Préhistoire Européenne, volume 8, 1996, p. 143 à 173.

PREHISTORIC SETTLEMENT IN THE KLISOURA GORGE, ARGOLID, GREECE (EXCAVATIONS 1993, 1994)

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SUMMARY

The Klisoura Gorge connects the Argive Plain and the Limnes Plateau in the eastern Paloponese. The systematic survey in the years 1993-1994 enabled us to register more than 30 caves and rock shelters of which majority contained traces of prehistoric settelment. Three caves were tested using trial trenches. Cave 4 yielded remains of Late Palaeolithic occupation with industries with backed bladelets with straight or convex backs and microburin technique from the end of the Xanthi Interstadial. Cave 7 produced a sequence falling at the very end of the Pleistocene which covered the Xanthi Interstadial and Dryas III; the sequence yielded an industry with simples backed bladelets with marginal abrupt retouch.

In Cave 1 the erosional phase marking the stratigraphic hiatus which separates the lower part of the sediments earlier than 16 000 - 19 000 years B.P. from the upper part which is much later, mainly Holocene. The lower part of the sediments produced flake industry with carenoidal and simple end-scrapers accompanied by big and small game remains. The upper part produced a sequence of flake industries with a few microliths. In the latest phase of the sequence single artefacts made from extralocal raw materials occurred bearing witness to posible contacts with the Early Neolithic of Argolid.

INTRODUCTION

The Klisoura Gorge occupies a key position as a communication route between the Argive Plain and the Berbati valley which constituted the hinterland for great centres of the Early Helladic and Mycenaean civilization in Argolid (Satlund 1965). This territory has not been systematically explored for prehistory so far. An archaeological survey carried out in 1988 covered the northern part of Berbati valley, north of the Prosymna-Limnes line (Wells et al. 1990). Only a small number of presumably Mousterian lithic artefacts was recorded in that area but the presence of Upper Palaeolithic or Mesolithic finds was not established. This situation has been accounted for by the fact that sites from that period were preserved mainly in caves and were not included in survey in 1988 (Wells et al. 1990, p. 217).

The investigation undertaken in the Klisoura Gorge in 1993 had been preceded by a survey of caves and rock shelters carried out by the Ephorate of Caves and Palaeoanthropology in cooperation with the Jagiellonian University in Kraków. The caves and rock shelters were were selected in which subsequently test trenches were made in 1993 (caves 4 and 7) and in 1994 (Cave 1).

REGIONAL GEOLOGY AND CAVES

The region bordering the Argive Plain is geologically varied which is reflected in its geomorphology. In the west there are crests of the Artemisian Mountains rising to more than 1 500 m a. s. 1., in the east there are the mesozoic hills of the Limnes Upland, which uplifted mainly during the Alpine

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orogensis (Bachman and Risch 1979), builit from Triassic limestones and dolomites. The landscape of high mountains dropping steeply into the sea caused that the rivers flowing from the mountains, with their fast current and considerable transportation power, reduced speed reaching the Argive Plain and deposited rock fragments eroded prior to deposition. As a result of this phenomenon the bay filled with redeposited sediments and a fertile plain developed. Today the plain is fed by perennial streams. It is suited perfectly for agriculture contrasting with the arid hills of other parts of the Peloponese.

The range of the Argive Plain changed in accordance with transgressive/regressive cycles. In the LGM the plain streched about 10 km further south. Between 15 to 10 Kyr B.P. it receded gradually to reach the present boundary line or even exceed it by about 1.5 km to north-east in the region of Nafplion and Tiryns. At the maximum sea transgression a large fresh water lagoon formed on the western side of the bay (Zangger 1991). The range of the maximum transgression corresponded to the Neolithic and the Early Bronze Age when multilayer sites formed at Lerna (Angel 1971, Caskey 1960, Kozlowski and Kaczanowska in press) and Tiryns (Finke 1987, Lambrinoudakis 1990). Subsequent regression was caused mainly by extensive soil erosion due to intensive anthropogenic exploitation of territories bordering the Argive Plain. In addition, these phenomena were superimposed by isostatic uplift of the mountain ranges both of the Pleistocene calcareous breccia recorded in the region of Nafplion and the alluvia of the Early Helladic age in the western part of the plain. In this region the movement rate has been estimated to have been 0.5 m per 1000 years (Zangger 1991, p.11).

The investigated Klisoura area is the george of the Berbaratiotis river, 2.5 to 3 km long and up to 500 m wide (Fig. 1). The rocky walls of the valley are built of Triassic limestones within which karstic phenomena developed such as numerous caves and rock shelters. At the foot of the rocky walls, at places where the valley is wider, there are alluvial fans covered by carbonate cemented or flowstone layers. The dating of the youngest of the carbonate cemented layers from the alluvial fan situated near the bridge on the Berbaratiotis river, near the outlet of Klisoura Gorge towards Prosimna, gave its age of 22 550 ± 60 years B.P. (Gd-3792).

Among 36 caves and rock shelters in the Klisoura Gorge majority have no sediments but in several Pleistocene and Holocene sediments have been preserved. On the surface of these sediments lithic artefacts of various age occured. The caves and rockshelters with sediments have been dennotated as follows (Fig. 2) :

Cave 1 - A large rock shelter (5-6 m high) created in the effect of river erosion about 12 m above the valley floor. The shelter is filled with carbonate cemented detritic sediments. These sediments obscure the entrance leading from the rock shelter to the underground gallery which is part of the karstic system. They form a fairly wide, flat terrace passing into the valley slope built from clayey-rubble sediments. Both under the shelter and on the valley slope numerous lithic artefacts occur.

Cave 3 - This is a vertical cave formed in the tectonic fissure. Its floor covers an area of about 20 to 25 sq m. The cave is filled with sediments but there are no artefacts on the surface.

Cave 4 - a shallow rock shelter situated near cave 3. It has an area of about 15 sq m and is filled with sediments containing substantial quantities of archaeological finds. The upper part shows recent anthropogenic perturbations.

Cave 5 - a small, shallow shelter, situated between cave 3 and 4. The surface area of preserved sediments is a little more than 2 sq m. Lithic artefacts are present on the surface.

Cave 7 - a large cave situated, just as the caves mentioned earlier, on the right side of the valley about 500 m further to NE, about 30 to 35 m above the valley floor. The cave is of karstic origin. The cave measures about 35 to 40 sq m in area but the sediments have been eroded from the surface. Some sediments, cemented by calcareous breccia in the top part, have been preserved on the slope in front of the cave. These sediments contain a large number of lithic artefacts.

Cave 8 - Situated about 35 m north of cave 7. Possibly, they form part of the same karstic system. No sediments have been preserved on the surface of about 20 sq m. Bronze Age ceramics was found on the slope in front of the cave.

Cave 14 - situated about 40 m above the valley floor, on the left side of the valley. It is almost totally filled with sediments.

Cave 15 - about 70 m above the valley floor, on the left side. The cave formed in a vertical tectonic fissure.

Cave 23 - a small cave situated in the cliffs of the right side of the valley facing the Argive Plain had a triangular entrance and the surface of about 4 sq m sloping to NW. It was almost wholly filled with sediments.

Cave 30 - situated high on the upland on the right side of the Klisoura Gorge, looking out in the direction of Prosymna. It had a triangular entrance 5 m high. Its floor was about 10 sq m in area and was throughout covered by sediments.

The remaining caves : 2, 6, 9, 10, 11, 13, 16, 17, 18, 19, 21, 22, 24, 25, 26, 27, 28, 29, 31a, 31b did not contain either sediments or traces of prahistoric human occupation. Some caves, besides, were cut in the conglomerates (12, 32, 33, 34, 35) and contained traces of very recent sediments.

Test excavations 1993 and 1994

Test excavations were carried out in three registered caves. Preliminary results are discussed in this raport.

Cave 4

Two trenches 1x1 m were made in this rock shelter. Trench B contained only mixed sediments, presumably from the levelling of the filling of the shelter which was once used for stock breeding. Similarly, the sediments were mixed also in trench A down to layer 3. They yielded Late Palaeolithic stone artefacts, bones and Neolithic and Bronze Age ceramics (Fig. 3).

It was only lower down that layer 4, built of terra rosa type clays with fine limestone fragments (up to 40 %), and layer 5, also clayey but with a small quantity of limestone fragments, were located in situ. These layers contained Late Palaeolithic finds only. Mineralogical analysis indicates that these clays developed from poorly crystallized kaolinite mixed with illite and quartz.

Finds from layers 4 and 5 are first of all bladelet and blade industry with specimans 15 to 40 mm long (predominantly from 15 to 21 mm) and from 5 to 16 mm broad. Blades were detached from single- and double- platform cores. Linear and punctiform blade platforms are more numerous than prepared and facetted types. The whole blade blanks production took place on the site, which is confirmed by the proportions of major technological groups (Table 1).

Industries from layers 6 and 7 are characterized by the predominance of simple backed bladelets with straight or slightly convex backs formed by steep or even bipolar retouch (Fig. 4). Microburin technique is present. In some cases it was applied to shape the tips of backed blades (piquant-triedre). From among other tool groups there are : blade and flake end-scrapers, heavy burins on flakes, blades and flakes with lateral retouching, denticulated and notched specimens.

Cave 7

Two test trenches (B, C) were made in the cave's interior and one on the slope in front of the cave (A), all measuring 1x1 m (Fig 5). The best stratigraphical data were provided by trenches B and C. The upper part of the sediments (unit a) was a kind of carbonate breccia with limestone blocks and fragments. Below this a brown clayey formation occured (unit b) with weathered limestone debris, also sealed by calcium carbonate which concentrated especially underneath finds. Underlying this was a yellow loamy sediment (unit c) with large quantities of thick debris with weathered surfaces and edges (Fig. 5). All the units dip to SE (20-25 %).

Mineralogical examinations of the sediments using X-ray diffraction (Fig. 6) has shown that all the units are composed of calcite with an admixture of clay minerals represented by illite and poorly crystallized kaolinite.

In the light of these examinations the carbonate breccia in unit a is a dripstone layer formed due to the presence of karstic waters in slightly colder conditions. Units b and c, on the other hand, are the effect of crystallization of calcite mixed with re-deposited terra rosa type clay in slightly warmer an wetter conditions.

In agreement with the above observations is the radiocarbon date obtained from the carbonates of the dripstone layer in cave 7 (unit a) which is : 12 500 ± 40 B.P. (Gd-3784). Since this date is based on carbonates therefore, because of the reservoir effect, it should be made younger by about 2 000 to 3 000 years i.e. it should correspond to the period of about 10 000 years B.P.

The industry from units a, b, and c has an even more distinct blade character than in cave 4. The general structure of major technological groups is similar at both sites (Table 1). Blades in cave 7 were detached from single platform cores with rounded flaking surfaces, mostly without preparation except on the platform (Fig. 7 : 1,2). However, tools made on bigger blades occur which had been detached from double-platform cores missing from the site. Bladelets are from 15 to 23 mm long (mean length in unit b - 20 mm) and from 4 to 16 mm broad (mean width - 9.6 mm). Specimens with punctiform platforms are, too, predominant.

The most numerous tools are simple backed bladelets; contrary to specimens from cave 4 they have exclusively fine, steep marginal retouch (Fig. 7 : 3-10). The use of microburin technique has not been established. End-scrapers, blades with marginal retouches, notched and denticulated tools were also present.

Both cave 4 and cave 7 gave relatively few faunal remains, mainly molluscs. In cave 4 remains of Helix sp. and Cepaea sp. were identified (acc. to S.W.Alexandrowicz).

Cave 1

In this largest of the investigated rock shelters three trenches were made : trench A was located within the range of the shelter (2x2 m), trench B at the very edge of the platform (1x2 m) and trench C on the slope of the valley (2x2 m).

Sediments which occur in trench A differed from those in the outer part of the platform and on the slope. Their distinctive feature is a strong anthropogenic component in the excavated part of the sediments (i.e. up to 1.25 m from the ground surface).

A layer of dung accumulated when the cave was used as a sheep pen covered the floor of the cave was used (Fig. 8). The dung layer lies on a layer of silty-clay (2) overlying, in turn, a layer of brown clay with sharp-edged debris (3). This layer contained some fragments of antique ceramics and charcoals of sub-recent age (240 ± 110 B.P. Gd-1020). Archaeologically sterile lenses of colluvial clay with limestone debris (4) were followed by anthropogenic sediment of white ash, partially cemented (5). Below this another series of anthropogenic sediments occurred (6). A hearth (hearth 1) was uncovered in the top of layer 6, in the NE corner of trench A. The hearth was bowl-shaped, filled with ashes, with a layer of red-burnt clay in its floor.

This upper portion of sediments (units 1-6) is lying unconformably on the lower portion (units 7, 7a, 7b) which is formed of brownish silty ash sediments with lenses of organic silts and flat hearths (Fig. 9). The hearths were contained in a sequence sandwiched between lenses and bands of ash and slightly burnt clay or silt (hearths no 2, 3, 4).

If the upper portion of sediments is clearly Holocene, the lower portion formed before the Upper Pleniglacial (LGM) which is confirmed by radiocarbon dates from hearth 5 namely : 20 600 ± 200 B.P. (Gd-10258) and from beneath hearth 5 namely : 19 400 ± 100 B.P. (Gd-7641). All the dates are based on carbonates because of strong mineralogical transformation of anthropogenic components in this profile, which resembles processes widespread in the whole eastern Mediterranean (cf. Goldberg, Nathan 1975, Bar-Josef et al. 1992, p.507). The youngest date obtained from the uppermost part of the lower portion of sediments (just below layer 6) is 16 130 ± 40 B.P. (Gd-3790).

Trench B situated at the edge of the platform displayed a totally different type of sediments. On the surface a layer of dark humic soil with small limestone fragments

was present (I). Its maximum thickness was up to 40 cm. This soil contained mixed lithic finds, classical ceramics and contemporary coins. The underlying layer was a very hard, calcite-cemented breccia, grey-beige in colour, with an admixture of clay and debris (II). Carbonates from this layer were dated to 6 230 ± 30 years B.P. (Gd-3790) which is *terminus ante quem* for only the clay-debris layer with its prehistoric contents. Below this layer terra rosa type clay was registered containing a relatively large quantities of limestone fragments (III). This layer was also strongly calcareous. It was excavated to a depth of about 1 m.

Trench C was located on the slope of the valley. Beneath modern humic soil (with numerous lithic finds) it revealed clayey sediments with weathered limestone fragments of various size (up to about 30 cm). They formed three layers differing in colour from yellow-brown passing to darker brown and brown-redish. These sediments accumulated due to the colluvial redeposition of the terra rosa type clays together with remains of a layer of scree on the slope of the valley. They were excavated to a depth of about 2 m.

All the sediments, both in trench A and trenches B and C, contained substantial quantities of lithic artefacts. The essential difference between them is the varied ratio of faunal remains which were numerous in trench A, occassional in trench B, and almost totally missing in trench C. In addition, the latter two trenches did not reveal any other anthropogenic components. The proportion of lithic artefacts decreases noticeably in the lower part of the clay-debris sediment in trench C, whereas this proportion remains fairly high throughout the explored stratigraphic units in trenches A and B.

The lower portion of sediments in trench A contained a flake dominated industry with rare retouched tools made on flakes or unworked chunks or fragments of tabular radiolarites. In layer 7a general structure shows that the flake group is most numerous (flakes - 23.2%, chips and smal flakes 1.5 cm - 58,2% - Table 2). There are only a few bladelets (1.7%) and cores (0.5%). A considerable proportion of splintered pieces is also characteristic. Among retouched tools end-scrapers of the carinate and nosed type are most numerous (Fig. 10). The collection is too limited for meaningful comparisons, however it demonstrates clearly Aurignacian features. This diagnosis is additionally supported by the occurrence of two bone points in the upper part of the lower portion of sediments : one flat with a conical base and the other slightly smaller with a single bevelled base.

The industry of the upper portion (layers 3-5) is also flake dominanted, however the proportion of blades and bladelets is higher than in the lower portion (layer 5 - 5.3%, layer 3 - 9.8% - see tables 3,4). In these units there occurred simple backed bladelets and a broader range of microliths : sauveterrian points, atypical triangles, segments and atypical trapezes - Fig. 11 : 1-8, 12 : 1-4, Table 5. In the uppermost part of the sequence, besides, Castelnovian blades with lateral notches and microlithic truncations appear (Table 6). A rich set of end-scrapers is also present among them discoidal and double specimens, also retouched blades, blade perforators, side-scrapers, notched tools (Fig.11 : 9-15, 12 : 6-11).

Layer 5 and the contact zone between layers 3 and 5 produced several lithic artefacts whose raw material and technology do not fit the microblade-flake context typical for this layer. These are the following :

1. a fragment of a macroblade made from „silex blond" transformed into a scaled piece (Fig. 11 : 19),

2. plunging flake from macroblade core (Fig. 11 : 18) made from similar flint,

3. a macroblade made from black, transparent flint,

4. a mesial fragment of a macroblade used as a sickle blade (with silica gloss), with retouch along the breaks giving the specimen a shape of large trapeze,

5. fragments of a flake and chips from obsidian (Fig. 11 : 17).

Moreover, layer 5 contained a grinder made from serpentinite.

Layer 3, on the other hand, yielded Middle Neolithic ceramics (type Urfirnis), Early Bronze Age and even classical ceramics.

Although the faunal remains from trench A have not been analyzed as yet the basic difference between the upper and lower part of the sequence can easily be noticed : in the former terrestial snails, mainly *Helix cf. figulina Rossm.*, and bird bones predominate,in the latter part (layers 7 and 7a) the dominance of snails is replaced by numerous fine fragments of mammal bones such as : Cervidae, cf. *Dama* and *Lepus sp.* (personal comm. P.Wojtal). Throughout the sequence large quantities of burnt plant macroremains occur but these have not been analysed yet.

Local raw materials dominate throughout the layers. These are first of all radiolarites (8 types dennotated as R1 - R8 have been distinguished on the basis of colour), flints (types F1 - F9), chalcedony (Ch), silicified limestone (SL) and quartz (Q). Burnt siliceous rocks whose identification was not possible have been dennotated as FB.

The geological survey carried out in the region of the Klisoura Gorge and the Berbati basin enabled us to locate most of the raw materials distinguished in the archaeological materials. The map in Fig. 13 shows the location of the most important outcrops of these raw materials,in the primary and secondary deposits within a radius of 3 to 4 km from Cave 1. In this way the area of deposits of radiolarites R1 - R5, flints F1a, F1b, F2, F3, F5 and of chalcedony has been precisely identified. Silicified limestons and quartzes occur in the alluvia of the Berbaratiotis river. So far the areas of occurence of radiolarites type R6 - R8 (black, pink, spotted) anf flints F6 - F9 (black-white, spotted, black-white with white dots, brown rough, black transparent) have not been located within the 3-4 km radius from the site. However, these raw materials, with the exception of chalcedony, occur only in trace quantities (Tables 2 - 4). There were sporadic individual finds limitted to layers 3/5 and 5, made from unquestionably extralocal flint known in Greece in the Neolithic, described by C.Perles as „silex blond" (Perles 1991) and obsidian from the island of Melos (Renfrew and Aspinall 1990).

In lower portion of sediments in trench A (layer 7a) radiolarite R1 shows the highest frequency, followed by flint F2 and flints F1b, F1a and chalcedony. In the upper portion (layer 5) the proportion of flint F3 is slightly higher, whereas in layer 3 the dominant materials are flints F1a and F1b and radiolarite R1.It should be stressed that the proportion of burnt artefacts made from siliceous rocks increased in layers 3/4 and 6.

Primarily local raw materials were worked in all the layers in trench A. They were obtained from primary and secondary deposits within of radius of 3-4 km from the site. The raw materials R1, F1a, F1b, and F2, which occur most frequently, are represented by basically all debitage products including cores and retouched tools. However, a tendency can be seen towards using first of all radiolarite R1 to produce retouched tools.

It is not easy to make a comparison between the sequence from trench A and from trench B where sedimentation had a different character. In trench B, below the calcite cemented layer lithic assemblages characterized by bladelet technology were recovered. The bladelet index for layer II is 19.2, for the top of layer III - 15.2, and for the bottom of layer III it is 14.2, that is much higher than the blade index even in the top part of trench A (Tables 7, 8). A specific feature of trench B is, besides, the increasing importance of flint F5 towards the bottom of the trench, which in the floor of layer III is 21.1 %. This flint occurs only in trace quatities in the whole of the sequence with the exception of layer 5 in trench A.

Considering the structure of collections from layers II - III in trench B, industries from this trench are significantly different from those in trench A. Possibly they represent Late Paleolithic occupations, filling the hiatus between lower and upper portion of sediments in trench A. Correlation with the Late Palaeolithic industries from Caves 4 and 7 is impossible since the clayey layers in trench B, below breccia, do not contain organics or carbonates suitable for dating.

Difficulties are also encountered when we attempt to establish parallels between the sequence in trench C and in the trenches A and B. The archaeological content of the humic layer was strongly mixed : Early Bronze Age ceramics occured together with possibly mesolithic finds. The mesolithic industry in this layers, predominantly microliths (among others triangles) is

accompanied by retouched flakes, end-scrapers, denticulated and notched tools, and individual specimens of perforators and burins. The blade index is only 2.9 while at the same time flakes are in ascendency (44.5 %). The situation resembles the upper parts of the sequence in trench A. The ratio of tools is smaller in the clay-debris sediments, especially microliths are fewer (only one backed bladelet). Retouched flakes and end-scrapers continue to appear. This part of the sequence could then be regarded as parallel with the lower part of the sequence in trench A if not for a slightly higher blade index (5.3 to 6.7 %). Possibly, this is the effect of the lower frequency of artefacts in the lower spits of trench C which makes the series finds much less numerous than in trench A.

CONCLUSIONS

The three tested sequences in the rock shelters in the Klisoura Gorge covered the Late Pleistocene and the Early Holocene. The oldest phase is represented by the lower levels in trench A (7a, 7, possibly 6a) and possibly also lower units in trench C, in Cave 1. These layers are placed by radiocarbon dates at the Upper Pleniglacial (in reality - considering that the dates were obtained from carbonates - the age of the samples may be younger by about 2 000 years; even then the layers would be earlier than the beginning of the Late Glacial). The flake industry in these layers should coincide with the late phase of the local Aurignacian. It is known as „Lithic Phase I" at the Franchti Cave where its age was determined within a fairly broad time-span by volcanic ash layers dated to more than 30 000 years B.P., and Phase II dated at about 21 000 years B.P. (Perles 1987).

The next settlement phase is represented by the industries from Cave 4 dated to the Late Glacial. They are characterized by blade technology, straight and convex backed bladelets, microburin technique similarly to phase IV in the Franchti in eastern Argolid (Perles 1983, 1987). This phase has been dated at about 12 540 ± 180 B.P. (P-1827) that is to the period corresponding to the Allerˆd Interstadial (the end of the Xanthi).

Layers VIII and IX in the Zaimis Cave (Cave 413) located in the region of the Saronic Bay near Megara (Markovits 1932-1933) belong very likely to the same phase. The layers contain blade industry (blade : flake ratio is 1 : 2), small crescents with piquant triedre and a large number of microburins are also present. The occurence of larger flakes with denticulated-notched retouching in the industry of layer IX is noteworthy (Tallenbach 1983, Pl. 8-9). Flakes like this occur as well in layer 5 in Cave 4.

The Late Palaeolithic blade industries occurs as well in cave 7 where the top part of the sequence gave a radiocarbon date falling at the very end of the Pleistocene (Dryas III). The lower part, on the other hand, regretfully undated, may have reached the Allerˆd due to warmer and wetter conditions of sedimentation. The industry in Cave 7 differs from that of phase V in the Franchthi cave namely : neither geometrical forms nor bladelets with blunting on two sides (lamelles a double dos) are present. This suggests, even on the mesoregional scale, variability of the industries of the Terminal Pleistocene. This variability could be more important if we take into account collections from trench B in Cave 1, which seem to be also related to one of the Late Palaeolithic occupation phases.

The upper part of the sequence in Cave 1 begins with flake industries with microliths, but they are separated by a chronological gap, caused by an erosional phase, from the flake industries in the lower part of the sequence. This gap coincides with the evolution of Epigravettian backed blade industries whose longer sequence is known from the caves of Kephalari and Franchthi (in the latter cave these are lithic phases II - IV). The upper flake industries from Cave 1 are not a continuation of technologically similar industries from the lower layers. They coincide with the Holocene industries from the Franchthi Cave (phases VII-IX) where the dominant flake technlogy is accompanied by various types of microliths. At the beginning of the Holocene the upper flake industries in cave 1 replaced the earlier blade and bladelets industries with geometrical microliths.

The phenomemnon of the substitution of Late Palaeolithic blade industries with backed bladelets (regionally also with geometrical microliths) by flake industries is typical for almost the whole of the Balkans.

It was recorded in Montenegro in the boundary zone between layers VIII and VII at Crvena Stijena, between layers VI-V at Medena Stijena, and layers Ia-Ib at Trebacki Krö (Dimitrijevic in press) where, however, the drop in the ratio of blades is not as dramatic as in Greece. Similarly, a decrease in the proportion of blades to only 3.5 % can be seen in the region of the Iron Gate between the Cuina Turcului sequence (Paunescu 1989) and the Early Holocene site at Padina (Radovanoviæ 1981). Typological affiliations with epigravettian tradition in the region of the Iron Gate and in the Montenegro are stronger than in Greece.

When the sequence in Cave 1 in the Klisoura Gorge and the Mesolithic at Franchti are compared both similarities and differences are ascertained. At Franchthi the blade index increases from 3 % to only 4.5 % between phase VII dated to about (9 500 - 9 000 years B.P.) to phase IX (dated to about 8 000 years B.P.) corresponding to the final Mesolithic. On the other hand, in comparison to Cave 1 the proportion of geometrical microliths is already in phase VIII (dated at about 8 500 years B.P.) considerable comprising a variety of types of trapezes often, however, made on flakes. The ratio of microliths to debitage products is 206 : 889. In the whole sequence in cave 1 microliths are present in modest quantities and geometrical microliths are rare. For example, in layer 5 which is richest in microliths their ratio to debitage is 9 : 659. Another difference is the presence of splintered pieces (2-3 %) in all the assemblages in Cave 1 which at Franchthi appear only in phase X (= NÈolithique initial acc. to C.Perles 1990, p.95). The above mentioned variations may indicate that even on the mesoregional scale (the distance from the Klisoura Gorge to Franchthi is about 70 km) fairly important differences in the evolution of the Early Holocene lithic industries may occur. If the use of almost exclusively local raw materials is also taken into account then the phenomena described above may reflect the isolation of particular mesolithic groups in settlement microregions delimited by mountain ranges.

In view of the above the materials from the Ulbrich Cave explored by A.Markovits (1928, p.114) are interesting. The cave should be situated in the region of the Nafplion Bay but its location is not known (Tellenbach 1983,p.43). If we assume that layer VII in the Ulbrich Cave belongs probably to a similar phase of the Late Palaeolithic as does Cave 4 in the Klisoura Gorge, then layer III may possibly represent the Mesolithic comparable with the beginning of upper portion of the sequence in Cave 1. This is confirmed by a substantial domination of flakes over blades (130 : 21), the presence of a sauvetarrian point, micro-truncations and atypical trapezes (including a specimen with retouch on three sides - Tellenbach 1983,Pl. 4B). In such a case the inventory from layer V in the Ulbrich Cave could represent a transitional phase, unknown so far in Cave 1 in Klisoura Gorge, between the Late Palaeolithic and Mesolithic. This phase too shows striking ascendancy of flakes over blades (365 : 25). The paralleles proposed above cannot, regretfully, be substantiated by geochronological data as there are no dates or lithological-stratigraphical data on the sequence in Ulbrich Cave.

The final phase of the mesolithic sequence in Cave 1, preceding the appearance of the Middle Neolithic ceramics of the „Urfirnis" type, is characterized by the presence of a few artefacts made from extralocal raw materials („silex blond", black transparent flint, obsidian). These artefacts display, to some extent, the macroblade technique. In all likelihood they are imports acquired from the Early Neolithic groups which occupied Argolide, suggesting contemporaneous functioning of the Late- and Final Mesolithic settlement and the Early Neolithic in Argolide. We shall be able to discuss other consequences of these contacts, first of all in the sphere of subsistence economy, when analyses of plant and faunal macroremains from Cave 1 have been complete.

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ACKNOWLEDGMENTS

Excavations in Cave n° 1 at Klisoura were greatly facilitated by the owner of the field : Demetrios Demas (Katsaris). Students of the University of Athens : Christos Koutsothanassis, Vassilis Marinis and Nicos Papazarkadas contributed substantively to the entreprise.

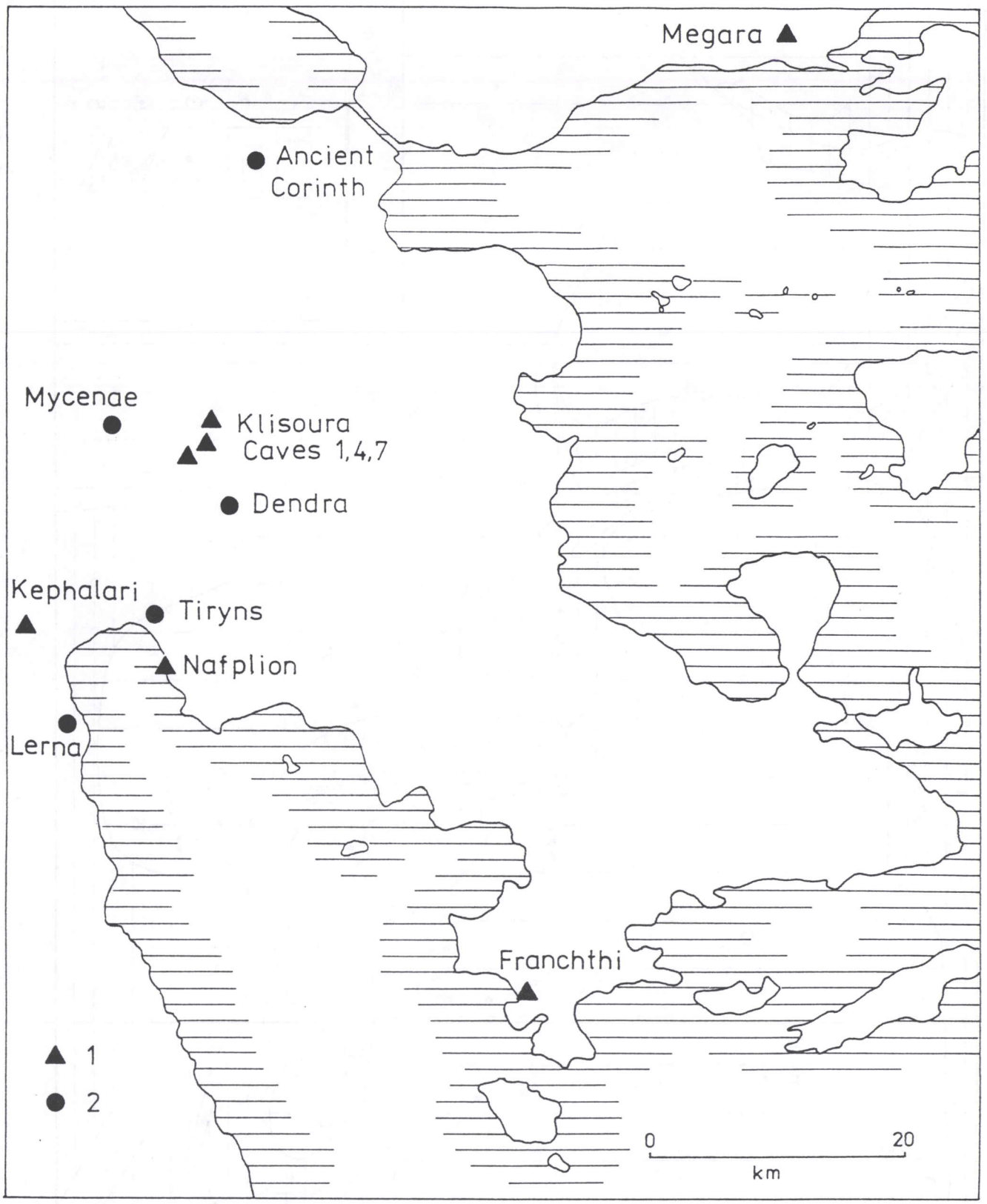

Figure 1 : Most important prehistoric sites in Argolid. 1 - Caves, 2 - Open air sites.

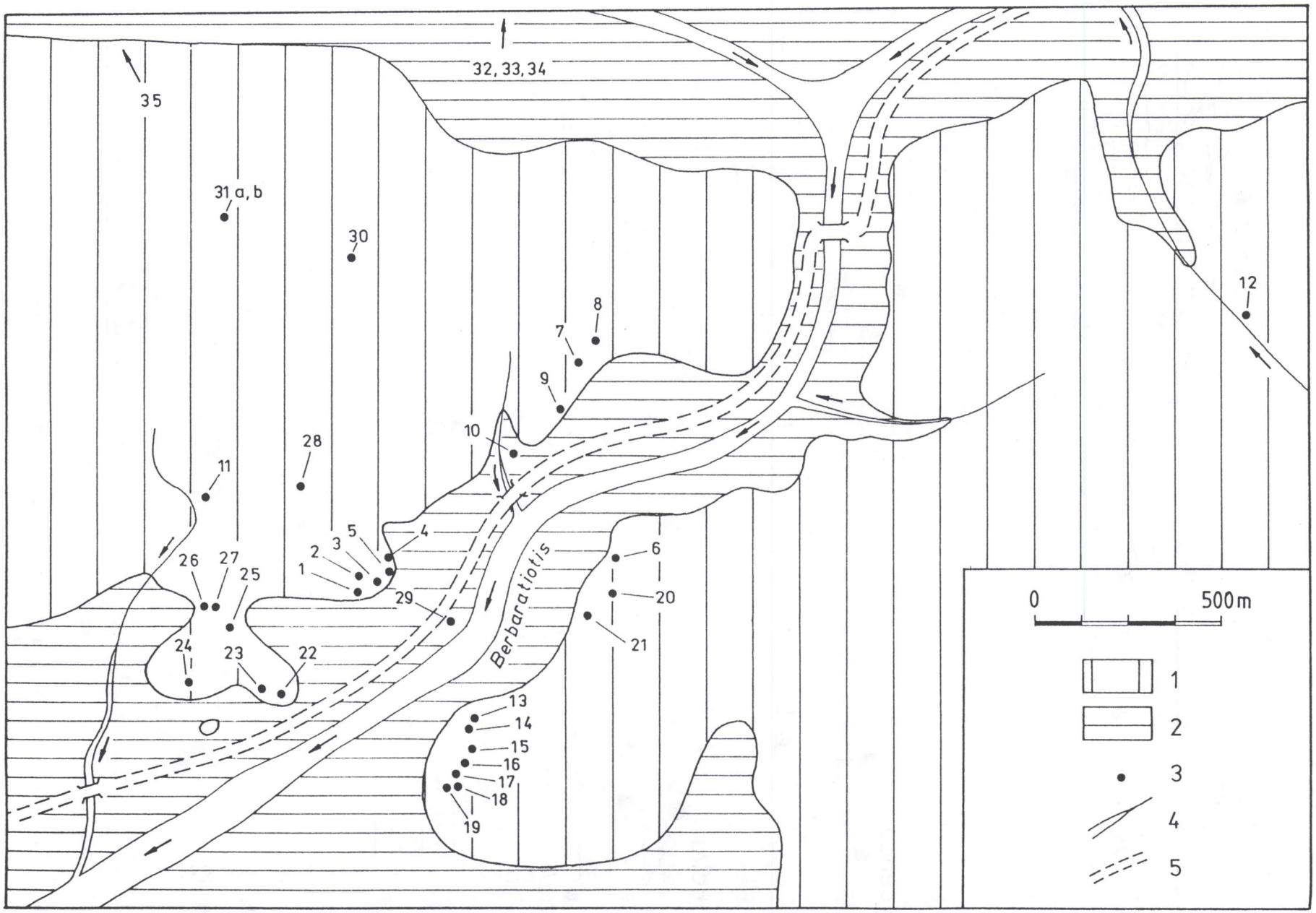

Figure 2 : Klisoura Gorge. Location of caves and rock-shelters. 1 - Triassic Limestones, 2 - Quaternary sediments, 3 - Caves and rock-shelters, 4 - rivers and streams, 5 - roads.

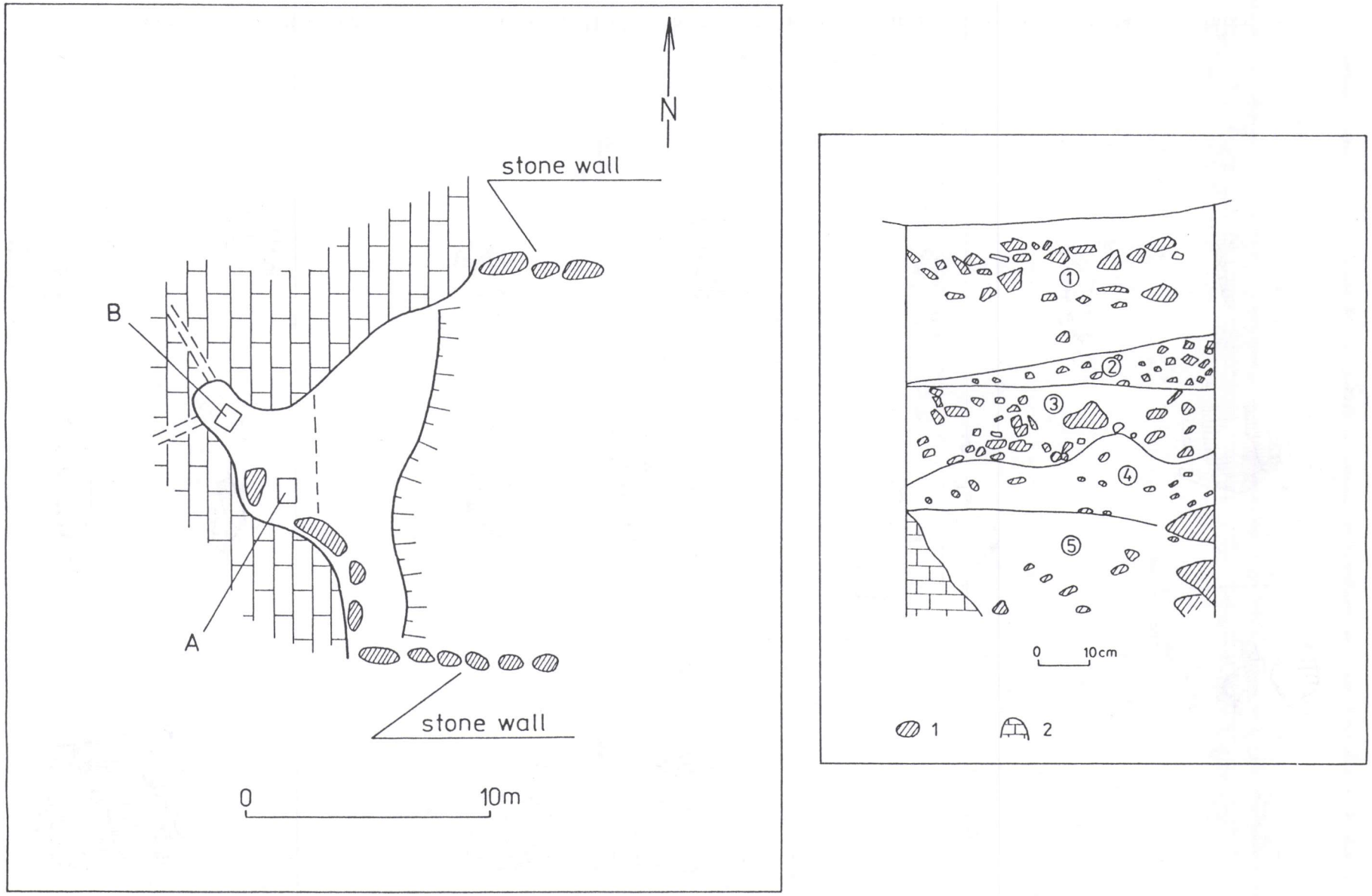

Figure 3 : Cave 4. Left : map of the Cave with location of trenches A, B. Right : profile of the sediments (1-5 - lithostratigraphic layers).

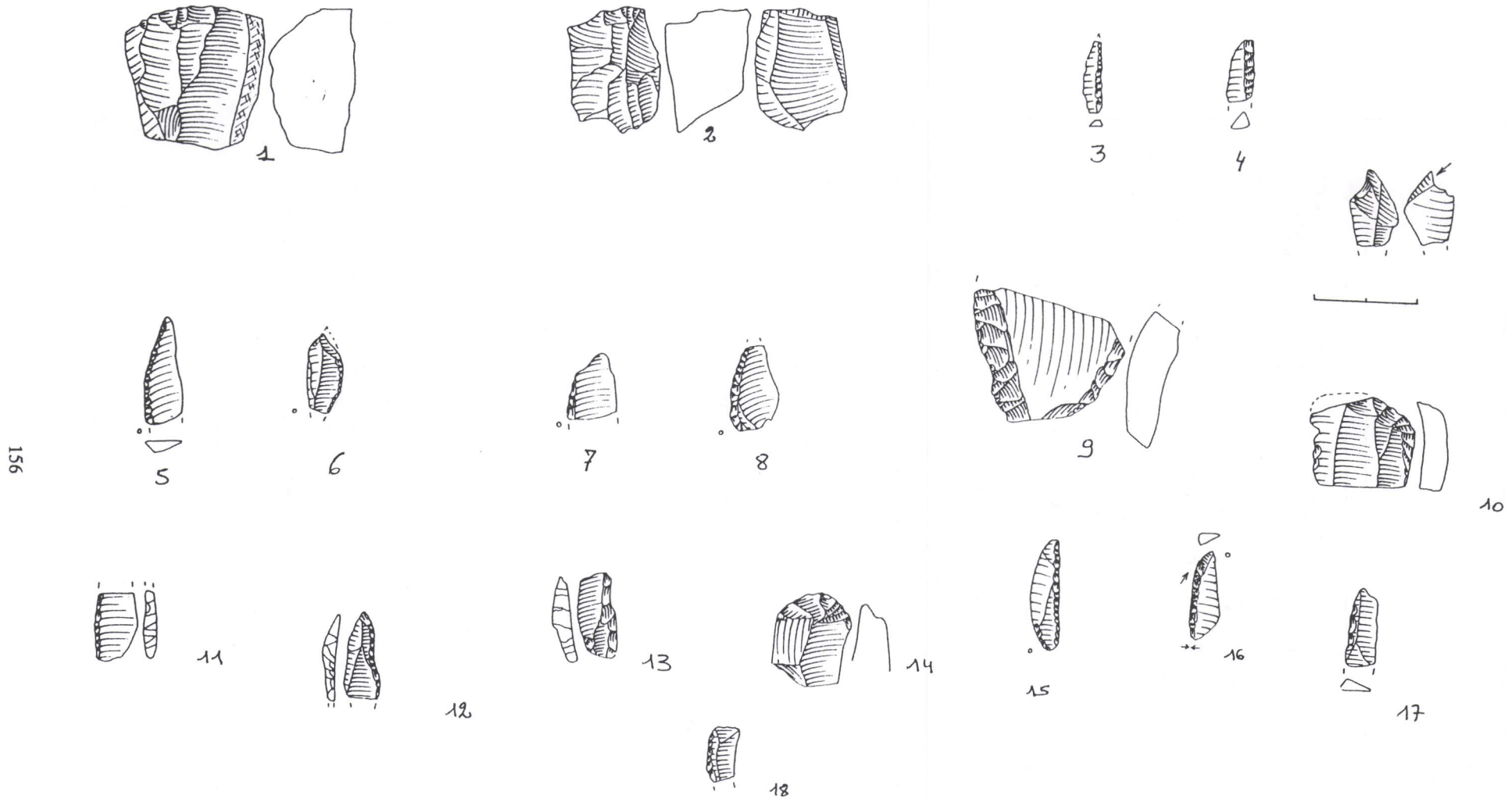

Figure 4 : Cave 4. Lithic implements : 1,2 - cores, 3-8, 11-13, 15-18 - backed bladelets, 10 - fragment of side-scraper, 14 - end-scraper.

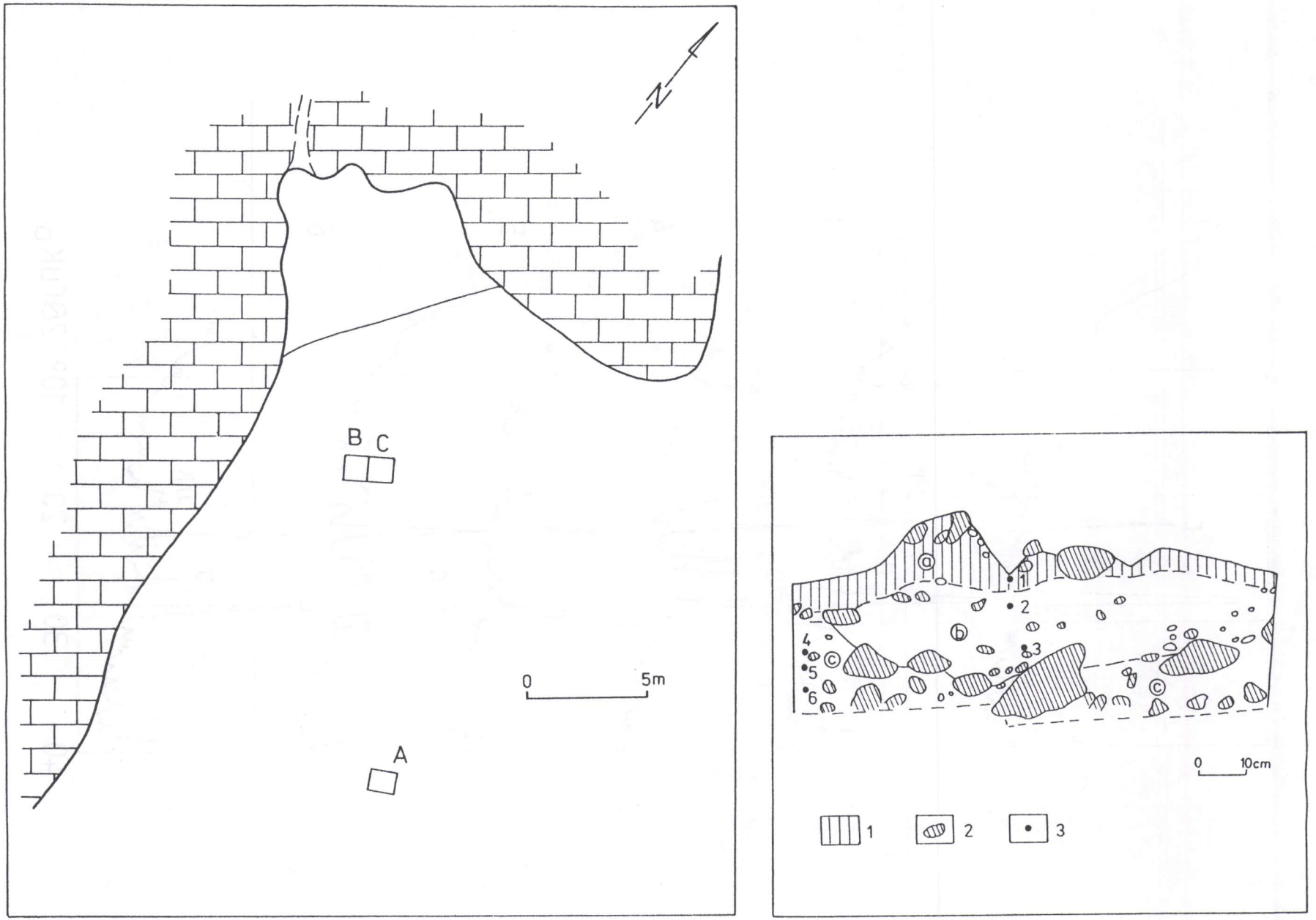

Figure 5 : Cave 7. Left : map of Cave with locations of trenches. Right : profile of sediments (a-c - lithostratigraphic units, 1-6 - sample locations).

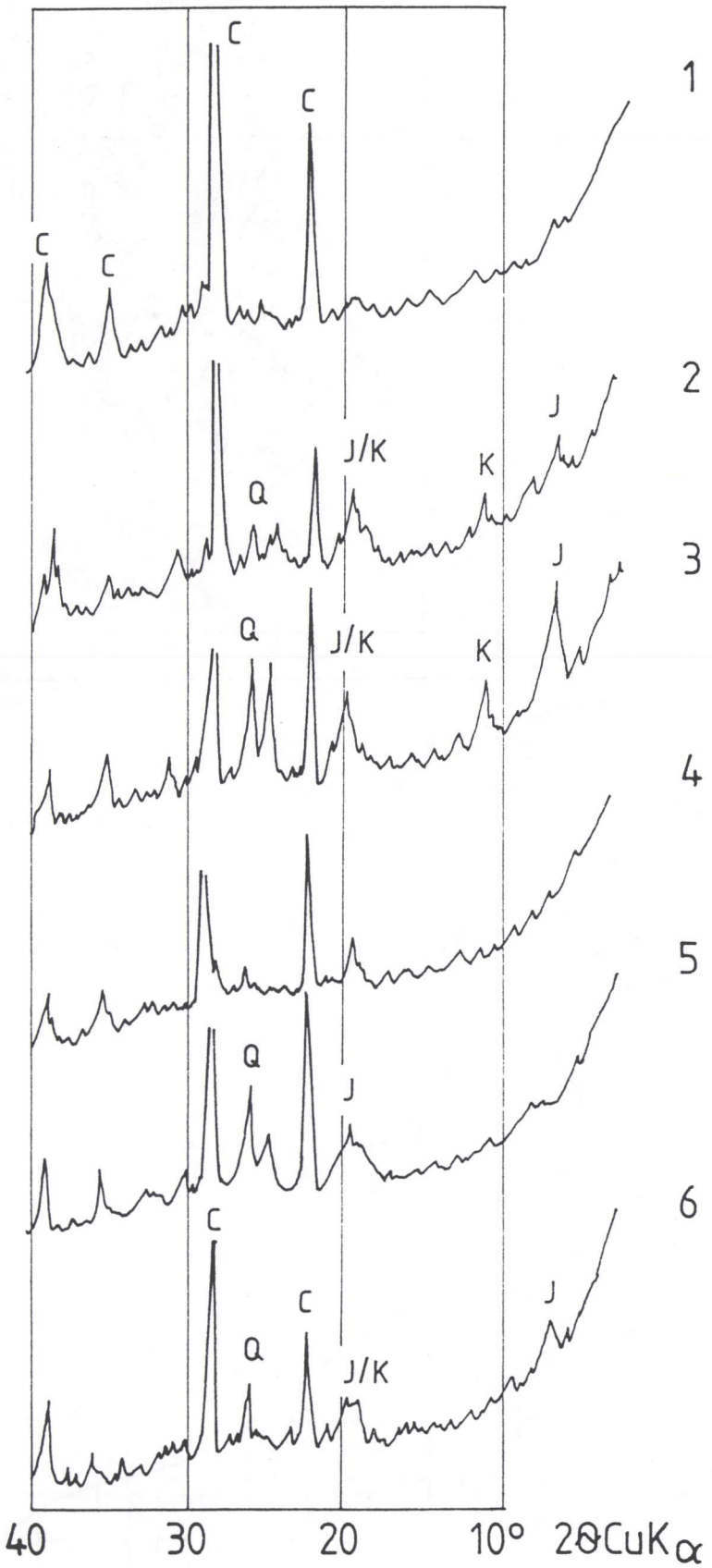

Figure 6 : Cave 7. Resultats of X-ray diffraction patterns of the sediments (sample 1-6).

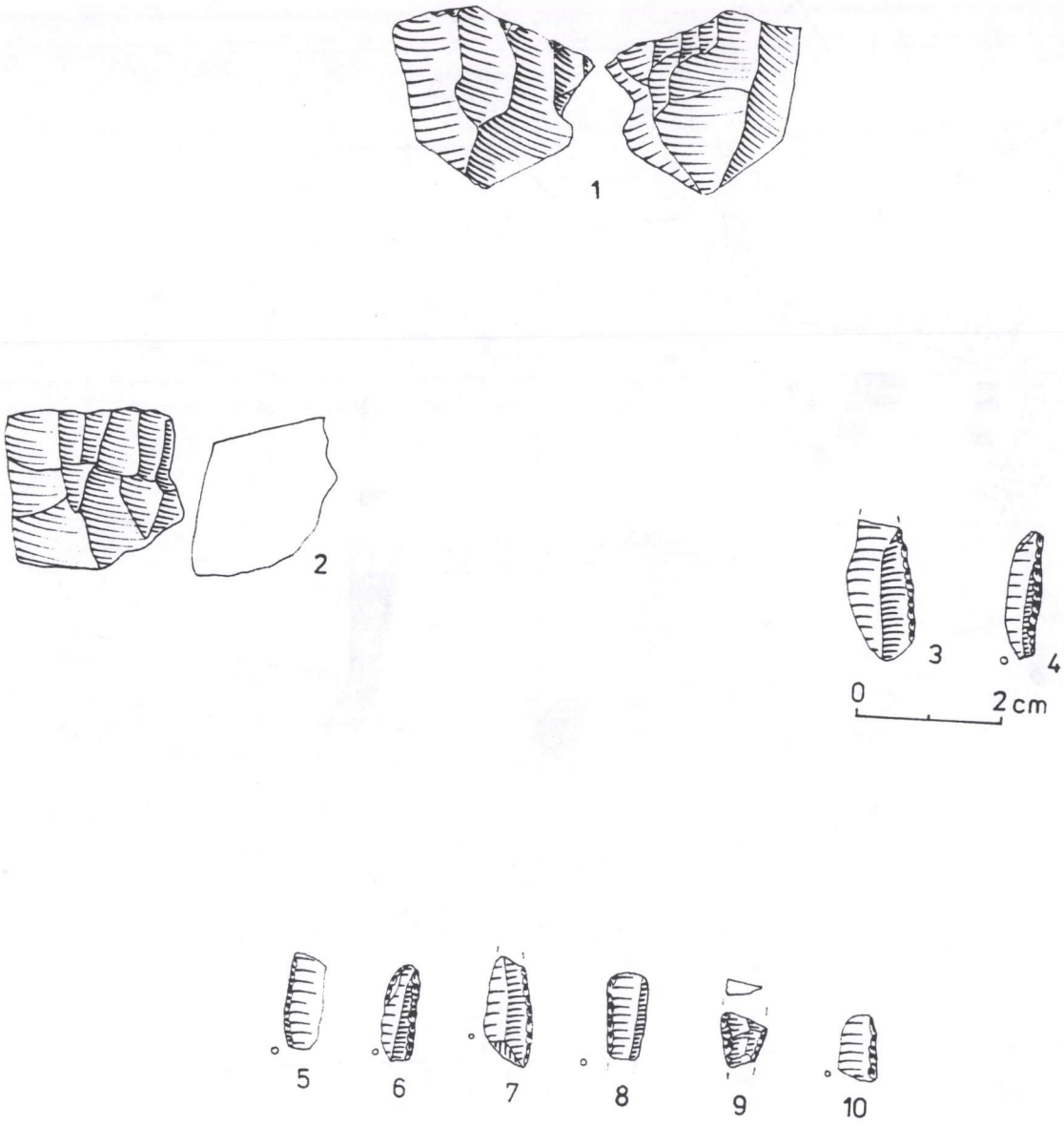

Figure 7 : Cave 7. Lithic implements : 1,2 - cores, 3-10 - simple backed bladelets.

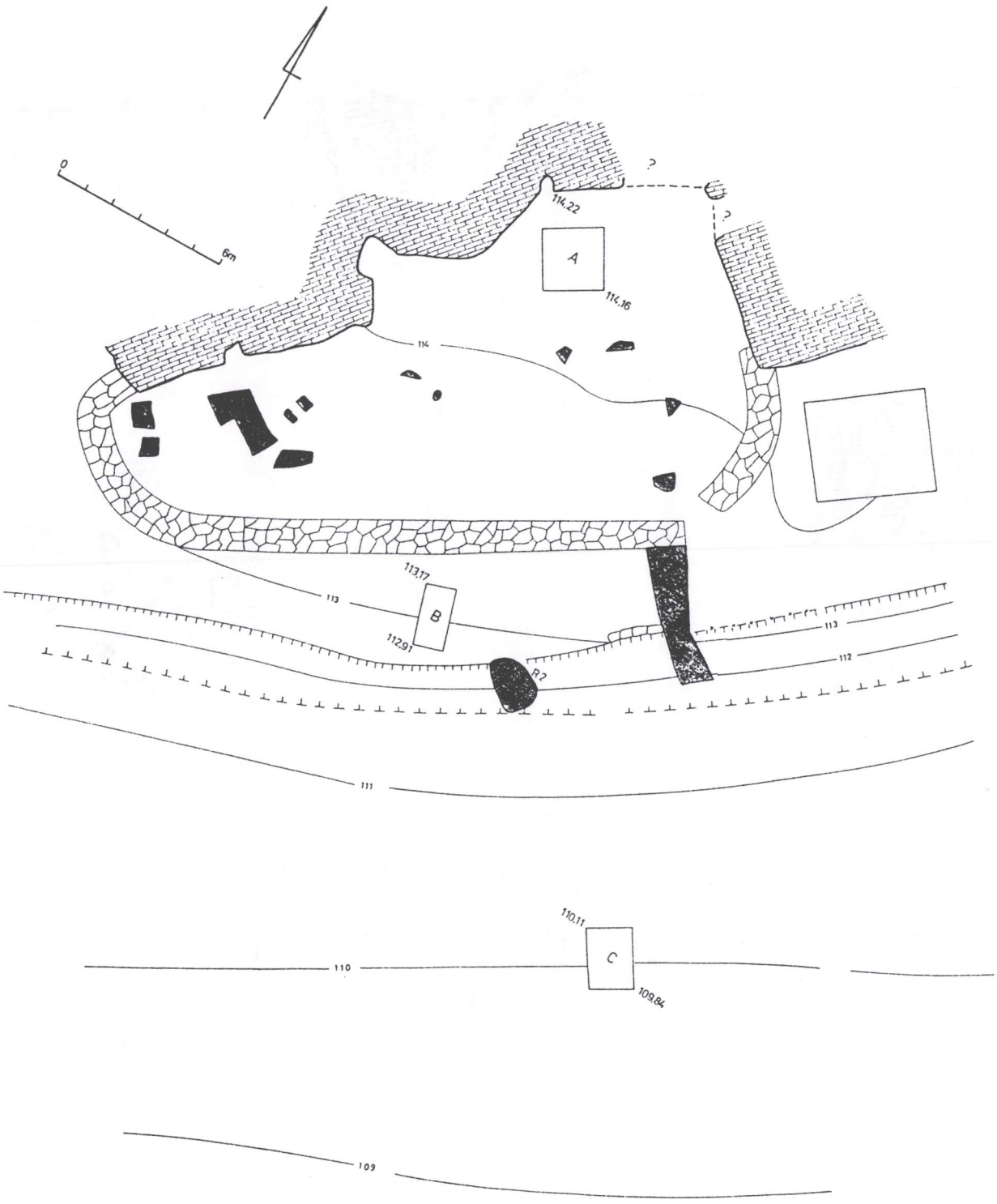

Figure 8 : Cave 1. Map of the Cave with location of trenches A,B,C.

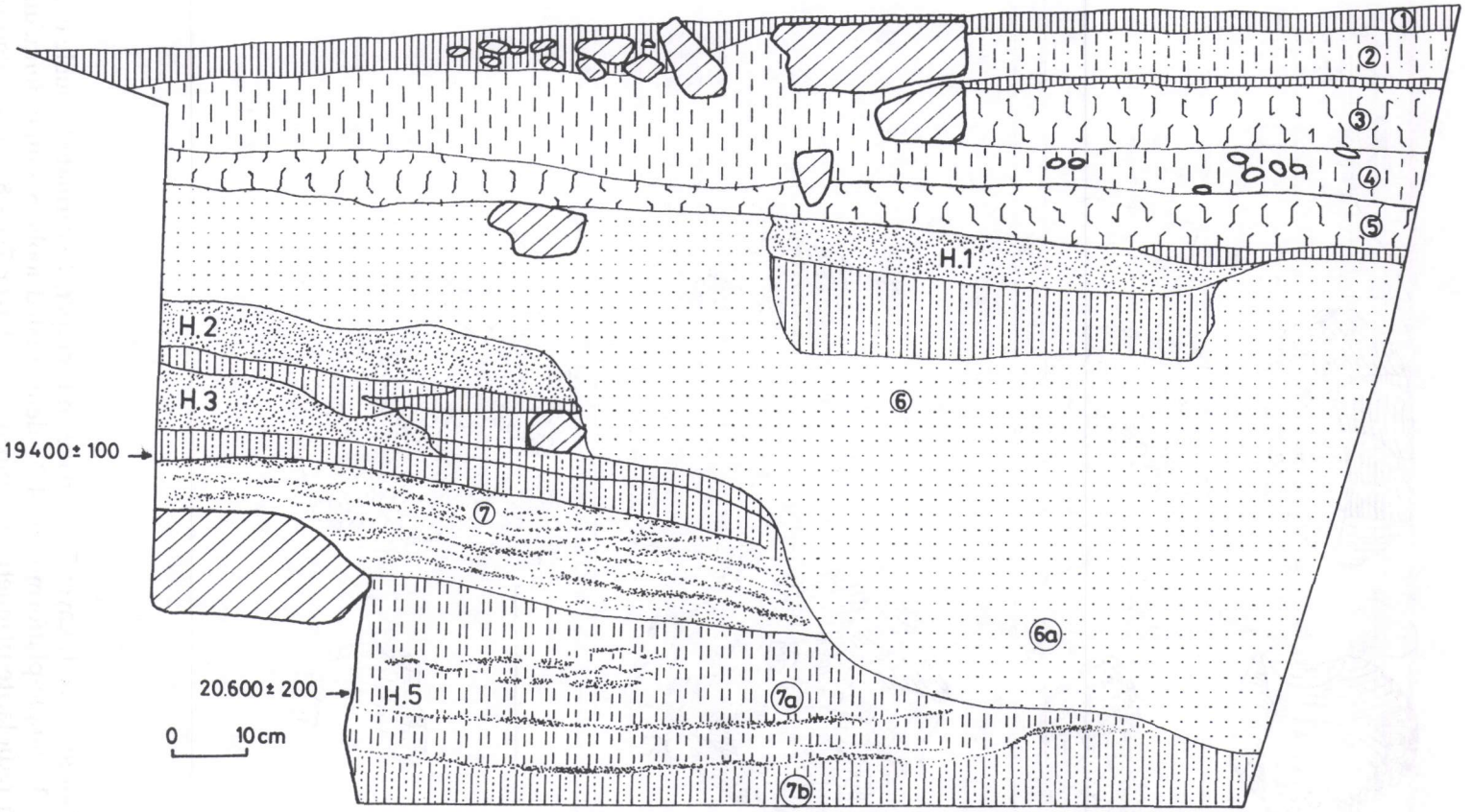

Figure 9 : Cave 1. Western wall of the trench A : 1-7b - lithostratigraphic units, H1-H5 - Hearths.

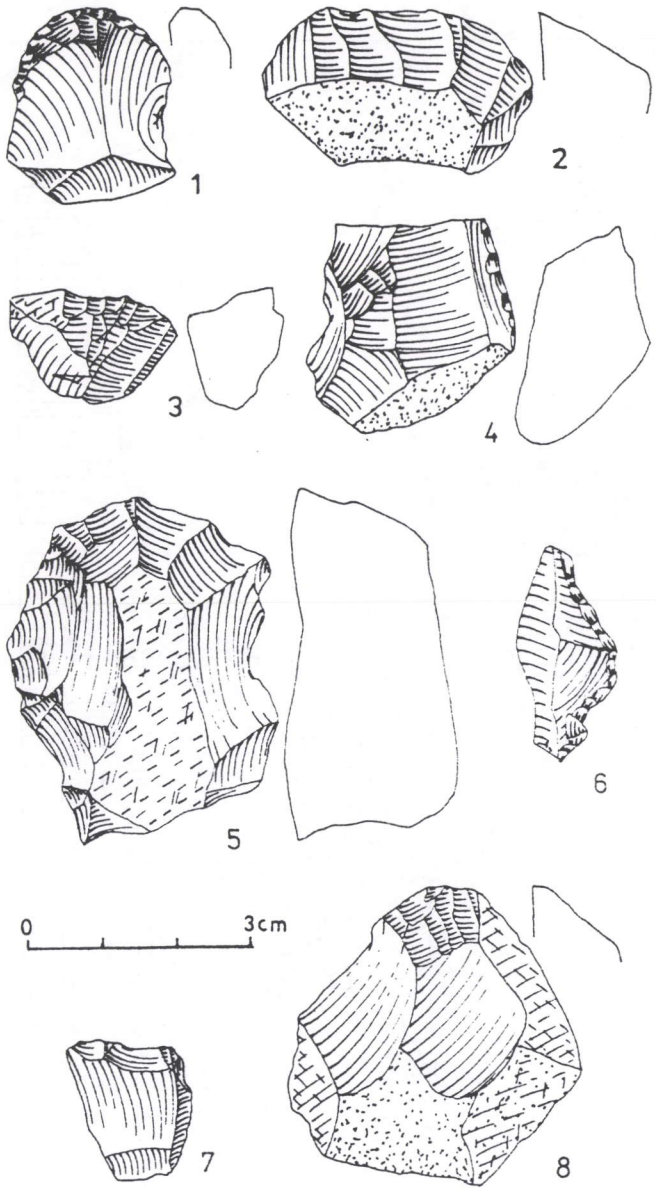

Figure 10 : Klisoura Gorge. Cave 1. Layer 7 : 1 - flake end-scraper, 2 - carinated double end-scraper; Layer 7a - 3 - single-platform core, 4,7 - denticulated tools, 5 - high denticulated end-scraper on radiolarite plaquette, 6 - burin spall; Layer 7w - 8 - nosed end-scraper on radiolarite plaquette.

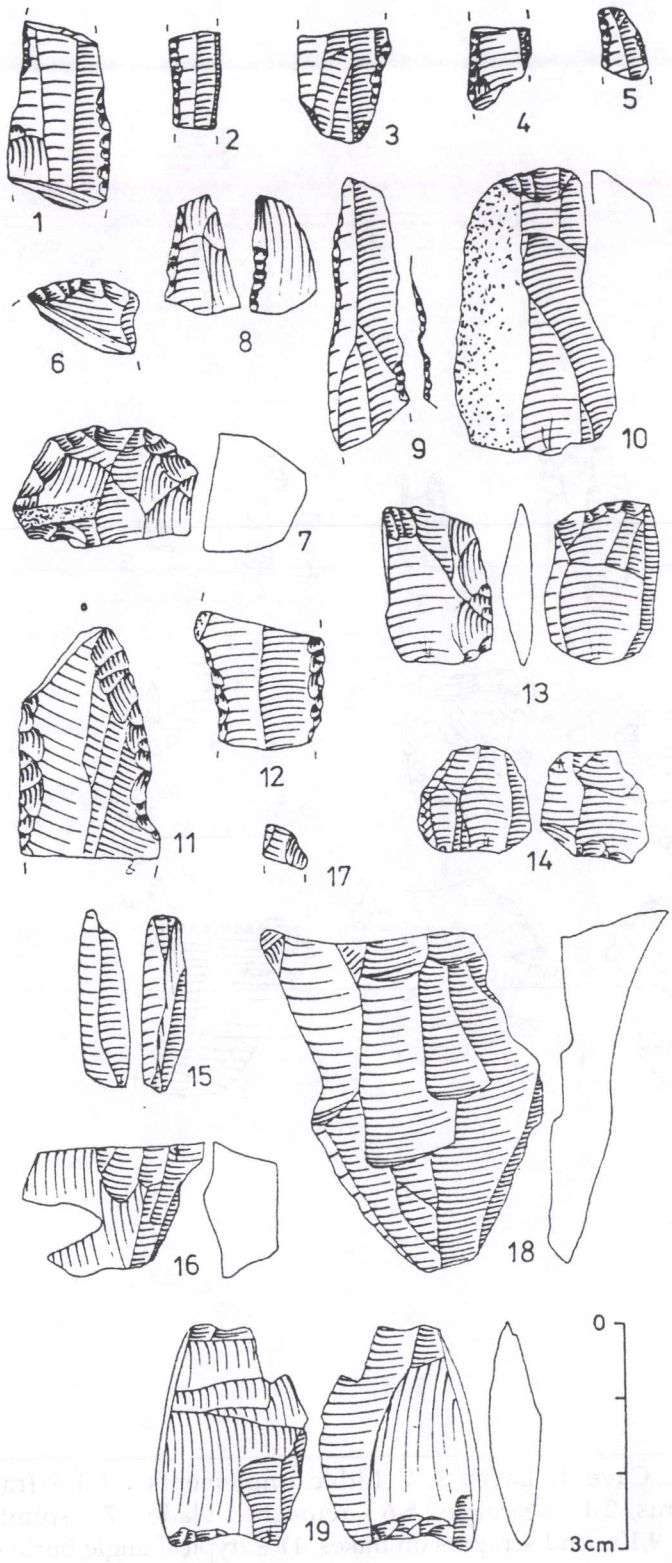

Figure 11 : Klisoura Gorge. Cave 1. layer 5. Lithic implements : 1-5 - backed bladelets, 6,7,10 - end-scrapers, 8 - atypical trapeze, 9,11,12 - retouched blades, 13,14,15 - splintered pieces, 16 - core fragment, 17 - obsidian chips, 18 - plunging flake from macroblade core, 19 - splintered piece on macroblade (made in „silex blond").

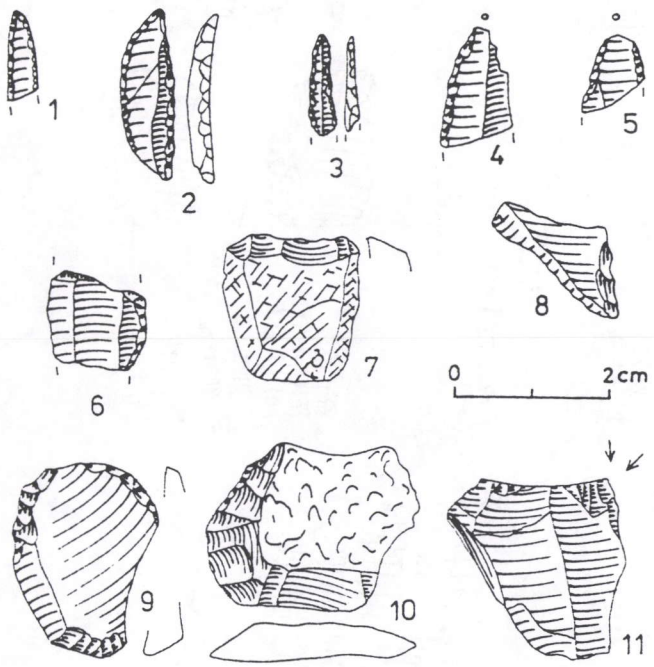

Figure 12 : Klisoura Gorge. Cave 1. Layer 3/4. Lithic implements : 1,3 - fragments of the Sauveterrian points, 2,4 - segments, 5,6 - retouched blades, 7 - splintered piece, 8 - denticulated tool, 9,10 - end-scrapers on flakes, 11 - atypical angle burin on flake.

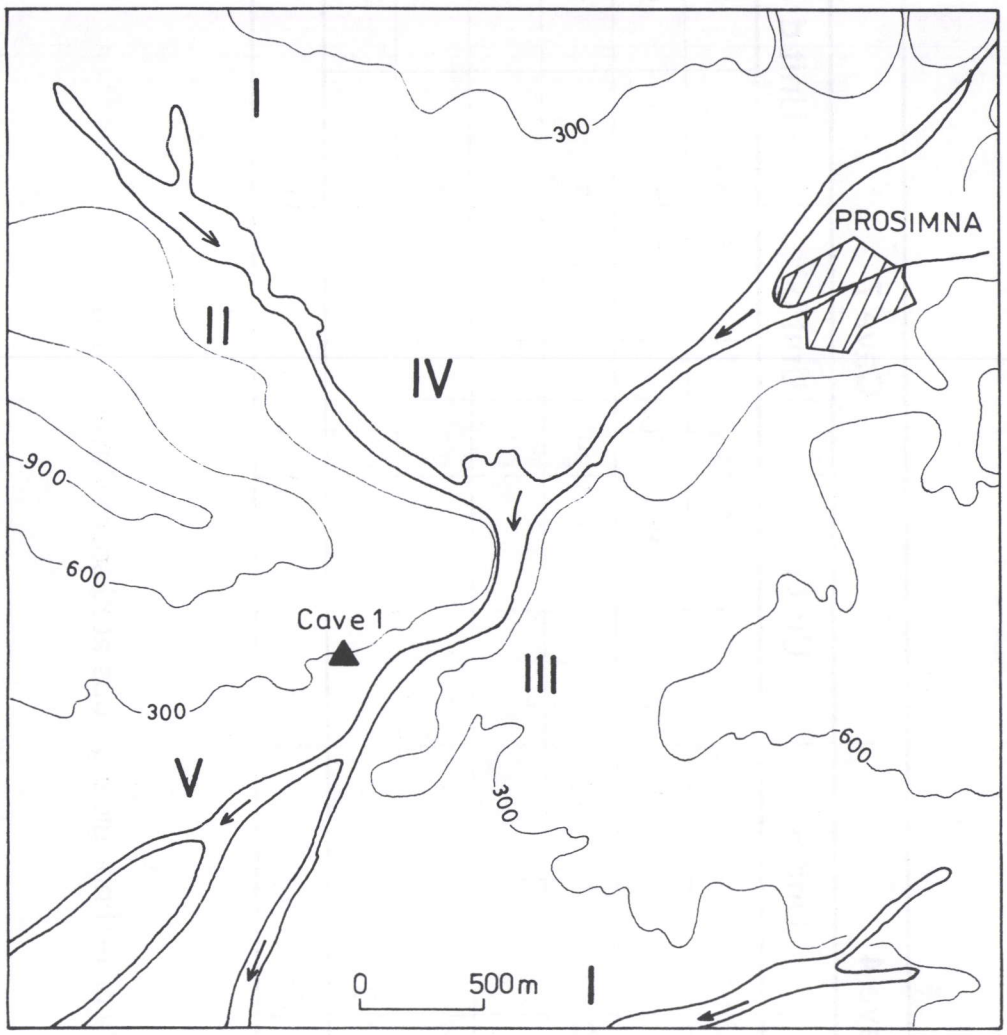

Figure 13 : Klisoura Gorge. Location of raw material sources : Area I - outcrops of radiolarites type R1, R3 and R5 (primary and secondary deposits), Area II - outcrops of Carboniferous sandstones with flints of F1, F2, F3 and F5 types, Area III - gravels of Berbaratiotis alluvia with pebbles of raw materials type : R1-R5, F1, F2, F3 and F5 flints, Area IV - gravels of a stream with pebbles of F1, F2, F3 and F5 flints, Area V - outcrops of radiolarites of R1 and R3 and flint F4 type in primary position.

	Cave 4				Cave 7					
	Unit 7		Unit 6		Unit c		Unit b		Unit d	
Flakes	50	66,6	64	27,3	5	4,0	17	6,7	34	18,0
Chips			115	49,1	108	86,4	156	61,9	111	59,0
Blades	9	12,0	32	13,6	8	6,4	29	11,5	21	11,1
Shutter							42	16,6		
Cores	4	5,3	3	1.3	2	1,6	3	1,2	7	3,7
Tools	12	16,0	20	8.5	2	1,6	5	2,0	15	7,9
TOTAL	75		234		125		252		188	

Table 1: Major technological groups at Klisoura Caves 4 and 7

	R1	R2	R3	R4	R5	F1a	F1b	F2	F3	F4	F5	F9	FB	Ch	SL	Serp	TOTAL	%
Flakes	59		2	1		7	69	68	1		1	1	2	7			**218**	**23,24%**
Chips	182	1		2		38	57	211			1		20	24	9	1	**546**	**58,21%**
Blades	6				1	5	1	2					1				**16**	**1,71%**
Shutter	70			1		5	13	10	1				3	21			**124**	**13,22%**
Cores	2					1		1	1								**5**	**0,53%**
Splintered Pieces	14					2	4			1		1		1			**23**	**2,45%**
Tools	2			1	1					1			1				**6**	**0,64%**
TOTAL	**335**	**1**	**2**	**5**	**2**	**58**	**144**	**292**	**3**	**2**	**2**	**2**	**27**	**53**	**9**	**1**	**938**	**100%**

Table 2: Raw material use at Klisoura Cave 1
(Trench A, layer 7a)

	R1	R2	R3	R5	R7	F1a	F1b	F2	F3	F5	F5a	F6	Ch	SL	TOTAL	%
Flakes	29		1		1	5		2	2	1				2	**43**	**30,07%**
Chips	20	1					7	1	2	1	1	1	1		**35**	**24,48%**
Blades	6			1		6				1					**14**	**9,79%**
Shutter	14					1	11	1						3	**30**	**20,98%**
Cores	1	1											1		**3**	**2,10%**
Splintered Pieces	1						1		1		1		1		**5**	**3,50%**
Tools	10	2					1								**13**	**9,09%**
TOTAL	**81**	**4**	**1**	**1**	**1**	**12**	**20**	**4**	**5**	**3**	**2**	**1**	**3**	**5**	**143**	**100%**

Table 3: Raw material use at Klisoura Cave 1
(Trench A, layer 3)

	R1	R2	R3	R4	R5	R6	R8	F1a	F1b	F2	F3	F5	F6	FB	F8	Ch	SL	Q	TOTAL	%
Flakes	125	5		4	2			4	41	9	2	2	2			1	2	1	**200**	**23,07%**
Chips	215	7	3	2				52	70	18	11	15		12		3	2	3	**413**	**47,64%**
Blades	32	1			1			5	5		1			1					**46**	**5,31%**
Shutter	60	4	2			1		2	59		12			3			3	1	**147**	**16,96%**
Cores	3			1				1	3										**8**	**0,92%**
Splintered Pieces	13								2		2			2				2	**21**	**2,42%**
Tools	16	2	2				1	3	1	3				1	1	1		1	**32**	**3,69%**
TOTAL	**464**	**19**	**7**	**7**	**3**	**1**	**1**	**67**	**181**	**30**	**28**	**17**	**2**	**19**	**1**	**5**	**7**	**8**	**867**	**100%**

Table 4: Raw material use at Klisoura Cave 1
(Trench A, layer 5)

	3	3b	3/4	3/5	5	6	TOTAL
Simple backed bladelet	2		2	3	3	3	13
Hypermicrolithic backed bladelet				1			1
Double backed bladelet			1		1		2
Segment			3		1		4
Sauveterrian point			2			2	4
Atypical triangle						1	1
Triangle		1					1
Microlithic truncation			1	1			2
Castelnovian blade					1		1
Atypical trapeze					1		1
Microretouched bladelet	1	3			2	2	8

Table 5: Klisoura Cave 1. Microliths from the upper part of Sediments in trench A.

	3	3b	3/4	3/5	5	6	6a	6/7	7	7a	TOTAL
Flake end-scrapers		1			1	1	1		1		5
Blade end-scrapers					2						2
End-scrapers on retouched blade		1		1	1						3
Double end-scrapers		1				1					2
Round end-scrapers						1					1
Nosed end-scrapers									1	1	2
Carinated short end-scrapers					1			1	1		3
End-scrapers on plaquette	1		2			1		1			5
End-scrapers + burin							2				2
Dihedral burin	1					1					2
Perforator on blade						1					1
Alternate perforator				1		1					2
Microlithic perforator	1			1	1						3
Retouched blade	1			2	2						5
Retouched truncation				1	1						2
Kostenki truncation + burin						1					1
Side-scraper	1			1	4	1	1			2	10
Notched tool	2			1	1	3					7
Notched blade					1						1
Denticulated tool										1	1
Irregular scraper				1		1					2
Retouched flake	2	2		3	2			1			10

Table 6: Klisoura Cave 1.
Upper Palaeolithic and Mesolithic tools (all layers)

	R1	R2	R3	R4	R5	F1a	F1b	F2	F3	F5	F7	F8	Q	Ch	other	TOTAL	%
Flakes	47				5	3	6	1	1	5	1	1	2	1	1	**74**	**32,31%**
Chips	41				5	4	9	2		15						**76**	**33,19%**
Blades	28	1	1		2	3				6			2	1		**44**	**19,21%**
Shutter	4				1	1				4				1		**11**	**4,80%**
Cores	4														1	**5**	**2,18%**
Splintered Pieces	7			1		1					1					**10**	**4,37%**
Tools	7									1	1					**9**	**3,93%**
TOTAL	**138**	**1**	**1**	**1**	**13**	**12**	**15**	**3**	**1**	**31**	**3**	**1**	**4**	**3**	**2**	**229**	**100,00%**

Table 7: Raw material use at Klisoura Cave 1
(Trench B, layer II, spit 30-40 cm)

	R1	R4	R5	F1a	F1b	F3	F5	F7	TOTAL	%
Flakes	66	3		27	10		10		**116**	**33,53%**
Chips	52	2		16	20		20		**110**	**31,79%**
Blades	21	3	1	3	5		16		**49**	**14,16%**
Shutter	26				4		23		**53**	**15,32%**
Cores	1				1	1			**3**	**0,87%**
Splintered Pieces	3				1		1		**5**	**1,45%**
Tools	4				1	1	3	1	**10**	**2,89%**
TOTAL	**173**	**8**	**1**	**46**	**42**	**2**	**73**	**1**	**346**	**100%**

Table 8: Raw material use at Klisoura Cave 1
(Trench B, layer III, spit 100-110)