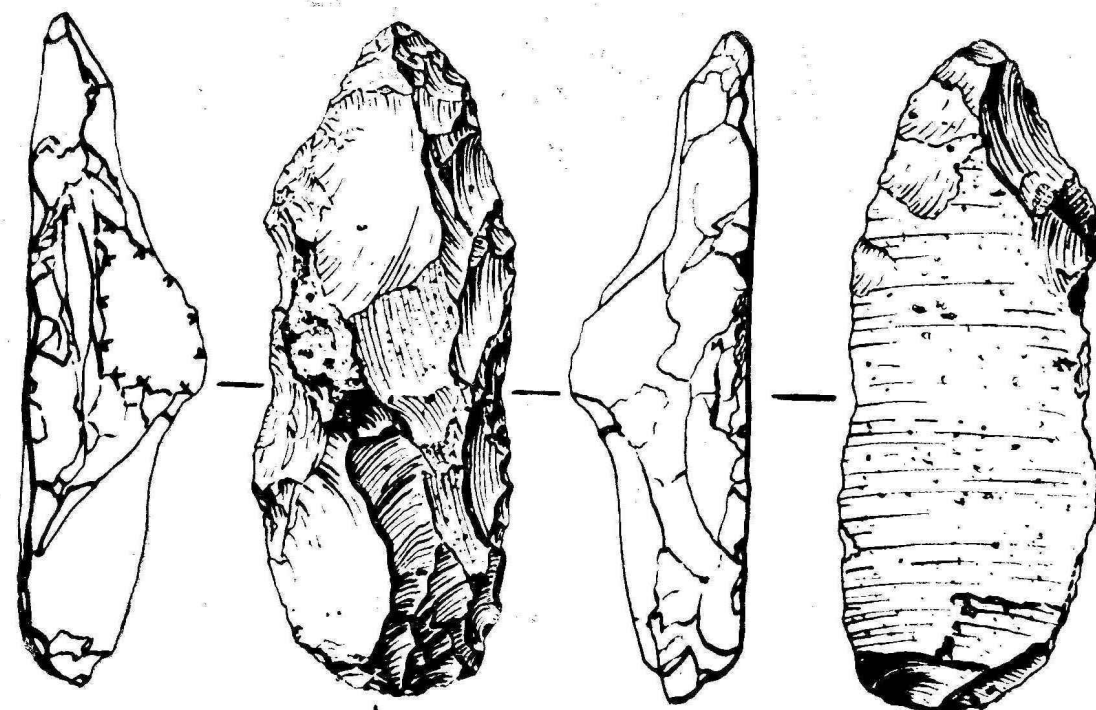
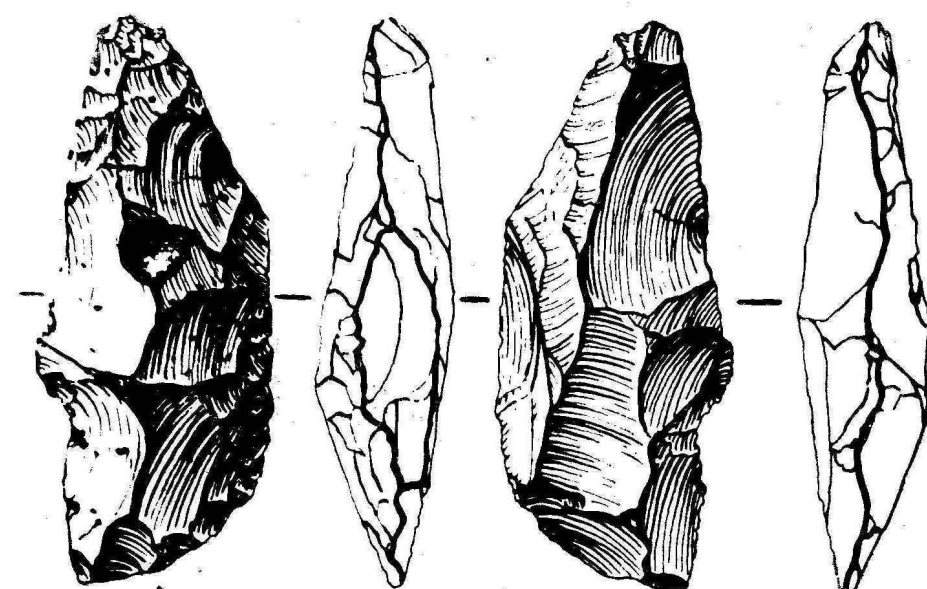
FIGURE 11. Korolevo II. Complex II. Tools.



3



FIGURE 12. *Korolevo II, Complex II, Tools.*



2



FIGURE 13. *Korolevo II, Complex II, Tools.*

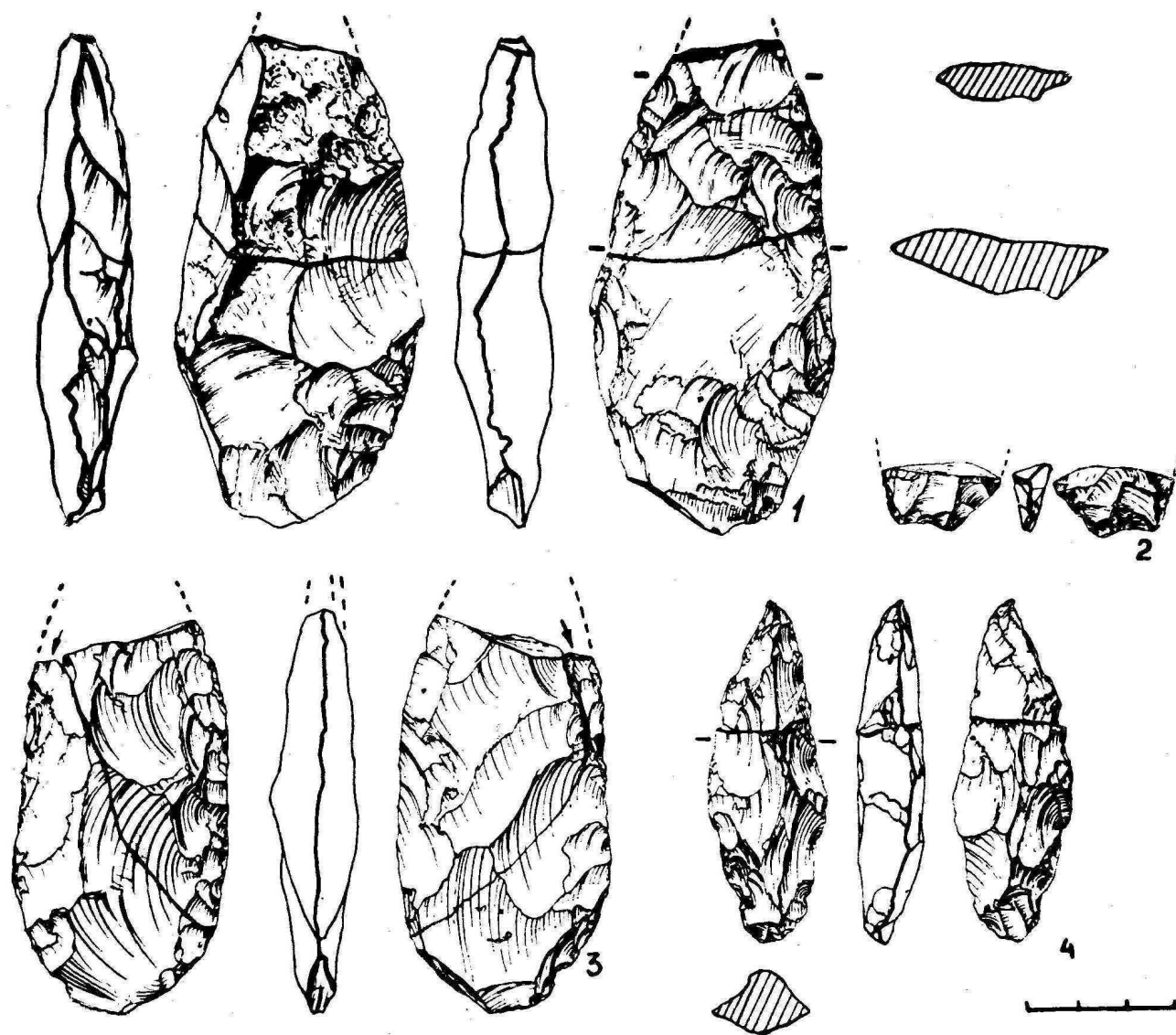


FIGURE 14. Korolevo II, Complex II, Tools.

basal parts 4 are rounded and two have a notch at the centre of the outline base (Fig. 14:2). The last two artifacts deserve our interest. The form of their base does not appear on whole leaf-points, but, as we can see, it can be found among the basal parts of leaf-points and it can be considered, together with the basally narrowed and basally pointed ones as a special basally-concave type. Nevertheless we cannot attach extraordinary importance to the bifacial basally-concave leaf-points, which are known in various European palaeolithic complexes and the notch in the base of those artifacts appears as one of the most wide-spread modifications of the base of leaf-points, which together with others was used in the complex II of Korolevo II.

On concluding the characteristics of bifacial and partly bifacial leaf-points we should mention their morphologically expressive character, large number, and also the fact that they form one of the significant and specific elements of the assemblage.

I will present now the summary technical-typological characters of the stone industry of the second complex from Korolevo II. The technique of primary flaking can be characterized by cores and precores obtained exclusively through parallel flaking, with considerable amount of blades ($I_{am} = 34.8$), the prevailing of blades and flakes with parallel edges (54.4%), with casual and atypical occurrence of radial Levallois flakes ($I_L = 0.7$), low standard of the striking platforms ($I_F = 27.4$ and $I_{Fs} = 8.0\%$), and with abundant pointed platforms — 19.9%. In the typological collection prevail tools of medium and large dimensions, exceeding 5 cm. The principal raw material used for the tool manufacture was andesite (85.8%), rarely flint, quartzite or slate — 14.2%. Among the identifiable blanks used for the tool manufacture the share of blades amounts to 35.2%. The division of the assemblage in Upper Palaeolithic — 39.55%, Mousterian — 23.88% and neutral tools — 36.57%, demonstrate the Upper Palaeolithic tools throughout Mousterian. Alongside with these facts we should not ignore the clearly archaic character of the end-scrapers, end-scraper-knives, graters and awls while the Mousterian tools are expressive and appear in large numbers. The "neutral" tools the denticulate-notched forms (15.67%) and the bifacial and partly-bifacial leaf-points (20.9%).

In general the secondary working makes a dual impression: the Mousterian component is still large enough, but the Upper Palaeolithic forms also appear as indicators of characteristic Upper Palaeolithic typology (points and knives on blades, Châtelperron knives and rezchiks). Thus from the technical viewpoint the uniform parallel technology of primary flaking resulting in blade-like blanks, has fully Upper Palaeolithic character. The tool assemblage showed Mousterian traditions and is typical of the transitional character of this industry from Mousterian to Upper Palaeolithic.

KOROLEVO I, COMPLEX I-a

Topography, History of research. Stratigraphy.

Korolevo I is situated on two hills: on "Beyvar" and "Gostriy Verkh". The research started in the

year 1974. Since then the excavations have resulted in the discovery and study of 15 stone tool assemblages: 7 Acheulian, 6 Mousterian and 2 Upper Palaeolithic¹²).

In the year 1978 we opened trench No. 14 (4×2 m) on the highest point of "Gostriy Verkh". Among the not-too-numerous stone artifacts our interest was caught by a series of artifacts (some 60 of them), prevailing made of andesite, embedded in the upper part of loam, underlying the IIIrd fossil soil of the regional Transcarpathian stratigraphic section. These andesite objects are of light-grey hue, their surface has been slightly less weathered, less than the artifacts of the IInd complex Korolevo II. Such a condition of andesite artifacts and similar stratigraphic situation have the artifacts of Mousterian complex II in Korolevo I, on the "Beyvar" hill. For this reason the finds of trench No. 14 were compared with the Mousterian II from Korolevo I. However it was striking that among these finds appeared a parallel bulky core, several blades of Upper Palaeolithic character, and also three end-scrapers on blades, without any analogy in the Mousterian collection from Korolevo.

In 1979 in order to obtain more of these artifacts, so exceptional in the local Mousterian complex, we started digging 8 metres to the west of trench No. 14. The pit (2×2 m) was numbered 19. Alongside the northern margin of trench No. 14 was opened excavation XII. The latter covered 32 sq. metres and consisted of 2×2 m squares, oriented into the four cardinal directions. The squares along the north-south line were marked with letters A, B, along the west-east line — with numerals 1—4. With excavation No. XII and pit No. 19 the top horizons, including fossil soil IV, has been removed. The three palaeolithic cultural horizons were studied. At the lower part of the loam above fossil soil III appeared occasionally artifacts of the Ist complex (Mousterian). In the upper part of fossil soil IV appeared several artifacts belonging to IIIrd complex, also Mousterian. Between the above Mousterian cultural horizons in the very top of the loam underlying fossil soil III and containing wedges filled with the soil material numerous stone artifacts were found; they are analogous to the finds discovered under similar conditions in trench No. 14. The technical-typological characteristics of the collection thus obtained (807 pcs) is evidently Upper Palaeolithic. It was clear that "Gostriy Verkh" had yielded a new palaeolithic complex, which in the general cultural-stratigraphic column of the Korolevo site should be placed between Mousterian layer I and II. The new cultural horizon received No. I-a (Fig. 15).

In 1980 continued the research in excavation XII. We opened squares A, B, V/I—IV; A, B/5—8; V/I—6; a/4—8; b/4 — The total areal of squares and excavations opened in the years 1978—1980 exceeded 188 square metres.

Planigraphy. Dating. In the chart of excavation No. XII, and of trench No. 14 and pit 19 (Fig. 16) we can see rather distinctly two accumulations of finds of layer I-a: in the western and eastern part of the settlement. Inside these extensive accumulations we can see small lots of stone artifacts, workshops where the primary flaking of the raw material took place. In particular in one of these workshops (square V — U) a total of 1613 artifacts were collected. The find included 5 cores and 3 tools; the rest were products of primary flaking, blanks and waste (knapping debris, blades, flakes). In the plan we can

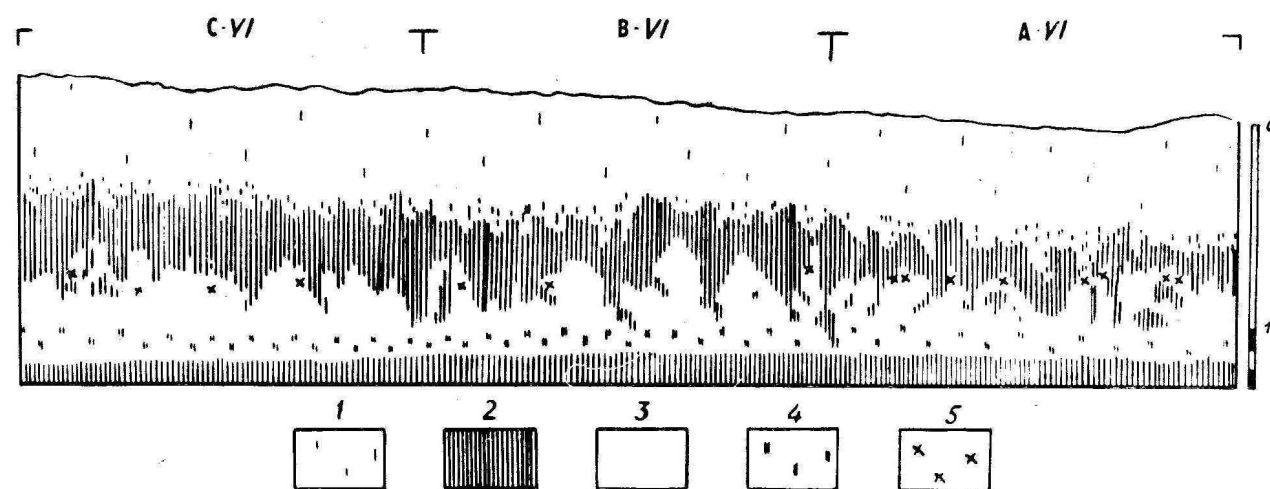


FIGURE 15. Korolevo I, Excavation XII. Stratigraphic section: 1, 4, loam with slight manganese content; 2, palaeosols; 3, loam without manganese content; 5, stone artifacts.

¹² See the paper by V. N. Gladilin in this issue

see the exact position of all artifacts of the I-a cultural horizon — cores, pre-cores, hammer-stones, artifacts with secondary working, blades, flakes and also data following the reconstruction of artifacts realized by V. I. Usik, well reflecting the general tendency of dispersion of the artifacts on the settlement. They were used at the same place where they had been produced.

In square a-5 an accumulation of charcoals was discovered, although no real fireplace appeared. In general pulverized charcoal particles were found practically all over the settlement. The collected charcoals were delivered for analysis in the laboratory of the Geological Institute of the Academy of Sciences USSR in Moscow, whence we obtained the radiocarbon data of $25\,700 \pm 400$ years (GIN — 2773) (L. D. Sulerzhitskiy et al. 1984, p. 168). Evidently, the charcoal samples delivered for analysis appeared to be contaminated with later charcoals: in cultural

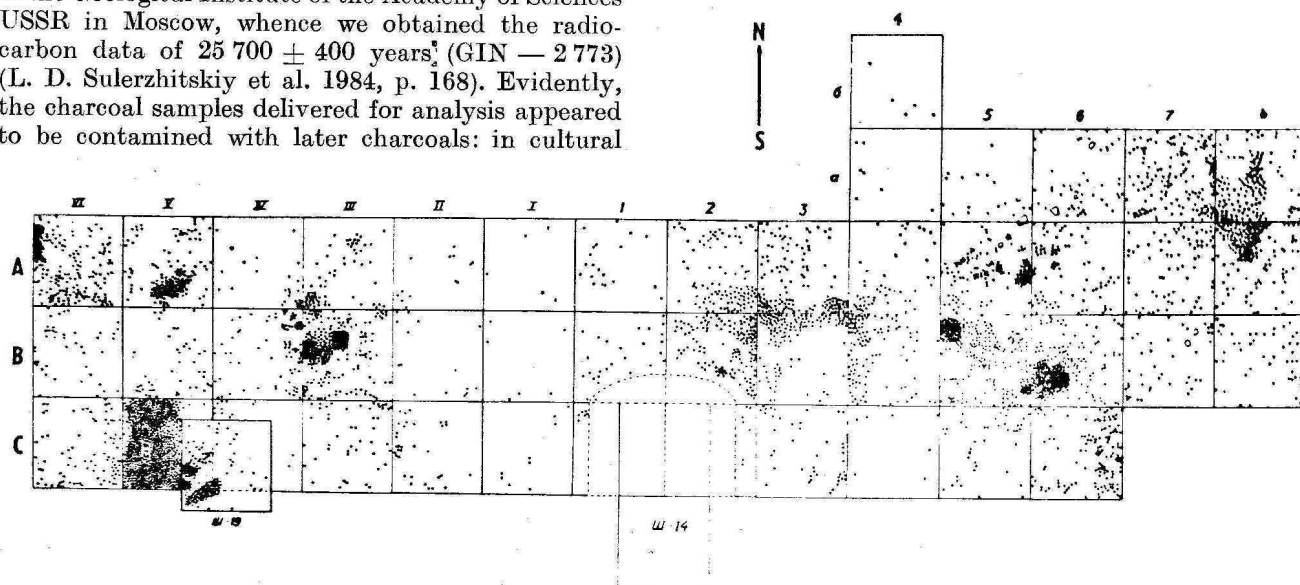


FIGURE 16. Korolevo I. Excavation XII. Complex I-a. Ground-plan.

horizon Ia containing Upper Palaeolithic finds Hallstattian urns containing cremated remains were buried. With the help of stratigraphy, supported by palynological, thermoluminescent and palaeomagnetic data, complex Ia should be dated to the end of the pre-Brörup section of Würm I.¹³

Stone industry. The finds of complex Ia in Korolevo I comprise 5803 artifacts.

Raw material. Prevailed the use of local andesite (97%), radiolarite, chalcedony, sandstone and quartz amount to 2.9%.

Primary flaking. The primary flaking can be characterized as follows: cores — 48 pcs/0.83%, pre-cores — 18 pcs/0.31%, flakes — 1 877 pcs/32.35%, blades — 1 282 pcs/22.09%, knapping debris — 2 470 pcs/42.56%, fragments — 17 pcs/0.29%.

CORES — 48 pcs/0.83%.

A) **Parallel cores** — 48/100:

a) **Unipolar** — 17/47.2
triangular-flat — 1/2.8

¹³ See V. N. Gladilin's paper in the present issue.

- subpyramidal — 4/11.2
- subpyramidal flattened — 1/2.8
- subpyramidal crested — 1/2.8
- pyramidal — 4/11.2
- subcylindrical-flat — 2/5.4
- cylindrical — 2/5.4
- cylindrical-flat — 1/2.8
- wedge-shaped — 1/2.8
- b) **Bipolar** — 4/11.2
- subquadrangular — 1/2.8
- subcylindrical-flat — 1/2.8
- subcylindrical flattened — 1/2.8
- cylindrical — 1/2.8
- c) **Transversal** — 8/22.2
- subpyramidal — 2/5.4

- pyramidal — 4/11.2
- subcylindrical — 1/2.8
- subcylindrical flattened — 1/2.8
- d) **Transversally-alternate** — 1/2.8
- quadrangular — 1/2.8
- e) **Bitransversal** — 3/8.2
- pyramidal — 1/2.8
- subcylindrical — 2/5.4
- f) **Bitransversal-contiguous** — 1/2.8
- subpyramidal — 1/2.8
- g) **Orthogonal** — 1/2.8
- subpyramidal — 1/2.8
- h) **Orthogonal-bifacial** — 1/2.8
- subpyramidal — 1/2.8
- i) **Unidentifiable** — 12

All cores are of parallel flaking. We can divide them as follows: definable (36 pcs), on the level of the group (direction of flaking, number and situation of working surfaces) and type (according to the form of cores and to the shape of their rear side) and also to indefinable (12 pcs) on the above levels of classification, due to their fragmentation, lack of characteristic features, or due to extreme degree of wear. Short general characteristic of cores of complex I-a of Korolevo I exists only according to definable cores on the level of group and of type.

On group level prevail single-platform unipolar cores (47.2%), less frequently transversal ones (22.2%). Of less importance are the two platform cores with opposite direction of flaking — bipolar (11.2%) and bitransversal (8.2%). Unique are the double-platform cores with different systems of flaking — transversally-alternate ones (2.8%), bitransversal-contiguous (2.8%), orthogonal (2.8%) and orthogonally bifacial (2.8%).

On type level the leading position is occupied by cores with large modification, the so-called prismatic cores — 88.8%. They can be divided to sub-pyramidal and pyramidal ones (55.8%), sub-cylindrical and cylindrical (33.0%). Cores flat in the ground plan and in the profile (triangular, sub-quadrangular, quadrangular) are rare — 8.4%. There is also a wedge-shaped prismatic core of parallel flaking — 2.8%. The rear sides of the parts of cores: flat — 5/17.0%, flattened — 3/8.2%, or they have a specially flaked rear crest on the wedge-shaped core — 1/2.8%.

Most of the discussed 36 parallel cores are of andesite — 32/88.8%, and of flint — 4/11.2%.

According to the used blanks they can be divided as follows:

made of fragments and nodules — 30/83.4%
on flakes — 5/13.8% — two of them on flakes of the much earlier IIIrd Mousterian complex
on blades — 1/2.8%

Striking platforms of the cores:

natural ones (covered with cortex) — 1/2.8%
plain — 21/58.4%
simply faceted — 14/38.8%

The metric data of the parallel definable cores are indicated separately for the length, width and thickness:

Length: 2—3 cm — 1/2.8%, 3—4 cm — 4/11.2%, 4—5 cm — 5/13.8%, 5—6 cm — 6/16.7%, 6—7 cm — 6/16.7%, 7—8 cm — 3/8.2%, 8—9 cm — 4/11.2%, 9—10 cm — 4/11.2%, 10—11 cm — 2/5.4%, 11—12 cm — 1/2.8%.

Width: 3—4 cm — 3/8.2%, 4—5 cm — 10/27.9%, 5—6 cm — 10/27.9%, 6—7 cm — 7/19.5%, 7—8 cm — 1/2.8%, 8—9 cm — 3/8.2%, 10—11 cm — 2/5.4%.

Thickness: 2—3 cm — 8/22.2%, 3—4 cm — 9/25.3%, 4—5 cm — 10/27.9%, 5—6 cm — 2/5.4%, 6—7 cm — 1/2.8%, 7—8 cm — 2/5.4%, 8—9 cm — 2/5.4%, 10—11 cm — 1/2.8%, 13—14 cm — 1/2.8%.

The above metric data indicate that in the collection prevail cores of a length ranging from 4—7 cm (47.2%), of a width between 4—7 cm (75.3%) and of a thickness between 2—5 cm (75.4%).

Among 12 unidentifiable parallel cores there are 7 made of flint (58.3%), and only 5 (41.7%) of andesite. Among identifiable parallel cores on the level of group and type the situation is the other way round; 88.8% of the artifacts are made of andesite and only 11.2% of flint. This can be explained by the trend of making the cores from high-quality, less brittle material, rare in Korolevo — from flint, with an evident effort to obtain the maximum possible amount of flakes, and for this reason it is impossible to determine these cores on the level of group and type.

PRECORES — 18/0.31%

As to the principle of their flaking and the preparation of the working surface all precores are parallel. As to their shape we can distinguish two wedge-shaped and one block-type core. The rest, due to lack of clear-cut features, is undefinable. Most of them are cores in the initial stage of their utilization. They have prepared their striking platform and several experimental flakes. There are also simply flaked precores, lacking in general flat surfaces resulting from flaking. They are made of andesite — 11/61.2%, quartzite — 6/33.3% and of flint — 1/5.5%.

Due to the above-mentioned morphological features of the precores the accuracy of measuring their length, width and thickness is problematic. We can simply say that the length of precores (along their longitudinal axis) varies between 5—13 cm.

Besides cores and precores also flakes — 1 877/32.35%, blades — 1 282/22.09%, knapping debris — 2 470/42.56% and fragments — 17/0.29% belong to the group of products of primary flaking and waste of complex I-a from Korolevo I.

FLAKES — 1 877/32.35%

primitive — 765/50.08%
Levalloisian — 10/0.6%
parallel — 734/48.6%
unidentifiable — 368

BLADES — 1 282/22.09%

primitive — 230/18.0%
parallel — 1 043/82.0%
unidentifiable — 9

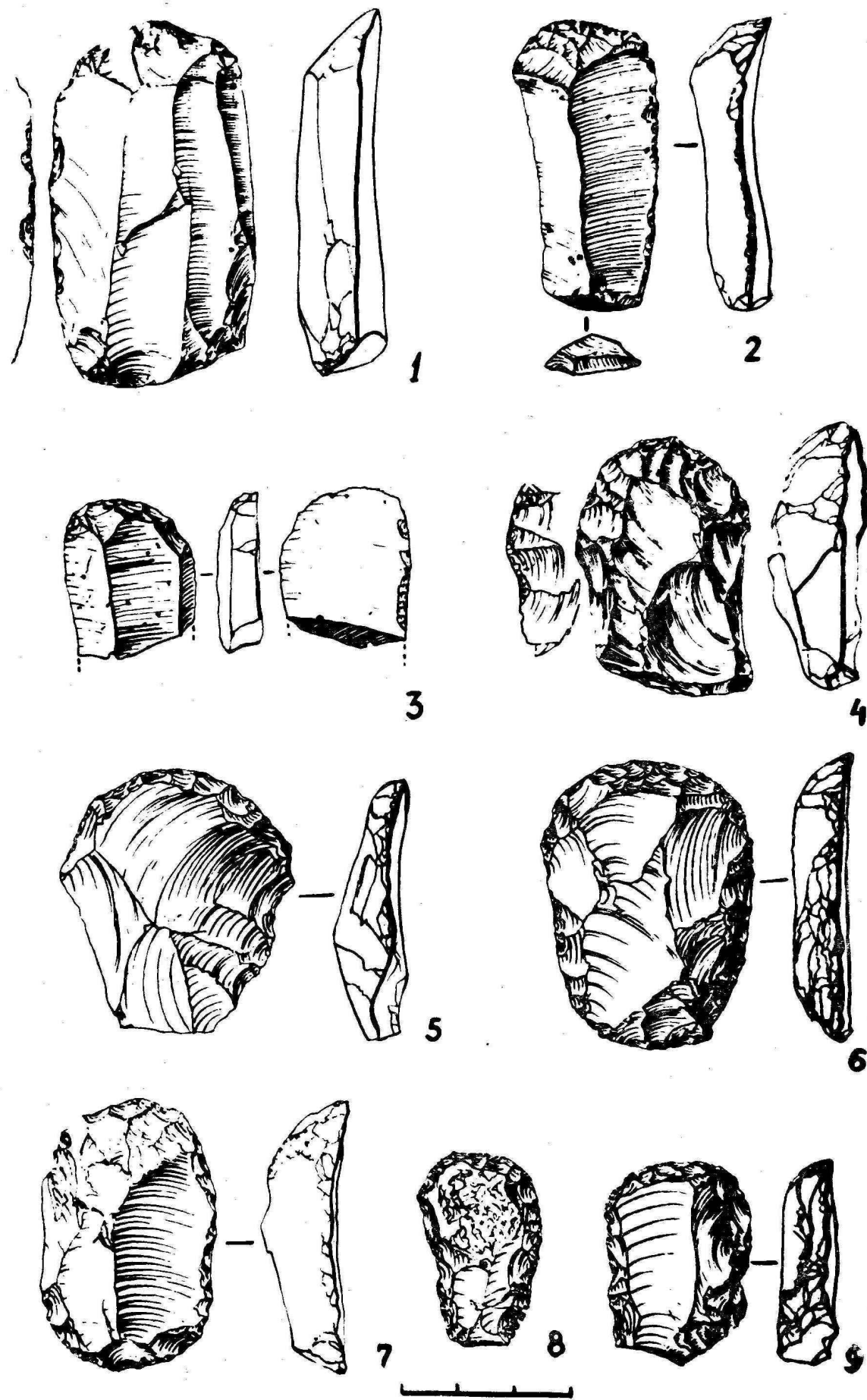
KNAPPING DEBRIS — 2 470/42.56%

FRAGMENTS — 17/0.29%

Flakes (32.35%) represent almost 1/3 of the whole collection; most frequent among them are the primitive (50.8%) and parallel (48.6%) flakes. Among the core-shaped finds of complex I-a we do not find systemless, radial or Levallois flaking methods. The presence of relatively numerous primitive flakes can be explained as a necessary by-product of flaking the fragments and nodules of the stone raw material for the preparation of cores, giving them a definite shape, creating the striking platform and shaping the working surfaces of flaking. Exactly for this reason prevail among primitive flakes primary, systemless-marginal, systemless and dorsally-smooth-marginal flakes, while radial and radially-marginal flakes are rare; among them most frequent are the amorphous flakes. To the group of primitive flakes belongs also the series of crested flakes (57 pcs, 7.45% of all primitive flakes). They are almost exclusively flakes "tablettes d'avivage" arising during the process of revival of the striking platforms. Levallois radial flakes (0.6%) appear only occasionally and Levallois points are altogether absent.

Significant is the group of parallel flakes (48.6%), many of them with rests of the cortex. Blades — 1 282 pcs/22.09% form the most representative series of flakes. There are 230 pcs of primitive blades (18.0% of all blades). 82 of them (35.65% of all primitive blades) are primary and systemless-marginal, 148 pcs (64.35% of all primitive blades) are crested (lames à crête) — they are flakes of specially shaped crest on the working platforms of the cores. Parallel blades prevail distinctly (82.0%), few samples with rests of cortex appear among them. A comparable comparative analysis of the flake structure illustrates that the share of primitive and parallel flakes is roughly the same, while among blades clearly the parallel ones prevail.

Thus, similarly as in case of flakes of the second complex in Korolevo II the purpose of primary



◀ FIGURE 17. *Korolevo I. Complex I-a. Tools.*

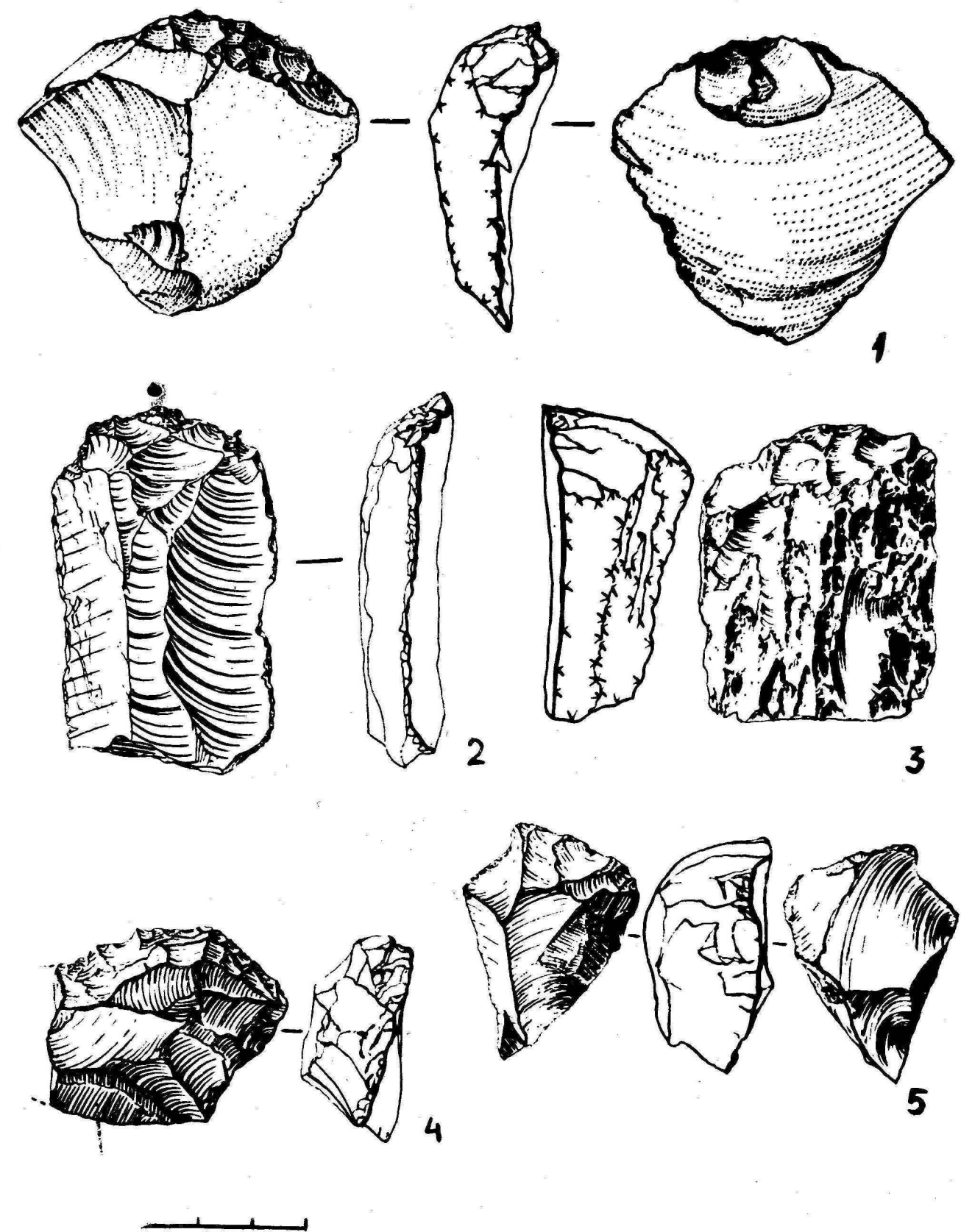


FIGURE 18. *Korolevo I. Complex I-a. Tools.*

flaking in complex I-a from Korolevo I had been to obtain blades as basic blanks for the manufacture of tools, most flakes were only production wastes.

Typological characteristics. The collection from complex I-a in Korolevo I comprises 91 tools¹⁴ (1.75%), among them 12 hammerstones made of sandstone (9) and quartzite (3) pebbles and of their fragments.

The assemblage of tools — 79 pcs/1.36% can be characterized according to secondary working and according to the traces of use. The assemblage includes three groups of artifacts: Upper Palaeolithic, Mousterian and neutral, based on the same principles of classification that were used for the typological complex II from Korolevo II. The Upper Palaeolithic group of tools counts 50 pcs/63.29%.

END-SCRAPERS — 37 pcs/46.83 %

Terminally-convex dorsal, usual — 10/27.04 (Fig. 19: 2—3)
Terminally-convex dorsal, laterally-retouched — 8/21.63 (Fig. 17: 1—3, 5)
Terminally-convex dorsal, bilaterally-retouched — 5/13.52 (Fig. 17: 6, 8, 9)
Terminally-convex dorsal, basally-backed — 1/2.7 (Fig. 19: 1)
Terminally-bowed dorsal, usual — 1/2.7 (Fig. 17: 4)
Terminally-sinuuous dorsal, usual — 2/5.41 (Fig. 18: 3, 5)
Terminally-sinuuous dorsal, laterally-retouched — 1/2.7 (Fig. 18: 4)
Biterminally-convex dorsal, laterally-retouched — 1/2.7 (Fig. 17: 7)
Obliquely-convex dorsal, usual — 1/2.7 (Fig. 19: 4)
Obliquely-convex dorsal, laterally-retouched — 1/2.7
Angular-convex dorsal, usual — 1/2.7
Angular-bent dorsal, usual — 1/2.7
Angular-sinuuous dorsal, usual — 1.7
Basally-convex dorsal, usual — 1/2.7
Basally-sinuuous dorsal, bilaterally-retouched — 1/2.7 (Fig. 18: 2)
Basally-sinuuous, partly bifacial, usual — 1/2.7 (Fig. 18: 1)

According to the raw material used for their manufacture the end-scrapers can be classified as follows: of andesite — 25/67.6%, of flint — 10/27.0%, of radiolarite — 2/5.4%. According to blanks used for the manufacture of end-scrapers we have the following division: on blades — 16/43.3%, on flakes — 19/51.3%, on unidentifiable spalls — 1/2.7%, on fragments — 1/2.7%. On end-scrapers we have the following types of retouches: scalariform — 13/35.1%, stepped — 1/2.7%, subparallel — 14/37.8%, parallel — 1/2.7%, convergent — 8/21.7%.

Metric data of the end-scrapers:

Length: 2—3 cm — 1/3.0%, 3—4 cm — 8/24.3%, 4—5 cm — 8/24.3%, 5—6 cm — 6/8.2%, 6—7 cm — 6/8.2%, 9—10 cm — 1/3.0%, 10—11 cm — 1/3.0%, 12—13 cm — 2/6.0%.

Width: 1—2 cm — 3/9.1%, 2—3 cm — 15/45.5%, 3—4 cm — 8/24.3%, 4—5 cm — 2/6.0%, 6—7 cm — 1/3.0%, 7—8 cm — 3/9.1%, 9—10 cm — 1/3.0%.

These data illustrate that most end-scrapers

¹⁴ Without taking into account 63 unidentifiable and doubtful tools.

are artifacts of a length between 3—7 cm (85.0%), while their width ranges from 2 to 4 cm (69.1%).

From the above list follows that in the group of end-scrapers prevails the group of terminally-convex dorsal usual (27.04%), together with laterally retouched (21.63%) and bilaterally retouched (13.52%). Unique is the terminally-convex dorsal basally backed end-scrapers (2.7%). The great majority of end-scrapers are terminally-convex dorsal laterally-retouched and bilaterally-retouched; the retouch appears along the longitudinal margins on the dorsal side; however, two laterally-retouched end-scrapers have retouch on their ventral side (Fig. 17: 3), and in one laterally-retouched scraper the retouch is partly bifacial (appearing both on the dorsal and ventral sides — Fig. 17: 1). To these end-scrapers belong, according to their principal morphological characters also the following end-scrapers: a terminally bow-shaped dorsal usual (2.7%), terminally sinuous dorsal usual (5.41%) and laterally-retouched (2.7%). There is also a double endscraper — it is biterminally-convex dorsal laterally-retouched (2.7%). The remaining end-scrapers form small series, distinguished according to the retouch of the working and longitudinal edges. They are the oblique-convex dorsal usual end scrapers (2.7%) and the laterally-retouched ones (2.7%), in which the working edge is bevelled with regards to the longitudinal axis.

Other end-scrapers groups are angular-convex (2.7%), angular-bent (2.7%), angular sinuous (2.7%) dorsal usual, whose main feature is that the working edges are along the angle of the artifact, but at the same time these working edges have been specially processed. In the second group of end-scrapers the working edges are situated on the basal parts of the flakes, namely on basally-convex dorsal usual (2.7%), basally sinuous dorsal laterally retouched (2.7%) and basally sinuous usual (2.7%) flakes. The angular and basal forms reminding of analogous artifacts of complex II from Korolevo II, provide end-scrapers of layer I-a from Korolevo with a touch of archaic character. In the group of the above-mentioned end-scrapers at the centre of attention is a collection of end-scrapers with denticulate working edges — 5 pcs/13.5% — terminally-sinuuous, angularly-sinuuous and basally-sinuuous. The denticulate character of the working edges of these end-scrapers can be regarded as a specific feature of this industry.

It is interesting to mention in this context the evidence provided by G. F. Korobkova. In her numerous experiments with processing animal hides, realized with the help of various stone tools of her own make, she has concluded that denticulate scrapers are more productive than those without denticulation (G. F. Korobkova 1983, p. 136).

A study of end-scrapers reconstructed from fragments has revealed also another specific feature: it appears that some of the end-scrapers broke when they were used attached to a handle. We can thus say that end-scrapers were used attached to handles already in the initial stage of the Upper Palaeolithic.

The comparison of end-scrapers and end-scrapers of II and complex of Korolevo II with those of complex I-a from Korolevo I, the study of blanks used and of the secondary trimming reveals further development and perfection of this category of tools. Many of these end-scrapers are already on blades (43.3%). There appear and are widespread also more advanced forms of retouch: subparallel (37.8%) parallel (2.7%) and convergent (21.7%). Especially significant is the presence of convergent retouch, documenting the development of end-scrapers.

On concluding the characteristics of the end-scrapers we should state that their features are fully developed, with the survival of some archaic characters and with the absence of real Aurignacian carinated forms, as well as with their position in the assemblage of the stone industry of the I-a layer of Korolevo I.

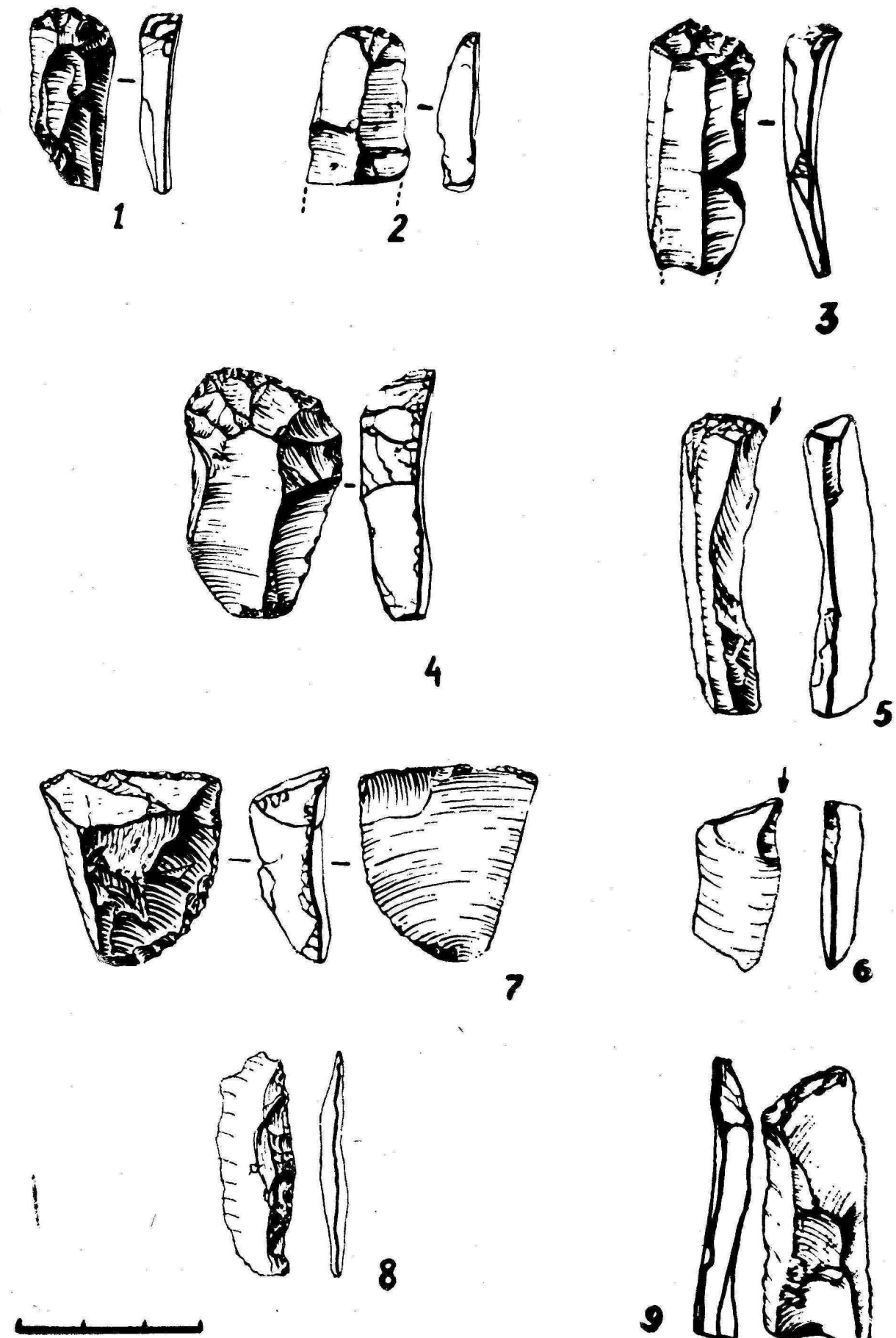


FIGURE 19. Korolevo I. Complex I-a. Tools.

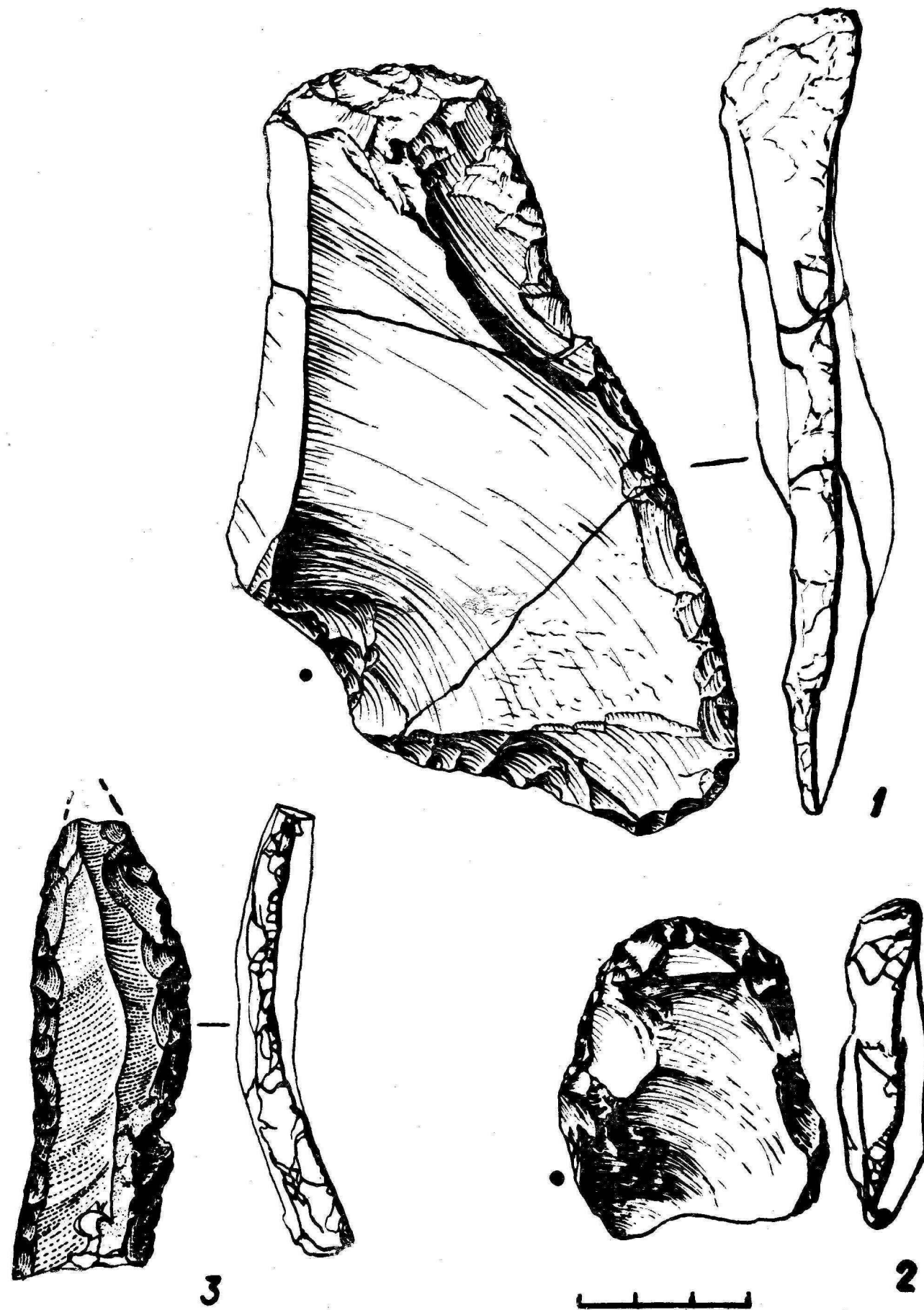


FIGURE 20. Korolevo I. Complex I-a. Tools.

END-SCAPERS-KNIVES — 2 pcs/2.53 %

The assemblage consists of two tools — one on a shortened andesite flake (Fig. 20:1 — length — 14.4 cm, width — 7.6 cm), the other is of similar proportions and is made of flint (Fig. 20:2 — length 5.3 cm, width 4.2 cm); with their morphological characteristics they are close to end-scrapers knives in the IIInd complex from Korolevo II. These artifacts form one of the most significant examples of genetical links between the two Upper Palaeolithic complexes.

END-SCRAPER-BURIN — 1 pc (1.37 %)

It is made on a transversal shortened andesite flake (length — 6.4 cm, width — 4.7 cm). On its longitudinal edge adjoining the striking platform of the blank the steep working edge of the scraper has been formed with scalariform retouch.

The notably denticulate character of the working edge makes it similar to the denticulate scrapers. On the other longitudinal edge of the artifact there is a beak-shaped polyhedral burin. This combined tool is oriented along its longitudinal axis and can be regarded as an atypical end-scraper-burin, a unique tool of its type in complex I-a from Korolevo I.

BURINS — 2 pcs/2.53 %

Rectangular faceted usual — 1/50 % (Fig. 19: 5)
Oblique-angled faceted usual — 1/50 % (Fig. 19: 6)

Made on parallel andesite blades. One burin spall has been taken from each striking platform. One burin has rectangular shape (length — 4.6 cm), width — 1.2 cm), the other is oblique-angled (length — 2.7 cm, width — 1.2 cm).

The accidental character of these burins is evident. In general it can be said that they are atypical, not expressive and are not characteristic of the complex I-a from Korolevo I.

REZCHIKS — 4 pcs/5.06 %

Rectangular partly bifacial, naturally backed — 1/25
Rectangular ventrally-faceted, laterally-retouched — 1/25 (Fig. 19: 7)
Birectangular ventrally-faceted, terminally-blunted — 1/25 (Fig. 19: 9)
Oblique-angular non-retouched, terminally-oblique blunted — 1/25

Rezhchiks in their faceted variable forms are called flat burins. Their working edges have been shaped by burin spalls on the angles of blanks. Their working edges are on the ventral side.

In one case we can see partly-bifacial secondary trimming. These artifacts are made on: primitive andesite flake — rectangular partly-bilateral naturally backed (length 8.9 cm, width 6.6 cm); on crested flint flake — rectangular ventrally faceted laterally-retouched (length 3.0 cm, width 2.8 cm), on systemless marginal blade — birectangular ventrally-faceted terminally-blunted (length 7.4 cm, width 2.3 cm). The terminal part of the last implement is blunted with retouch; two flat burin spalls have been taken from its ventral side. One artifact is on parallel andesite plate (it is oblique-angled, non-retouched, terminally-oblique-blunted; length 4.4 cm,

width 1.6 cm). It does not fit into the above-described series of tools. Such implements are characterized as a rule as truncated artifacts. It can be considered as a rezhchik, provided that the obliquely-blunted edge of the artifact is accepted as a retouched back, and the longitudinal non-retouched edge is accepted as a working edge. In general rezhchiks of the I-a complex from Korolevo I are close to rezhchiks of complex II from Korolevo II; differing of course due to the absence of retouched examples, and by the presence of such a specifically Upper Palaeolithic artifacts as the truncated blades.

KNIVES ON BLADES — 2 pcs/2.53 %

Longitudinally-straight dorsal, naturally-backed — 1/50
Longitudinally-straight ventral, naturally-backed — 1/50

They are of andesite. In one case there is pearly retouch on the dorsal site of the parallel blade (length 14.4 cm, width 5.8 cm), in the other case the same shallow gently sloping pearly retouch appears on the ventral side of the crested blade (length 13.2 cm, width 6.5 cm).

On the level of the type both artifacts have been determined as naturally-backed; their edge, opposite to the working edge forms a back, appearing on blanks up to their processing proper. These knives on the blades are analogous to knives of IIInd complex from Korolevo II, and typologically they fit into the single group of slightly retouched blades.

RETOUCHED BLADE ET pc/1.27 % (Fig. 19: 8)

In the typological collection there is also a narrow andesite blade (length 3.5 cm, width 1.1 cm) with flat dorsal retouch along all length of one of its longitudinal edges.

Functionally this artifact is very close to knives on blades, but differs from them with its more perfect retouch (parallel one), and with its relatively miniature size.

POINT — 1 pc/1.27 % (Fig. 20: 3)

Semisegmental dorsal, usual — 1/100

This is a fragmented flint blade (length 8.1 cm, width 2.8 cm) with steep parallel Aurignacian retouch along its both longitudinal edges with a pointed end.

The artifact broke most likely during the retouching, nevertheless, the tool can be definitely identified as a point even in fragmented state. In view of a small asymmetry the point can be regarded as semi-segmented. The presence of such a development of Aurignacian feature points to the further evolution of the Upper Palaeolithic typology, fixed at the transition from one stage of the Upper Palaeolithic technology to the other (complex II Korolevo II to complex I-a Korolevo I).

Mousterian group of tools — 20 pcs/25.32 %

SIDE-SCRAPERS — 2 pcs/2.53 %

Longitudinally-convex dorsal, usual — 1/50 (Fig. 21: 2)
Longitudinally-convex dorsal, naturally backed — 1/50 (Fig. 21: 1)

Both side-scrapers are made of andesite. In one of them (length 6.5 cm, width 3.4 cm) on a parallel blade on the dorsal side part of the longitudinal section is a steep parallel retouch.



FIGURE 21. Korolevo I. Complex I-a. Tools.

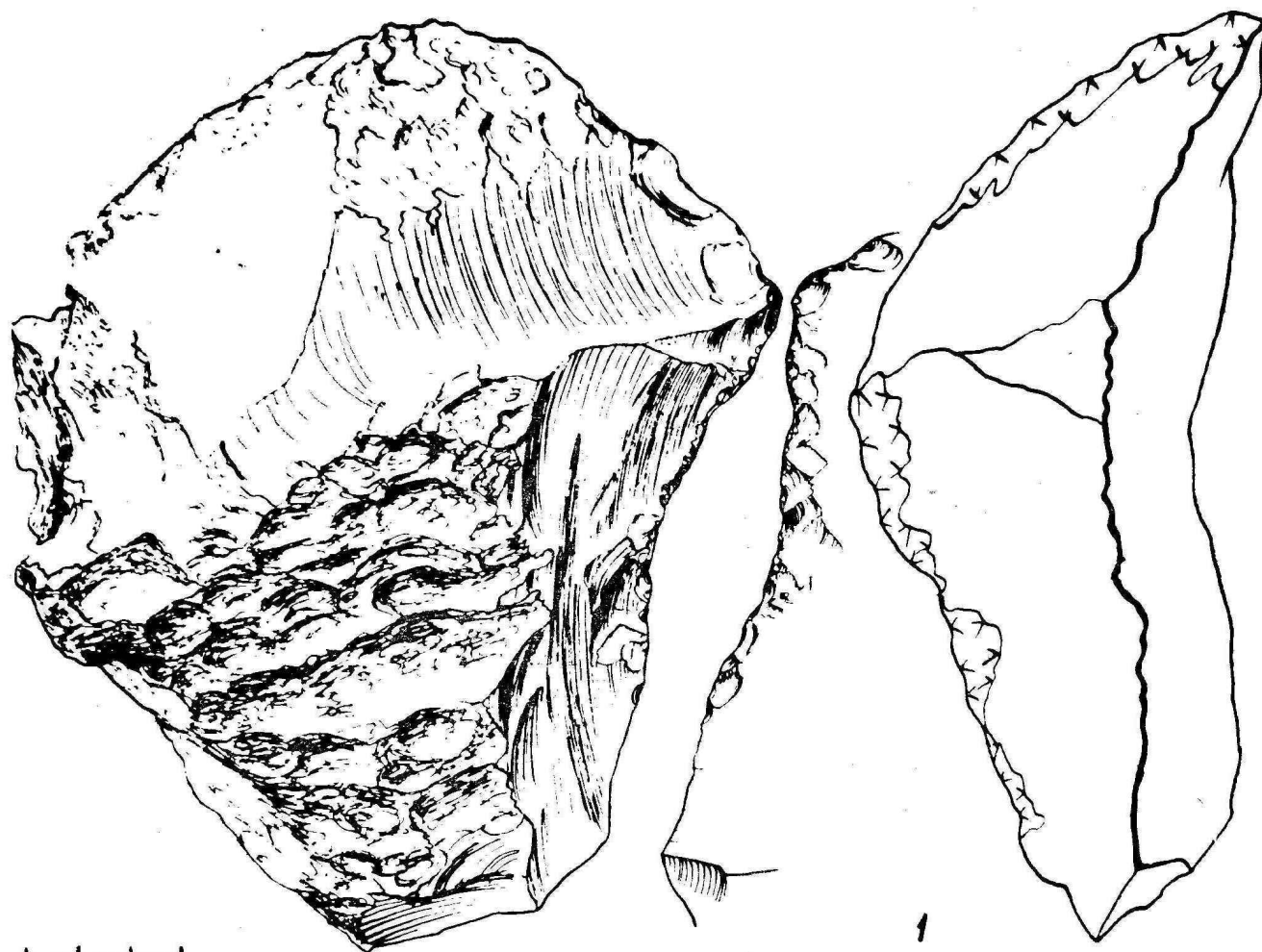


FIGURE 22. Korolevo I. Complex I-a. Tools.

The other side-scraper (length 9.6 cm, width 13.3 cm) is on crested flake, whose longitudinal working edge from the dorsal side has been shaped with steep scalariform retouch. According to its type the artifact has been determined as naturally backed; its massive crested edge situated opposite to the working edge can be accepted as a natural back. As we can see side-scrapers are rare and are not typical of the studied collection.

KNIVES ON FLAKES — 8 pcs/10.13 %

Longitudinally-convex dorsal, usual — 2/25
Longitudinally-convex dorsal, unidentifiable — 1/12.5
Longitudinally-concave ventral, naturally-backed — 1/12.5
Transversally-convex dorsal, usual — 2/25
Transversally-concave dorsal, usual — 1/12.5
Bow-shaped dorsal, narrowing rear — 1/12.5

These tools are made of andesite (7) and of a chalcedony (1). Their retouch is scalariform (1), subparallel (3), or pearly (4). Their length ranges from 4 to 10 cm, the width from 3 to 11 cm.

The knives on the flakes are of simple shape: longitudinal dorsal convex (3) and ventral concave (1), transversally dorsal convex (2) and concave (1). Among these artifacts on the level of type only a single natural back has been found. As a single complex shape can be distinguished a knife with a bow-shaped edge, reduced by several flakes taken from the ventral rear side.

The presence of side-scrapers and knives on flakes in the assemblage of complex I-a from Korolevo I underlines the significance of some other surviving Lower Palaeolithic features in the toolmaking, pointing to links with similar side-scrapers and knives on flakes of complex II Korolevo II.

CHOPPING-TOOLS ON FLAKES — 7 pcs/8.86 %

Longitudinal-convex non-retouched, naturally-backed — 1/14.28
Longitudinally-concave non-retouched, naturally-backed — 1/14.28 (Fig. 22: 1)
Longitudinally-concave non-retouched backed — 1/14.28
Longitudinally-concave non-retouched, heeled 1/14.28
Longitudinally-sinuuous dorsal, naturally-backed — 1/14.28
Transversally-straight non-retouched, naturally-backed — 1/14.28
Straightly-convex non-retouched, naturally-backed — 1/14.28

They are made of andesite. According to the blanks these chopping-tools can be divided as follows: on flakes (6) and blades (1). All are of large dimensions: the length ranges from 10 to 25 cm, the width from 7 to 17 cm.

The working edge of a single tool is processed with scalariform retouch. In other tools the longitudinal working edges show numerous traces of their use, determining the shape of the working edges: straight (1), convex (1), straightly-convex (1), concave (3), sinuous (1); the edges opposite to the working edges served as backs; in one case the striking platform of the artifact has been accepted as natural back. Among chopping tools of complex I-a we do not find any implement on long massive blades described in complex II from Korolevo II, perhaps with the exception of morphologically similar artifact on the fragment of a massive primitive flake. It seems that this can be explained simply by the absence of big massive blades among the debitage.

CLEAVERS — 3 pcs/3.8 %

Triangular, partly bifacial, laterally-blunted — 1/33.33 (Fig. 23: 1)
Triangular non-retouched, laterally-blunted — 1/33.33
Trapezoidal non-retouched, laterally-cut — 1/33.33

All cleavers are on andesite flakes. Their length is 12—16 cm, the width between 8—12 cm.

On one artifact the working edge is formed by partly-bifacial retouch, on other two we can see numerous traces of use. As to their shape the tools are triangular (2) and trapezoidal (1), and on type level one of the longitudinal edges of the cleavers is either blunted by the retouch (2) or is flaked off by a single blow (1), so as to provide better grip for the hand.

In general the chopping-tools on flakes and cleavers of complex I-a of Korolevo I continue in the tradition of the manufacture of big chopping-tools on flakes, existing also in complex II Korolevo II, and also in the Lower Palaeolithic Korolevo complexes.

Neutral group of tools — 9 pcs/11.39 %

DENTICULATES — 5 pcs/6.33 %

Longitudinal-straight dorsal, usual — 1/20
Longitudinal-convex dorsal, usual — 1/20 (Fig. 24: 3)
Longitudinal-convex alternate, naturally-backed — 1/20 (Fig. 25: 1)
Transversally-concave dorsal, usual 1/20 (Fig. 24: 2)
Beak-shaped dorsal, usual — 1/20 (Fig. 24: 1)

Made on andesite flakes and worked with scalariform retouch.

Two of the artifacts are of simple shape of the longitudinal edges of the flakes — one straight (length 7.7 cm, width 6.4 cm) and one convex (length 6.4 cm, width 4.9 cm). There is another longitudinally-convex denticulate with alternative retouch of the working edge (length 9.7 cm, width 8.3 cm). To the simple shapes belongs also the transversally-convex denticulate (length 6.2 cm, width 7.1 cm). We can distinguish also a beak-shaped denticulate with retouched projecting-beak on the longitudinal margin of the flake (length 9.9 cm, width 9.1 cm). With the exception of a single naturally-backed all the other denticulate are usual on type level, without natural of artificial holding platform or other accommodation.

NOTCHED TOOLS — 4 pcs/5.06 %

Longitudinal dorsal, usual — 3/75 (Fig. 25: 2; 26: 1)
Transversally ventral, usual 1/25

Made on parallel andesite flakes (3) and on a blade (1). Their dimensions exceed 5 cm. The retouch all notched tools is pearly — probably traces of use.

The group of denticulate-notched tools represent a considerable part of the assemblage of complex I-a of Korolevo I, illustrating the survival of traditions in the manufacture of tools.

In conclusion to the characteristics of stone industry of complex I-a in Korolevo I we shall present its technical-typological indices, showing in detail the further development of the cultural tradition of complex II from Korolevo II.

Characteristic of the technique of primary flaking are the cores and pre-cores, excluding parallel flaking; the flat cores practically disappear and

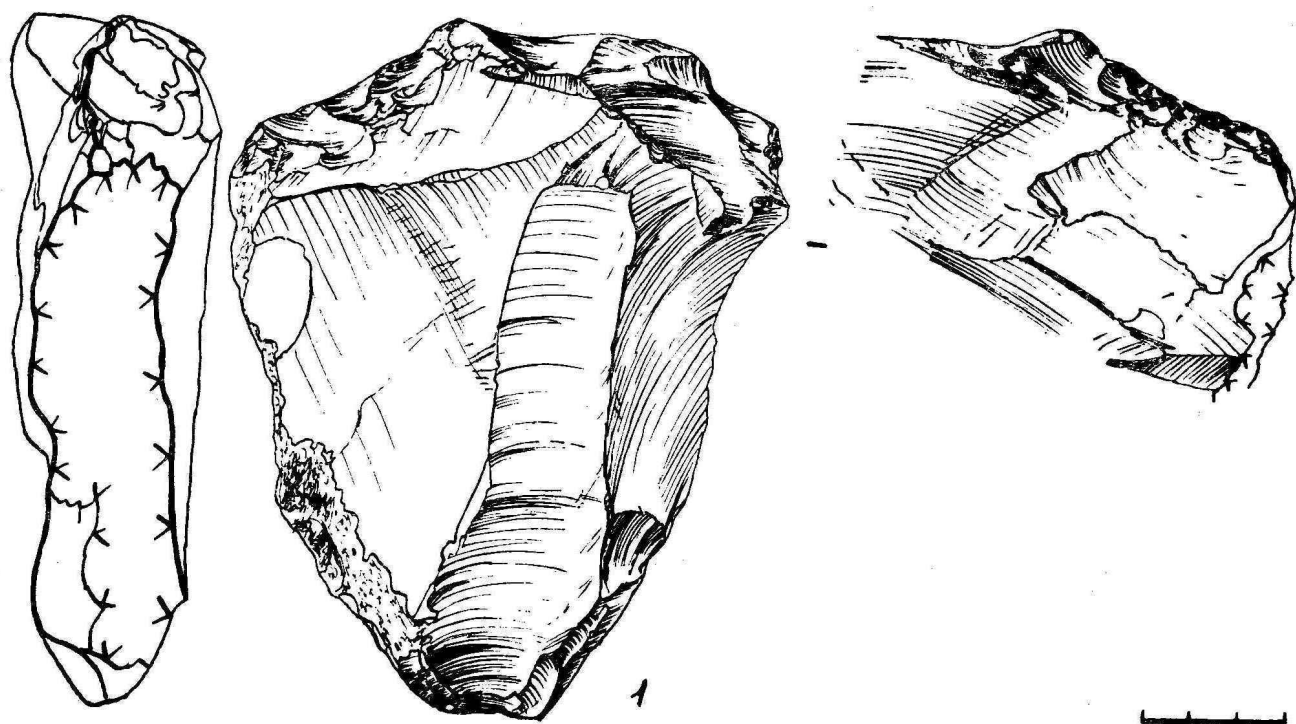


FIGURE 23. Korolevo I. Complex I-a. Tools.

prevail single-platformed longitudinal and transversal massive cores. Technical indices show that the quantitative growth of blades ($I_{lam} = 40.5$) and in general of flakes with parallel edges are 64.1%. There are only sporadic radially Levallois flakes ($I_L = 0.4$), evidently of fortuitous origin. At the same time the faceted striking platforms show a decreasing trend ($I_F = 18.3$ and $I_{Fs} = 3.1$), and increases the share of the pointed platforms on 26.5%, which, as it is known, are characteristic in the Upper Palaeolithic parallel primary flaking.

In the assemblage prevail artifacts of medium and large dimensions — exceeding 5 cm. The principal raw material used is andesite (78.5%), but the share of non-volcanic rocks has also increased somewhat (flint, radiolarite, chalcedony) on 21.5%. Among the definable blanks the blades amounts to 34.6%. The division of the assemblage to Upper Palaeolithic (63.29%), Mousterian (25.32%) and neutral (11.39%) groups of tools well illustrates the prevalence of Upper Palaeolithic types over Mousterian types. The presence of denticulate-notched implements adds to the specific character of the industry, documenting as it seems, the continuity of the tradition from complex II in Korolevo II. The preservation of denticulate-notched artifacts can be explained perhaps with the use of bone points which replaced in the inventory the disappearing bifacial, and also partly bifacial stone leaf-points, abundant in complex II from Korolevo II. Bone point do not appear in the industry of complex I-a in Korolevo I, as in general no bone artifacts have been preserved in the Transcarpathian open-air sites.

In general on characterizing the assemblage of complex I-a from Korolevo I it is necessary to underline that besides the considerable prevalence

of Upper Palaeolithic tools we can demonstrate also their expressive character and serial production. These are already typically Upper Palaeolithic features. It concerns especially end-scrapers representing 46.83% of the assemblage. Such a great amount of end-scrapers is typical of the Early Aurignacian industries in Europe, and as we can see it is one of the stadial features of the development of the Upper Palaeolithic typology of the given extensive region.

Nevertheless the stone industry of complex I-a from Korolevo I is already fully Upper Palaeolithic and it is a further coil in the development of the Upper Palaeolithic tradition (of complex II Korolevo II to complex I-a Korolevo I). Here, alongside with the developed uniform Upper Palaeolithic parallel blade technique of primary flaking appeared and prevailed Upper Palaeolithic types, alongside with the presence of considerable, but subordinate Mousterian components in typology.

Thus in Korolevo we have not only a unique case of the existence of two Upper Palaeolithic cultural-chronological complexes inside Mousterian industries, but also the development, during the pre-Brörup period of Würm I, of the same Upper Palaeolithic cultural tradition (Gladilin, Demidenko 1986).

In the year 1987 the quarry on "Beyvar Hill", Korolevo I, was extended. Before the extension of the quarry only Lower Palaeolithic stone tools were found on the site. In the new situation large numbers of finds appeared (more than 2000 pcs). Their technological features, and also the state of preservation of the andesite surface are very close to the Upper Palaeolithic artifacts of Korolevo II/IInd complex, and also to the finds of Korolevo I/I-a. Excavation No. XV of 8 sq. metres was opened exactly in an

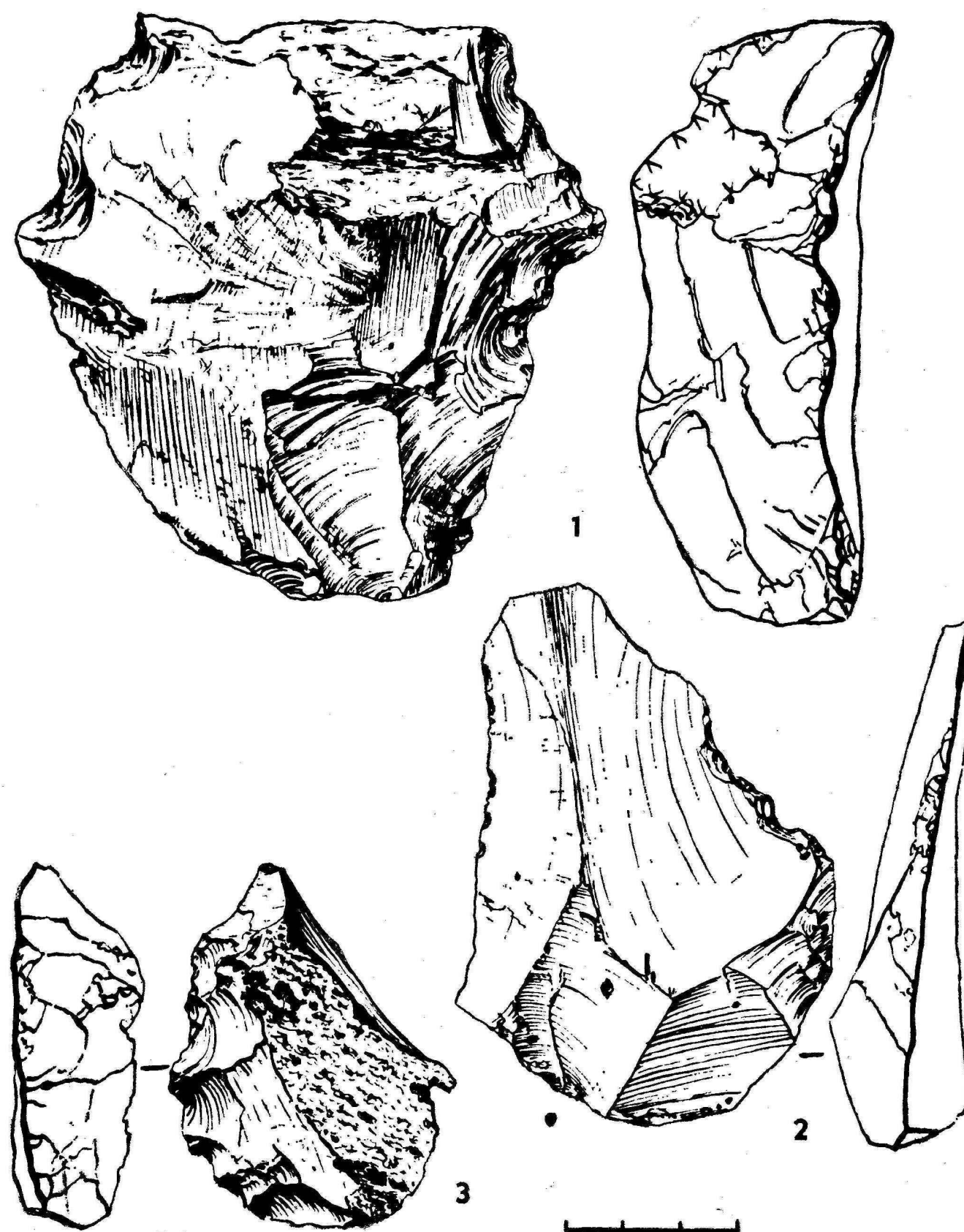


FIGURE 24. Korolevo I. Complex I-a. Tools.

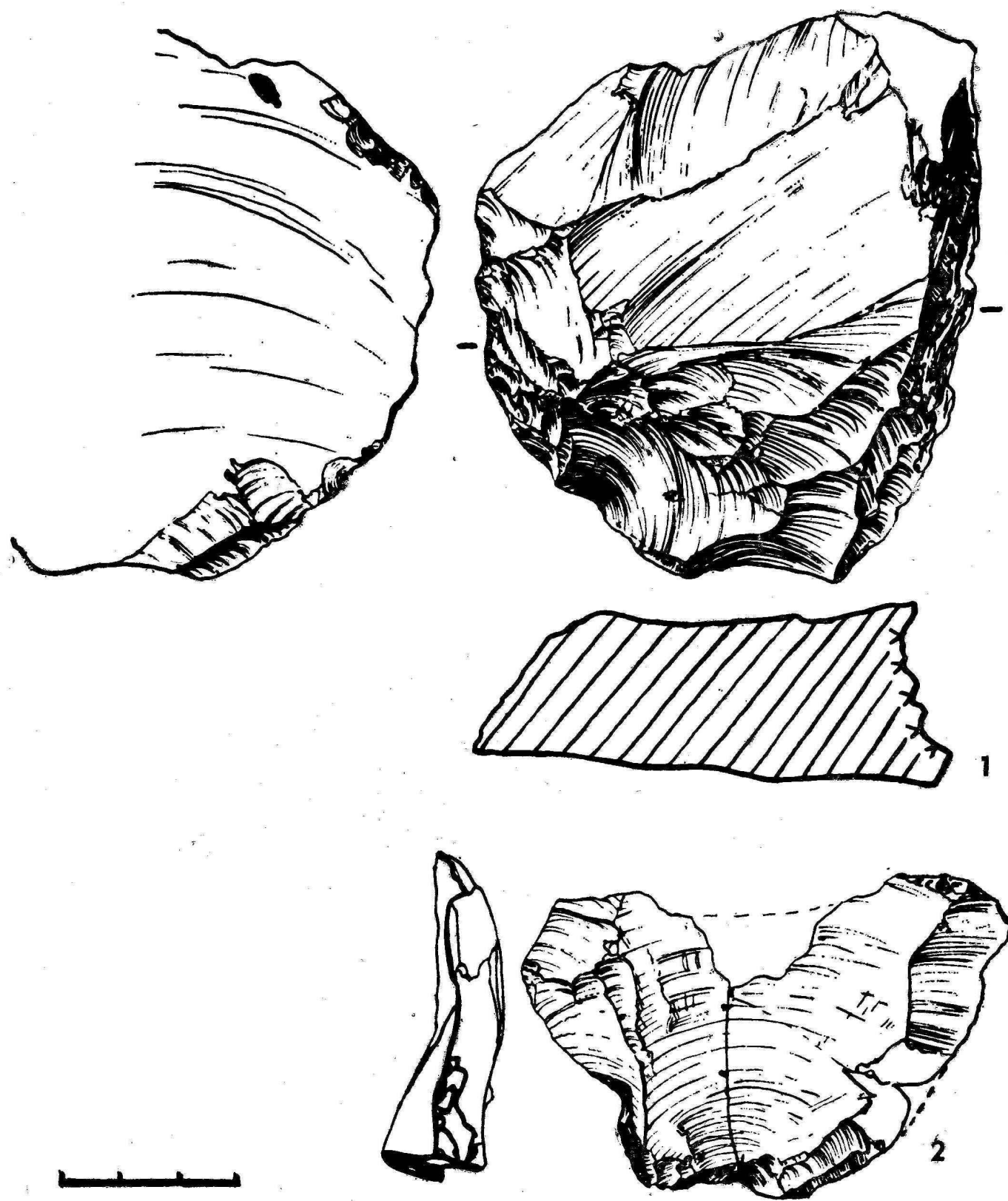


FIGURE 25. Korolevo I. Complex I-a. Tools.

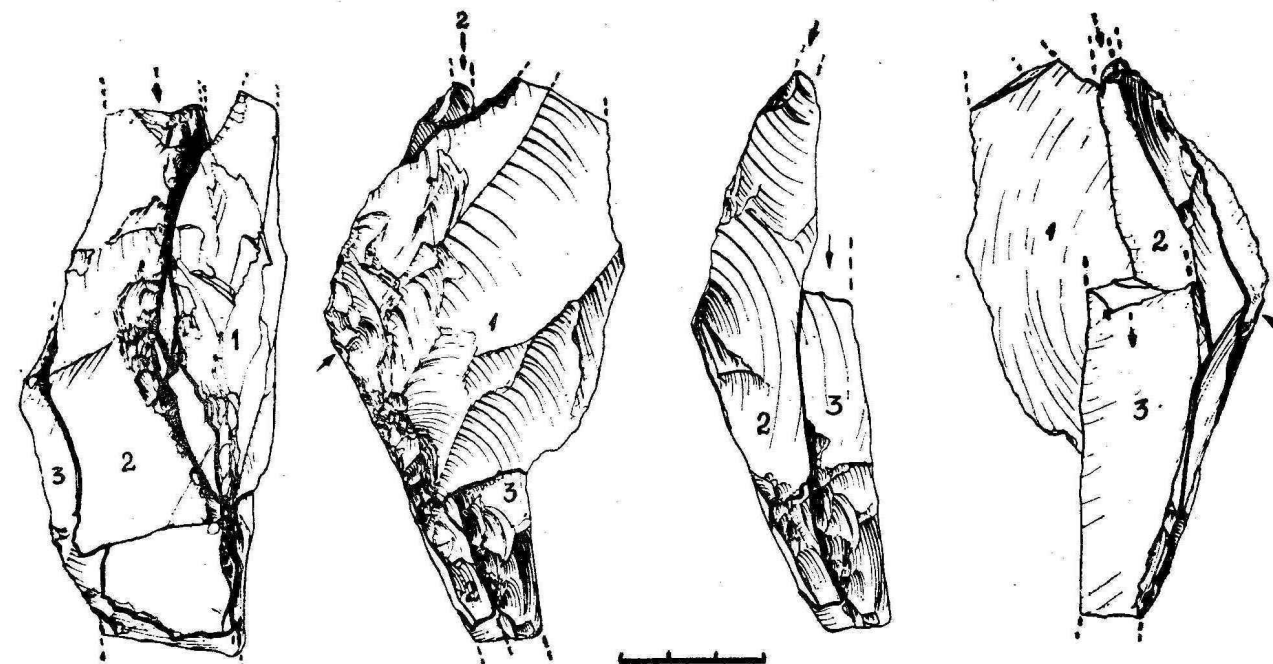


FIGURE 26. Korolevo I. Complex I-a. Tools.

area concentrating large numbers of such finds. Here we found in undisturbed position: loam (layer 3 of the general Korolevo section); fossil soil III (layer 4 of the general Korolevo section); loam (layers 5 and 6 of the general Korolevo section); the upper horizon of fossil soil IV (layer 7 of the general Korolevo section); deluvium and the weathered crust of the rock formations.

Artifacts with characters of Upper Palaeolithic technique of primary flaking (II¹ complex of Korolevo I) were found in the loam (layers 5 and 6) separating fossil soils III and IV. Stratigraphically they were situated above the horizon with Mousterian complex III of Korolevo I.

The finds are exclusively debitage: cores, pre-cores, flakes. The technique of primary flaking is Upper Palaeolithic unequivocally parallel. The degree of weathering of the artifacts is close to that of cultural-chronological complexes Korolevo II/II and Korolevo I/I-a. In general the collection of implements is characteristic of workshops. Its relation to Korolevo II/II and Korolevo I/I-a complexes has not been fully clarified. There are three possibilities:

1. The artifacts are remnants of a workshop of Korolevo II/II complex.
2. These tools are remnants of a workshop of complex Korolevo I/I-a.
3. The tools are remnants of a workshop or of part of a settlement occupying an intermediate chronological position between Korolevo II/II and Korolevo I/I-a complexes. The two latter suggestions are the most probable.

In the course of the research of Upper Palaeolithic complexes in Korolevo their cultural and chronological independence has been established not only according to stratigraphical position, but also

according to the degree of preservation of the andesite artifacts. The study of the collected materials of Transcarpathian surface sites has shown that among them appear in various proportions tools made of volcanic raw materials, with the same degree of weathering. Such artifacts were collected on the Shayan site in the Khust District and in Pleshka in the Vinogradov District; in their assemblages prevail artifacts of non-volcanic raw materials. At present it is hard to say whether they form organic part of the above complexes, or whether they form an admixture of other cultural-chronological complexes.

Nevertheless in Soviet Transcarpathia appears a new, well perceptible and expressive centre of early Upper Palaeolithic industries, not fitting into the generally accepted chronology of the appearance of the Upper Palaeolithic. It can be proved that this phenomenon — the surge of an extraordinarily early Upper Palaeolithic is fixed to certain territories — to Czechoslovakia, Hungary, Bulgaria (Gladilin, Demidenko 1986). It is very tempting to regard the Carpatho-Balkan region as the centre of the origin of the Upper Palaeolithic, and all the facts at hand suggest that there existed really such a centre — but of course not in the global sense of the word, it is only one of the numerous roads of transition from Lower Palaeolithic to Upper Palaeolithic.

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V. N. Gladilin, Yu. E. Demidenko
Archaeological museum
of the Academy of Sciences
of the Ukrainian SSR
Lenin Str. 15
252030 KIEV,
U.S.S.R.