



## THE PALEOLITHIC COMPLEXES OF THE NORTH-EASTERN SLOPE OF ARTS-BOGDO (MONGOLIA)\*

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The territory of Mongolia represents itself a unique region of investigations in archaeological respect. The geographic position of the region near the ancient centres of the Mankind's coming into existence (here, at different times and in all directions, the migratory routes passed through) caused the early penetration into this territory of the human populations, as well as the appearance of the original cultures not only in the Stone Age but also in the posterior periods of time. The peculiar natural and climatic conditions of Mongolia left an impression on the formation and preservation of archaeological objects, and, first of all, those relating to the epoch of Stone age. The prevalence of arid conditions on the great part of Mongolia, during the whole Quaternary, created obstacles to the process of active accumulation of sediments. This, in its turn, was conducive to formation of archaeological objects of a special type - sites, yielding artifacts, which lie on the surface of blow outs.

One of the common peculiarities of such sites is their disposition near the sources of raw material. The latter are represented by exposures of beds of rocks of high quality (jasper, flint, etc.), as well as by small boulders and slabs of the same rocks, by the desert pavements and the alluvial exposures, scattered over the surface of the ancient proluvial-diluvial shelves. Such common peculiarity allows one to consider the majority of the sites as the workshops of ancient craftsmen. Moreover, at the sites, located near the natural "compact" sources of raw material (exposures of jasper, flint, etc.), one

can speak about the presence of different zones of practical activities or even of some elements of complexes, indicative of lasting permanent occupation of these places, whereas at the localities with more or less even distribution of raw material over large area (as for instance, on the surface of the diluvio-proluvial shelves, and so on), such clearly defined zones are absent, just this has provoked introducing into scientific turn of such a term as "the scattered workshops of ancient craftsmen" (PETRIN, 1988). Among the criteria, allowing to consider this or that site as the such one, are the followings ones :

1) considerable area reaching tens of square kilometres;

2) a long time of existence of the sites of this kind;

3) location on these territories of the typical settlements and sites too, those having the subdued character, as one can judge from the number and diversity of archaeological material.

The long period of existence of such objects in the arid conditions, when the processes of sedimentation were actually absent, had caused another peculiarity of the sites, with artifacts lying on the surface. Here, on one and the same surface, of different times complexes are represented. Such situation, of course, leads to considerable difficulties, during the time of analysis of the archaeological material, and, to overcome these difficulties, special methods of investigation are required. The latter differ from those used for study of the stratificated archaeological objects.

The wide territorial distribution of the sites, with artifacts lying on the surface,

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over the whole arid zone of Eurasia (the latter is not limited only to the territory of Mongolia), the presence of the common tendencies in the formation, preservation, structure, etc., of such objects, as well as the necessity of use of the special methods for their analysis, possibly, require recognizing, among the sites of the Stone Age, of a special research category - the Paleolithic objects of the arid zone (or the Paleolithic of the arid zone). In favour of such recognizing, the quite different level of the informative potential of the sites, with artifacts lying on the surface, in comparison with that of the informative potentialities of the stratified objects, speak (PETRIN, 1994). Any detailed inspection of a large geographical region allows, for a short period of time, to investigate a great number of sites of the examined category. The analysis of the obtained numerous finds gives one the following opportunities: *Firstly*, to determine the extent of saturation of the territory with sites relating to this or that Paleolithic stage. Such a fact, in its turn, creates prerequisites for solving of the paleogeographical and paleodemographic problems, concerning the character, rate of settling of the given region by ancient people, as well as for solving of the problem of interrelations of the human populations with environment. *Secondly*, using the accumulated knowledge in archaeology of the Stone Age, one can reveal the main trends of evolution of the stone industry, establish the main stages of existence of cultures, assess their distribution over the territory (the global or local one). *Thirdly*, the opportunity of creation of the common type-forms for separate stages of the Stone Age of large geographical subdivisions. Establishing by such a way the typological-technological trends of evolution, we have the opportunity to determine the consecutive order in the evolution itself.

The study of the sites, with buried cultural layers, allows to solve another class of problems. Due to the possibility of complex investigation of the stratified objects, with the help of the contiguous scientific disciplines, some prerequisites of the authentic paleogeographical reconstruction, with determination of the absolute chronology of the sites by the radiocarbon methods are created. For this reason, in the study of the Paleolithic of Mongolia, collation of the conclusions, connected with

investigation of the sites, with artifacts lying on the surface, and those, unfortunately, unnumerous, with buried cultural layers, is a matter of great importance. Such correlation allows rather quickly to move forward on the way of perception of the past. The stratified objects help one to make the chronological placement of the evolutionary "chains", reconstructed according to the materials of the surface finds. In accordance with this, the authenticity of recognizing of certain trends of development increases.

In this case, as it has already been mentioned above, the problem of elaboration of some methods of analysis of the unstratified Paleolithic objects of the arid zone comes up. The investigations of many years of the Institute of Archaeology and Ethnography of SD RAS on the territory of the Mongolian and Gobi Altai, Hangai and Gobi have demonstrated, that, for separating of mixed complexes, the most effective methods of correlation are those, connected with the most important indices of complexes, such as:

- 1) geomorphological location of a site;
- 2) dividing up of a collection according to the initial raw material;
- 3) the extent of preservation of the surface of artifacts;
- 4) reshaping of the earlier artifacts in the later times.

This paper is devoted to employment of the above-mentioned methods for the study of the jasper complexes, discovered by the participants of the Joint Mongolian-Russian-American Archaeological expedition in 1995, on the north-eastern side of the mountain mass Arts-Bogdo (fig. 1).

Four locations (Loci 7, 8, 9 and 10), taken for analysis in the paper, are represented by one and the same raw material (the red jasper) and economical type of the objects ("the scattered workshops of ancient craftsmen"). This provides their rather correct correlation. All of the examined locations are on the terrace-like levels of one and the same ancient aquatory but at different gypsometrical heights ("terraces"?).

This investigation was directed to the solution of the following tasks :

1) the techno-typological analysis of the collections, organized into groups according to the extent of preservation of the surface of artifacts (the extent of deflation);

2) correlation of the main characteristics of the complexes, lying at different gypsometrical heights but having one and the same extent of deflation;

3) determination of the chronology of complexes, with different extent of preservation of the surface of artifacts;

4) using correlation of complexes of the kind, to reveal the main trends of development of industries on the examined territory, the continuity or interruption in existence of these complexes.

#### LOCUS 7

The locality lies in the latitude of 44°20'55,7" North, the longitude of 103°20'36,7" East. It is in the Arvaikher Aimak, on the territory of the Bugan-Somon, at 35 kms from the Bugan-Somon along the road to the Bogdo-Somon (Khovd). The selective gathering of artifacts was earned out on a plainpart of an ancient surface, covered with small pebbles, from the area of about 510,000 m<sup>2</sup>. In total, 123 stone artifacts have been gathered. All of them, excluding 3 specimens, were made of the red jasper.

These finds have different extent of deflation : 61 specimens are heavily deflated, 31 are of the medium deflation and the remnant 31 are slightly deflated. In every of these three groups of artifacts, there are those, with traces of reshaping in later times. Moreover, the removal-scars of such reshaping have also different extent of deflation. Such artifacts number 34 specimens. Below, three groups of finds, with different extent of deflation, are described and those of them, with traces of reshaping in later times, are specially mentioned too.

*The heavily deflated group of artifacts* is represented by 61 specimens, and 30 of them have traces of reshaping in later times. On 18 specimens, the removal-scars of

such reshaping have the medium extent of deflation and 13 artifacts are slightly deflated. The reshaping of the majority of artifacts was made by striking of a single flake. However, in some cases, the subsequent treatment made the artifacts greatly changed. For this reason, 7 specimens from the heavily deflated group and the other 10 may be logically examined as those belonging respectively to the groups of finds with medium extent or insignificant extent of deflation. Thus, only 44 specimens are taken for the techno-typological analysis of the heavily deflated series. Here, the primary splitting of stone is represented by the following categories of artifacts : 3 preforms, 5 cores, a blade (fig. 4 : 1), 3 fragments of blades (fig. 4 : 2, 3), 32 flakes.

The preforms have the subtriangular outlines and are rather small-sized (the largest of them - 34x54x46 mm).

All the cores are related to the Levallois tradition and are the monofrontal single-plateformed ones. One of them has a natural counter-front (fig. 3) and the removal-scars of flakes, struck in the centripetal direction. Three cores were used for obtaining the triangular flakes (fig; 2 : 2, 3) and the last one - for obtaining blades.

Among the flakes (32 spec.), there are 5 specimens of the Levallois type (?), with removal-scars of the centripetal orientation on the dorsal face (fig. 4 : 4, 6), and 4 specimens relating to the technique similar to the "citron" system (fig. 4 : 5).

The great extent of deflation makes definition of the types of striking-platforms of all the flakes impossible.

The tool-kit consists of only one rather expressive tool - the Mousterian knife with one thick end (butt) (fig. 4 : 5). There are also 7 flakes of the regular outlines, which could possibly be tools but, unfortunately, the extent of deflation is the such one, that makes definition of the second treatment extremely difficult. Thus, for the heavily deflated group of artifacts it is practically impossible to recognize any kind of a tool-kit. The analysis of the finds of this series is indicative of the evident dominance of the Levallois system of utilization of cores.

*The group of artifacts with the medium extent of deflation.* With taking into account the reshaped artifacts, this group numbers 60 specimens. The primary splitting of stone is represented by 3 rock pieces, 22 preforms, 11 cores, a Levallois flake, 3 blades, 20 flakes.

All the finds are made of the red jasper.

The preforms represent themselves small pieces of jasper, with their maximum and minimum dimension being equal to 1086x52x56 mm and 45x41x24 mm respectively. As a rule, one of the elongated edges of such preforms is bifacially flaked. The initial blanks have mostly the subtriangular cross-section and, in the system of preparation of the preforms, the maximum use of their natural form is traced. Later on, such articles were used with minimum additional treatment (fig. 5 : 2; 6 : 1, 4, 5).

All the cores relate to the Levallois tradition. On the whole, the following technological chain of utilization of the cores, which consists of three stages is evident (figs. 5 : 2; 6 : 1, 4, 5 : 5 : 4, 5) : 1) bifacial flaking of one elongated edge by the transversal strikes (such a detail of treatment is also typical of the preforms). The removal-scars of the kind sometimes find themselves on the frontal and/or counter-frontal planes; 2) by the same transversal strikes, resulting in the removal-scars of flake-blades, the convex, bevelled to the counter-front, striking-platform was shaped; 3) treating of the front of flaking by the strikes, directed to the centre of such cores.

These stages of treating cores preceded the beginning of their regular utilization. In this process, the first chip - tool blank, as a rule, was the tortoise-shaped one.

The extent of deflation of the examined cores does not allow to recognize certain types of their striking-platforms.

In the collection, there is a small Levallois flake (fig. 6 : 2) of the type, which can't be referred to the pronounced one in its character.

All the blades are those of the high form. They have irregular outlines. Two of them, were used as tool blanks.

The pebble crust retains only on the dorsal surface of 6 (from 20) flakes. The thin edges of all flakes are covered with intensive microretouch, probably, of natural origin.

The tool-kit consists of 5 specimens. Among them, - a retouched blade and 4 skreblos with one working edge. Three skreblos are made on separate pieces of jasper, and the fourth one - on a massive flake, with one thick end. The second treatment is represented by the unifacial, in two rows, retouch of different extent of steepness (fig. 5 : 1, 3; 6 : 3).

The both longitudinal edges of the blade, shaped by the regular, in one row, retouch, served as the working elements of this tool.

On the whole, the group of artifacts with the medium extent of deflation includes many (44,9%) corelike specimens. This allows to speak that here we have to deal with a workshop of ancient craftsmen. The presence of a great number of cores, which were half used, just at the same locality, also witnesses in favour of such a conclusion.

The same way, as in the case with the heavily deflated complex, here the primary splitting of stone is of the pronounced Levallois character. Moreover, in the technology of preparation of the cores, the analogous production of all the main morphological elements of the latter are traced. In other words, there is direct evidence of homogeneity of the heavily deflated artifacts and those with the medium extent of deflation.

*The group of slightly deflated artifacts.* With taking into account of the reshaped artifacts, this complex numbers 43 specimens. The primary splitting of stone is represented by the following categories : preforms (4 specimens), cores (4), chips struck from cores (3), primary chips (10), blades (2), segmental chips (2), a point and 17 flakes. All these finds were made of red jasper.

Two of the preforms are, most probably, blanks of the Levallois triangular cores. The third preform, judging from the character of shaping of its striking-platform, was destined for obtaining a core, with its counter-front used for flaking.

Different types of cores are represented in the collection, however, all of them were destined for obtaining shortened flake-blades, with subparallel edges and longitudinal cutting of the dorsal face.

The first core is the bifrontal and double-platformed one, with its length being less than the width. One of the fronts is more expressive, with removal-scars of flake-blades struck from it. The striking-platforms were not specially treated. There are only traces of retouching of the arc of flaking. The second front is on the opposite side. As its striking-platform, the first front of flaking was used (fig. 7 : 7).

The second core is the monofrontal and double-platformed one. As the striking-platforms, its natural planes were used. On the front, the fan-tailed tendency of flaking is traced. The lateral edges - the counter-front of the core retain the natural surface (fig. 7 : 8).

The third core has four striking-platforms and the same number of fronts of flaking. However, the two fronts, which were used "from the edge" on the principle of the alternate flaking, are the dominant ones. The fourth core is close to the same type.

Among the chips struck from cores, the most expressive is the one connected with renewal of the front of a core, from which flake-blades were struck (fig. 7 : 5).

The primary chips are rather numerous (37%) in the collection.

The blades are those of small dimensions and high form.

The flakes and segmental chips have small dimensions and shortened proportions.

The analysis of the cores allows to speak about the presence in the examined series of finds of a new principle of utilization of cores - the technology of obtaining shortened blade-flakes.

At the same time, there are also typical forms for complexes with the medium extent of deflation. However, artifacts of the slightly deflated series differ from those with the heavy and medium extent of deflation by their smaller dimensions.

*The tool-kit.* It numbers 9 specimens, including 5 notched and denticulated pieces, 2 retouched blades and the same number of specific tools. The notched and denticulated tools have different dimensions. They are shaped by the fine retouch on the ventral and dorsal surfaces (fig. 7 : 2, 3, 6). The same retouch covers the working edges of the blades (fig. 7 : 1). The first specific artifact represents itself a tool with projection made on a primary chip. At the distal end of the article, there is a bevelled blade of a pin-spout. The lateral edge is touched up to form an implement for carving (fig. 7 : 4). The second specific tool is made on a triangular chip of the post-Levallois character. The ventral surface of this artifact has traces of touching, up by secondary retouching.

Taking into consideration the extents of deflation, typology and technology of the examined complexes of finds, one can conclude that the series of artifacts with the heavy and medium extents of deflation have much in common. In the latter, first of all, the primary splitting of stone is characterized by the undoubted dominance of the Levallois technology in its specific (regional) manifestation. For the group of slightly deflated artifacts quite different principle of the primary splitting, the one of obtaining blades, is typical, though among the preforms, there are some specimens similar in their form to articles of the other two groups. Correlation of the examined complexes on the level of the typology of their tool-kits is not a simple matter because of an extreme inexpressiveness of the tools themselves. Nevertheless, the presence of an expressive series of the notched and denticulated tools in the group of slightly deflated artifacts is quite obvious. Moreover, the slightly deflated artifacts differ from those of the groups of finds with the heavy and medium extents of deflation by their less dimensions.

As a whole, basing on the technotypical peculiarities of the examined complexes, one may suggest that the first two series of artifacts may be dated to the Mousterian periode, and the articles of the slightly deflated group - to the Late Paleolithic one. However, at present, it is difficult to determine the chronological placement of all three groups of finds. To solve this problem we must have at our disposal the well-advanced arguments for correlation with complexes, having the reliable age data.

## LOCUS 8

This locality is at the latitude of 44°21'22,5" North and the longitude of 103°18'18,7" East, at 3 kms from Locus 7, farther along the road to Bogdo-Somon. But it lies on a higher gypsometrical level (a terracelike projection). The artifacts were gathered on a area of 40.000 m<sup>2</sup>. In total 96 specimens have been collected. Only two of them were made of chalcedony, the remnants - of jasper (mostly of the red colour but several artifacts made of yellow jasper have been found on the same area too). Evidently, the raw material was derived from a single source.

The extent of preservation of the surface of artifacts of the examined collection allows to divide the latter into three series, those of artifacts with the heavy, medium and slight extents of deflation. Traces of later reshaping are present on the surface of 24 specimens.

*The group of heavily deflated artifacts.* Of 33 specimens of this series of finds only 18 have no traces of reshaping. Facets of reshaping with medium or slight extent of deflation are traced on 8 and 6 specimens respectively. For this reason, the techno-typological analysis of the series of heavily deflated artifacts was carried out on the base of those 18 specimens, which had no traces of reshaping. The primary splitting of stone is represented by the following categories of finds : preforms (4 specimens), cores (3), a slab with flake-scars, 2 fragments of blades (fig. 8 : 3), 2 Levallois flakes (fig. 8 : 2, 4), a segmental chip (fig. 8 : 1) and 5 fragments of artifacts.

The preforms have small dimensions and inexpressive character.

Two of the cores are of the discoidal type. One of them (fig. 8 : 7) has two fronts of flaking. On the other (fig. 8 : 4), flake-scars are traced only on one side of the artifact. The both cores have small dimensions.

The third core represents the technology of primary splitting of stone "from the edge", with alternate flaking from two sides. The core is triangular in its cross section, and the base of the triangle is the one of the core (fig. 8 : 5).

The tool-kit consists only of one artifact - a skreblo with single working edge and one thick end (butt). A natural slab was taken as the preform for such an implement (fig. 8 : 6).

The products of primary splitting do not allow to conclude about the main principles of utilization of cores. However, the presence of the discoidal samples seems to be an important indication. The segmentary chip is, possibly, indicative of the use of the technique of "citron".

*The group of artifacts with the medium extent of deflation.* It numbers 36 specimens, with taking into account the reshaped ones, those having heavily deflated flake-scars. The primary splitting of stone is represented by preforms (10 specimens), cores (11), primary chips (6), the Levallois flakes (2) and slabs with facets of flaking (3 specimens).

The preforms are mostly rather inexpressive. Only three of them, judging from shaping of one of the lateral edges by the transversal strikes, were destined for production of the Levallois cores of the subtriangular form (fig. 10 : 2, 3).

Among the cores, the following 5 types are recognized. A single-platformed monofrontal core, which was used for obtaining of shortened flake-blades. The fan-tailed principle of splitting of stone is represented on the core (fig. 10 : 1), retaining some traces of reshaping of the latter into the wedge-shaped core. Two specimens are referred to cores of the third type. A small elongated blade served as the base for one of them. Here, from the massive thick end microblades were struck (fig. 11 : 1). The other core is the more "classic" one and similar to the wedge-shaped forms. Its edge - counter-front is well marked, the front of flaking is slightly outlined (fig. 11 : 2) and the striking-platform is prepared by a single strike. The fourth and fifth types of the recognized cores are those of the Levallois tradition. Six of the cores were destined for striking of flakes and two other for obtaining points. The Levallois cores of the first group differ in their dimensions. Two of them were only prepared for utilization and one-core represents itself an exhausted form. As a whole, cores of this group can be characterized as transversal ones, used for

obtaining shortened preforms. The counter-front of one of the cores is shaped as the working surface of a discoidal core. Two cores have the droplike cross-section and the bevelled striking-platform (fig. 9 : 1-3). Cores for obtaining points have the bevelled striking-platforms touched up by transversal strikes.

Among the flakes, 7 specimens retain the natural crust on their dorsal surface.

The tool-kit numbers 4 specimens, including a retouched flake and 3 natural slabs with flake-scars. One of them can be referred to the notched and denticulated tools (fig. 11 : 3). The techno-typological analysis of this complex allowed to reveal a large percent (58%) of the corelike artifacts (preforms and cores). The primary splitting strategy is represented by rather wide spectrum. However, the Levallois technology has obviously the dominant significance. The technique of striking flakes from the thick end of the cores also takes its important place.

*The group of slightly deflated artifacts.* With taking into account the reshaped artifacts from the groups of artifacts with the heavy and medium extents of deflation, this collection numbers 42 specimens. The primary splitting of stone is represented by the following categories : preforms (13 specimens), cores (10), the technical chips from cores (2), flakes (15) natural slabs with flake-scars (2 specimens).

Among the preforms, 6 specimens are, probably, connected with attempts of shaping of subtriangular Levallois cores for obtaining points. The remnant preforms are difficult for diagnosing.

Cores of 4 types are recognized : 3 Levallois specimens, a fan-tailed core, the prismatic one and 5 specimens with the front at their thick end. Among the Levallois cores, one specimen was used for obtaining points (fig. 12 : 2), one more - for striking of flakes and the single-platformed monofrontal core - for striking wide blades.

The core of the fan-tailed principle of flaking has its striking-platform slightly bevelled to the counter-front. At the distal section of the core, there are traces of the attempt of its reshaping into one with the

front of flaking placed at the thick end of this artifact (fig. 12 : 4).

The prismatic core has slightly planed oval cross-section and rectangular vertical-section. It is the double-platformed one with its counter-front touched up by transversal strikes (fig. 12 : 3).

All the cores with the front of flaking at their thick end are not heavily worn. Among them, there are two specimens similar to the "classic" form, with thorough treating of the both lateral sides and semicircular edge - counter-front. The other three cores are of another type. They are massive in cross-section, with one convex lateral side touched up by the strikes directed to the centre and the other lateral side covered with removal-scars of parallel flaking. Their counter-front (edge) is displaced concerning the central axis of the artifacts.

The technical chips are connected with reshaping of cores.

Four specimens of 15 retain natural crust on their dorsal surface.

*The tool-kit* consists of 8 specimens. Six of the tools were made on flakes and two - on natural slabs. Among the tools, the following categories are recognized : 4 notched and denticulated pieces, a skreblo with one working edge and one thick end, an end-scraper, a skreblo with two working edges, a bifacially flaked knife made on chalcedony.

The analysis of the primary splitting of stone demonstrates that among the preforms, the Levallois ones are dominant, and among the cores, those destined for striking of flakes from their thick end (butt) are prevalent. Thus, in the complex of slightly deflated artifacts, there is no concurrence in the types of preforms and cores. Here, preforms, relating to the Levallois method of utilization of cores, are met in association with artifacts indicative of the principle of splitting from the thick end of cores.

In the tool-kit, the notched and denticulated forms are the dominant ones. The presence of the bifacially flaked tool (knife) speaks about rather late age of the examined series of finds.

A small number of tools in every of the examined complexes does not make their comparison informative enough. At the same time, in the technology of primary splitting of stone, obvious peculiarity of every series is traced.

In the heavily deflated complex, the presence of discoidal cores is very important, although they are represented by isolated finds. In the series of artifacts with the medium extent of deflation, the association of the Levallois core with those having the front of flaking at their thick end is observed. In the group of artifacts with slight deflation, the association of the Levallois cores with those having the front at their thick end is also traced, but the latter are more numerous here. Moreover, at least three types of such cores are recognized. This complex is remarkable for the presence of the prismatic core too. As a whole, one can speak about the sufficient similarity of the complex of artifacts with the medium extent of deflation with the series of slightly deflated finds in the techno-typological characteristics. As far as the chronology of these complexes is concerned, one can suggest that the series of heavily deflated artifacts related to the Mousterian Period and those with the medium or slight extents of deflation - to the same period or to the Late Paleolithic. However, the possibility of presence of the Holocene materials here is not excluded too.

#### LOCUS 9

This locality is at the latitude of 44°23'12,5" North and the longitude of 103°18'18,7" East, at 4 kms from Locus 8, farther along the road to Bogdo-Somon. It lies on the next higher gypsometrical level. The stone artifacts were gathered on an area of 40.000 m<sup>2</sup>. In total, 17 specimens have been collected. It must be noted that here the surface finds were less numerous than at Loci 7 and 8. All the artifacts were made of red jasper. The extent of preservation of their surface allows to divide the collection of artifacts into the following three groups : the group of heavily deflated artifacts (3 specimens), the series of finds with the medium extent of deflation (4 specimens) and the complex of slightly deflated artifacts (10 specimens). On the finds, no traces of later reshaping have been revealed.

*The group of heavily deflated artifacts* is represented by a wide flake-blade (fig. 13 : 2) and two fragments of flakes.

*The series of finds with the medium extent of deflation* consists of 2 preforms, a core and a massive flake. One of the preforms was destined for shaping of the Levallois core, from which points would be struck (fig. 13 : 1).

The core in this collection is a single-platformed one. It has small dimensions. The massive flake was used for shaping of a skreblo with one straight working blade formed by of two rows unifacial retouch.

*The complex of slightly deflated artifacts.* In it, the primary splitting of stone is represented by the following categories : 3 preforms, a fragment of core, 3 primary chips, a flake and 2 fragments of flakes. The tool forms are absent. As a whole, this locality is the poorly informative one, despite the presence of some expressive articles (a preform of Levallois core in the group of artifacts with the medium extent of deflation, and a wide flake-blade in the heavily deflated series of finds). Most probably, one can speak that these complexes of artifacts belong to the Mousterian period.

#### LOCUS 10

The locality is at the latitude of 44°24'47,2" North and the longitude 103°15'12" East, at 4 kms from Locus 9, farther along the road to Bogdo-Somon. It lies on the next higher gypsometrical level. From the area of about 40,000 m<sup>2</sup>, over 60 artifacts have been gathered. All of them are made of red jasper.

The extent of preservation of their surface allows to divide the collection of finds into the following three groups : the group of heavily deflated artifacts (24 specimens), the series of finds with the medium extent of deflation (22 specimens) and the complex of slightly deflated artifacts (15 specimens). Traces of later reshaping are present on 10 specimens of 61.

*The group of heavily deflated artifacts.* In it, there are 6 reshaped articles. The primary splitting of stone is represented

by the following categories : 7 preforms, 2 cores, a blade, 2 Levallois flakes (fig. 14 : 1), 5 flakes and a fragment of flake.

The preforms are mostly inexpressive. Only one of them was obviously shaped as a blank for the Levallois core (fig. 14 : 3).

One of the cores demonstrates "the orange slice" technique and the other - the fan-tailed principle of splitting of stone. For the second core as the blank a natural slab of the subtriangular outline was used (fig. 14 : 6).

*The tool-kit* numbers 2 specimens : a knife with one thick end, made on small-elongated blade and treated along its thin working edge by episodic retouch (fig. 14 : 4); and another tool made on a fragment of flake. There is a projection on its high working edge (fig. 14 : 7). This tool-kit is inexpressive.

Judging from the primary splitting, one can speak about association of the Levallois tradition (a fan-tailed core and the Levallois flakes) with the "citron" system.

*The series of finds with the medium extent of deflation* consists of specimens, including the reshaped ones. The primary splitting of stone is represented as follows : 6 preforms, the same number of cores and 9 flakes. Among the preforms, 3 specimens are connected with preparation of the Levallois cores of subtriangular form, *i.e.* those destined for production of points. Cores are represented by two types. Those of the Levallois type, from which flakes and flake-blades were struck, are 5 in all. On some of them, the fan-tailed utilization of the front of flaking is observed. All the cores are slightly worn (figs. 15 : 2, 3; 16 : 2, 3). The other type of cores is represented by a single prismatic single-platformed specimen. Flakes were struck almost over the entire perimeter of the striking-platform. Several small transversal flake-scars outline the counter-front (fig. 15 : 2).

The tool-kit consists of 3 specimens. All the tools are made on flakes. Among them, - 2 skreblos with one working edge (fig. 16 : 1), and a skreblo with one thick end (butt) and one working blade.

The primary splitting of stone is characterized by the dominance of the Levallois tradition and of cores destined for obtaining of the tortoise like flakes or the forms similar to them. In this connection, the presence in this complex of the pronounced prismatic core seems to be extremely interesting.

The tool-kit is not numerous but remarkable for its homogeneity.

*The complex of slightly deflated artifacts* numbers 22 specimens, with taking into account the reshaped ones. The primary splitting of stone is represented by 6 preforms, 3 cores, 2 fragments of cores, a technical chip, 8 flakes and 2 fragments of slabs.

On some preforms, well-shaped striking-platform is fixed. One can suggest that such specimens were blanks of the prismatic cores (fig. 17 : 1, 2).

Two cores belong to the single-platformed monofrontal ones, with their width exceeding the length. From these specimens wide shortened flakdes were struck. The third cores has traces of shaping of the striking platform at one of the narrow ends (fig. 17 : 3).

*The tool-kit* consists of 9 specimens. Among them, 6 tools are made on flakes, 2 on fragments of slabs and 1 - on a technical chip. There are 6 notched and denticulated pieces and 3 skreblos in this collection of finds. The working elements of the notched and denticulated tools are shaped by fine retouch fixed on the dorsal and ventral surfaces of the artifacts (fig. 18 : 1, 2, 4).

Two of the skreblos are made on fragments of slabs. They have one working edge formed by of many rows, subparallel retouch (fig. 18 : 5). The third skreblo is made on a flake. On one of its edges, it has the working element of a notched and denticulated tool (fig. 18 : 3).

Judging from the analysis of the primary splitting of stone, in some cases, there is no closest correspondence of the types of prepared preforms with those of finished cores. Here, one can speak about association of the prismatic technique with the system directed on obtaining wide shortened flakes.

This tool-kit is rather expressive. It consists of notched and denticulated pieces and skreblos with one working edge.

As a whole, in all examined complexes, gradual change of priorities among the technologies of utilization of cores is observed. In the series of heavily deflated artifacts association with the Levallois tradition with the "orange slice" technique is fixed: in the group of finds with the medium extent of deflation the dominance of Levallois with appearance of prismatic forms is traced: and the group of slightly deflated artifacts is remarkable for association of the prismatic strategy with single-platformed monofrontal cores destined for obtaining of wide shortened flakes. There are also considerable changes in the tool-kits of the same examined complexes. The considerable share of notched and denticulated tools is typical for the group of slightly deflated artifacts connected apparently, with the Late Paleolithic period and, possibly, with its initial stage. The series of artifacts with the heavy and medium extents of deflation seem to be those of the Mousterian age, and it is not excluded that the heavily deflated group relates to the initial stage of Mousterian.

## CONCLUSION

The analysis of complexes disposed at different gypsometrical levels demonstrate that, independent of the relative height of dislocation of the sites, the tool-kits with one and the same extent of deflation have considerable techno-typological similarity, allowing to speak about their cultural and chronological homogeneity.

Taking into consideration the territorial dislocation of the finds (close to each other and in the common conditions of the arid zone), a legitimate conclusion about the equal extent of influence on them of the natural factors, and mostly of the deflation processes, can be inferred. So far as all the artifacts of the examined complexes were made of one and the same raw material (red jasper), so in this case, a direct dependence of the extent of preservation of the artifacts surface (that of deflation) upon the duration of their presence at the sites becomes quite apparent, *i.e.* heavily deflated complexes have the earlier age than those with the

medium extent of deflation, which, in their turn, are older than the ones of slightly deflated series. Such supposition is strongly supported by the results of the techno-typological analysis of the complexes of artifacts with different extents of deflation.

The primary splitting of stone *in the heavily deflated group of artifacts* (table 4), is characterized by the predominance of the Levallois strategy of utilization of cores. For production of slightly elongated Levallois flakes cores prepared by the centripetal or parallel strikes were used. On a level with cores destined for obtaining one crude chip-blank, those from which several crude chips were struck are met too. Such specimens are remarkable for the fan-tailed placement of the removal-scars on them. In the same group of artifacts, more "primitive" strategies of the primary splitting of stone are also present, such as the discoid one, represented by monofrontal and bifrontal cores, and the strategy of "utilization of cores from their edge", when blanks were struck from one platform by turns on two sides and the removal-scar of every flake became the platform for striking of the next one. The tool-kit of the heavily deflated series of artifacts (table 7 : 1) is not expressive. Undoubtedly, the heavy deflation could destroy traces of the secondary retouch on many of the finds and, probably, by this the presence of a small number of tools in the examined series can be explained. Among the latter, - the forms with one tick end (butt), represented by a skreblo, a knife and a specific tool with one pronounced "projection".

The primary splitting of stone *in the series of artifacts with the medium extent of deflation* (table 5), is also characterized by the predominance of the Levallois strategy of utilization of cores. However, the latter differs by more variable methods. The Levallois cores shaped on the subtriangular elongated blanks have the most important significance here. Their front of flaking was formed by strikes directed from the lateral side. The flakes struck from such cores left wide transversal removal-scars on their frontal surface. In some cases, the counter-front was touched up the same way. But as a rule, the counter-front and the other lateral side retained the natural surface. The convex striking-platform bevelled to the counter-front was prepared by a series of strikes from the side of the front. The cores of this series

were used for obtaining of the convergent elongated Levallois flakes. The other variant of the Levallois strategy of splitting of stone is represented by cores destined for production of shortened blades. In this case, the front was shaped, as a rule by the centripetal strikes. Cores, having the removal-scars with their fan-tailed placement are not numerous here.

In addition to the Levallois methods of splitting, the subprismatic technique is also represented in the examined series of finds. Cores have mostly the subtriangular form. The plane striking-platform was shaped by removing of wide shortened flakes and slight treating of the arc of flaking. There are also cores with their fronts at the thick end, those representing themselves reshaped Levallois cores with touched up lateral side. Such specimens look not expressively and it is difficult to fix the system of their splitting.

In the tool-kit (Table 7 : 2), skreblos of different types are prevalent. There are also not expressive notched and denticulated tools.

*The series of slightly deflated artifacts* is also characterized by the presence of considerable (but not the predominant) number of the Levallois elements in splitting of stone, especially at the level of preforms (Table 6). Among the Levallois forms, the predominance of subtriangular cores with touched up lateral side retains (the same as in the series of artifacts with the medium extent of deflation). Not numerous are specimens representing the technique of the so-called splitting "from the edge". There are also "citron" chips in the collection, those allowing to suppose that the "orange slice" technique was used too. But the cores, from which such chips were struck, have not been found. The subprismatic cores are represented by rather expressive forms. Artifacts of this category were used for obtaining of shortened flake-blades.

The primary splitting of stone in the group of slightly deflated artifacts is remarkable for the pronounced prevalence of cores with one thick end (butt), including not only reshaped Levallois cores but also some other varieties and even almost "classic" wedge-shaped specimens.

The tool-kit (Table 7 : 3) demonstrates the obvious predominance of notched and denticulated pieces represented by different forms. Skreblos are not numerous here. An end-scraper and a bifacially flaked tool (knife ?) are the isolated but rather typical finds in the examined collection of tools.

Correlation of the investigated complexes of artifacts with different extents of deflation allows to speak with certain extent of confidence about the continuity and evolution of the traditions, especially in the sphere of primary splitting of stone. The Levallois splitting, which is the predominant one in the series of heavily deflated artifacts, reinforces its significance in complexes of artifacts with the medium extent of deflation by increasing of the variability of its methods. The typical subtriangular cores, with their touched up lateral side, those aimed at obtaining elongated blanks, assume the priority. On a level with this tendency, among the artifacts with the medium extent of deflation, the appearance of the subprismatic technique of splitting and cores with their fronts at the thick end is traced. In complexes of slightly deflated artifacts, the latter become more numerous than the Levallois subtriangular cores. Not so much can be said about the tool-kits in the examined complexes of artifacts with different extents of deflation, because of the facts that the latter have been found at the scattered workshops of ancient craftsmen and that certain traces of the secondary retouch on many of the finds have been destroyed by the deflation processes. Nevertheless, we may speak about the consistent tendency of diminishing of index of skreblos, owing to the growing significance of the notched and denticulated artifacts.

As far as the age of the examined complexes is concerned, the one of the heavily deflated artifacts, probably, is related to the Mousterian period (in the broad sense), that of the artifacts with the medium extent of deflation (according to the available data on the Paleolithic of Mongolia) to the Final Mousterian or the beginning of the Upper Paleolithic, and the series of slightly deflated artifacts is, apparently, connected with the Late Paleolithic.

Meanwhile, the problem of chronological frames of existence of the examined sites remains still unsolved.

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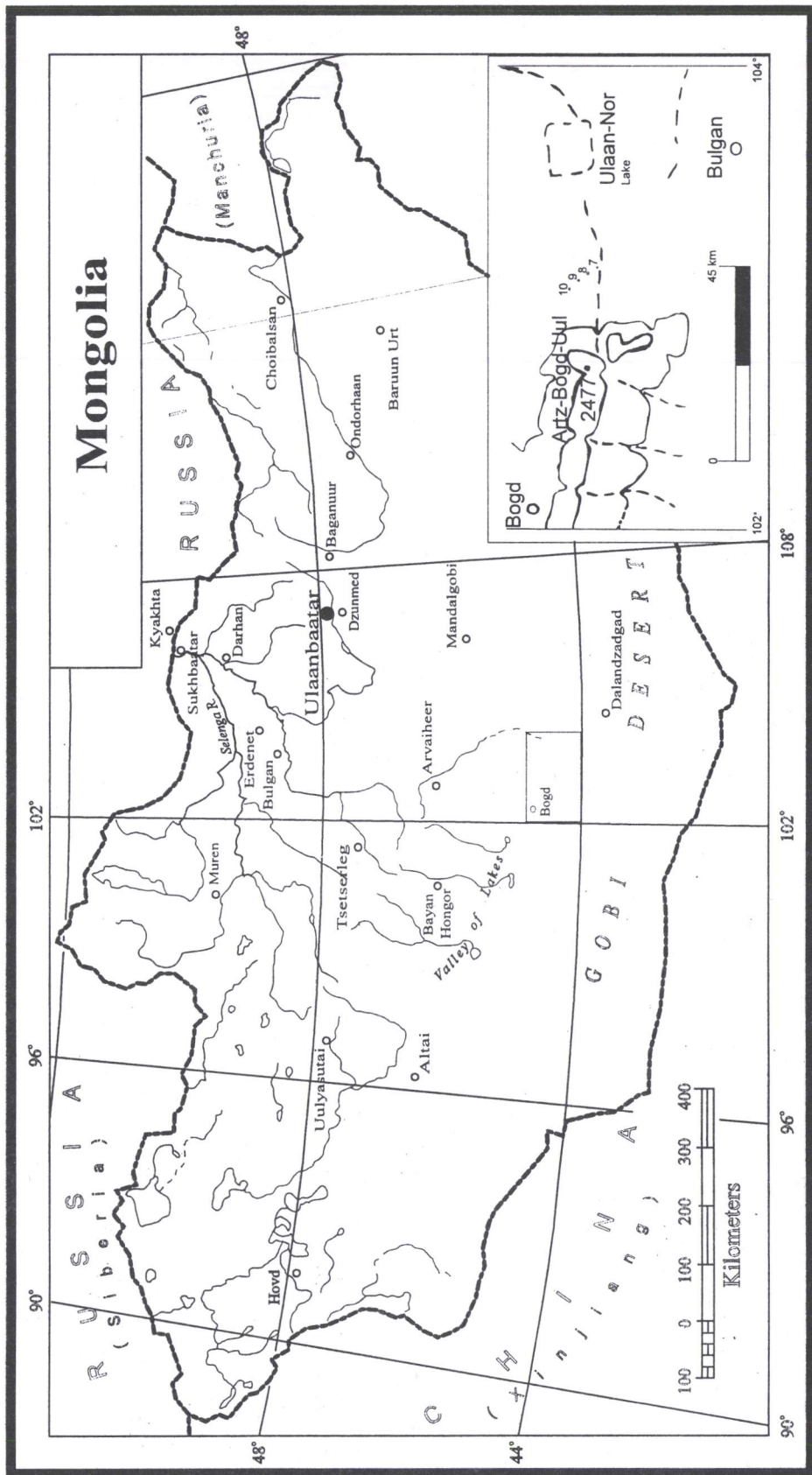


Figure 1. Map of Mongolia providing indication of the territorial placement of the examined sites.

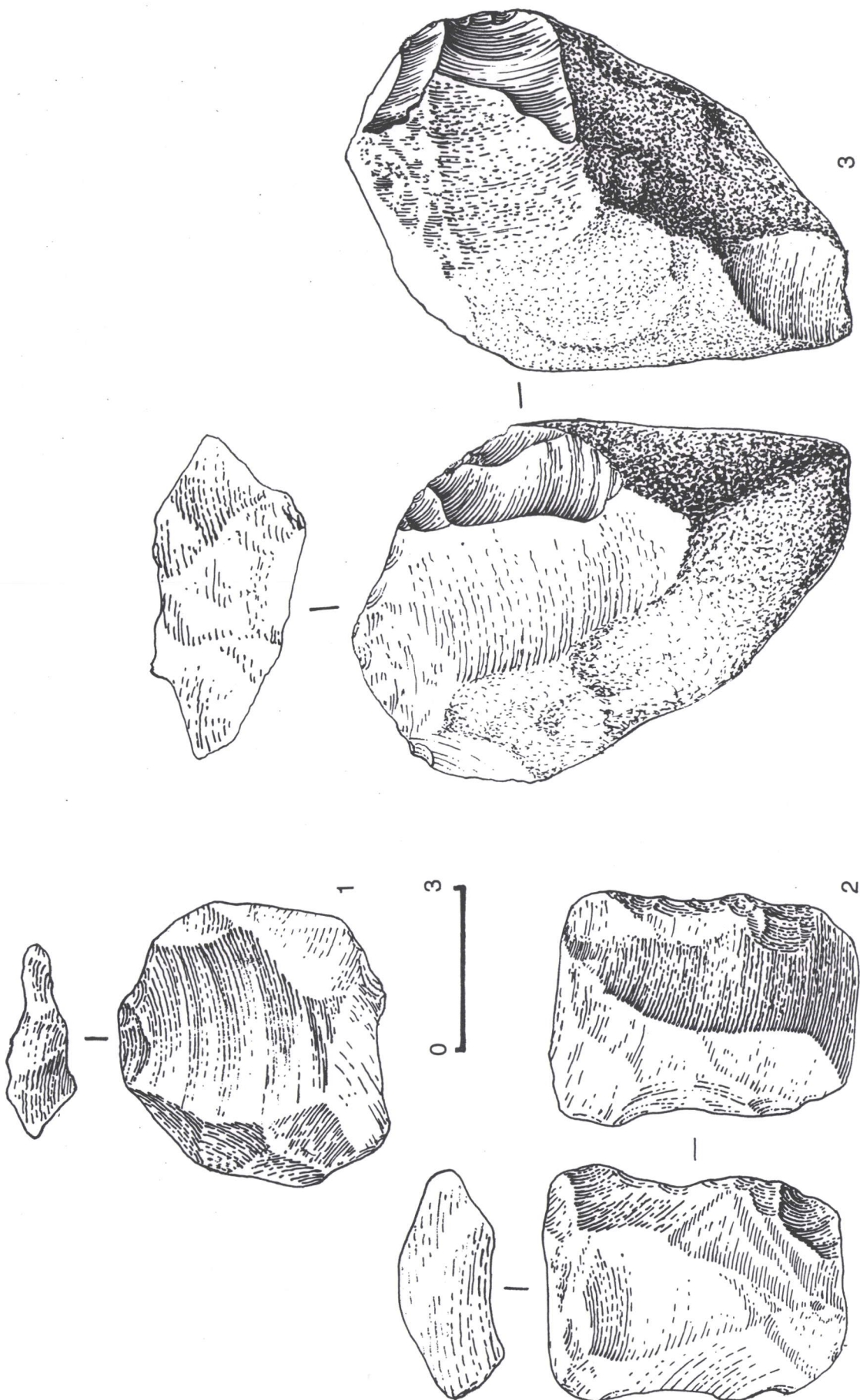


Figure 2. Locus 7. The group of heavily deflated artifacts. Cores.

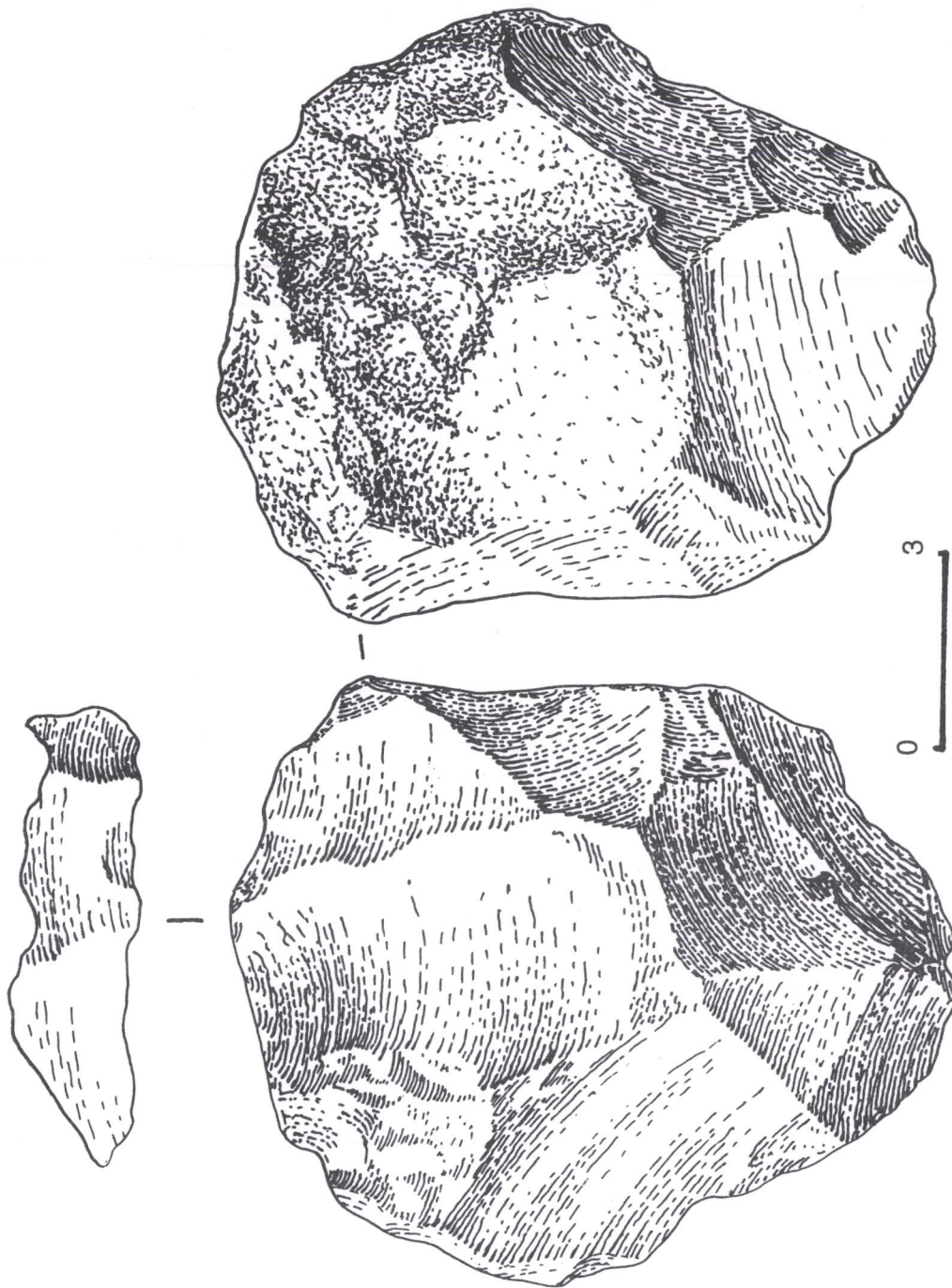


Figure 3. *Locus 7*. The group of heavily deflated artifacts. A core.

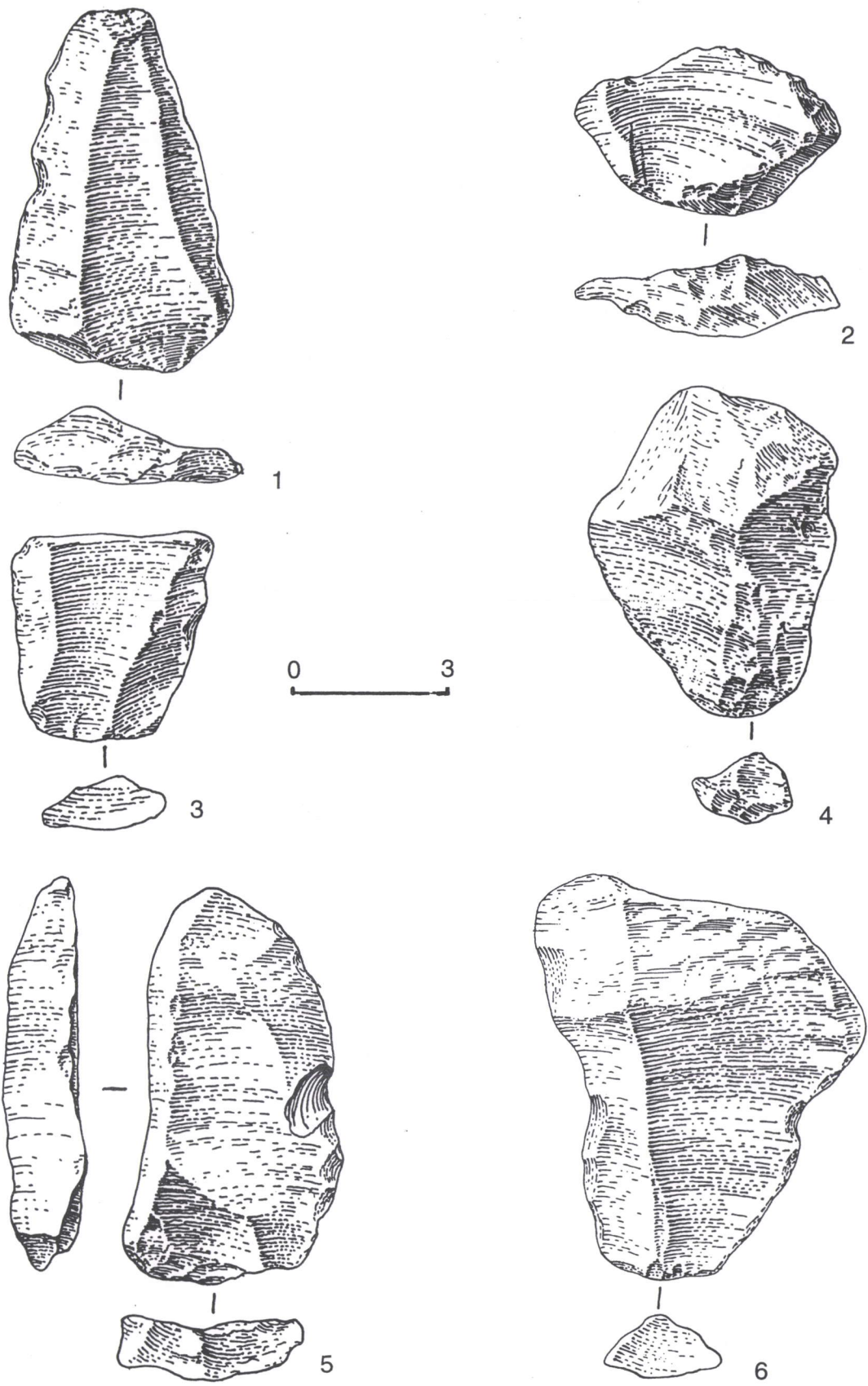


Figure 4. *Locus 7*. The group of heavily deflated artifacts. 1 - a blade; 2, 3 - fragments of blades; 4, 6 - the Levallois flakes; 5 - the "citron" flake (knife with one thick end).

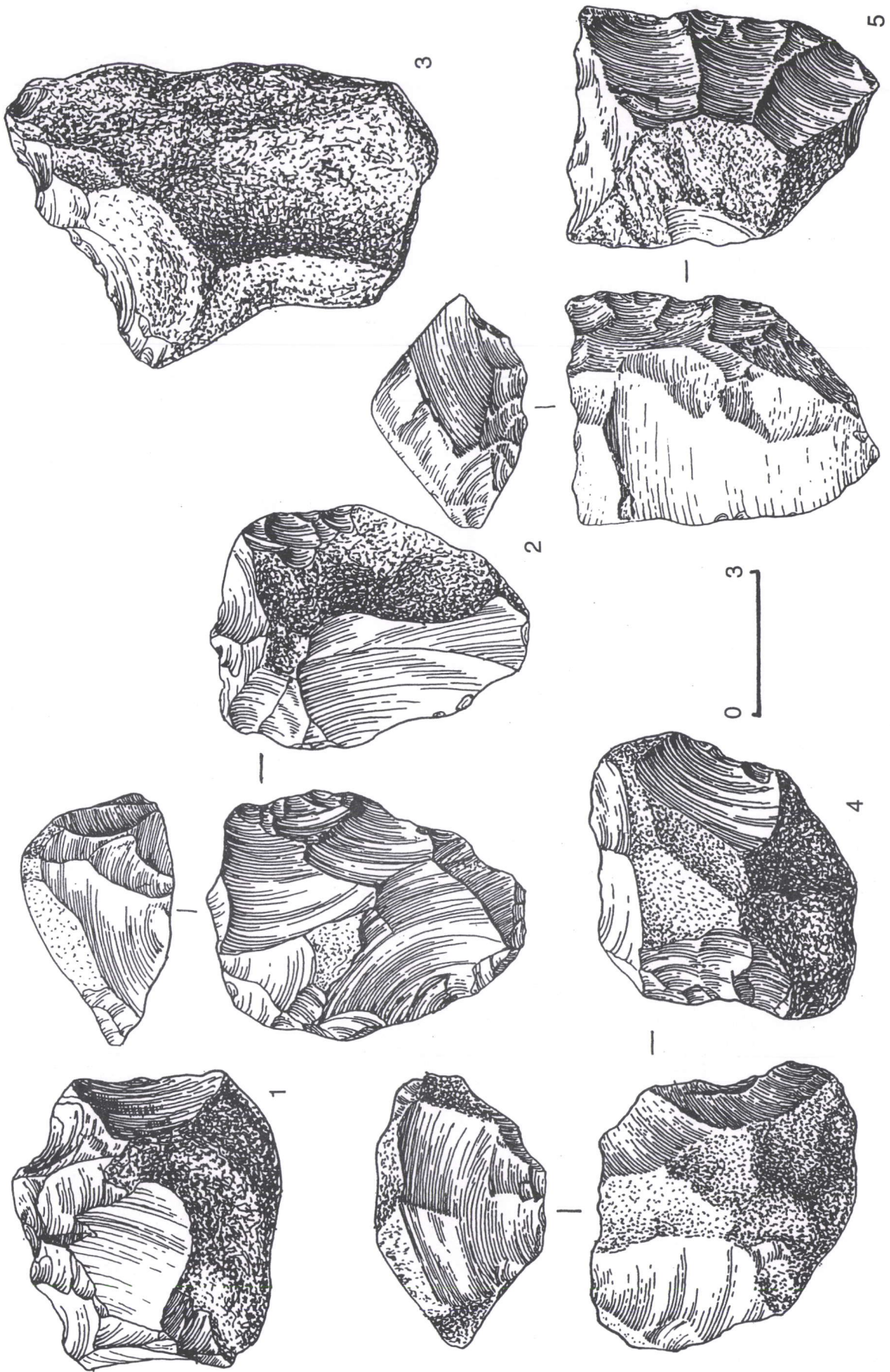


Figure 5. *Locus 7*. The series of artifacts with the medium extent of deflation. 1, 3 - skrebljos; 2 - preform of a core; 4, 5 - cores.

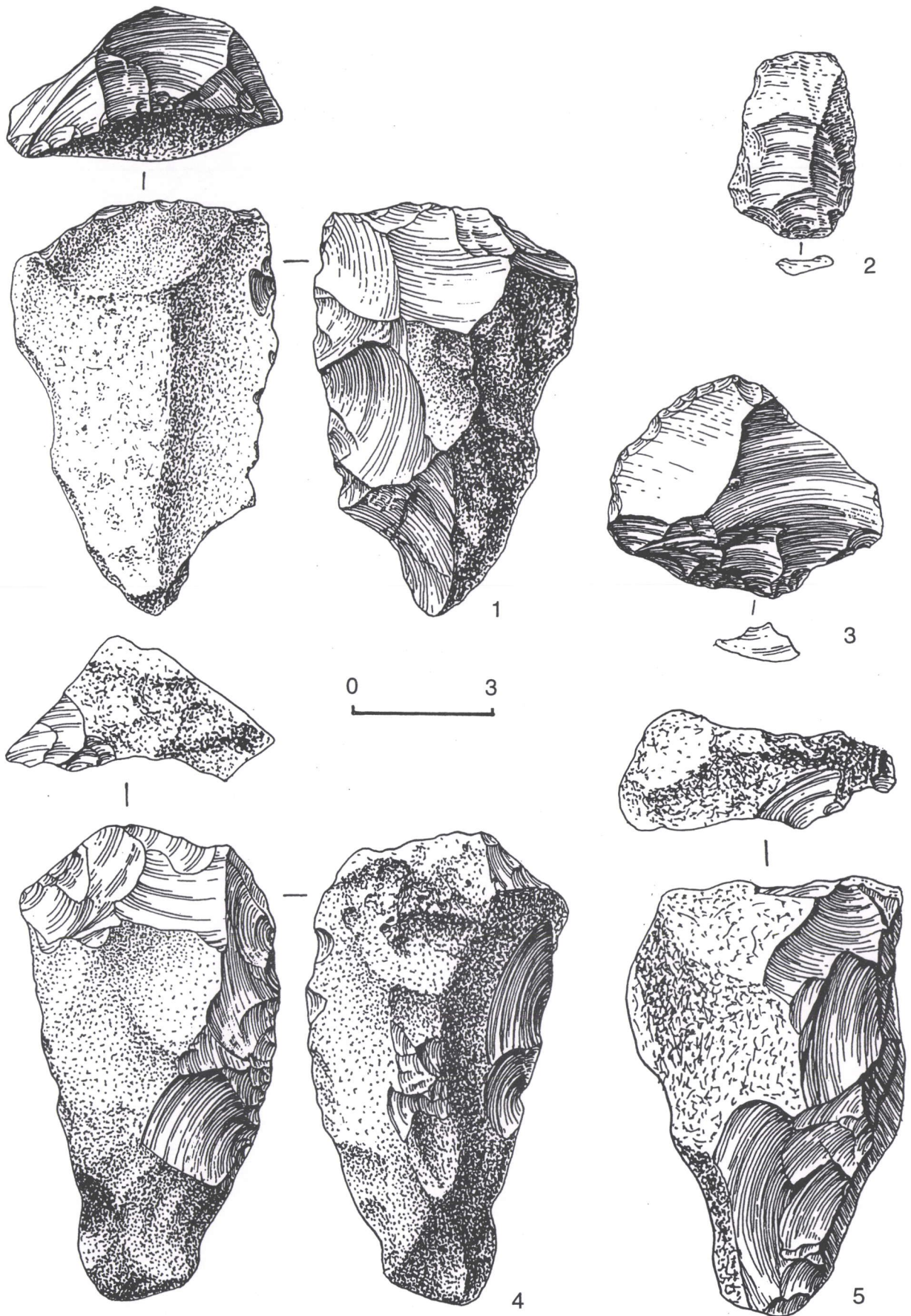


Figure 6. *Locus 7*. The series of artifacts with the medium extent of deflation. 1, 4, 5 - preforms of cores; 2 - the Levallois flake; 3 - a skreblo.

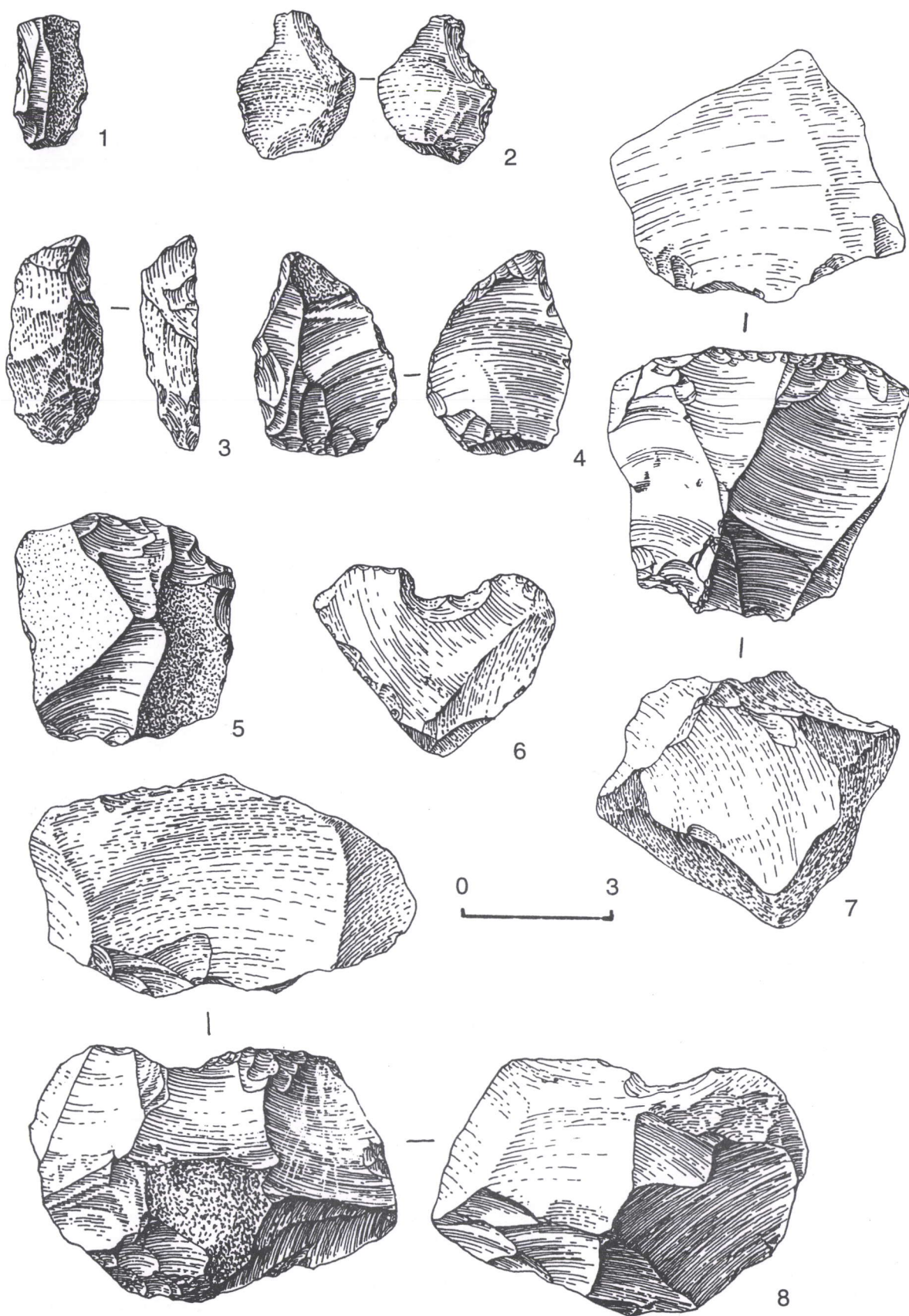


Figure 7. *Locus 7*. The group of slightly deflated artifacts. 1 - a retouched blade; 2, 3 6 - notched and denticulated tools; 4 - tool with a projection; 5 - a technical chip; 7, 8 - cores.

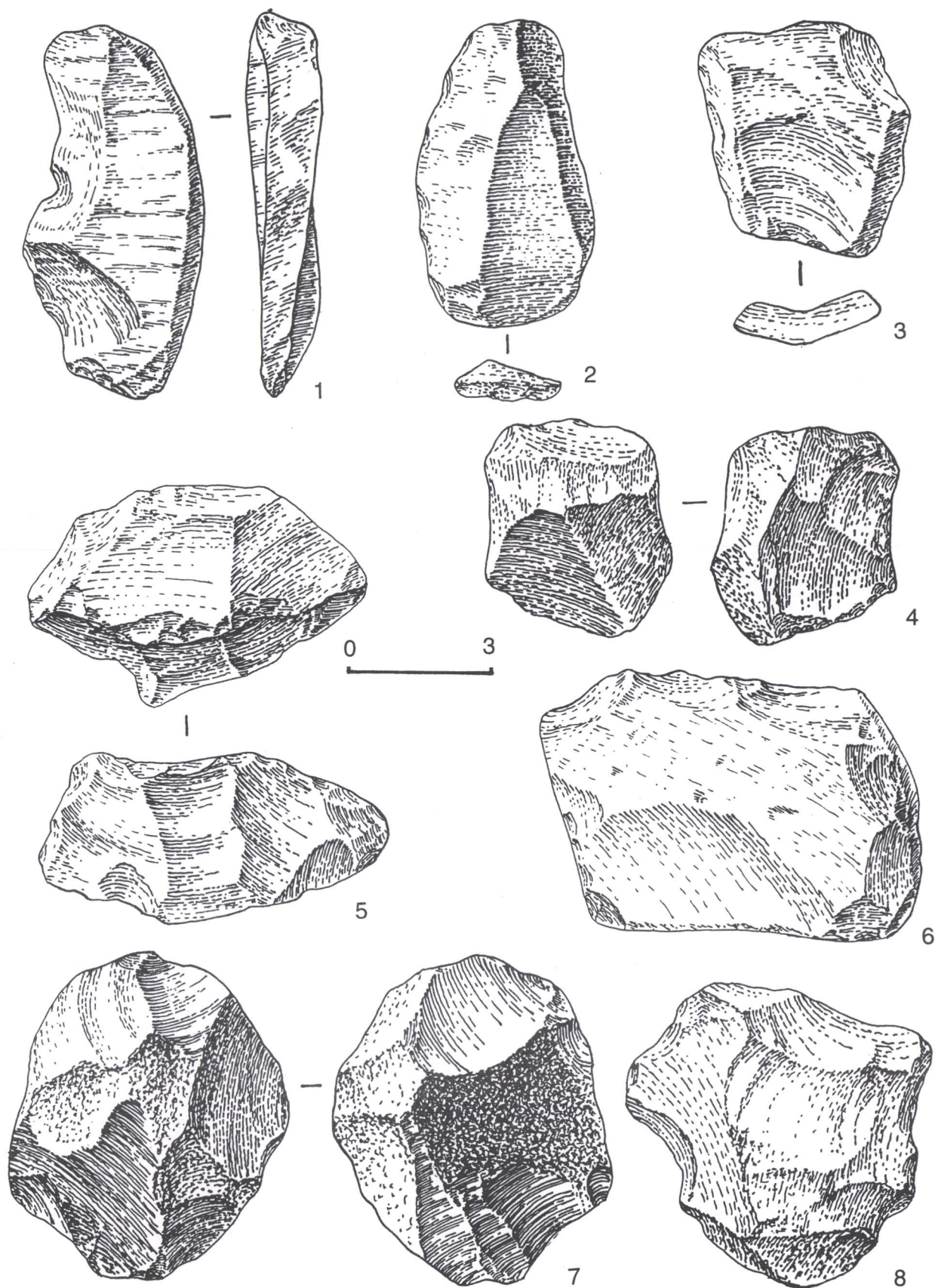


Figure 8. *Locus 8*. The group of heavily deflated artifacts. 1 - segmental chip; 2, 4 - the Levallois flakes; 3 - fragment of a blade; 5, 7 - cores; 6 - a skreblo.

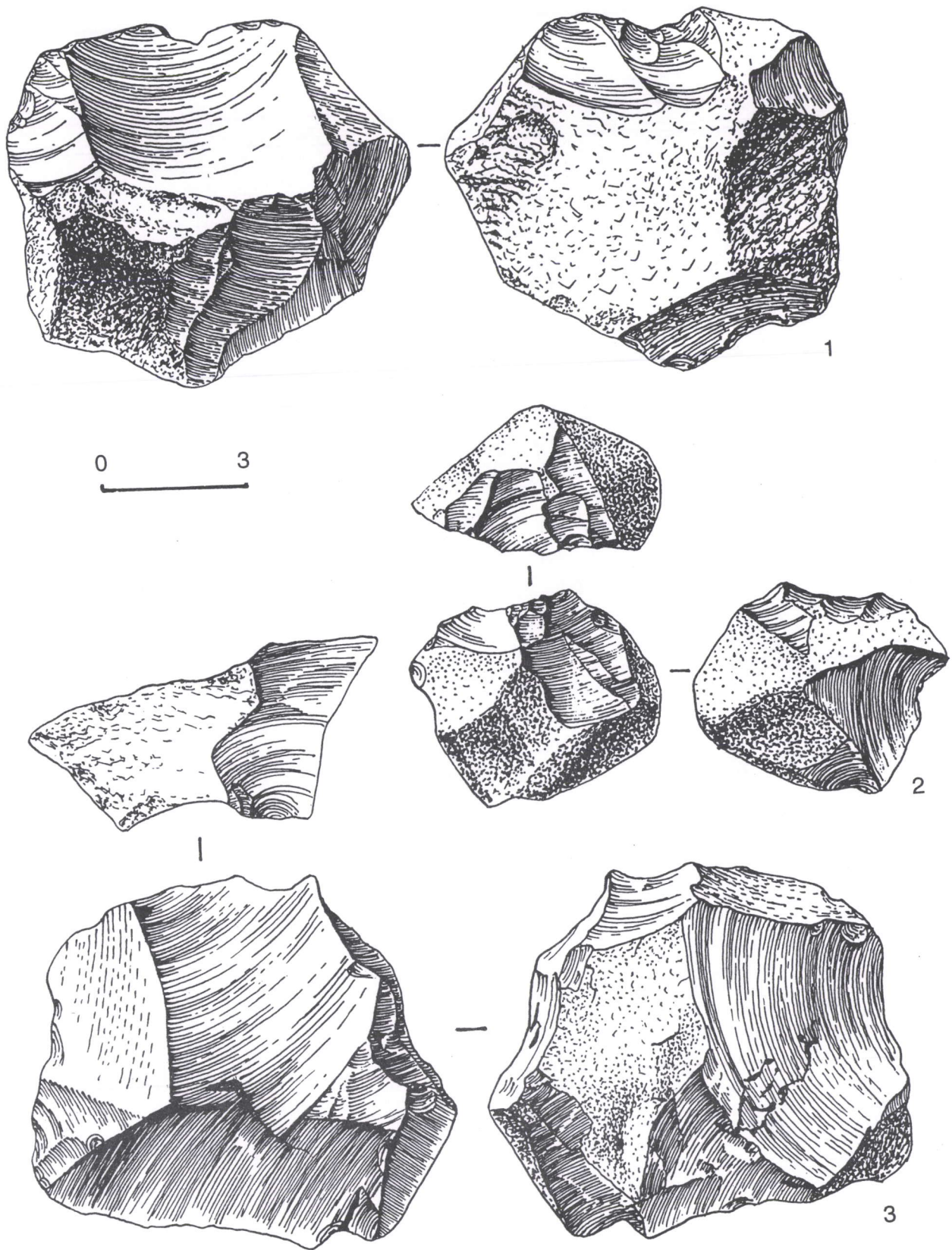


Figure 9. *Locus 8*. The series of artifacts with the medium extent of deflation. 1-3 cores.

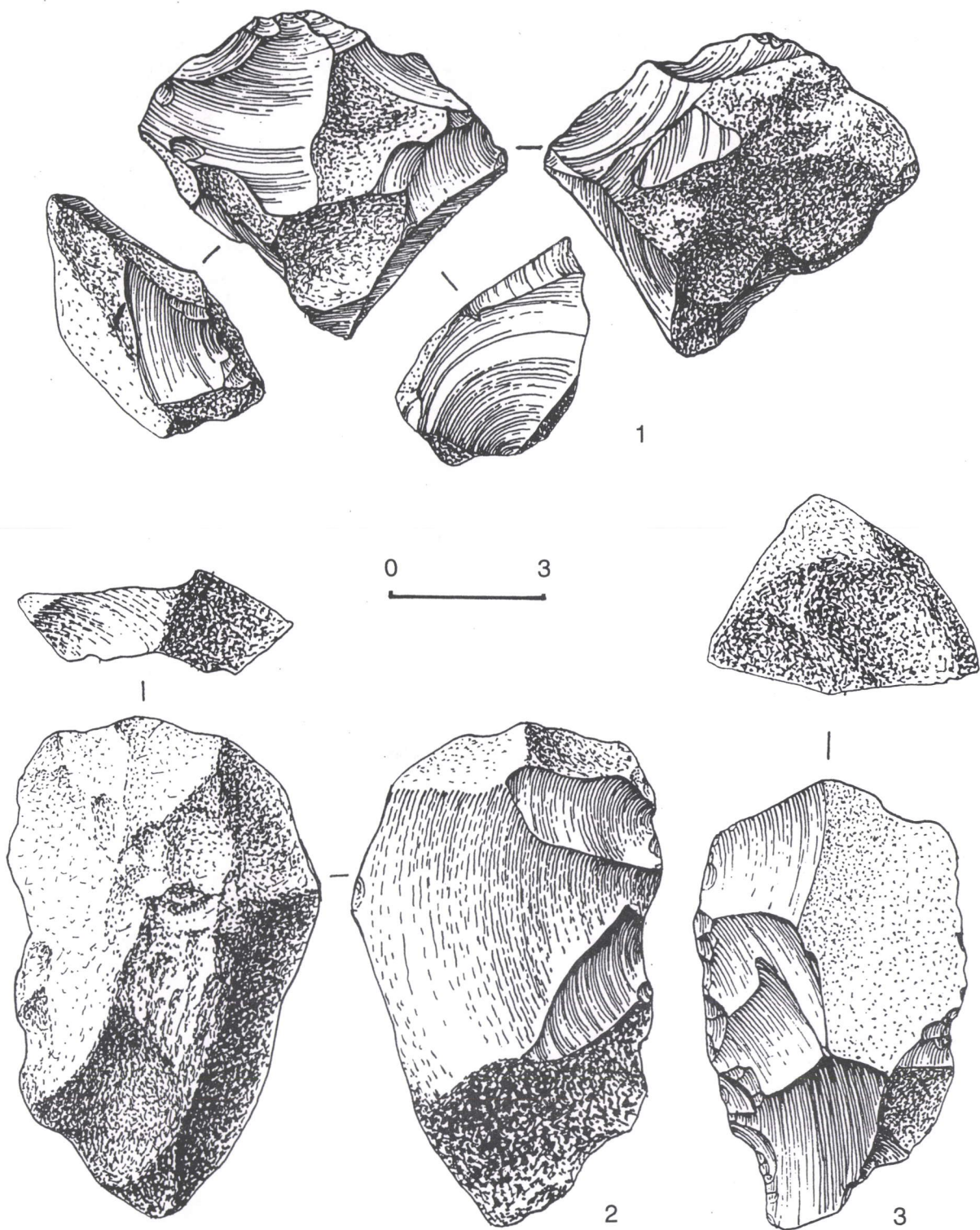


Figure 10. *Locus 8*. The series of artifacts with the medium extent of deflation. 1 - a core; 2, 3 - preforms.

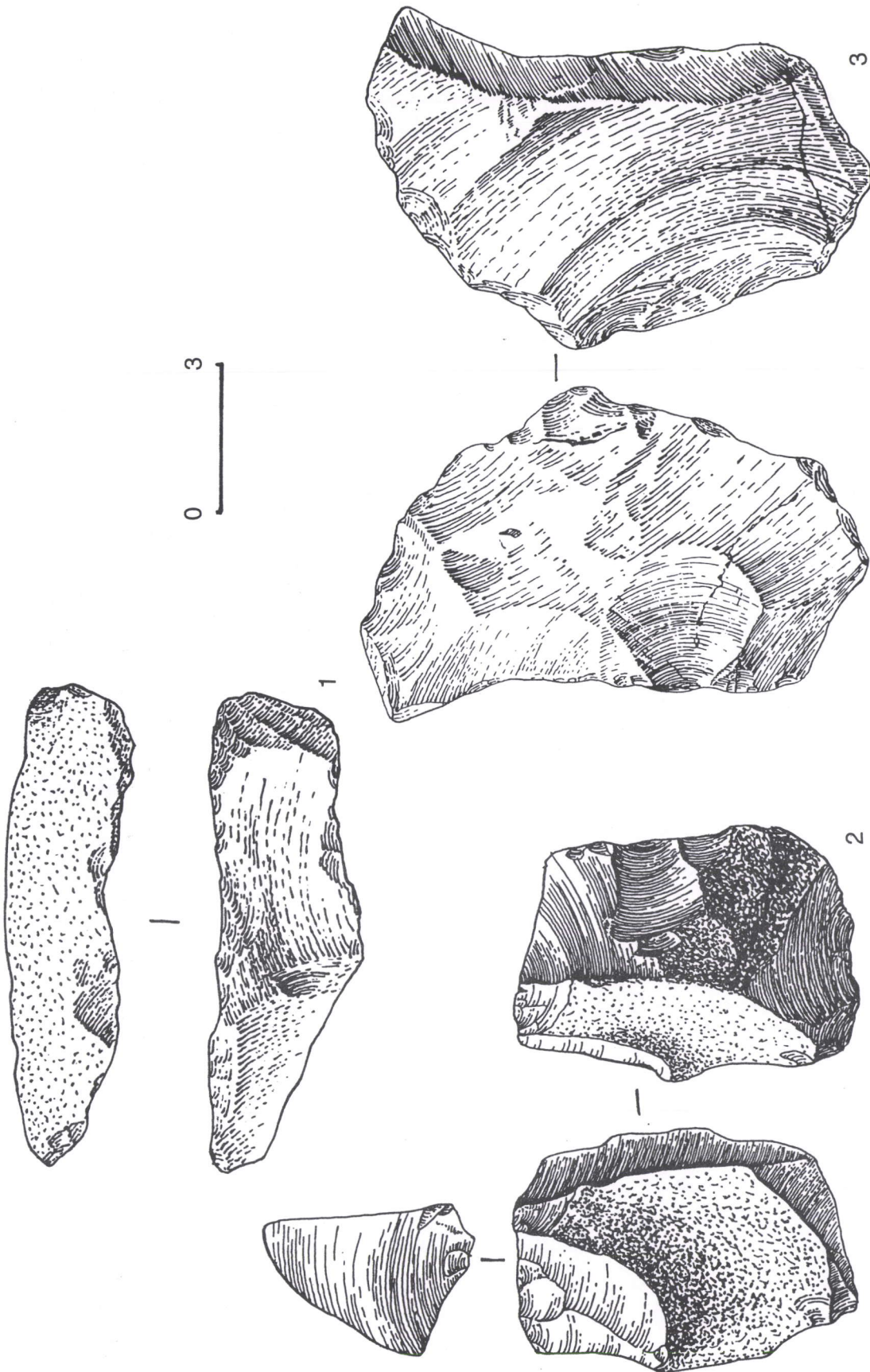


Figure 11. *Locus 8*. The series of artifacts with the medium extent of deflation. 1, 2 - cores; 3 - a notched and denticulated tool.

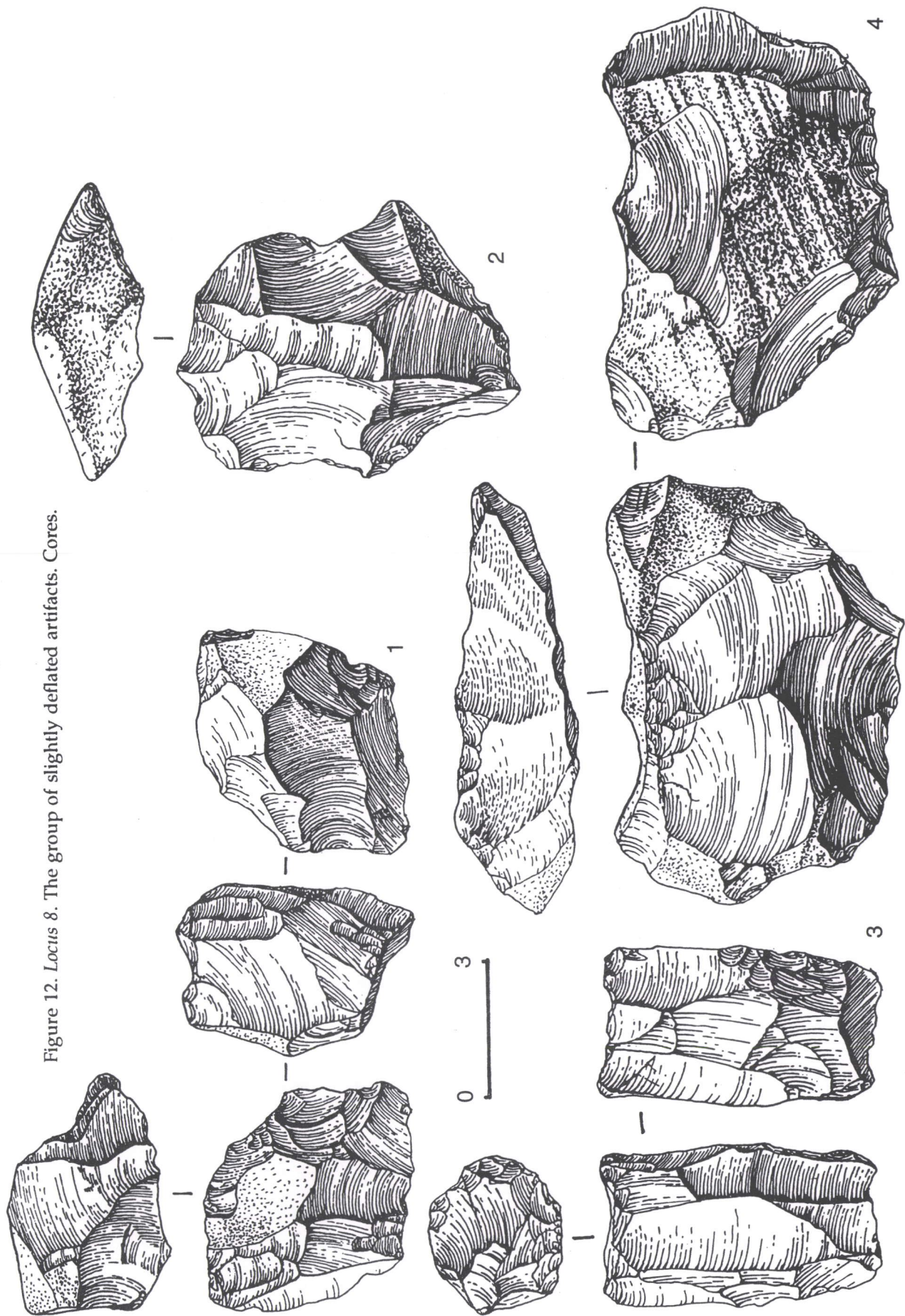


Figure 12. *Locus 8*. The group of slightly deflated artifacts. Cores.

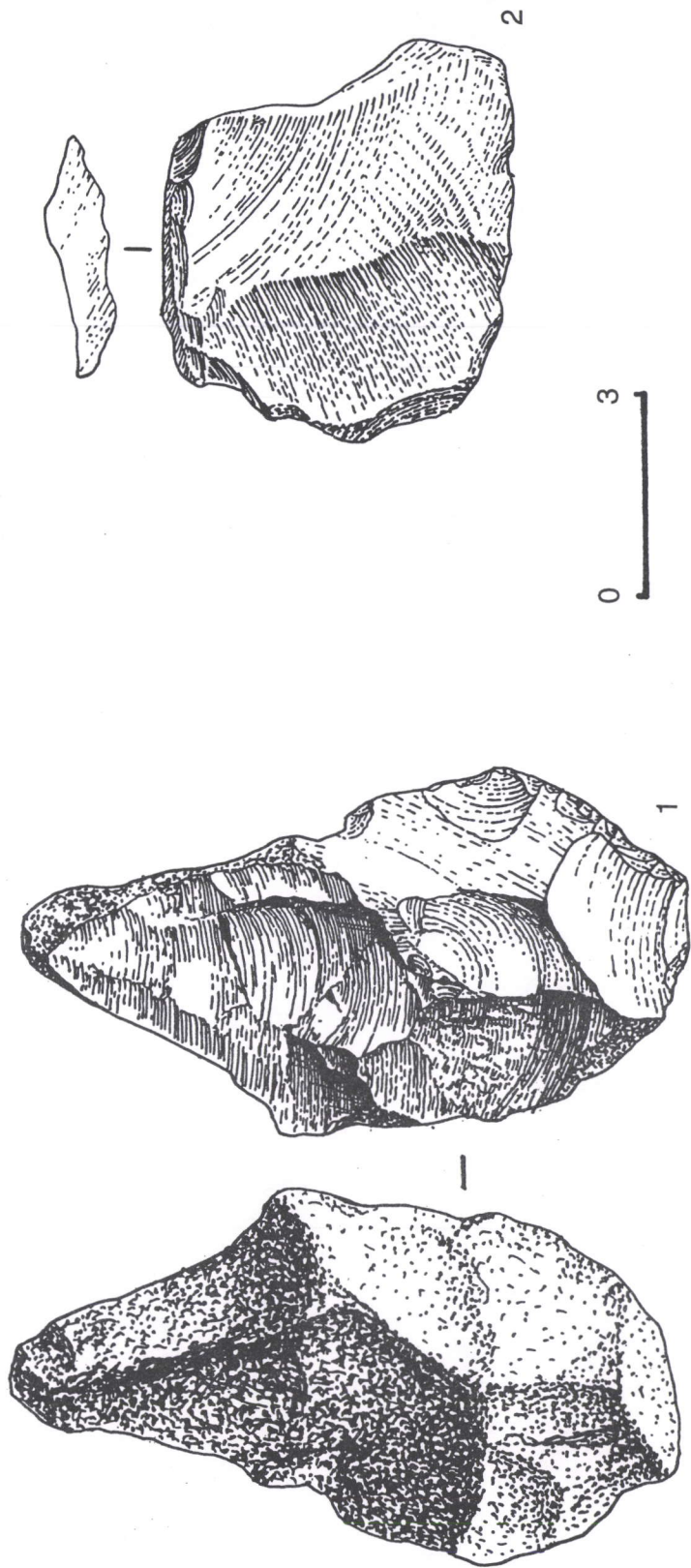


Figure 13. *Locus 9*. 1 - preform of a core (medium extent of deflation); 2 - a flake-blade (heavily deflated).

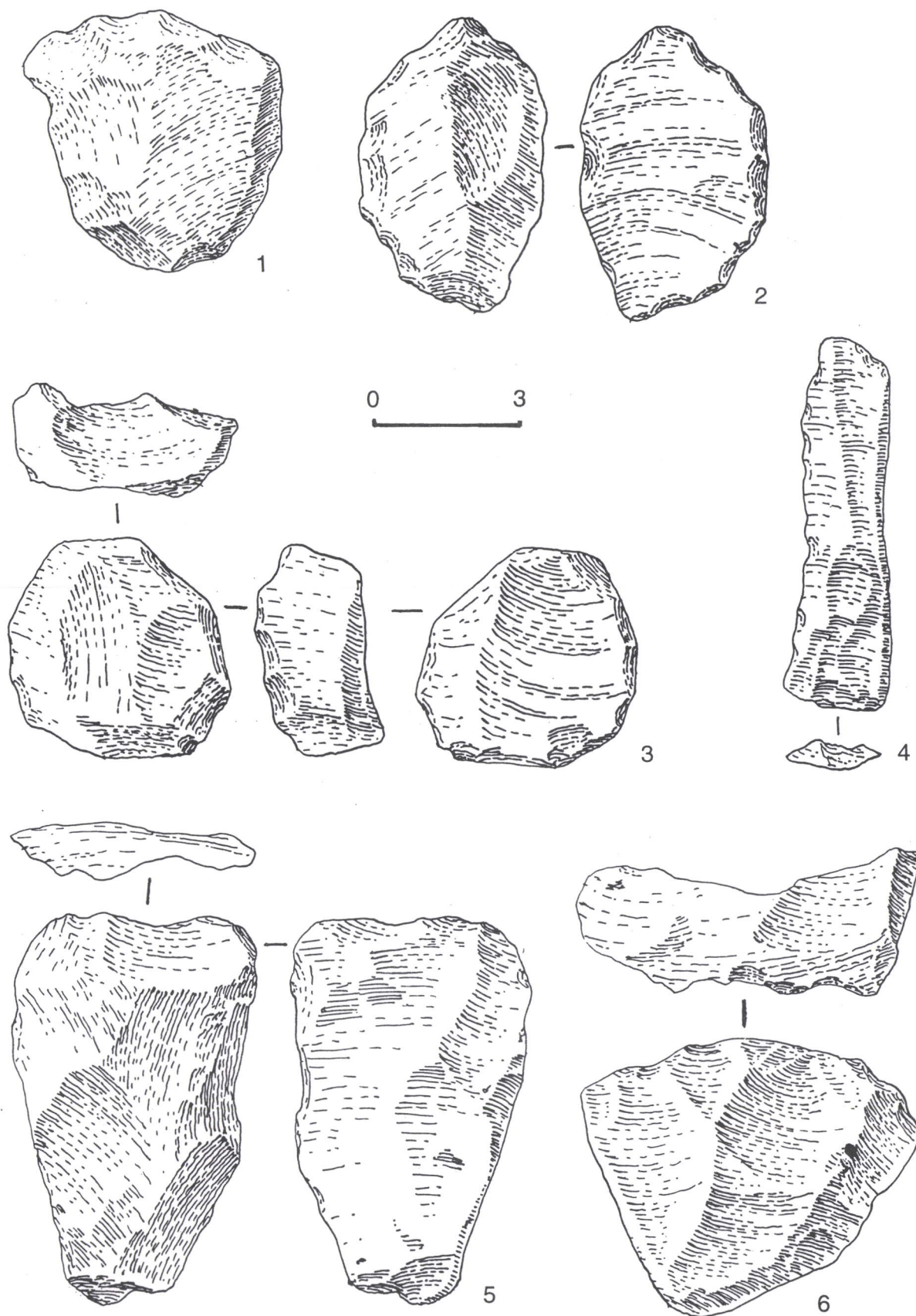


Figure 14. *Locus 10*. The group of heavily deflated artifacts. 1 - tool with a projection; 2 - the Levallois flake; 3, 5 - preforms of cores; 4 - a knife with one thick end; 6 - a core.

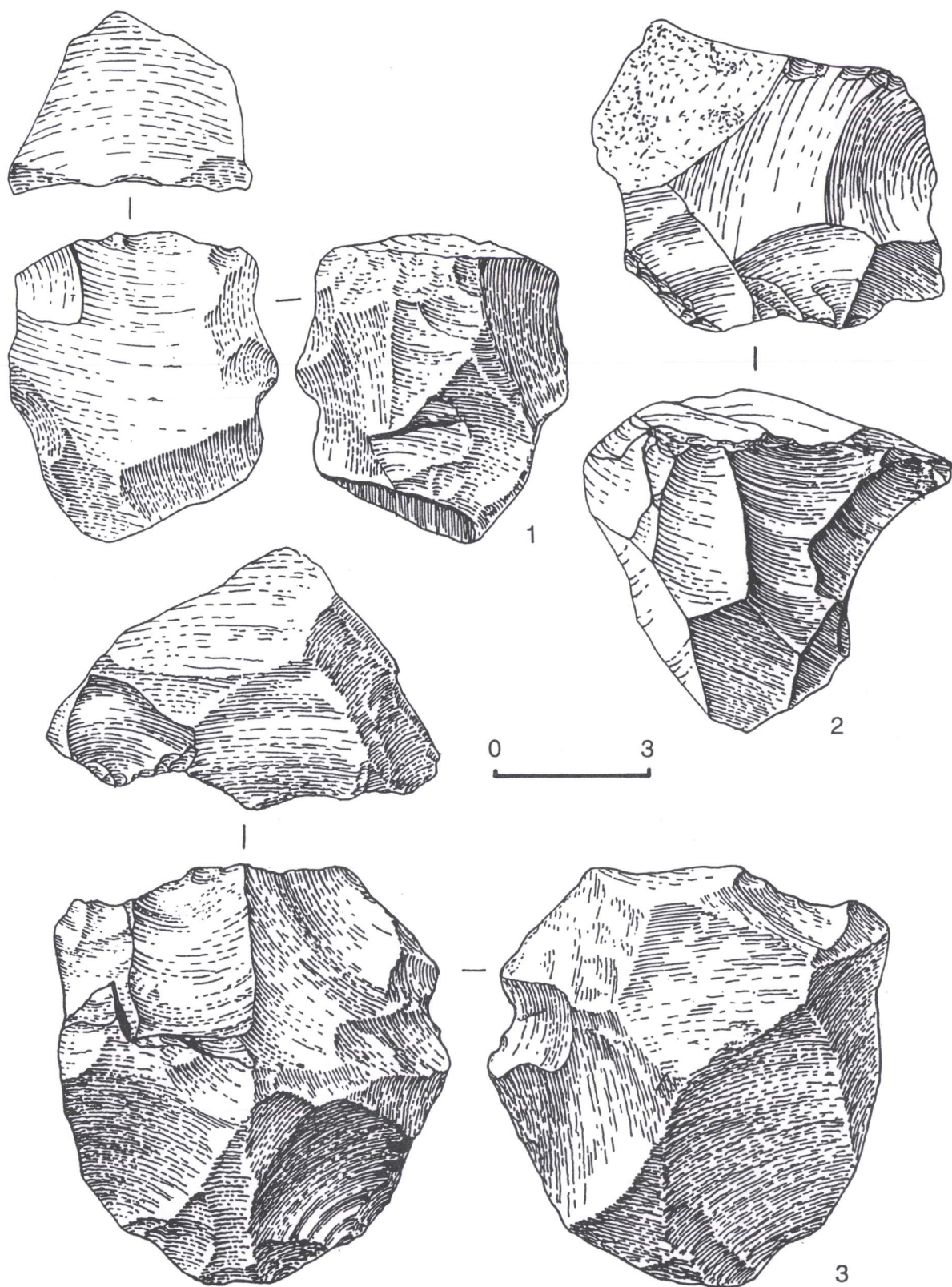


Figure 15. *Locus 10*. The series of artifacts with the medium extent of deflation. Cores.

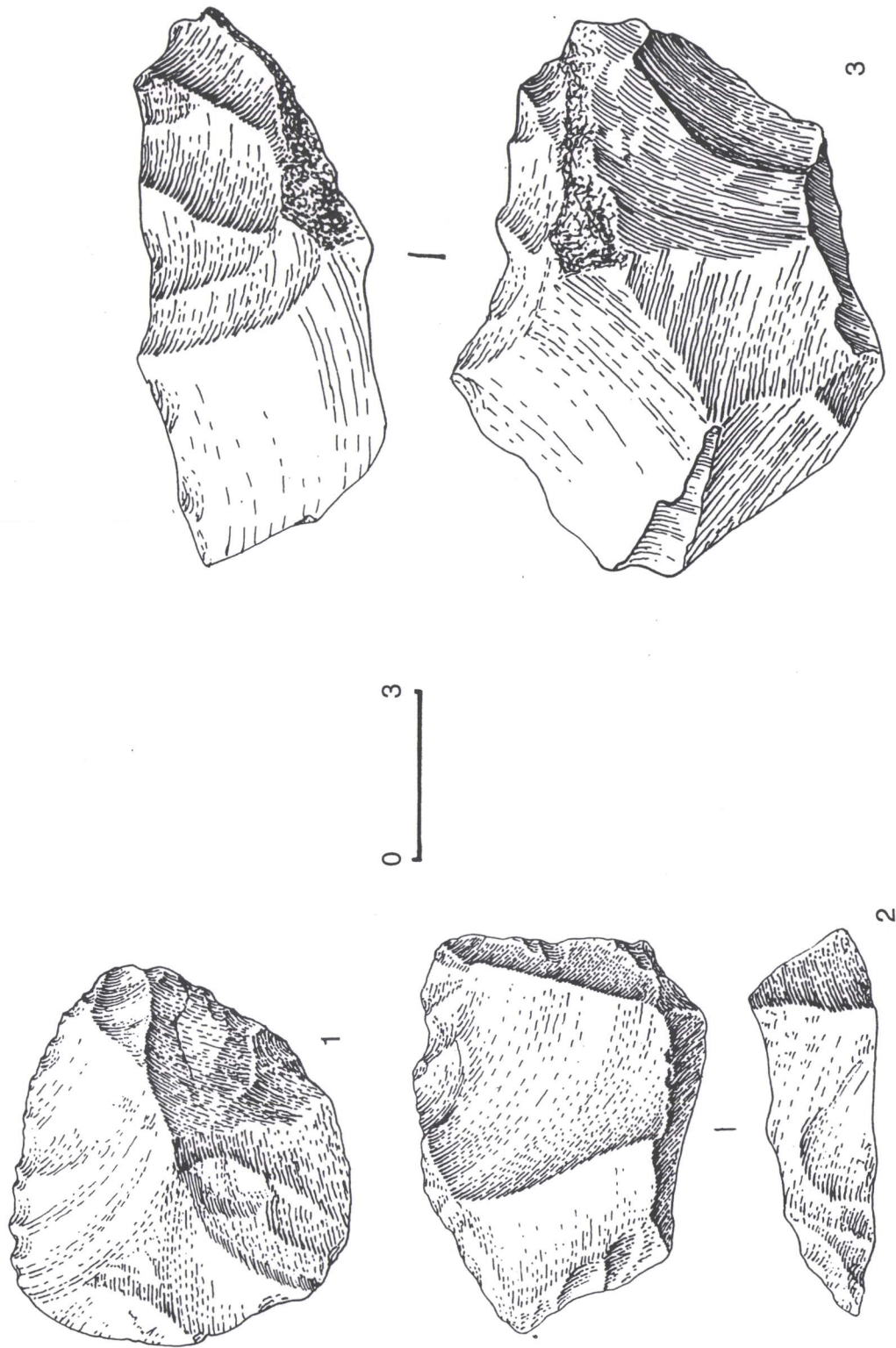


Figure 16. *Locus 10*. The series of artifacts with the medium extent of deflation. 1 - a skreblo; 2, 3 - cores.

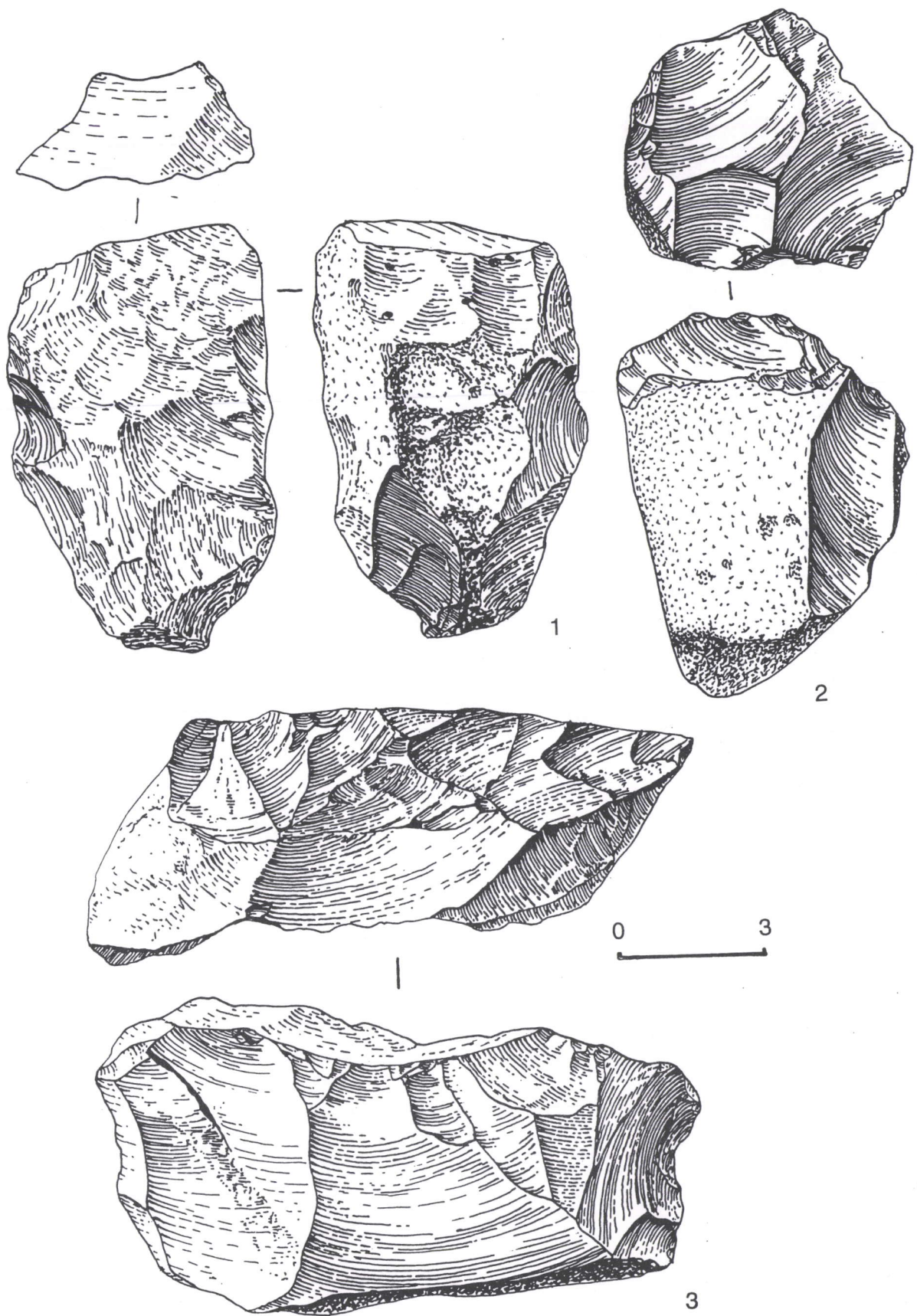


Figure 17. Locus 10. The group of slightly deflated artifacts. Cores.

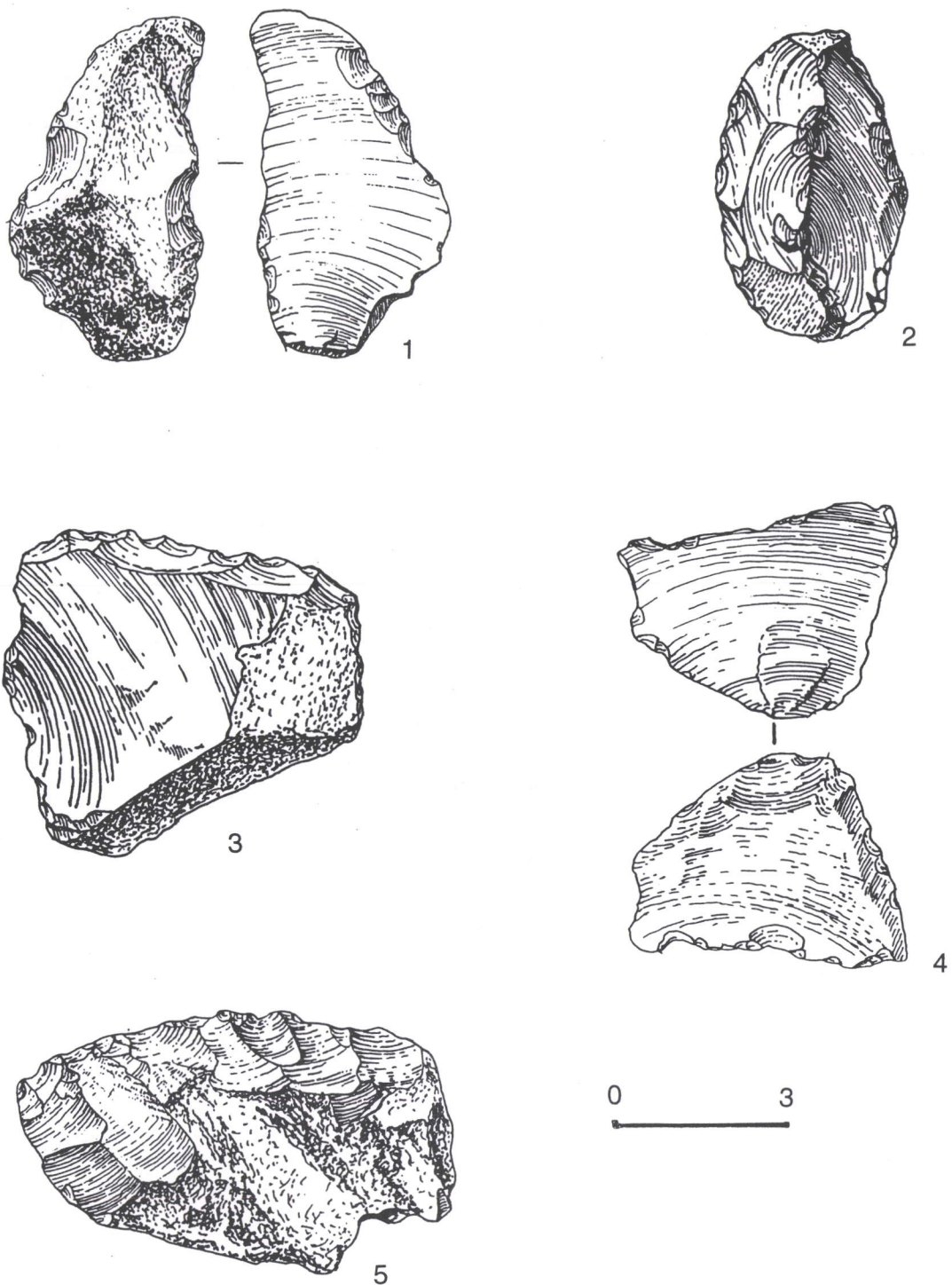


Figure 18. *Locus 10*. The group of slightly deflated artifacts. 1, 2, 4 - notched and denticulated tools; 3, 5 - skreblos.

Table 1. Representation of artifacts in the groups of different extents of deflation.

	Total	Heavy-deflated	Moderate-deflated	Weak-deflated	Number of reused artifacts
Site 7	123	44 (17)	49 (18)	44 (13)	34
Site 8	96	18 (15)	36 (1)	42 (16)	24
Site 9	17	3	4	10	
Site 10	61	18 (6)	21 (1)	22 (7)	10

Notes. The number in brackets indicates the number of reused artifacts. Artifacts having different deflated scars were accounted in several groups.

TABLE 2. Core type distribution according to deflation degree

CORE TYPE	SITE 7			SITE 8			SITE 9			SITE 10			TOTAL
	Heavy-deflated	moderate deflated	weak-deflated	Heavy-deflated	moderate deflated	weak-deflated	Heavy-deflated	moderate deflated	weak-deflated	Heavy-deflated	moderate deflated	weak-deflated	
preform	3	22	4	4	10	13		2	3	7	6	6	80
Levallois flake core	1	11			6	1					5		24
point core	3				2	1							6
blade core	1					1							2
fan-shaped					1	1				1			3
discoid													
monofrontal				1									1
bifrontal				1									1
"citron"										1			1
"from ridge"			2	1									3
monofrontal													
single platform					1								1
double platform			1										1
bifrontal													
single platform			1										1
prismatic						1					1		2
narrow-faced					2	5							7
TOTAL	8	33	8	7	22	23	9	9	9	9	12	9	137

TABLE 3. Tool type distribution according to deflation degree

CORE TYPE	SITE 7			SITE 8			SITE 9			SITE 10			TOTAL
	Heavy-deflated	moderate deflated	weak-deflated	Heavy-deflated	moderate deflated	weak-deflated	Heavy-deflated	moderate deflated	weak-deflated	Heavy-deflated	moderate deflated	weak-deflated	
scrapers													
ordinary		4											
backed				1		1							10
double						1							3
backed knife	1									1			1
biface (knife ?)						1							2
denticulates													1
endscraper						4							15
retouched blade						1							1
retouched flake		1											3
specific tools													1
natural tabulars with scars			2		3					1			3
TOTAL	1	5	9	1	4	8		1		2	3	9	43

Table 4. The heavily deflated complex of finds. Types of cores.

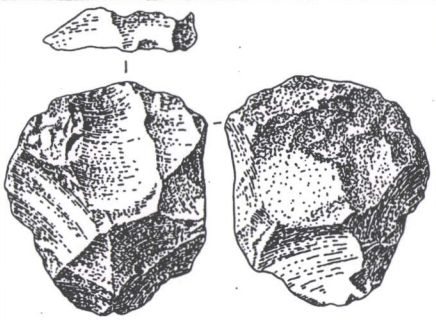
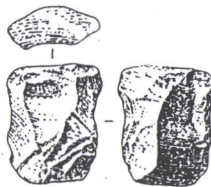
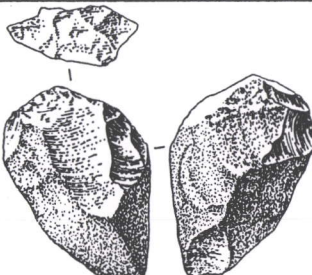
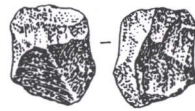
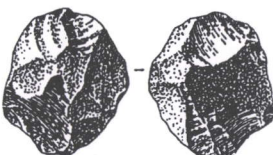
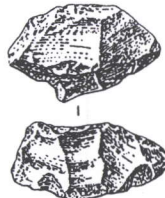
class		cores		
subclass		levallois		
group	centripetal			
	parallel			
shape		ovaloidal	trianguloidal	rectanguloidal
subclass		diskoidal		
group	monofrontal			
	bifrontal			
shape		ovaloidal		rectanguloidal
subclass		"from ridge"		
group	bifrontal side-structured			
shape		ovaloidal		

Table 5. The complex of finds with the medium extent of deflation. Types of cores.

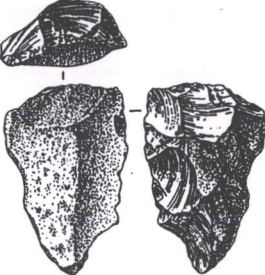
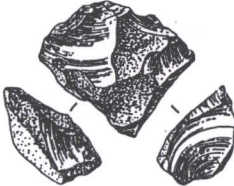
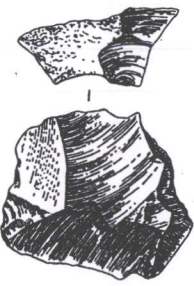
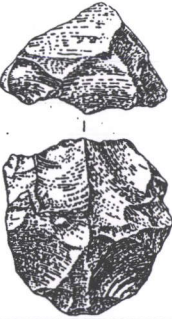
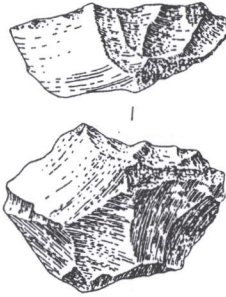
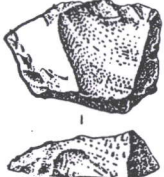
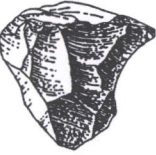
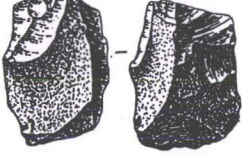
class		cores			
subclass		levallois			
group	with prepared lateral				
	centripetal				
	centripetal side-structured				
	convergent				
shape	trianguloidal	rectanguloidal	rounded	amorphous	
subclass		proto-prismatic			
group	parallel				
	shape	trianguloidal			
subclass		narrow-faced			
group	parallel				
	shape	rectanguloidal			

Table 6. The slightly deflated complex of dins. Types of cores.

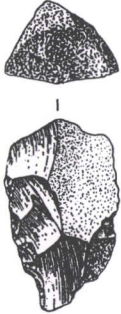
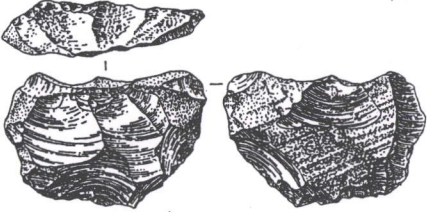
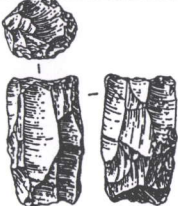
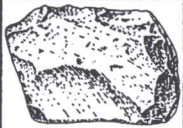
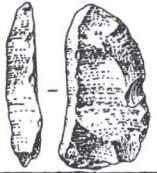




class		cores	
subclass		levallois	
group	with prepared lateral		
	centripetal		
shape		trianguloidal	
subclass		proto-prismatic	
group	side-struck		
	biside-struck		
shape		ovaloidal	rectanguloidal
subclass		prismatic	
group	biparallel		

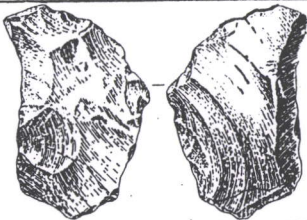
Table 7. The categories of tool-kits. 1 - the heavily deflated complex of finds; 2 - the complex of finds with the medium extent of deflation; 3 - the slightly deflated complex of finds.

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subclass		transversal	
group	dorsal		
	bifacial		
type		backed	

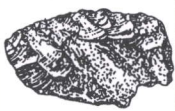

class		knives	
subclass		convex	
group	dorsal		
	bifacial		
type		backed	


1



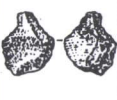


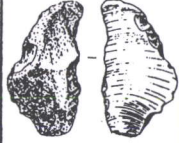
class		scrapers		
subclass		side-scrapers	transversal	convergent
group	dorsal			
	bifacial			
type		backed	backed	ordinary

class		denticulates	
subclass		convex	
group	alternative retouched		
	bifacial		
type		backed	

2

class		scrapers	
subclass		transversal	
group	dorsal		
	bifacial		
type		ordinary	natural back

class		beaks	
subclass		distal	
group	ventral		
	bifacial		
type		base-thinned	

class		denticulates					
subclass		straight		concave		convex	curved
group	dorsal						
	alternative retouched						
type		longitud.	transversal	longitud.	transversal	double	longitudinal

3

