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EARLY PALAEOLITHIC ASSEMBLAGES IN TRAVERTINE, SOUTHERN KAZAKHSTAN (A VARIANT OF AN ADAPTATION MODEL)

ABSTRACT: Palaeolithic sites occurring in travertine and recorded in the Piedmont zone of Central Asia as well as in some other regions of Eurasia, probably represent a specific adaptation by ancient humans to the local environment. The industrial complexes at the sites have a distinctive micro-industrial character that may be used as evidence that a major area of identical Early Palaeolithic cultures existed on the vast continent of Eurasia.

KEY WORDS: Kazakhstan – Travertine Palaeolithic – Micro-industries

A series of Palaeolithic sites of specific character located near ascension springs (fountains) have been discovered in western Central Asia (Uzbekistan, Kazakhstan). Kutur Bulak, Kulbulak, Koshkurgan I, II, Shoktas I–III sites should be mentioned as examples. Proceeding from this situation, all these multilayered sites may be defined as "fountainal". These sites can be distinguished by the presence or absence of travertine formations. Following V.A. Ranov who suggested the term "loess Palaeolithic" for the specific Early Palaeolithic sites recorded in loess sections of Tajikistan, the term "travertine Palaeolithic" should probably be applied to the sites located in travertine (Koshkurgan, Shoktas), especially as sites of this kind are known in some other regions as well. Vértesszölös in Hungary (Kretzoi, Dobosi 1990), Bilzingsleben in Germany (Mania, Weber 1986) and Isernia La Pineta in Italy should be mentioned among these.

The presence of the "fountainal" sites in Central Asia and some other regions supposedly serves as evidence of specific environmental conditions, under which activities of Early Palaeolithic people in the zone of piedmont plains were concentrated near sources of freshwater.

The Kulbulak site, located in the Akhangaron River Basin (Uzbekistan) and during two decades investigated by M. R. Kasymov, is one of the well-known sites of this kind. The extent of the deposits containing archaeological remains is 8 m. Forty-nine cultural layers have been identified within them: Acheulian (IL–XXIV), Mousterian (XXIII–IV) and Late Palaeolithic (III–I) culture bearing horizons. The earliest strata are referred to Ql. Two important points stressed by M.R. Kasymov should be noted: 1) the specific character of the Kulbulak industry, if compared with the known Acheulian and Mousterian collections of western Central Asia and Kazakhstan, which are reflected by terms "notched/denticulated complexes" and the "Tayacian forms"; 2) the stable character of the Kulbulak industry through the time, that is, in terms of industry, Acheulian and Mousterian layers demonstrate one and the same line of evolution.

The industrial complexes obtained at Koshkurgan I, II and Shoktas I–III sites exhibit some similarities to the Kulbulak collections by many parameters, though there are some manifestations of their specific character too.

Presently, in the Koshkurgan region, on the area of

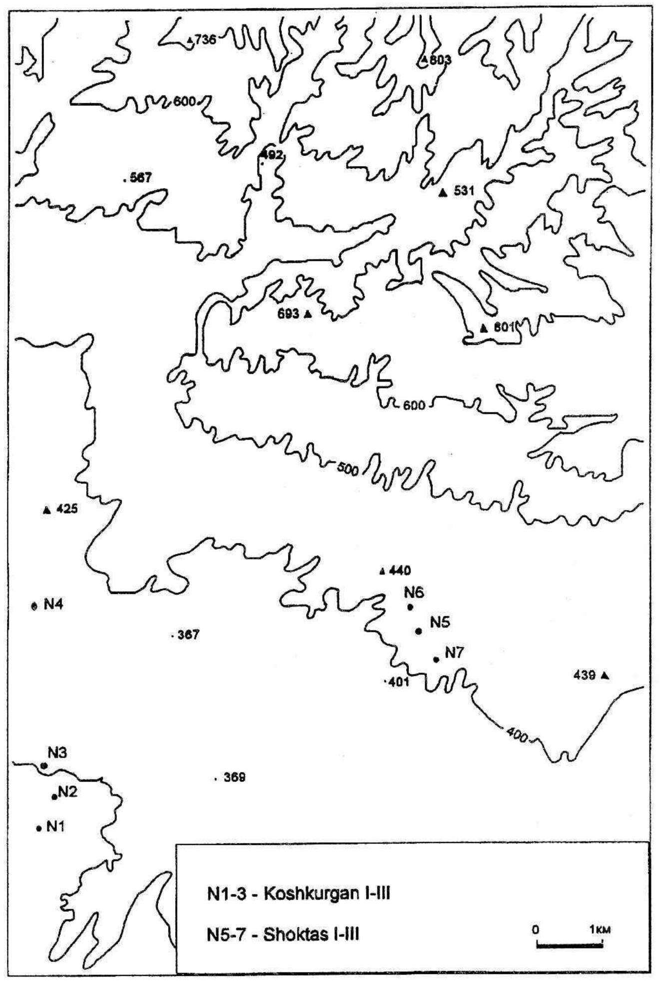

FIGURE 1. Map indicating sites in travertine on the piedmont plain of the Karatau Range.

about one hundred square kilometers, seven springs surrounded by travertine have been found: three loci near the village of Koshkurgan, three loci near the village of Shoktas and one locus north of Kotyrbulak village. The sites are situated in the Turkestan Region of the Chimkent Province, the Republic of Kazakhstan, on the piedmont plain, between the south-western slope of the Karatau range (the south-western margin of the Tien Shan) and the Syr Daria River. This region is characterised by the arid conditions of central Asia that are determined by the proximity of the Kyzyl Kum desert. The relief of the piedmont plain of the Karatau range (elevation 450–250 meters above sea level) is of denudation/accumulative character, with weathered surface and isolated erosion remnants of Cretaceous and Neogene rocks at watersheds and Quaternary/Holocene accumulations in local depressions *(Figure 1)*.

Summing up the geomorphological observations, the region under study may be subdivided into two complexes of morphological features. The first one is a complex of arid/denudation low hills of the Karatau range and small knolls of peneplained heights formed by the desquamation processes of areal and linear drift, as well as by deflation and erosion caused by the seasonal river system. A complex of denudation/accumulative inclined piedmont plain belongs to the second complex of morphological features. Closer to the mountains, pebble and loam accumulations resulting from snow-melt and warm summer rains occur. Non-laminar and non-graded horizons of dejection with pebbles, breakstone and fine adjoin outcrops or overlie them. In some places they are cut down by erosional processes with subsequent deposition of well-rounded

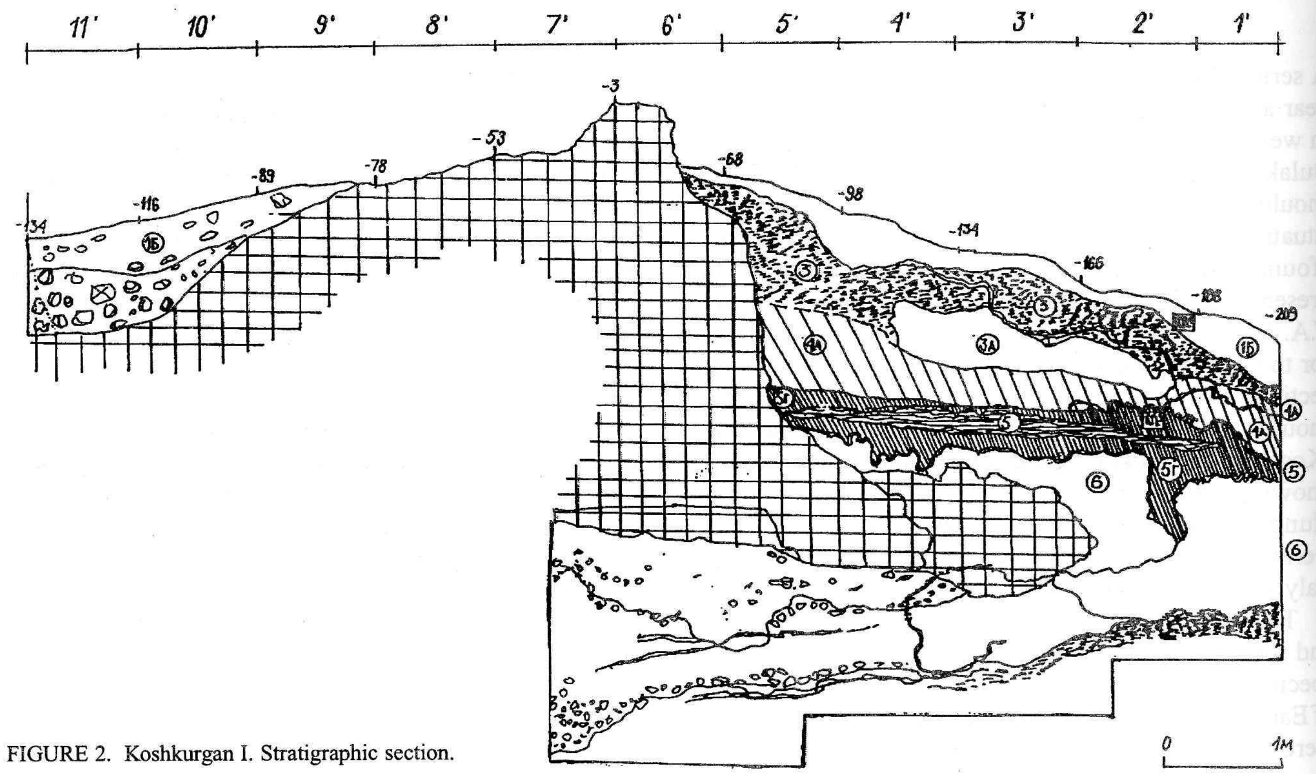

FIGURE 2. Koshkurgan I. Stratigraphic section.

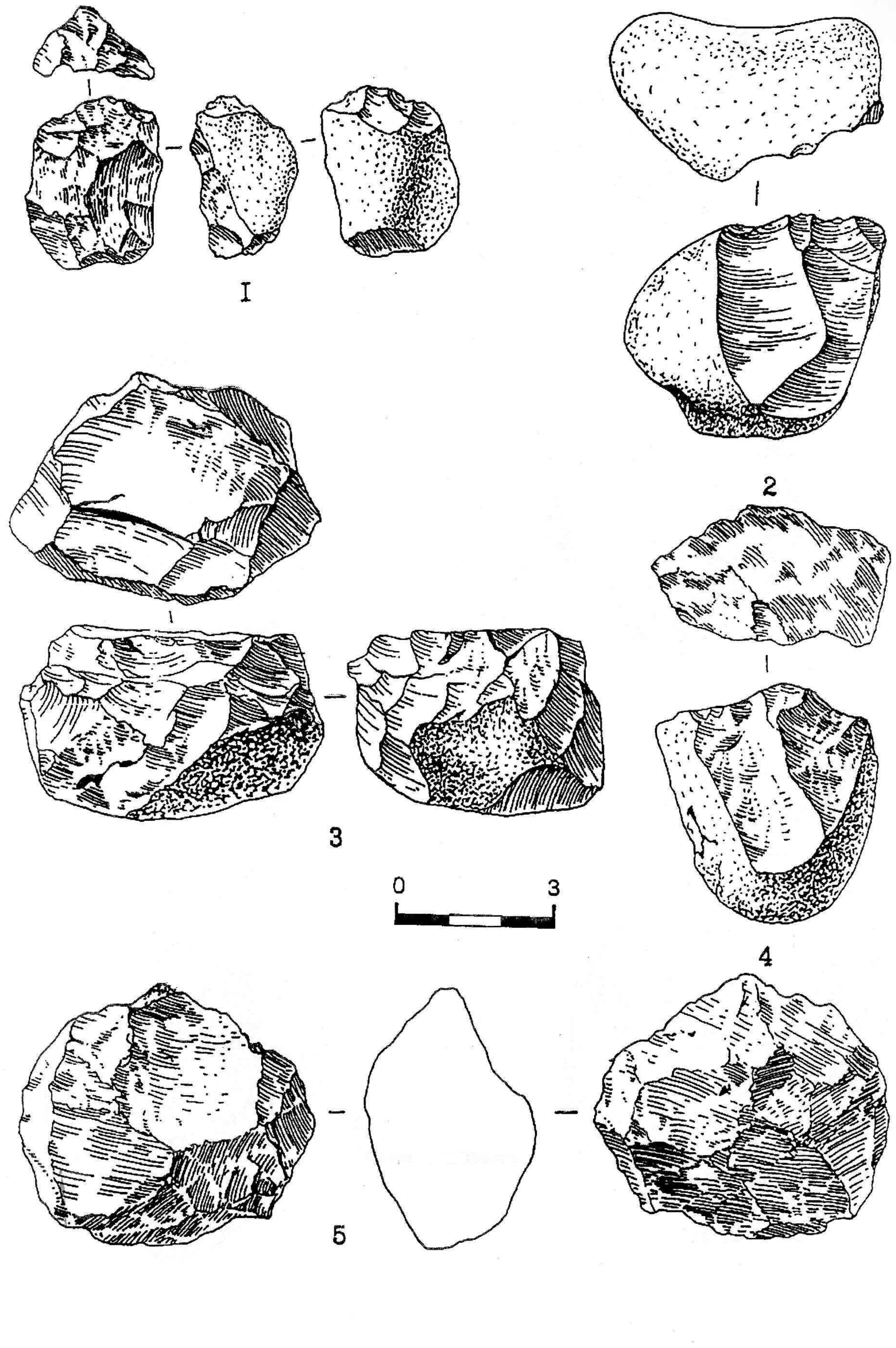

FIGURE 3. Koshkurgan I. Lithic inventory. Cores.

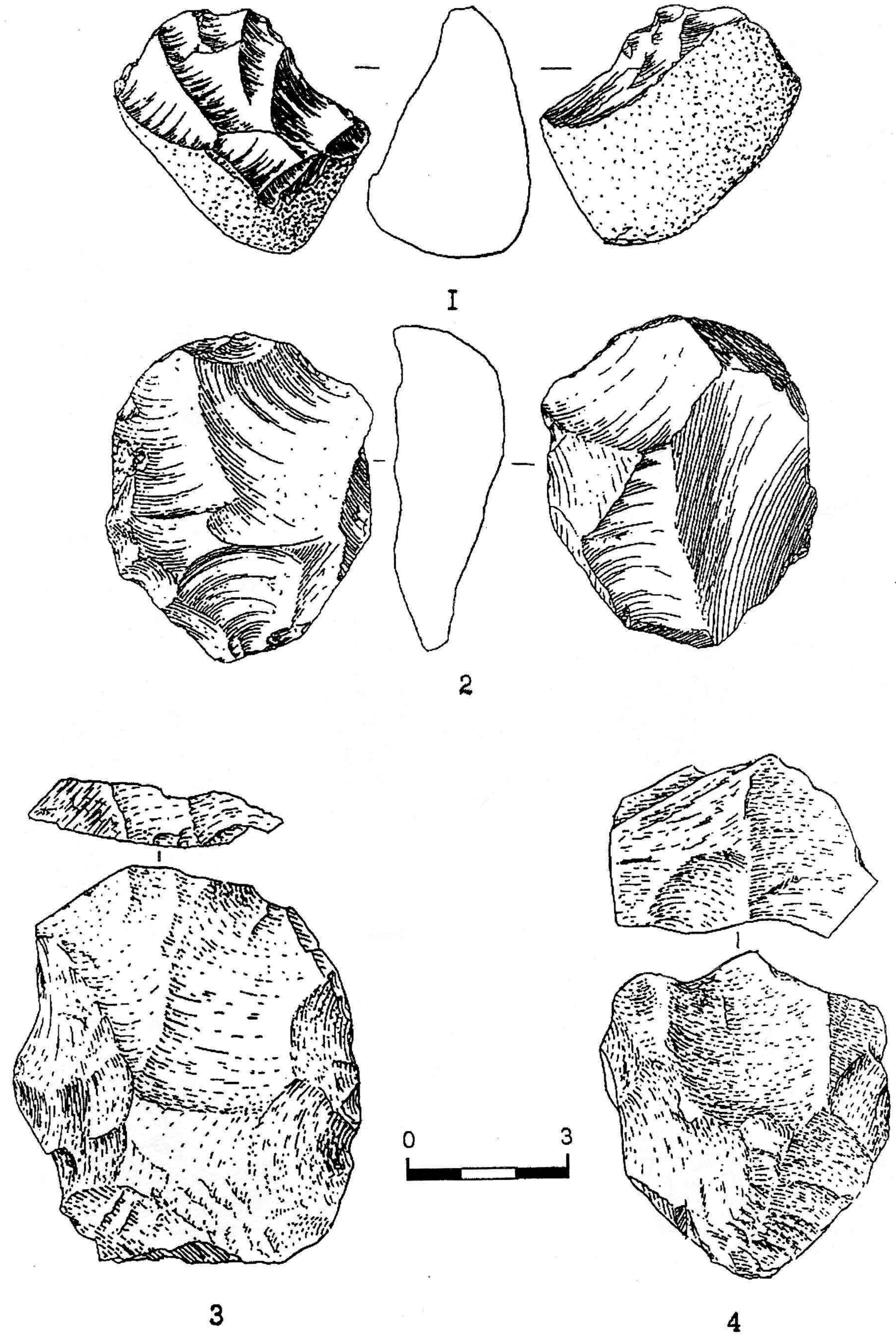

FIGURE 4. Koshkurgan I. Lithic inventory. Cores.

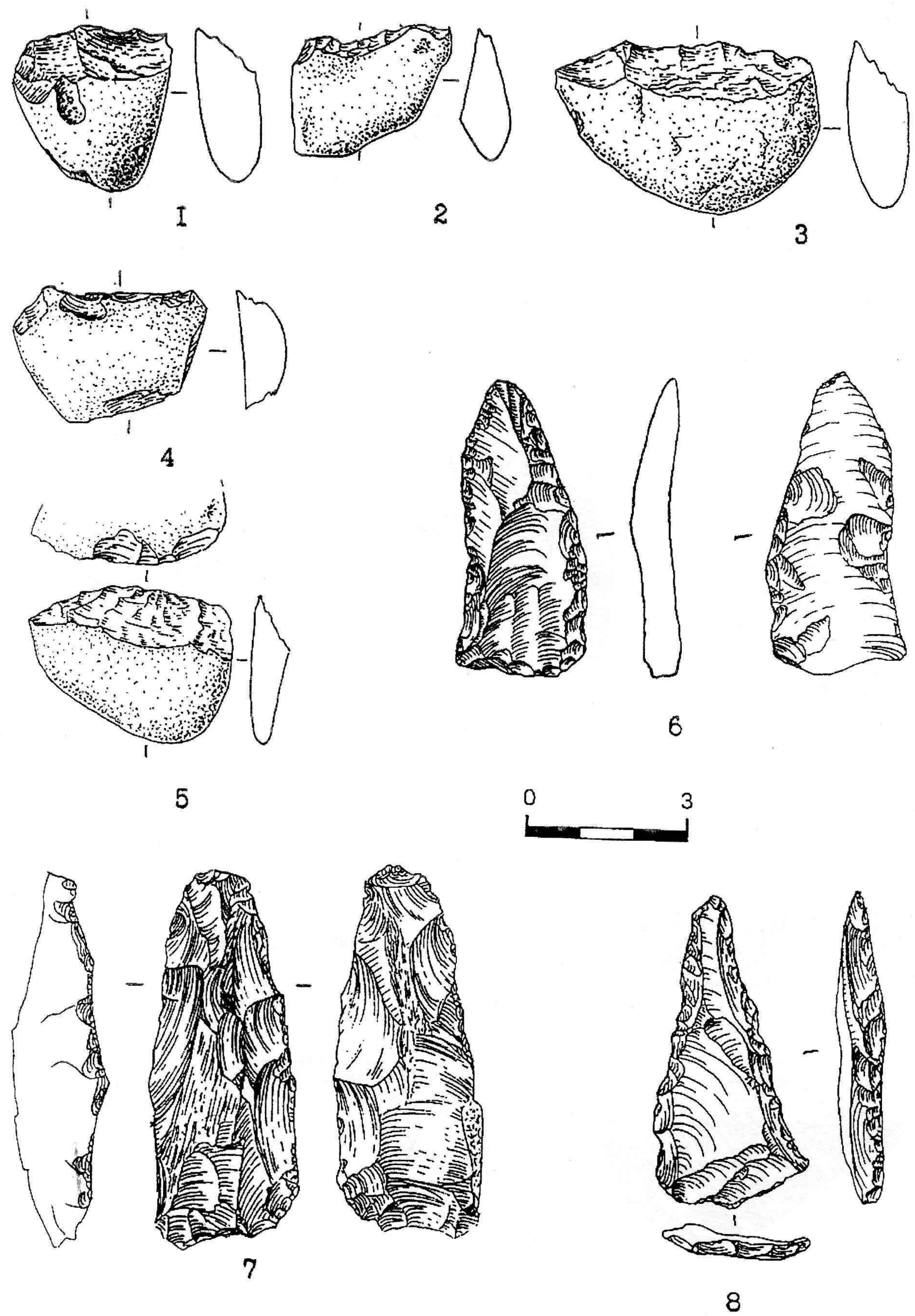

FIGURE 5. Koshkurgan I. Lithic inventory. Tools.

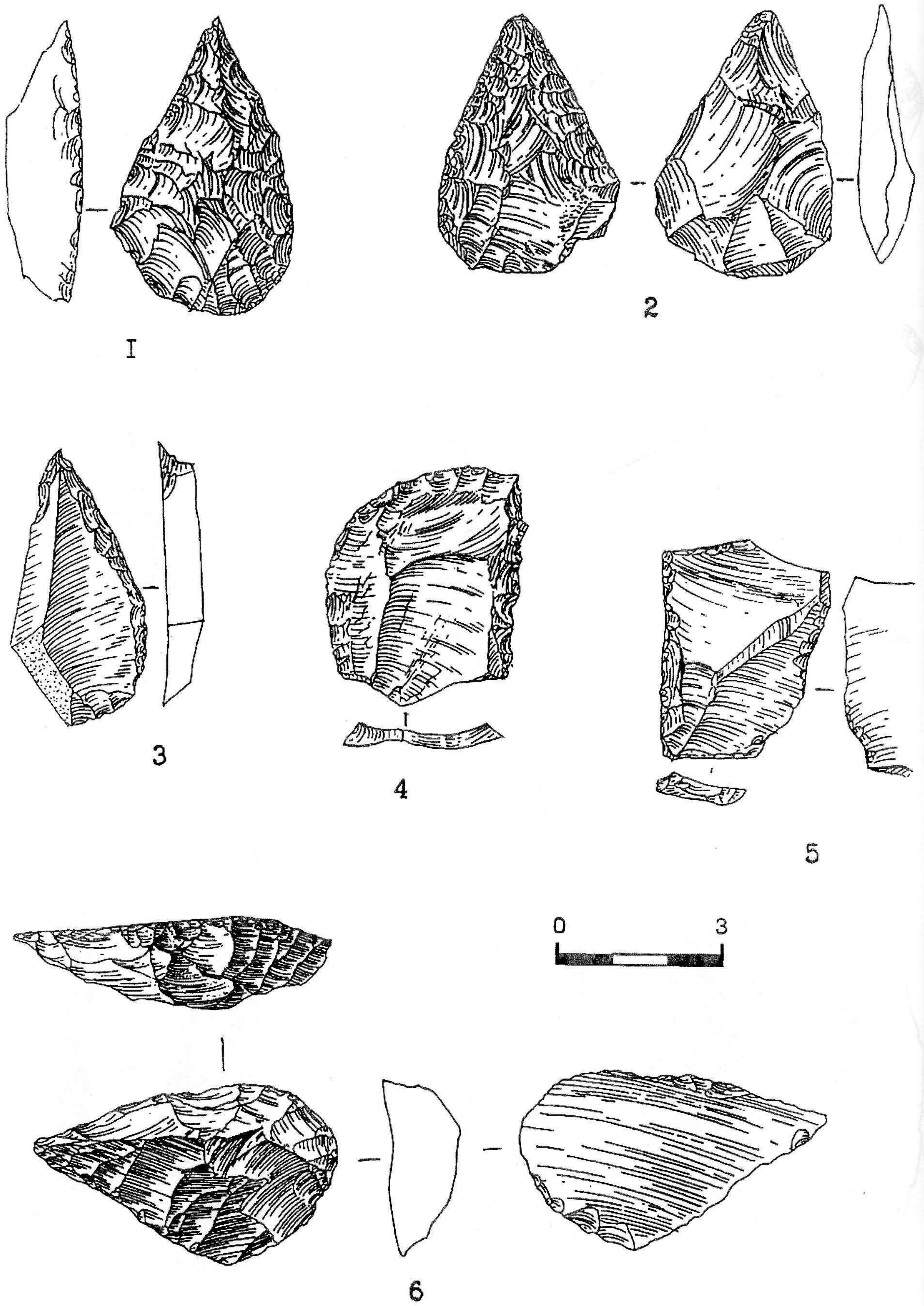

FIGURE 6. Koshkurgan I. Lithic inventory. Tools.

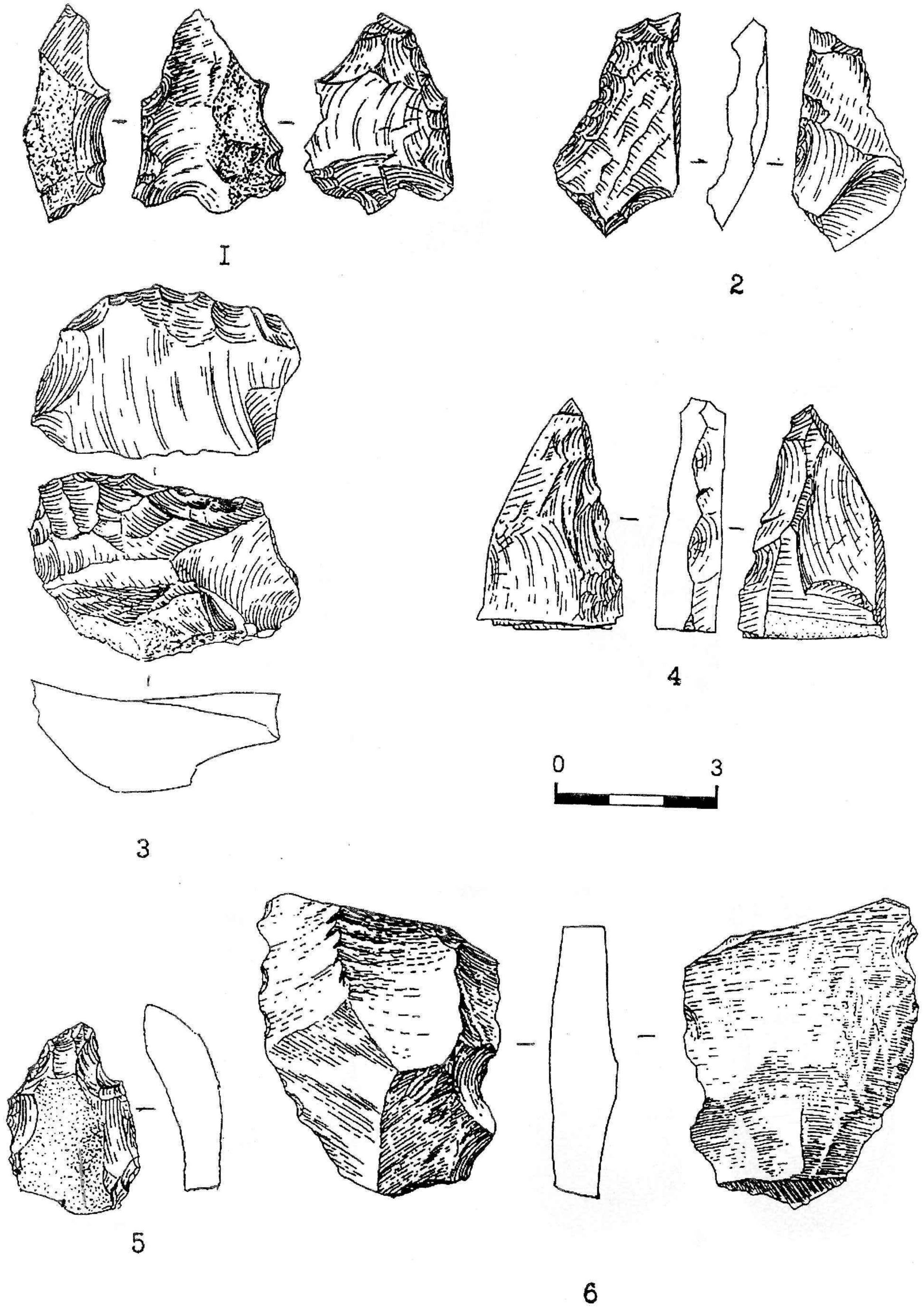

FIGURE 7. Koshkurgan I. Lithic inventory. Tools.

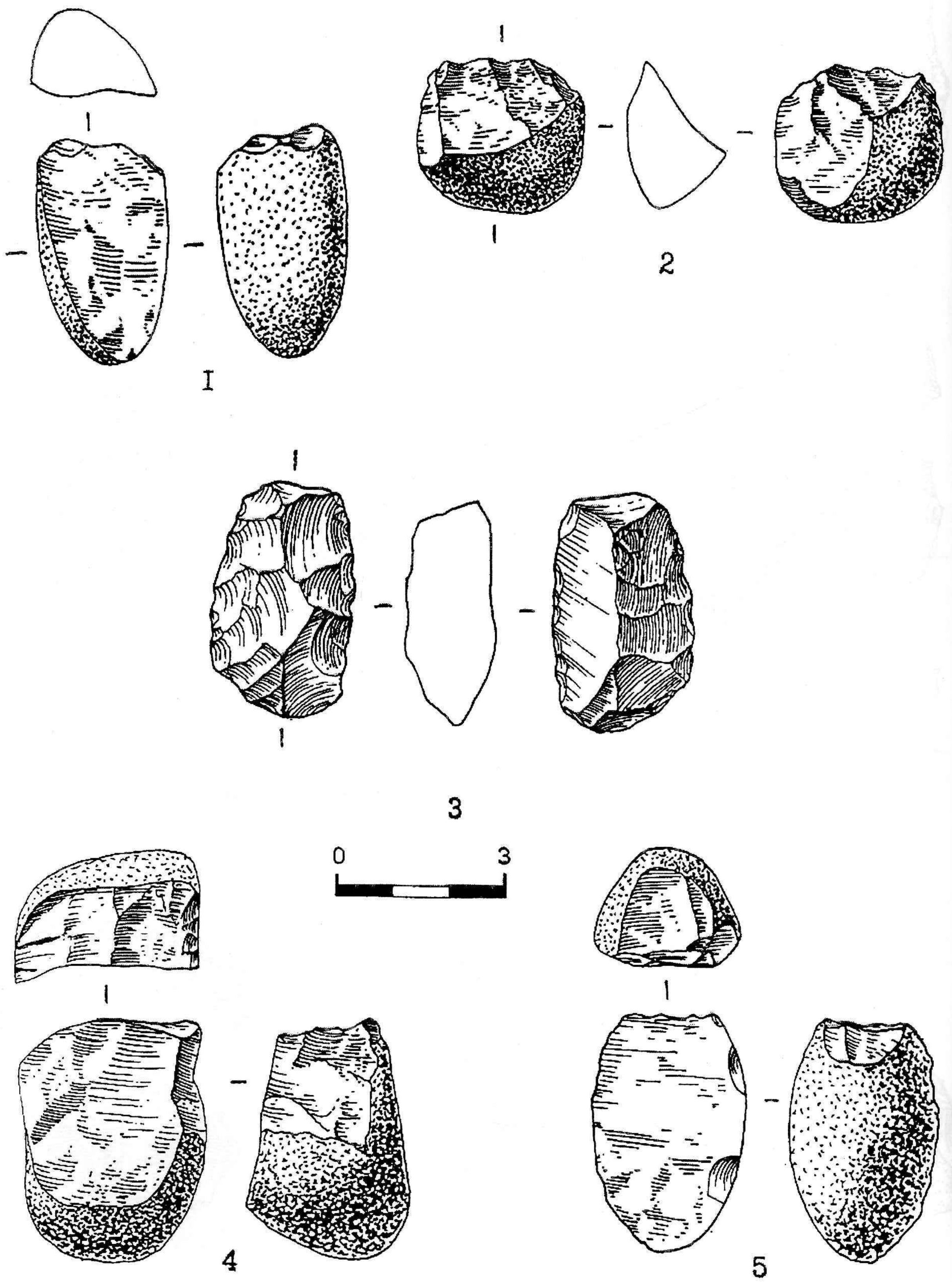

FIGURE 8. Koshkurgan II. Lithic inventory. Cores.

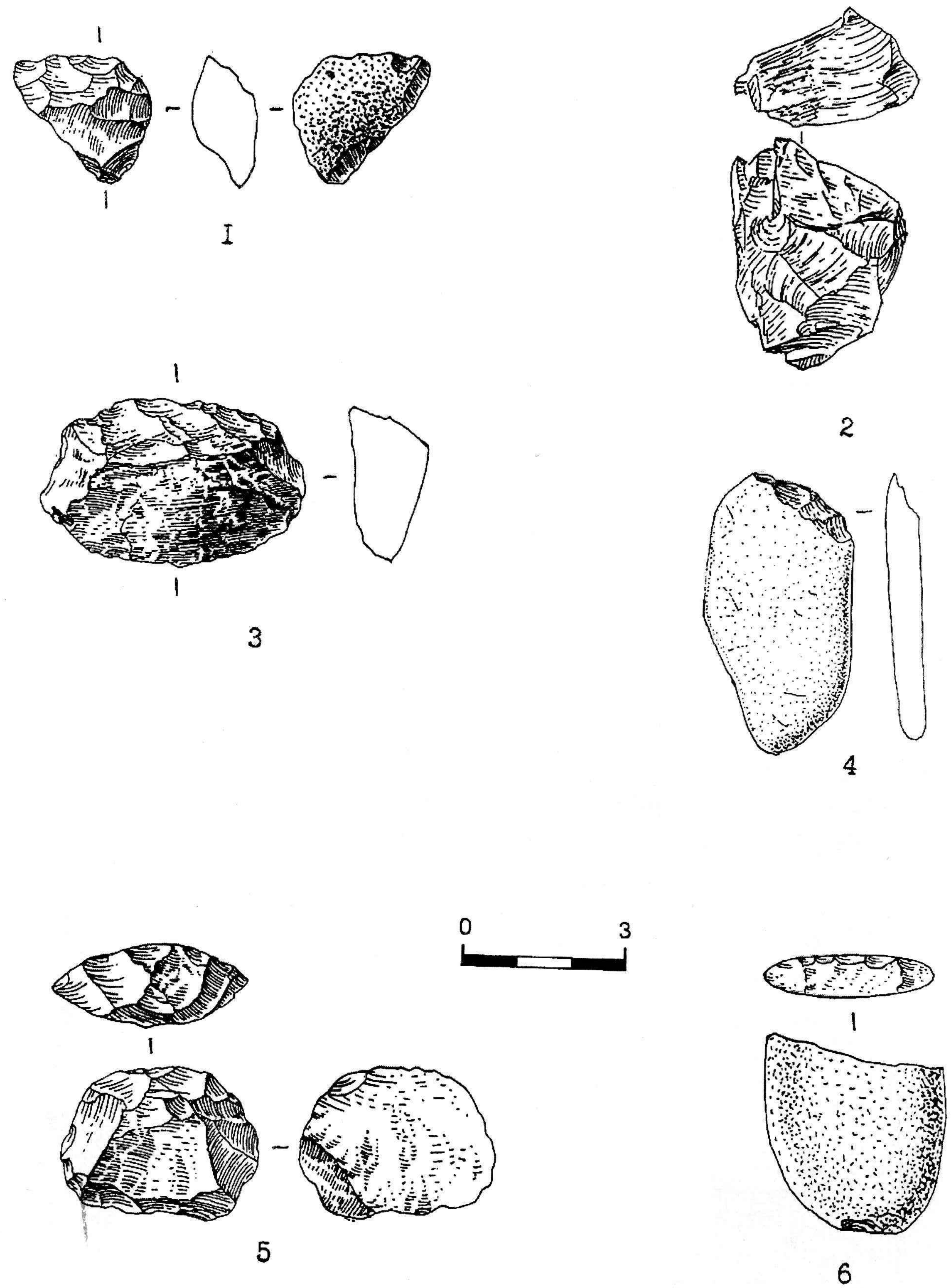

FIGURE 9. Koshkurgan II. Lithic inventory. Tools.

pebbles, gravel or sand of the channel facies. Off the mountains, the sediments are getting more and more fine-grained, up to loamy. In some places they are overlain by morphological features of the aeolian loess cover controlled by very abundant vegetation. Proluvial sediments of seasonal watercourses, in addition to piedmont detritus, are mixed with abundant redeposited aeolian material and accumulations of perennial springs fed by groundwater. Filtration abilities of proluvial sediments are so little that even in small drainage basins the proluvium is of large extent often facially passing into lacustrine deposits. Finally, the calmer and longer is the seasonal or annual drainage of piedmont rivers and springs, the more evident are the traits of typical alluvial morphological features.

In the course if the investigations at Koshkurgan I site, two interperpendicular profiles have been made, with one of them crossing the travertine ring *(Figure 2)*. In the profiles, aleurites of bluish-greenish-grey colour occur. They are non-laminar, often with stains of iron hydroxides. This layer was deposited due to the activity of the ascension spring (griffon). It is overlain by the lower portion of travertine. Travertines differ by mechanical characteristics (firmness of cementation). In their lower part, they are weakly cemented, though firmly cemented areas are present. The process of their accumulation proceeded with short intervals, which is proved by the presence of a bed composed of clay and sand. This bed was formed when the griffons, due to some slackening of their activity, brought out clay material and probably gushed out below the ground level, and thus the acting griffons became small reservoirs.

Six stages of travertine formation have been tentatively identified in the ascension spring of Koshkurgan. In all appearances, there was an earlier stage during which a travertine of different kind was formed. This travertine comprises early Pleistocene fauna and artifacts. Several travertine samples with travertine of quite different appearance come from a sand lens. Bones and artifacts are incorporated into these travertine samples. If the more recent travertine was formed due to precipitation of carbonates from water solution, the artifacts bearing travertine was formed by impregnation of sandy/loamy

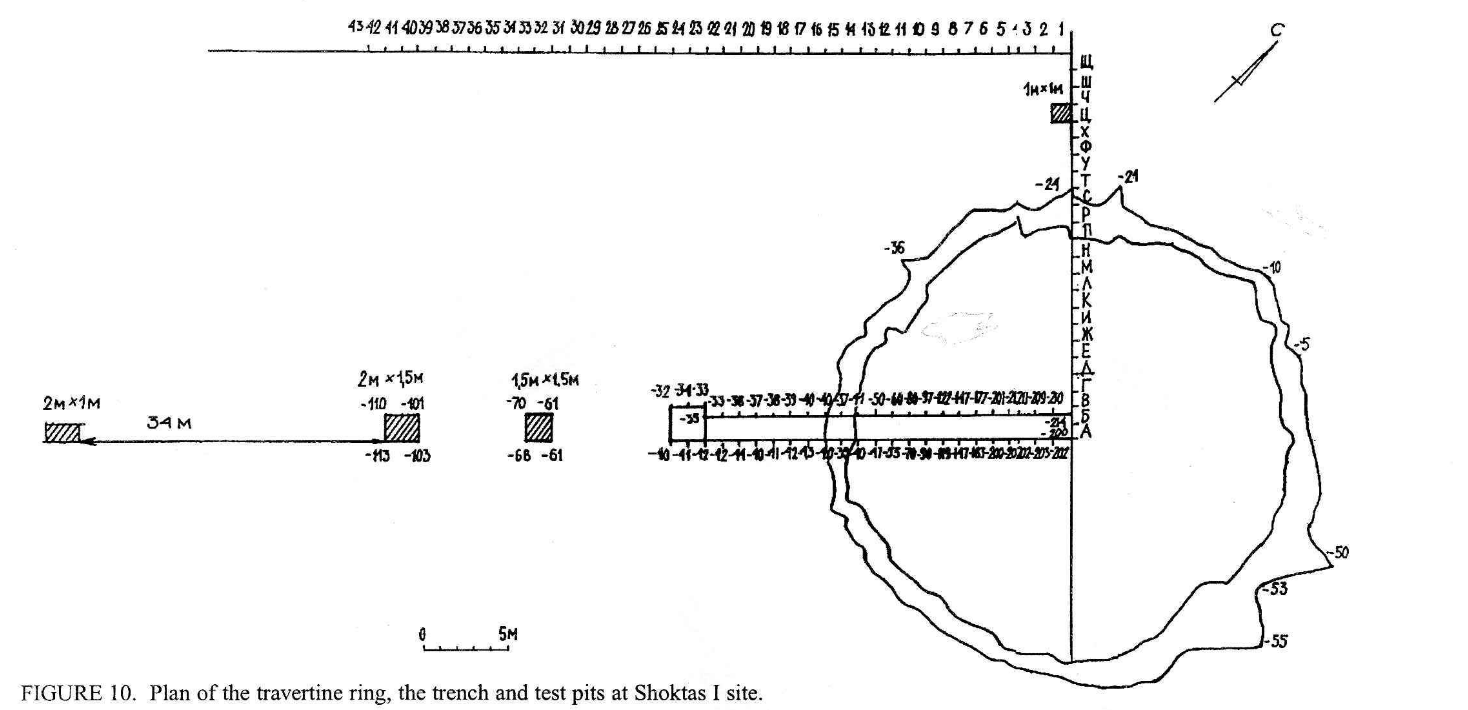

FIGURE 10. Plan of the travertine ring, the trench and test pits at Shoktas I site.

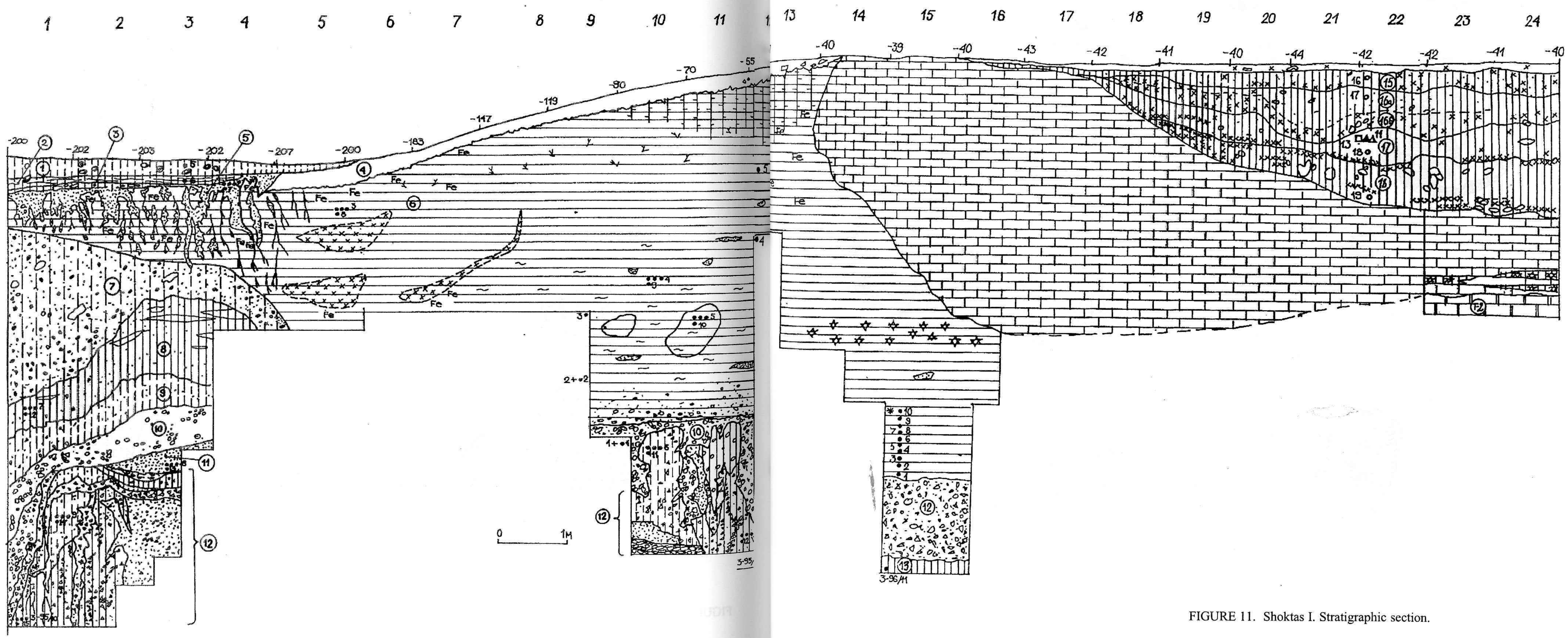

FIGURE 11. Shoktas I. Stratigraphic section.

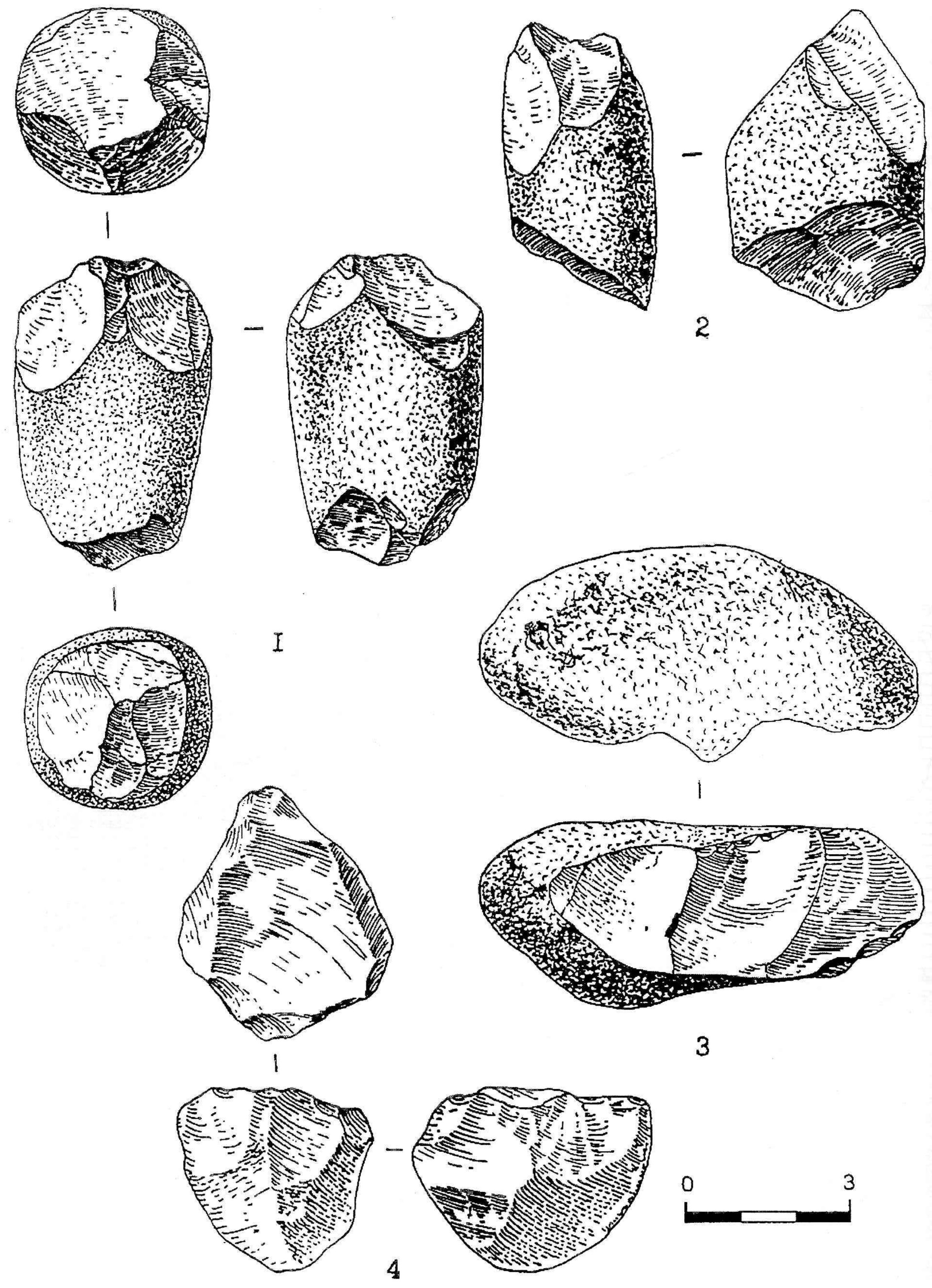

FIGURE 12. Shoktas I. Lithic inventory from horizons 20–26. Cores.

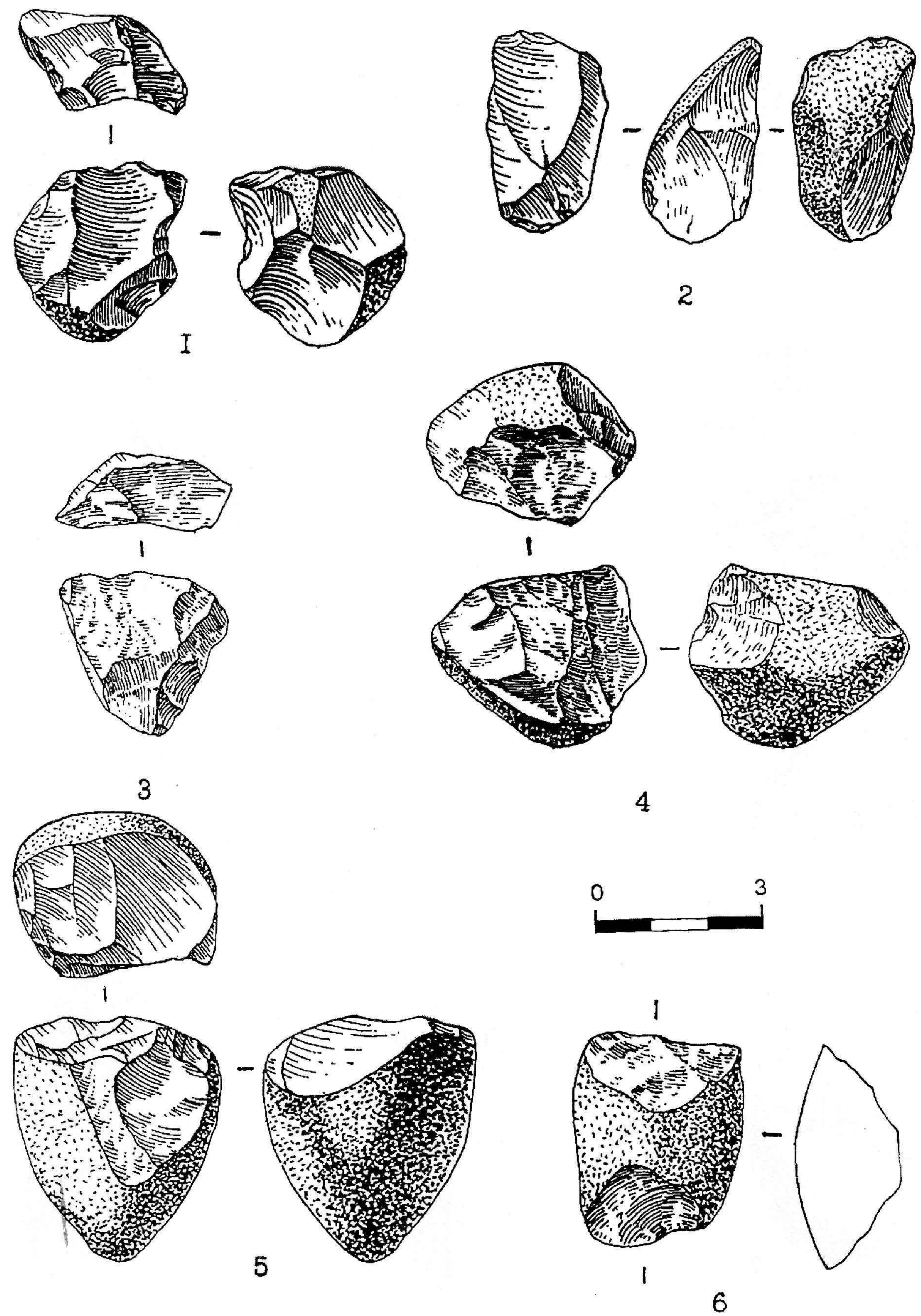

FIGURE 13. Shoktas I. Lithic inventory from horizons 20–26. Cores.

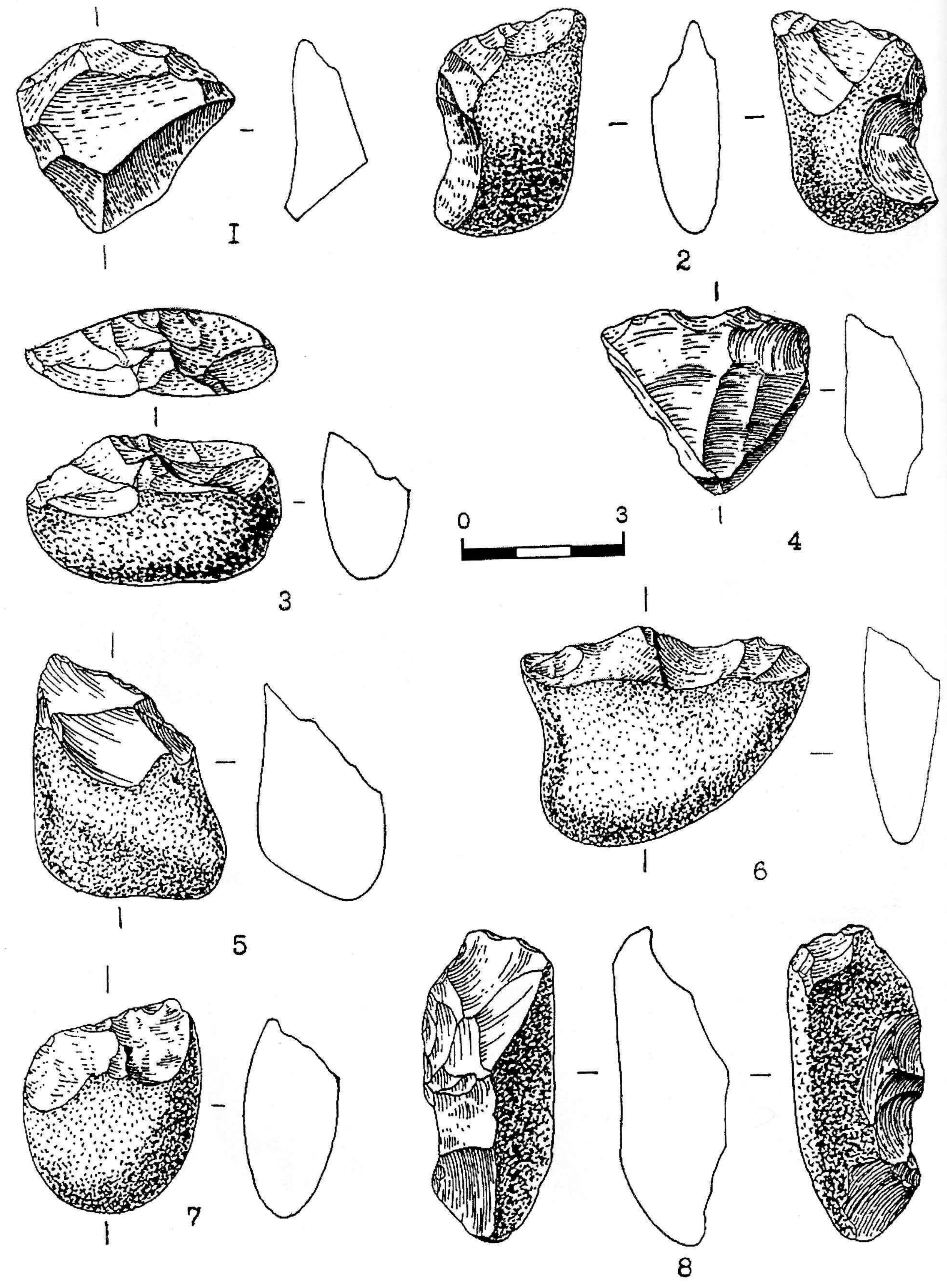

FIGURE 14. Shoktas I. Lithic inventory from horizons 20–26, sections 1 and 2. Tools.

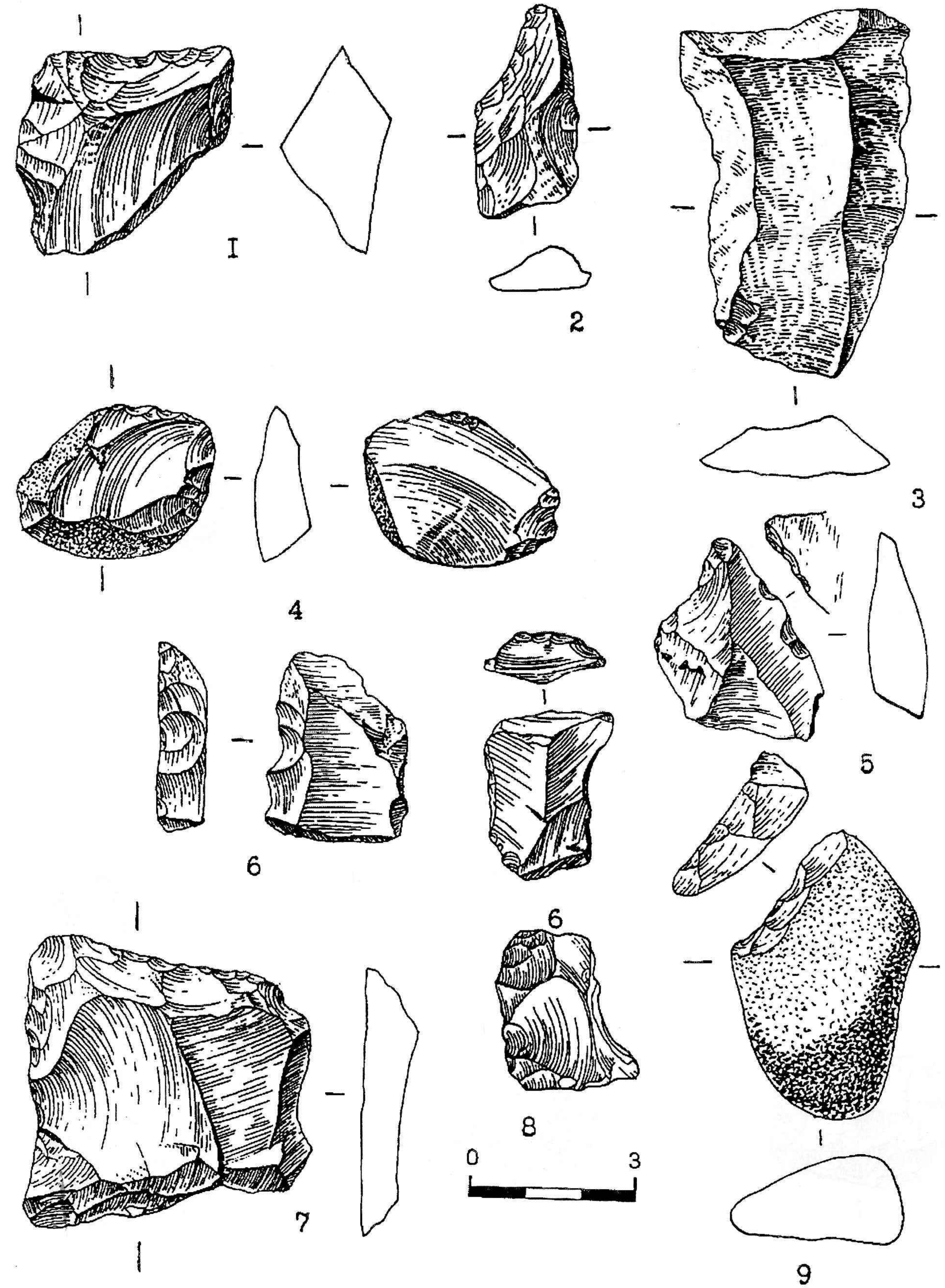

FIGURE 15. Shoktas I. Lithic inventory from horizons 20–26, sections 1 and 2.

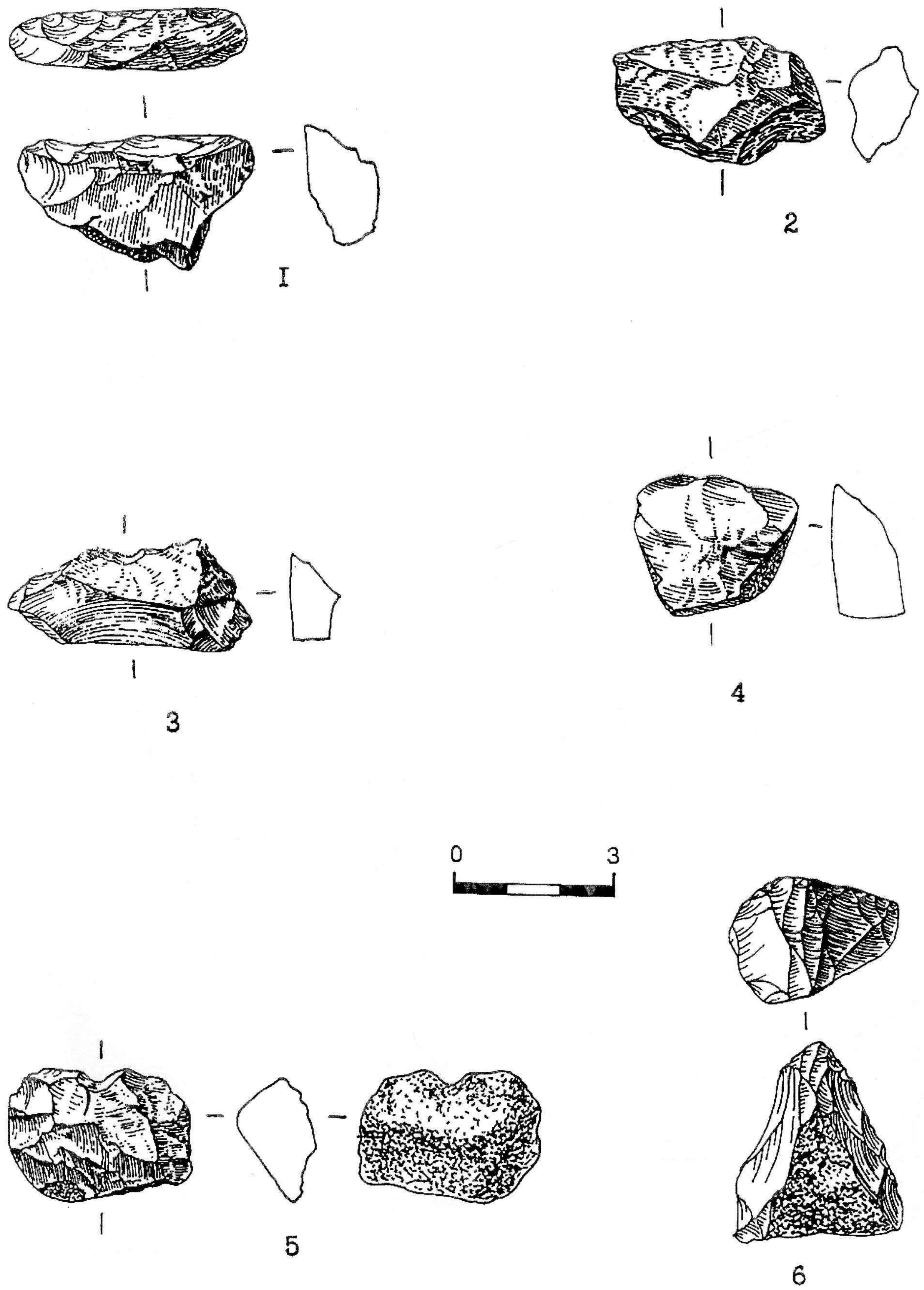

FIGURE 16. Shoktas I. Lithic inventory, sections 14 and 15, depth 400–420 cm. Cores.

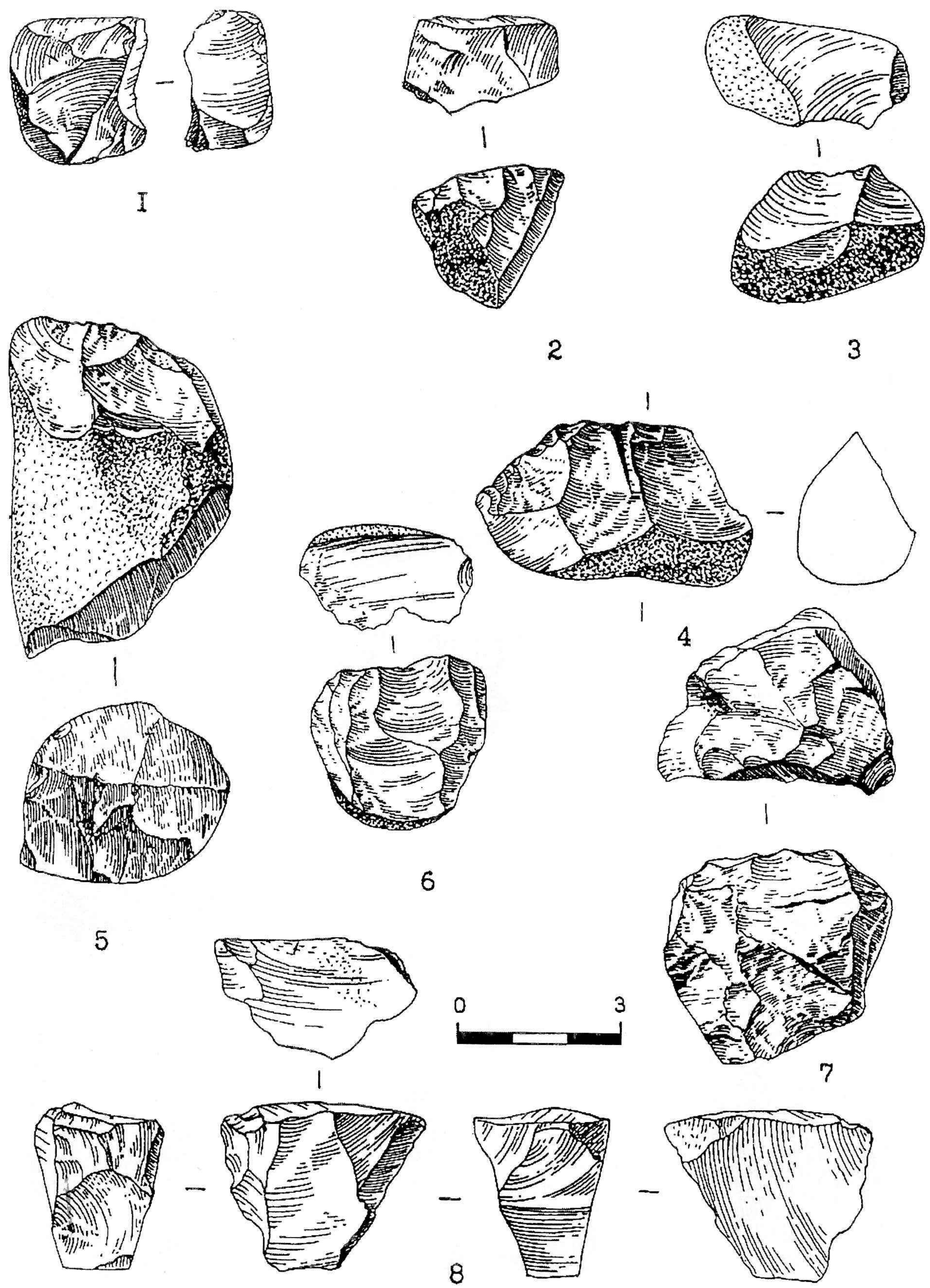

FIGURE 17. Shoktas I. Lithic inventory, sections 14 and 15, depth 400–420 cm. Tools.

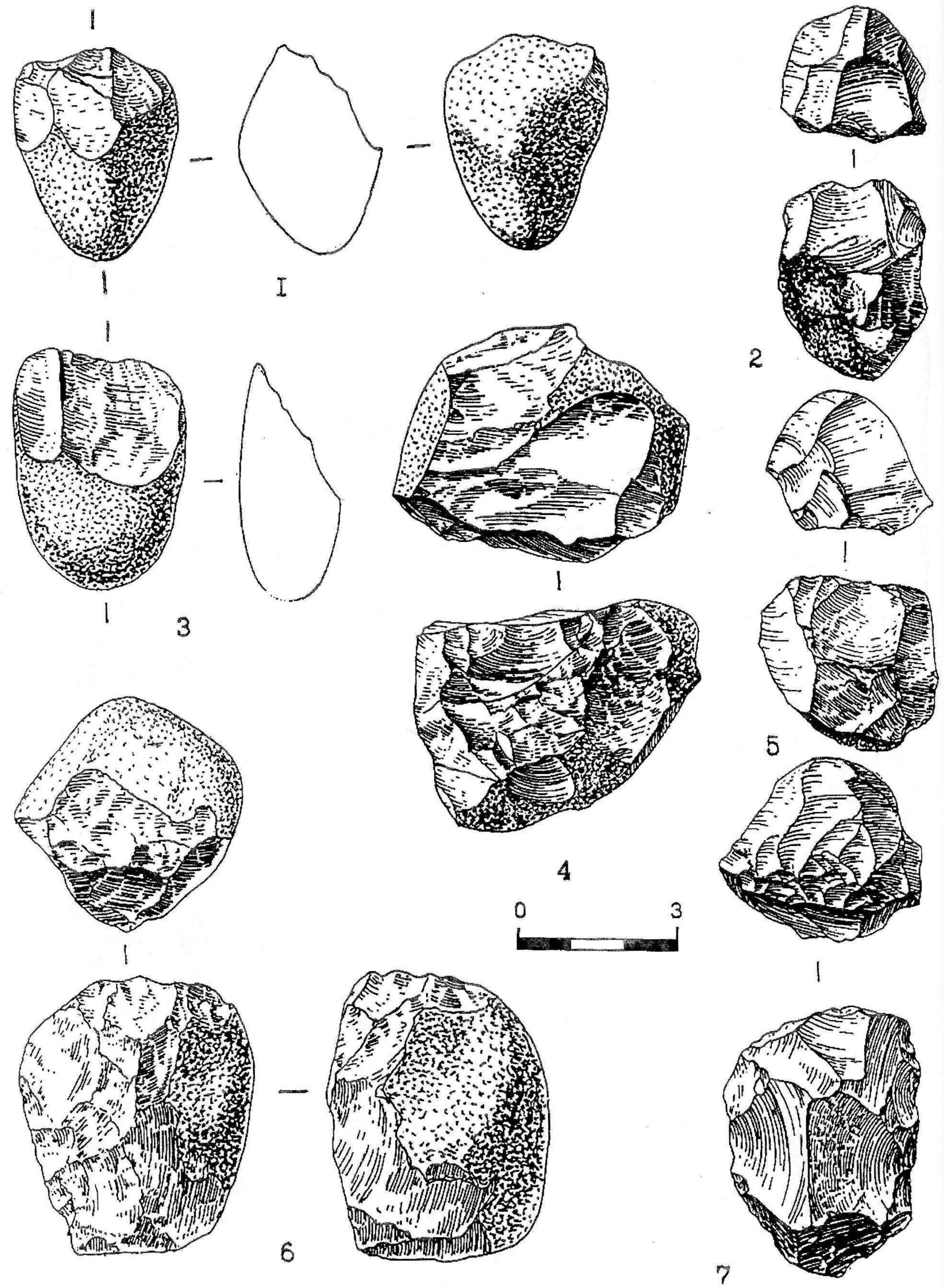

FIGURE 18. Shoktas I. Lithic inventory, sections 14 and 15, depth 420–440 cm.

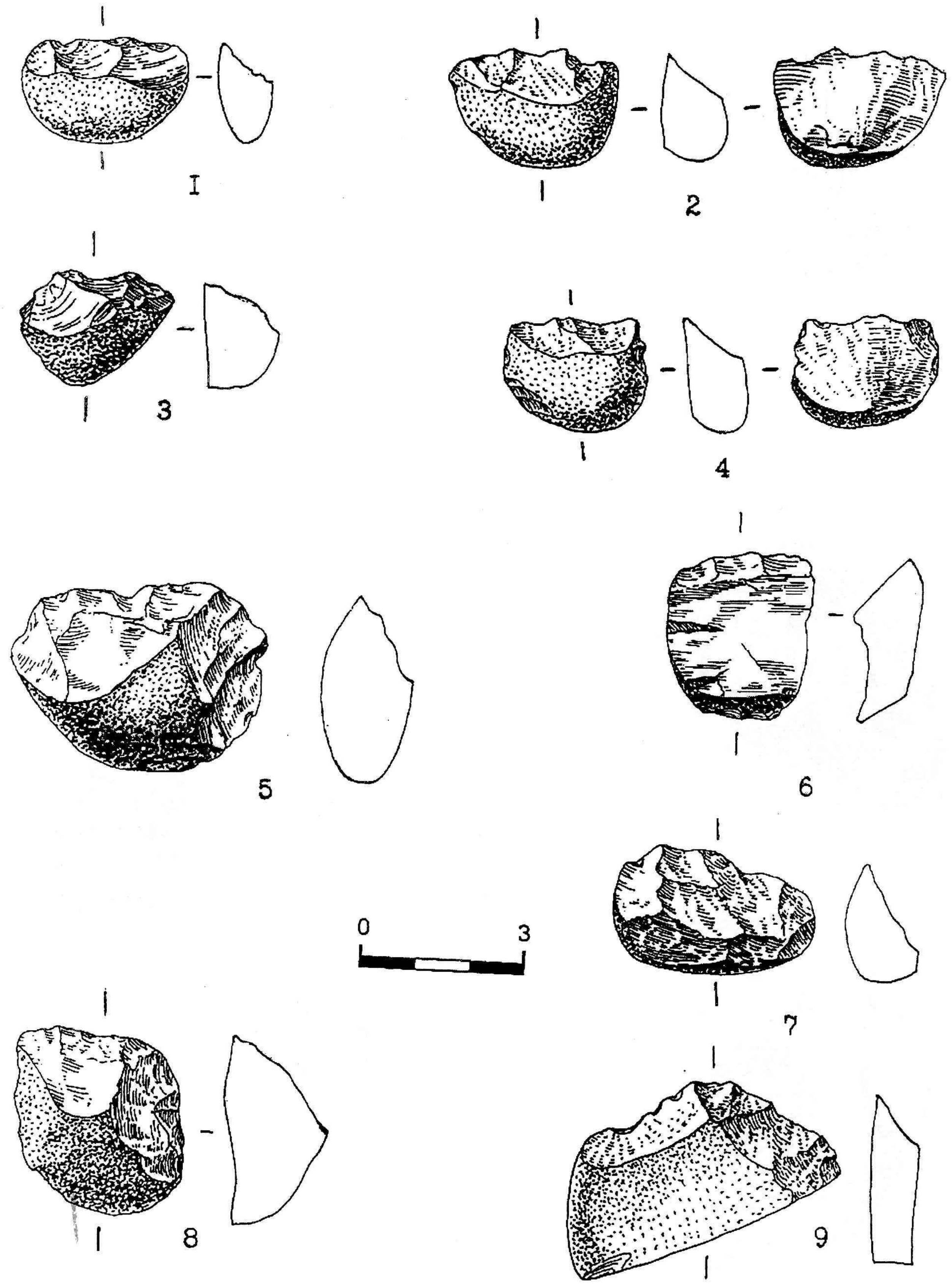

FIGURE 19. Shoktas I. Lithic inventory, sections 14 and 15, depth 420–440 cm. Tools.

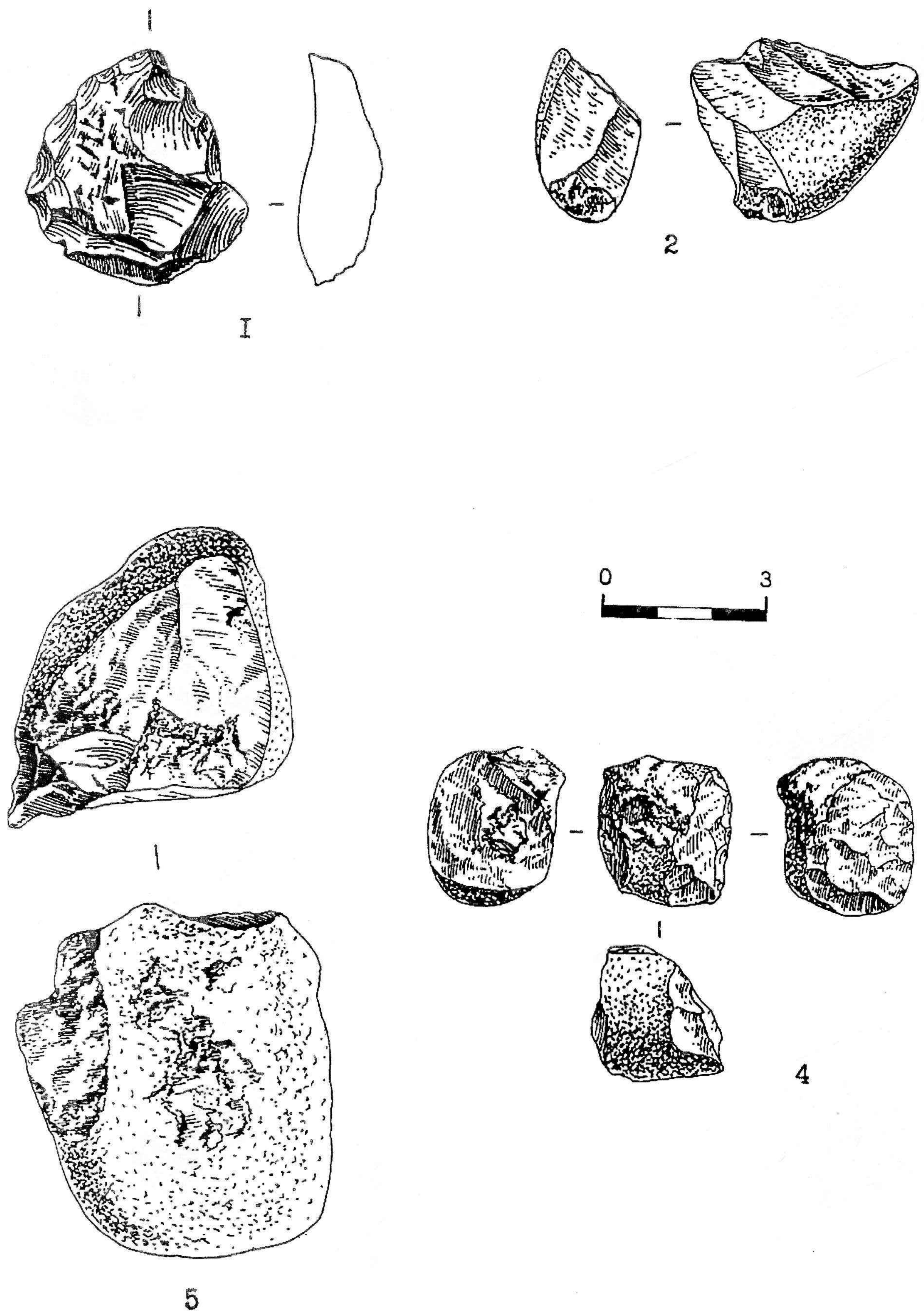

FIGURE 20. Shoktas I. Lithic inventory, sections 23 and 24, a horizon between two kinds of travertine.

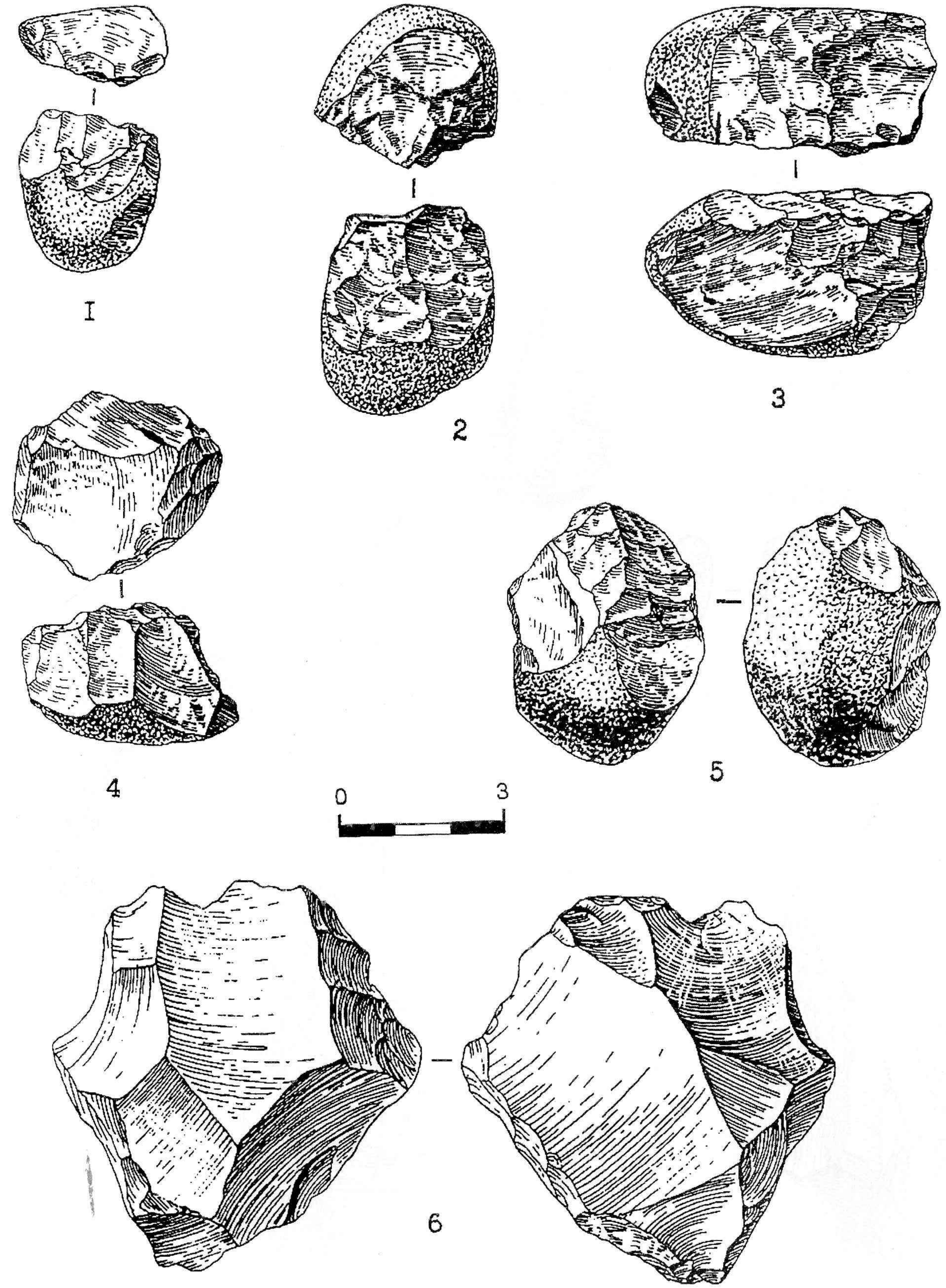

FIGURE 21. Shoktas II. Lithic inventory. Cores.

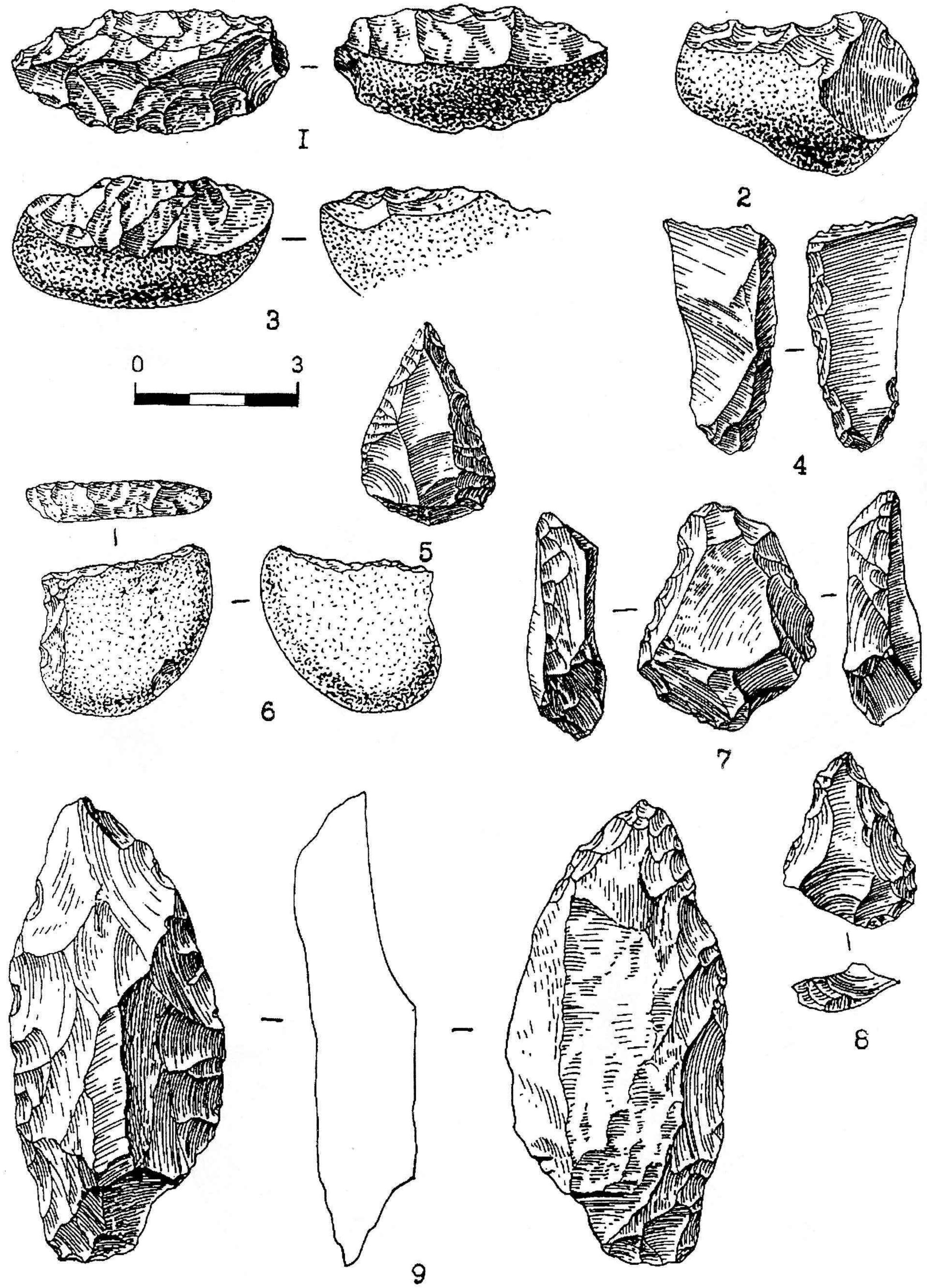

FIGURE 22. Shoktas II. Lithic inventory. Tools.

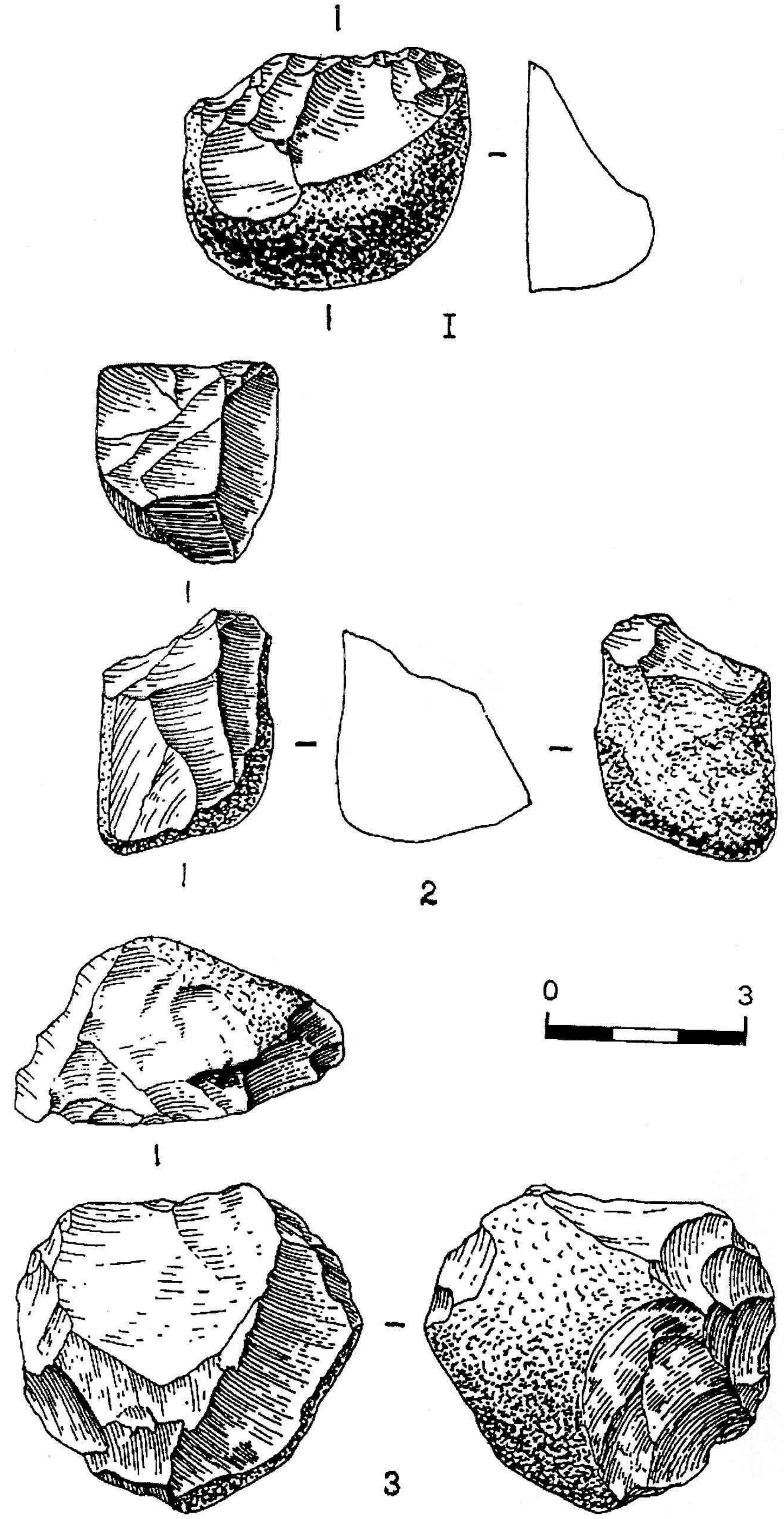

FIGURE 23. Shoktas III. Lithic inventory. Cores.

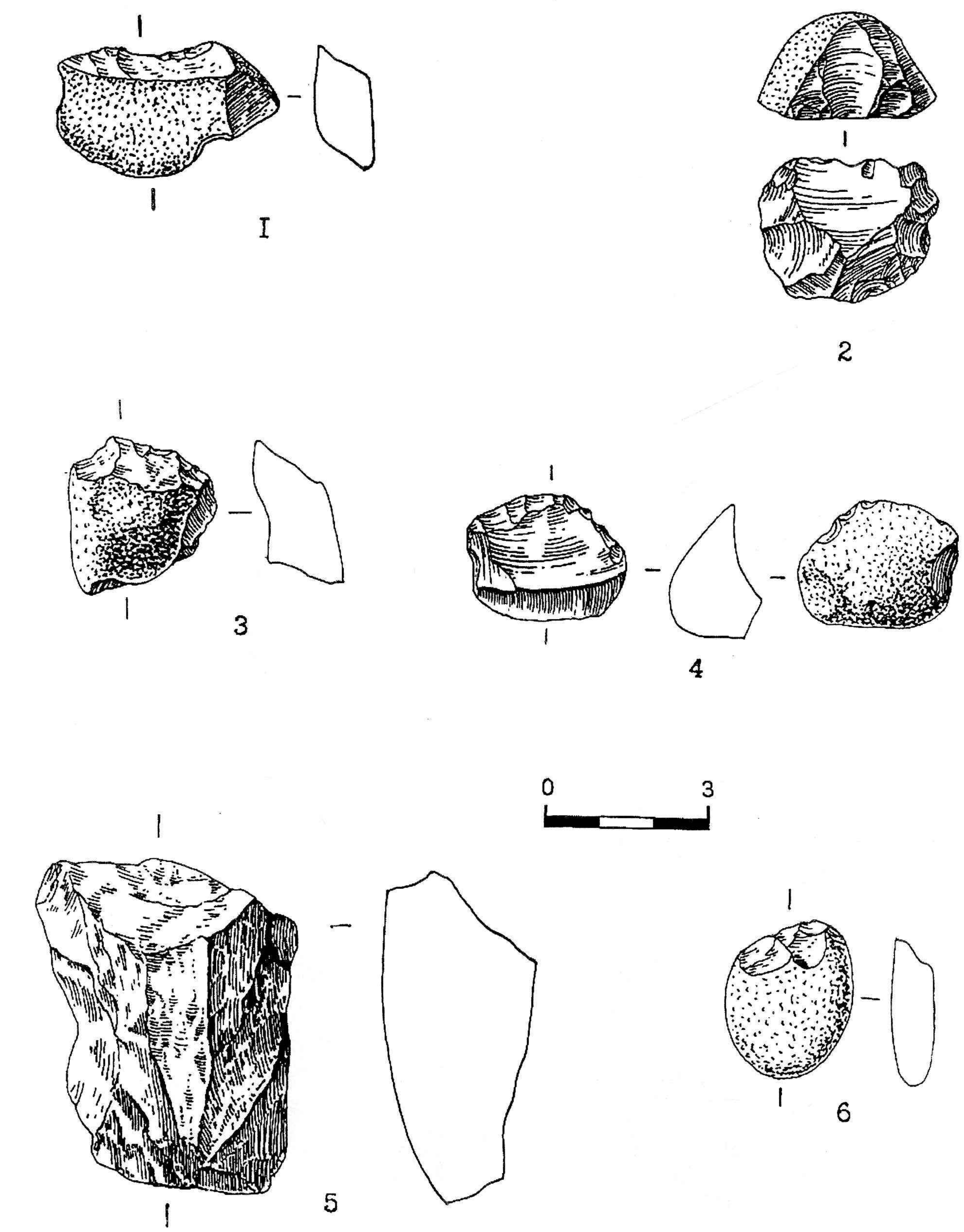

FIGURE 24. Shoktas III. Lithic inventory. Tools.

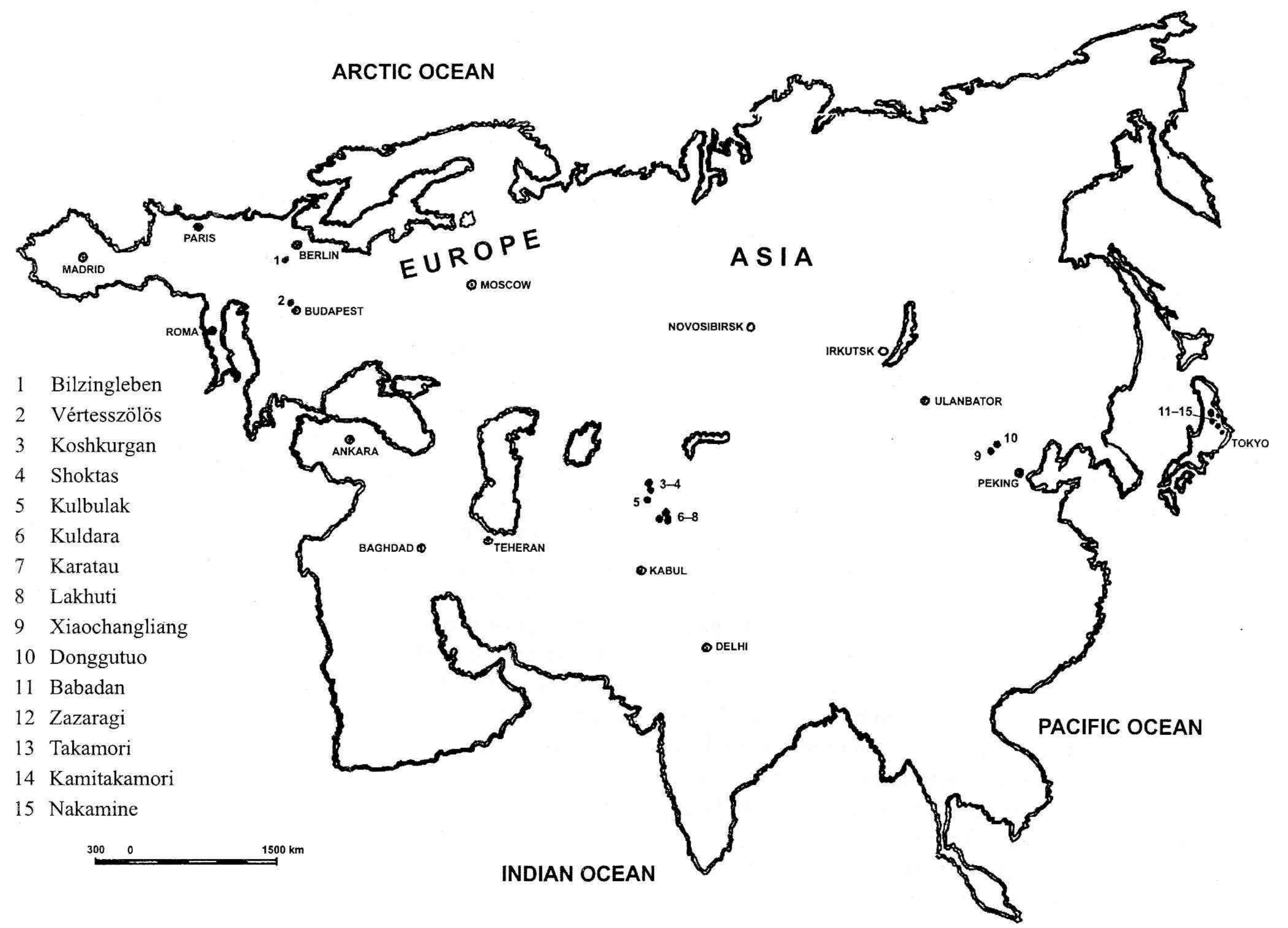

FIGURE 25. The locations of the main complexes of microindustry.

deposits by carbonate. Judging by the samples, this travertine layer in the griffon crater was destroyed by some chemical/physical processes. It is quite probable that intact spots of the old culture-bearing travertine have been preserved outside the griffon crater. Further investigations are required to record them.

Four bone samples from the sand lens have been dated by the EPR method at the Institute of Chemical Kinetics and Combustion of the Siberian Branch, Russian Academy of Sciences: 501 ± 23; 487 ± 20; 470 ± 35; 427 ± 48 ky. These dates are in good concordance with the faunal complex identified on the base of palaeontological remains. The so called Koshkurgan Fauna Complex (analogous to the Tiraspol Fauna Complex of East Europe) is referred to the Early Pleistocene (Mindel period). The main species of the Koshkurgan Complex that were recorded in the ascension spring are as follows: *Canis lupus, Archidiskodon* cf. *Wusti, Equus caballus* cf. *mosbachensis* Reich, *Equus hydruntinus* Reg., *Dicerorhinus kirchenbergensis* Jaeg., *Elasmotherium sibiricum* Fisch, *Paracamelus gigas* Schloss., *Cervus* sp., *Bison schoetensacki* Boj., *Gazella* sp., *Ovis* cf. *ammon, Struthio* sp. There is high probability that artifacts and bones are synchronous and belong to one and the same archaeological complex, especially as there are artifacts found cemented with animal bones.

Lithic artifacts revealed in the course of investigations number nearly five thousand. They represent an impressive technical/typological complex *(Figures 3–7)*. This complex seems to be rather homogeneous by all main characteristics: raw material, preservation of surfaces, typology, system of primary flaking and technology of secondary treatment. Materials of various kinds were used, but mainly veined quartz, coarse-grained sandstone of grey colour, quartzite, flint, calc-sandstone and fossil wood. Nearly 70 % of the artifacts were made of veined quartz and coarse-grained sandstone of the Cretaceous age. These materials were used in the state of lumps or clasts. The rest of the rocks were mainly used in the state of small pebbles from destroyed breccias of the Cretaceous age. On the whole, the industry is of microlithic appearance; the mean size of the tools is 3–5 cm. However this is mainly determined by the technological tradition rather than by the size of the raw material. Strategy of flake production is similar to Levallois technique, though undoubtedly with many distinctive traits of its own. This method of core reduction may be defined as "the Koshkurgan variant of

Levallois". "Citron" and radial techniques also have their manifestations, though they were evidently of subordinate character *(Figures 3, 4)*. Blanks detached from the cores are mainly represented by short flakes. The bifacial technique is absent, though rare samples are sometimes encountered. Unifacially worked pieces are more common. Secondary treatment is represented by retouch of different kinds, located mainly on the dorsal side. Stepped, scaled and subparallel types of retouching have been distinguished. Sizes of retouching vary from micro to large. Steep, sometimes almost abrupt, and semi-steep kinds of retouch are the most common. There are tools trimmed on the narrow ends. Dissection and very seldom the method of burin span removal were used. Clactonian encoches, sometimes adjacent to each other, are available.

The tool kit is obviously dominated by side-scrapers of any kinds; Mousterian points, burins, knives, raclettes, Mousterian denticulated and notched tools, end-scrapers and pebble tools are also available *(Figures 5–7)*.

Inferences concerning the site context, conditions of travertine formation and accumulation of cultural remains, drawn from the study of Koshkurgan I, have been supported by the materials obtained at Shoktas I site. At Shoktas I, the travertine ring has been dissected by a trench *(Figure 10)*. In the section, four kinds of sediments have been identified *(Figure 11)*. Sandy sediments occur in the central part of the travertine ring. The majority of finds are associated with this very formation (strata 2–12). The second kind of sediments are represented by the aleurite (stratum 6). The loess formation outside the travertine ring is referred to the third kind of deposits. Sediments of the first and the second kinds are separated by the travertine ring (stratum T–1) representing the most recent type of travertine. Below the light grey travertine T–1, a heavily sillicified, yellowish-brown travertine monolith (T–2) occurs. Clay (stratum 13) probably represents a separate kind of sediments, possibly of Neogene age.

Lithic artifacts are mainly associated with the sandy deposits inside the travertine ring. Bones are less numerous if compared with those found in the Koshkurgan I travertine ring. The list of animals recorded at Shoktas I is analogous to the Koshkurgan fauna complex.

The collection of lithic artifacts numbers nearly three thousand specimens. Technico-typologically the Shoktas industry is similar to the Koshkurgan complex. The former might be a little bit more "archaic" *(Figures 12–20)*. The presence of a rather distinctive horizon of artifact occurrence in the sections 14, 15 at the depth of 400–440 cm *(Figure 12)* should be mentioned. The set of artifacts from this horizon does not differ significantly from the main collection *(Figures 16–19)*. In the sections 23 and 24 between the two kinds of travertine, a horizon with lithic artifacts occurs. Judging by the stratigraphy, it may be compared with the artifact-containing horizon in the sections 14 and 15 *(Figure 20)*.

Small-scaled investigations have been carried out at the sites of Koshkurgan II and Shoktas II, III. A collection of lithic artifacts have been gathered from the surface *(Figures 8, 9, 21, 22, 23, 24)*.

All above mentioned facts testify to the identity of the sites by the three parameters: 1) localization at ascension springs; 2) similarity of industrial complexes; 3) similarity of faunal remains. Proceeding from these, the complexes under study can be referred to one and the same chronological period and cultural tradition. They probably existed in a similar environmental situation.

All discovered localities are concentrated in two groups in proximity to Koshkurgan and Shoktas villages, in the area of approximately 100 km^2. The method of actualisation (modern observations made near springs in the Gobi Altai) lets us suggest that the marshy areas adjacent to the Koshkurgan and Shoktas springs could have served as natural traps for animals coming for watering. The adaptation strategy implied reiterative visits to the spring-trap area where an animal got stuck. Thus the spring area was utilized by humans as a place for butchering and habitation as long as food resources were available. Then the group of people changed the dislocation, moving to another spring with another trapped animal. Conditions existing in the Karatau piedmont were favourable for human habitation: food resources, lithic raw material and drinking water were available. The suggested hypothesis should be regarded as one of the probable adaptation models appearing in the interaction of two systems – nature and man.

Speaking about the cultural context, attention should be paid to the "specific character" of the lithic industrial complex Koshkurgan – Shoktas, in any case, to the sharp distinction between the Koshkurgan industry and the industry of the Tanirkazgan, Borykazgan, Kyzyltau and Kainazar type from the northeastern slope of the Karatau Range (Alpysbaev 1979) or the Semizbugu industry from the northern Cis-Balkhash region (Derevianko *et al.* 1993). As it has already been mentioned, some similarities are observed with the Kulbulak industry (Kasymov 1972). In relation to the Palaeolithic record of western Central Asia, specific complexes of the so called "loess Palaeolithic" in Tajikistan intensively studied by V. I. Ranov in collaboration with specialists from natural sciences disciplines (Ranov 1980, 1984, 1992, Ranov *et al.* 1987) should be mentioned. Karatau, Kuldara and Lakhuty are the most known and intensively studied sites. The earliest complex at Kuldara has been dated at >800 ky. The latest manifestations of these complexes have been recorded at the boundary of 100 ky.

The specific character of the context of the above mentioned "loess Palaeolithic " should be noted. It is not quite clear whether the researchers deal with the remains of a site that had been redeposited both vertically and horizontally or with extensively transported remains of human activities of different kinds (workshops in particular). In addition, the limited quantity of artifacts in the collections from the sites hampers the definite identification of the industry's "face". The industry is obviously of microindustrial character. The Levallois tradition is seen in the cores. There are artifacts made of small pebbles. Pebble clasts were often utilized. Supposedly, fragments of the industry represented at the sites of the "loess Palaeolithic" bear relation to the industrial complexes of Kulbulak (the Acheulian-Mousterian horizon) and especially with the Koshkurgan industry that provides exhaustive information about technical/typological characteristics of one of the main lines in the stone tool evolution during the Early Palaeolithic in western Central Asia, and more widely in the whole territory of Eurasia, that is the sites of Bilzingsleben in Germany and Vértesszölös in Hungary. These sites may be referred to the type of the sites with cultural remains occurring in travertine. Bilzingsleben and Vértesszölös sites are attributed to the circle of micro-Acheulian industries. It should be noted that both sites represent the most complete "Early Palaeolithic chronicle" of Europe. Their information field includes not only environmental conditions of that time and occupational details, but also anthropological characteristics of the people who had left traces of their habitation. Comparing the Vértesszölös (Buda industry) and Bilzingsleben (Micro-Acheulian denticulated) industries with the Koshkurgan complex of artifacts, many similarities can be found in the selection of raw material and its sizes, system of primary flaking, typology. The cultural remains from Vértesszölös are known to be dated in a wide chronological range, with the earliest ones being 350–600 thousand years old. Culture-bearing layers of Bilzingsleben are somewhat younger, with uranium and amino-acid dates of 228, 179–301 and 335–350 ky.

Farther eastwards, analogies to the Koshkurgan industry are found at Dongguto and Xiaochangliang sites, the Nihewan Basin, and, possibly, at Zhoukoudian (Locality 1) in China (Keates 1994). Chronological limits of the Nihewan sites are 700–800 ky, while Zhoukoudian Locality 1 is chronologically placed between 220 and 450 ky. All these sites are characterised by the presence of a microindustry based on specific methods of primary flaking and wide utilization of flakes.

In Japan, on the Honshu Island, the Miyagi Prefecture, several sites have recently been discovered by the group of researchers headed by professors Serizawa and Kajiwara of the Tohoku University. The best known are the Babadan A, Zazaragi, Nakamine, Takamori, Furayashika and Sodehara sites. On the basis of the dates obtained by a set of research methods (thermoluminescent – TL, electron spin resonance – ESR, fission-track – FT, uranium-thorium – U and tephrostratigraphy), these sites have been referred to the Early Palaeolithic. At Takamori site, TL dates ranging from 380–520 ka and ESR dates of 430–610 ky have been obtained for the artifacts from the test pits "A" and "B" respectively (Abe, Rakuda 1994, Kamada *et al.* 1996, Soda 1996). The assemblages of these sites are defined as microindustries and correlated with the Nihewan complexes of China. Interestingly, all these assemblages had been existing during 400 thousand years.

Thus, from the above mentioned facts, an inference can be tentatively drawn that on the whole territory of Eurasia stretching from the Pacific Ocean in the east and to the Atlantic Ocean in the west, during the period from *ca* 700–800 ka (Xiaochangliang, Donggutuo) to *ca* 150–100 ky (stratum 20 of Babadan A4; soil of Lakhuti, Karatau) there existed a distinctive microindustry. This inference undoubtedly needs to be defined more precisely and more details on regional peculiarities of manifestations of this Early Palaeolithic "civilization", association of archaeological remains with specific anthropological type, etc. should be obtained. These problems, however, are of subordinate character if compared with the identification of a major area of identical Early Palaeolithic cultures that existed on the vast continent of Eurasia *(Figure 25)*.

NOTES

Russian text translated by Olga Volkova (Institute of Archaeology and Ethnography SB RAS, Novosibirsk).

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