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THE EARLY PALAEOLITHIC SITE STRÁNSKÁ SKÁLA I. NEAR BRNO (CZECHOSLOVAKIA)

ABSTRACT — On the north-western slope of Stránská skála, a Jurassic crag on the eastern fringes of the town of Brno there is a denuded and rather accidented section, containing a rich fauna of vertebrates. The whole association is typical of the so-called Upper Biharian fauna. In one layer of the upper part of the section stone implements were found. Deeper in the loess Matuyama-Brunhes' palaeomagnetic boundary was detected. This fact, as well as the fauna, document the age of the artifacts.

KEY WORDS: Early Palaeolithic — Stone implements — Split animal bones — Documents of non-utilitarian activities — Upper Biharian vertebrate fauna — Matuyama-Brunhes boundary.

INTRODUCTION

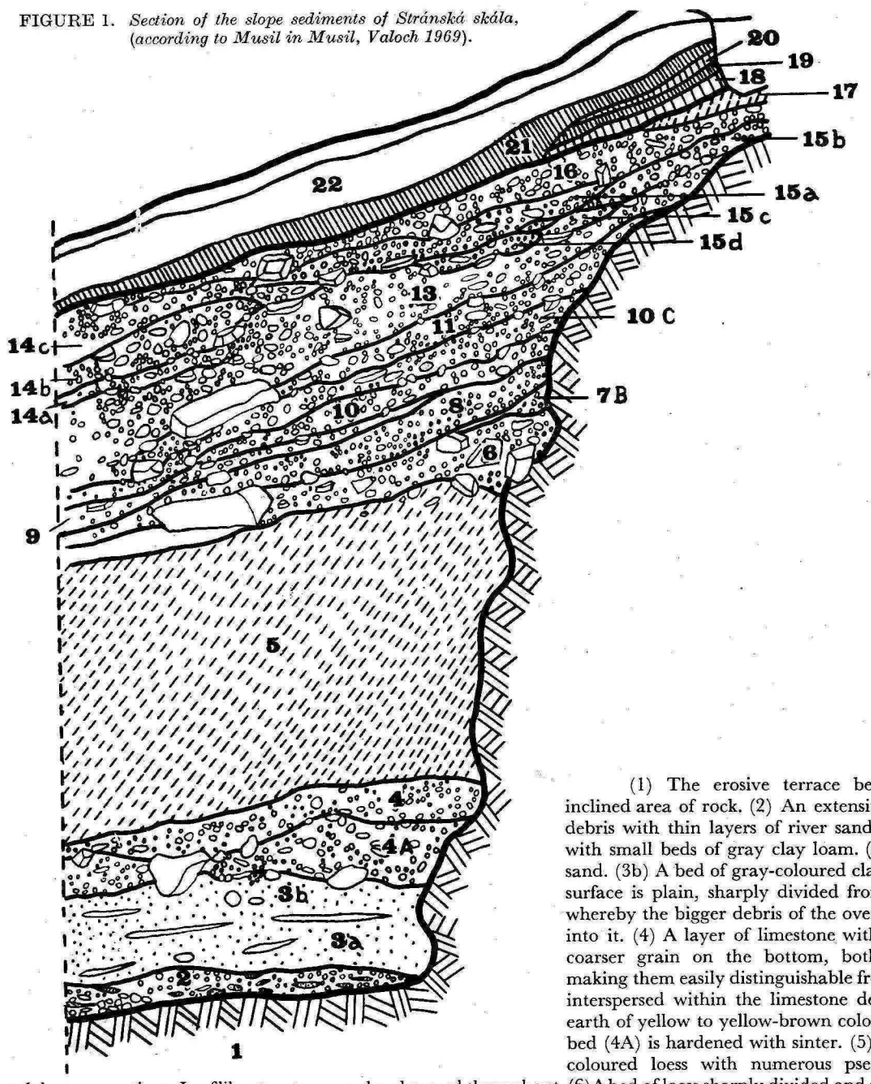
Jan Woldřich studied the Pleistocene bones from Stránská skála already in the late nineteenth century. He explored among other things a small cave (now cave No. 8—Woldřich's Cave) yielding a profusion of palaeontological material, and it seems that also the first traces of the presence of man, which he, however, failed to recognize. The following research, namely in the nineteen-twenties (by K. Absolon and others) has not brought about further documents on the Lower Pleistocene settlement and most scholars assumed a rather sceptical attitude regarding this question (compare Valoch 1972).

In the years 1956—1972 the Anthropos Institute of the Moravian Museum organized an extensive research led by R. Musil, both into the slope sediments and also inside the caves. The sediments in the open-air, and also in caves Nos. 4 and 8 in their very vicinity, yielded conclusive evidence of the presence of man. Published is, however, only the palaeontological material from the earlier excavations (Musil, ed. 1972), the processing of the finds obtained during the research organized by the Anthropos Institute has not been completed. In view of the fact, however, that the sections with slope sediments, as well as those from Cave No. 4 have been published, and the chronostratigraphic position of the artifacts is sufficiently known, we can publish an information on the artifacts assemblage.

GEOMORPHOLOGY, GEOLOGY AND TOPOGRAPHY

The city of Brno lies in a region with widely varied geological structure. To the west and north, Palaeozoic (or older) rocks form slightly rounded hills; the region south of Brno is a flat broad plain composed of soft Neogene sediments. The northern periphery of Brno -the most southern promontories of Moravian Karst- are marked by Devonian and Lower Carboniferous limestones with numerous karst phenomena, both subterranean and superficial. Slightly south of the Moravian Karst but north of Brno are found isolated islands of Jurassic limestones which largely form rounded hills rising slightly above the

FIGURE 1. *Section of the slope sediments of Stránská skála, (according to Musil in Musil, Valoch 1969).*



(1) The erosive terrace bench—a smooth, slightly inclined area of rock. (2) An extensively weathered limestone debris with thin layers of river sand and gravel, interspersed with small beds of gray clay loam. (3a) A bed of fine alluvial sand. (3b) A bed of gray-coloured clay alluviated by water; its surface is plain, sharply divided from the overlying stratum, whereby the bigger debris of the overlying stratum falls partly into it. (4) A layer of limestone with finer grain on top and coarser grain on the bottom, both extensively weathered, making them easily distinguishable from the overlying stratum; interspersed within the limestone debris is a loess-like sandy earth of yellow to yellow-brown colour. The lower part of this bed (4A) is hardened with sinter. (5) A bed of typical, yellow-coloured loess with numerous pseudomycelia $CaCO_3$ and calcium concretions. Leaflike structure may be observed throughout. (6) A bed of loess sharply divided and somewhat darker than the substratum, with numerous calcium concretions filling up hollow shrub roots. The bottom sedimentation contains large limestone blocks from the vertical rock wall. These are to be found still on its surface. The position and thickness of these big blocks is like an analogous siting of coarse waste in the cave entries of the Moravian Karst, dated at the early Holocene. (7B) When the sedimentation of the large blocks was finished and the aeolation of loess had ceased, a deposit of sinter began forming at the rock. Notably, it is developed solely at the rock, and thins out as we descend the slope. Where it is absent a gradual transition between beds 6 and 8 is observable. Bed 7 is exactly analogous to bed 6 as an example of Holocene sediments in the entries of caves. (8) Brown compact earth with a fine debris. Both the earth and debris gradually change colour; the layer as a whole, however, is darker than the superstratum. (9) Loess-like earth to loess with a slight amount of fine debris, but occasional larger limestone blocks. The bed is of yellow-brown to yellow colour and is not clearly differentiated from the substratum. (10 + 10C) Big blocks of limestone are to be found on the surface of substratum. Again the bed at the rock is formed by sinter which thins out down the slope and changes to an earth thickly saturated with $CaCO_3$. More sinter is found here than in Bed 7B. $CaCO_3$ thins out as we proceed to the superstratum. (11) Rusty-yellow loess-like earth saturated thickly with $CaCO_3$. (12) Not present in this profile (13) Brown-coloured loam with medium size debris. Its surface is striated by erosion. The uppermost part seems to have been removed secondarily. (14a) A loess-like earth with numerous stripes of dark loam. It is obviously a remainder of fossil soil which developed on loess denudated later on and mixed with the substratum. (14b) Loess to loess-like earth with coarse waste. (14c) A yellow-brown coloured loess. (15) Brown-coloured loess-like loam with pseudomycelia of $CaCO_3$ containing a quantity of fine sharp-edged debris, obviously thrust by solifluction. (16) A brown-coloured loess with numerous $CaCO_3$ pseudomycelia, much debris. (17) A brown-coloured loess with $CaCO_3$ pseudomycelia, little debris. This marks the end of the Pleistocene layers (18–21) Holocene layers. (22) Recent fill.

surrounding terrain. One of these hills is Stránská skála, situated about 5 km northeast of the center of Brno.

Stránská skála is 1,5 km long, almost 400 m wide and lies 310 m above sea level. While the southeastern slope is quite moderate and passes gradually into a plain formed by gravels of the Tuřany Terrace (cca. 30 m above the present level of the Svratka and Svitava rivers), the northwestern boundary is steep, the limestone rock face falling vertically into the valley. This part of the hill is extensively karsified. There are both vertical joints, often with horizontal extensions, and longer systems of corridors of larger dimensions. A large part of the northwestern slope is covered with a massive talus fan. Both the cave sediments and deposits of a relatively complicated talus section produce palaeontological finds. On the rocky northwestern side of Stránská skála there is a number of stone quarries situated at two levels. The area of the southern quarry, at the lower level, was subjected to palaeontological research from the very beginning. The slope sediments are situated on the left side of the entrance to the quarry and are leaning against the perpendicular rock face of about 7 m of height. Above the wall there is a quarried platform ending with a further, roughly 4 m high rock face. Higher it continues as a steep rocky slope. The platform and Cave No. 8 are connected by a narrow corridor, impassable by man; the entrance to the corridor is 6 m lower, in the left wall of the quarry. The cave is formed by a horizontal cavity beyond the entrance. It is relatively narrow and roughly 5 m long. The cave ends with a chimney-like corridor leading to the rock platform. The cavity is so high that one can stand in it. Cave No. 4 (*fig. 3*) is on the right side of the entrance to the quarry, roughly 40 m from the rock with the scree sediments. It is formed by a system of short horizontal and considerably deep vertical cavities, measuring about 15 m. in depth and with a water reservoir at the bottom. The quarry is very old, its operation was stopped in the thirties. The original shape of the hillside is already unknown. It is very probable that the natural entrance to Cave No. 4 was destroyed by quarrying, and perhaps the entrance to Cave No. 8 was also blasted. During the quarrying operations and earlier excavations most of the slope sediments were removed.

STRATIGRAPHY AND CHRONOLOGY

In connection with earlier excavations a 11 m long and 14 m deep shaft has been dug in the slope sediments; R. Musil determined in its section 20 lithologically different layers of soil sediments, loesses and debris (*Figs.* 1, 2). Inside the small caves there were fewer sediment types. The best preserved section in vertical corridor E of Cave 4 contained 6 layers (*Figs. 4, 5*); as regards the filling of Cave No. 8 we have so far no report.

The palaeontological materials form a reliable basis for the age of all sediments. Of great importance is the mass of microfauna, with *Pitymys* prevailing in it, but well documented is also the presence of *Mimomys, Microtus* and *Lagurus*. The whole association of vertebrates is characteristic of the biostratigraphic phase of the Upper Biharian. We can assume according to the section in the slope sediments, containing both soil sediments and loesses, debris and calcareous sinters that the above fauna lived throught a long period, comprising warmer and cooler climatic oscillatious. From the archaeological viewpoint the slope section includes important soil sediments in its

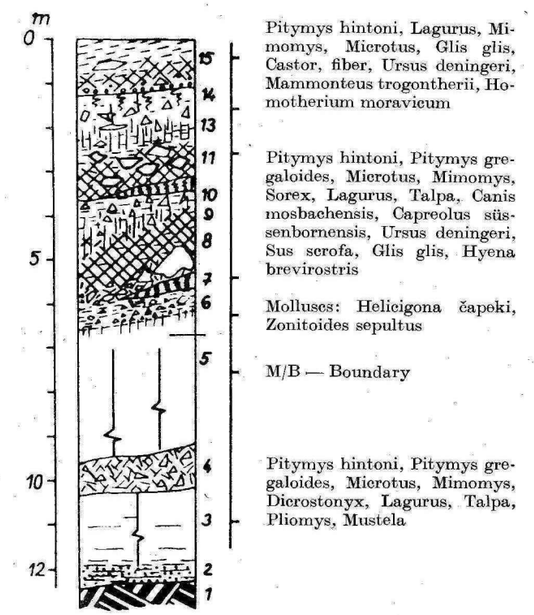


FIGURE 2. *Scheme of the section of slope sediments containing fauna and indicating the Matuyama/Brunhes boundary (according to Kočí, Šibrava 1976).*

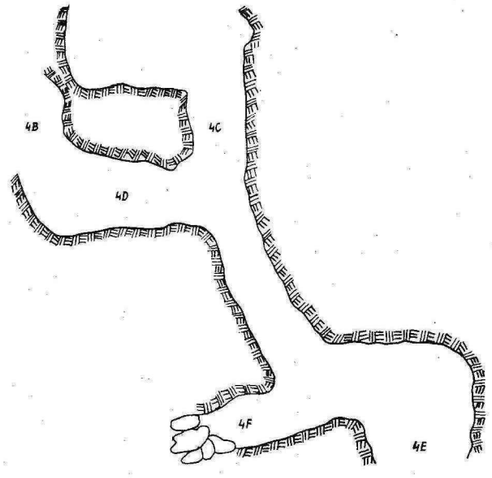


FIGURE 3. *Stránská skála. Ground plan of the small cave No. 4 (According to Musil 1969).*

upper part. Layers 6—16 evidently represent the period of an interglacial. The rich collections of microfauna found in the slope sediments and in the two caves are according to R. Musil roughly identical, with some quantitative differences in the frequency of individual species (Musil in R. Musil, K. Valoch 1969, p. 538; Musil 1972).

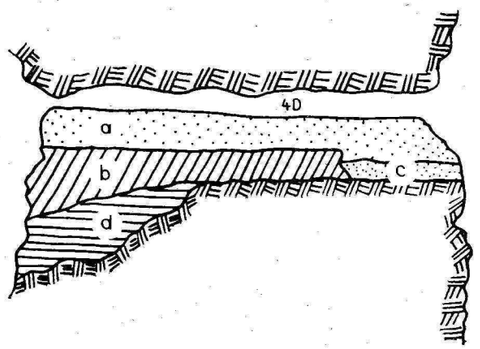


FIGURE 4. *Stránská skála. Section of sediments of the Upper Biharian Age in corridor D of cave No. 4 (according to Musil 1969).*

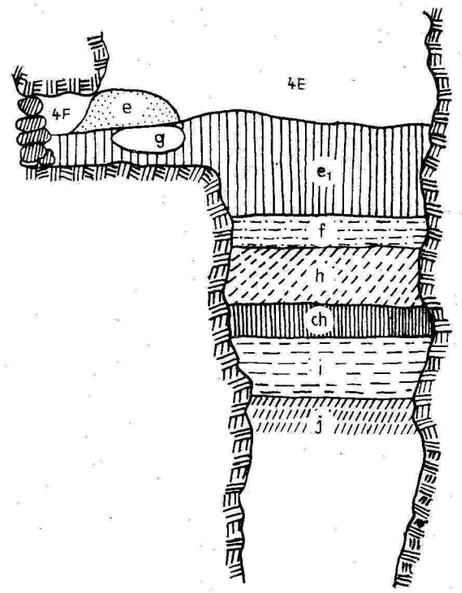


FIGURE 5. *Stránská skála. Section of the sediments in areas E and F of cave No 4 (according to Musil 1969).*

Other important factor for dating is the determination of the Matuyama-Brunhes palaeomagnetic boundary passing through the upper part of loess layer 5 under the of interglacial soil sediments (Kočí, Šibrava 1976). This boundary, whose age is put at 700 000 years approximately, is put as a rule into the younger third of the Cromerian complex. (*Fig. 2*).

The stone implements and the split and used animal bones were found in layers 14 and 13 of the slope section. Layer 13 is probably chronologically identical with the stay of people; in layers 14a—c we have to assume the presence of a mixture of Upper Pleistocene sediments, as documented by a find of an end scraper, coming without the least doubt from the Upper Palaeolithic (fig. 6:1). It means that the Early Palaeolithic artifacts come from the end of the interglacial following the formation of loess of layer 5 and are younger than 700 000 years, but probably older than 600 000 years. The artifacts discovered in the two small caves come approximately from the same period, although we cannot say whether the whole assemblage is the result of a single stay or of repeated stays of bands of hunters.

ARCHAEOLOGICAL EVIDENCE

In view of the earlier negativistic views concerning the settlement of Stránská skála in the Upper Biharian we treated the first finds of hornstone flakes with considerable scepticism. The main reason for this attitude was the fact that Jurassic limestones reach in some levels the position of hornstone (chert) nodules, weathered out in the scree and broken due to natural mechanical and thermic processes. According to our knowledge we expected in that period—in case of real settlement—pebble tools, which we failed to find.

It took some more years to realize—namely on the basis of evidently processed tools found in cave No. 4—that among the natural hornstone fragments there are also real tools (Musil, Valoch 1968, Musil 1969, Valoch 1984, 1986).

Raw materials

The tools were made almost exclusively of local raw materials, of Jurassic hornstones and limestones. The limestones of Stránská skála are about 60 m thick—according to the Malm period fauna they contain (Oppenheimer 1926), and have been divided into three geological levels, to bottom hornstone limestones, crinoidal limestones and upper hornstone limestones. Thus, hornstones occur on two levels. They were analysed by J. Koutek (1926), who concluded that a characteristic feature of the upper hornstones is their zonal structure caused by thin alternating of darker and lighter layers, while the bottom hornstones are light-grey and contain a profusion of limestone enclaves. Basically we should agree with this conclusion in general, in detail, however, the variability of hornstones is much wider. A. Přichystal (in print) points out e.g. that in the upper limestones besides zonal hornstones we can find also homogenous specimens.

The research of caves No. 4 and 8 situated in the lower limestones has revealed that neither are these hornstones of uniform character. The sediments of cave No. 4 contained a large amount of weathered out nodules of irregular, sometimes of rather bizarre features with numerous projections, but of not too big dimensions. Their crust is porous, brown and does not contain any limestone (not reacting on HCl). The hornstones are dark blue-grey in colour, and as a rule they contain numerous very small, but also bigger brown

coloured patches and orifices perhaps caused by fossils (according to A. Přichystal) and are of low fissility. Such nodules are protruding from the walls of the cave up to these days. The lumps in the sediments had obviously weathered out of the massif during the process of cave formation. The hornstones differe from the description by J. Koutek regarding the hornstones at the lower limestone level. They were flaked by people only to a small extent; only a single implement is pictured (*Fig. 7:2*), the rest are little typical flakes, fragments and crushed nodules.

More profusely were used the hornstones, with the description by J. Koutek fitting for the bottom level. They are light-grey-to-light-grey-blue and are of pseudo-breccia type. It is characteristic that they contain numerous small and also bigger limestone enclaves, eventually alternating thin hornstone and limestone layers. Their concretions reach considerable dimensions and as a rule they are not covered by crust. They do not appear on the wall of caves No. 4 and 8. The artifacts have been flaked of them, regardless of the course of the thin limestone layers and most of them are enclaves of limestone. They cannot be pieces of hornstone, weathered out from the massif and broken through natural processes. They were evidently obtained intentionally from bigger blocks and the flakes did not respect the course of the thin layers and enclaves of the limestone. There are also several flakes with bulbs of percussion from pure limestone, one of them is pictured (*Fig. 8:4*).

On the basis of macroscopic observation we can say that besides the above-described two varieties of hornstones numerous flakes were taken also from others varieties. The flake pictured in *Fig. 11:1*, coming from Cave No. 8 is of dark blue-grey homogeneous hornstone reminding of the high-quality upper limestones described by Přichystal. The raw material of the big flake comes according to A. Přichystal from the vicinity of crinoid limestones, since in the limestone layers there are crinoid needles. Also flake *Fig. 8:3* from the slope sediments—with its crust and light-blue colour differs from the hornstones coming from the bottom level.

The halved pebble *Fig. 9:1* reminds of the zonal hornstones from the top level. The original hornstone lump was heavily worn by the water, from the projections remained only small nodes. The crust arising through the weathering of hornstone is up to 4 mm thick, light-grey, and almost smooth. There is no doubt that the pebble brought to Cave 4, comes from river gravel.

From Cave 4 comes also another pebble of non-Jurassic hornstone found in the sediments excavated from the cave prior to our research. It is difficult to say whether the traces of strokes are artificial. From the slope sediments come also the pebble of brown cretaceous hornstone with several retouches (?) on the edge, and a halved quartz pebble, in which vestiges of human intervention are questionable. The same applies to the crushed cretaceous hornstones pebble from cave No. 4. It can be assumed that the quartzite pebble from Cave 4 (*Fig. 12:1*) and the quartz pebble from Cave No. 8 (*Fig. 12:3*) were used as tools. However, all the above objects are manuports, since similar pebbles naturally do not appear either in the slope sediments or in the small caves. An exception are perhaps only the small pebbles well worked by water and enclosed in the rest of Miocene sediments on the top of Stránská skála and in some of its cavities.

Technology of processing and the typology of the stone tools

The technology of hornstones had not yet been stabilized. Most lumps were simply shuttered, as documented by irregular fragments without bulbs. On the other hand the flakes of hornstones with limestone have usually a well perceptible bulb, only seldom is it little distinct. The striking platform is usually flat, with crust or linear. The cores were evidently not prepared.

Retouched tools are rare. In most cases they are local, not too expressive, flat and short retouches, or more often only mere traces of use. Only a single tool shows traces of regular, almost step-shaped retouches, and another has high, steep retouches. With the exception of a convex side scraper the tools cannot be classified typologically. The halved hornstone pebble served either as a hammerstone or as an anvil. The collection of artifacts from Stránská skála I with the used raw materials differs from the pebble-tool industries occuring in Europe in that period; I think that we could call it "scrap-tool industry", based on the exploitation of the local source of raw materials.

Before some time six artefacts were subjected to micro-wear analysis. In four of them, among them e.g. also *Fig. 6:2* and *9:2* when enlarging it 200 times typical short parallel linear scratches and grooves were found (Gramsch 1973).

However, we should mention in detail a typical end scraper on blade (*Fig. 6:1*). There is no doubt at all as regards its belonging to the Upper Palaeolithic. On top of Stránská skála, on the base of the northern slope and the nearby field called Podstránská, south of the site, there are rich finds from the Upper Palaeolithic, thus the occurence of the scrapers in the sediments is not surprising at all. The scraper was found in layer 14, 110—120 cm below the surface, i.e. some 30—40 cm deep below the Holocene (according to the entry into the diary from July 29, 1964), evidently it is layer 14 c. According to Musil (in Musil, Valoch 1968, 536) all layers below the Holocene, including layer 17, contained Lower Pleistocene fauna. The entire Middle and Upper Pleistocene are missing from the section and it is very probable that the upper levels beneath the Holocene, in this case layers 14, contain an admixture of Würmian sediments, from which the scraper originates.

Description of the pictured tools

Fig. 6:1 — Endscraper on a thin blade, hornstone with grey-brown patina, layer 14, m² 55, 110—120, July 29, 1964.

Fig. 6:2 — Core-type tool chipped on both sides. On the dorsal side there is a retouched distal part, and on the ventral side there is an edge. Layer 14, 90—100 cm, June 22, 1966, grey-blue hornstone without patina.

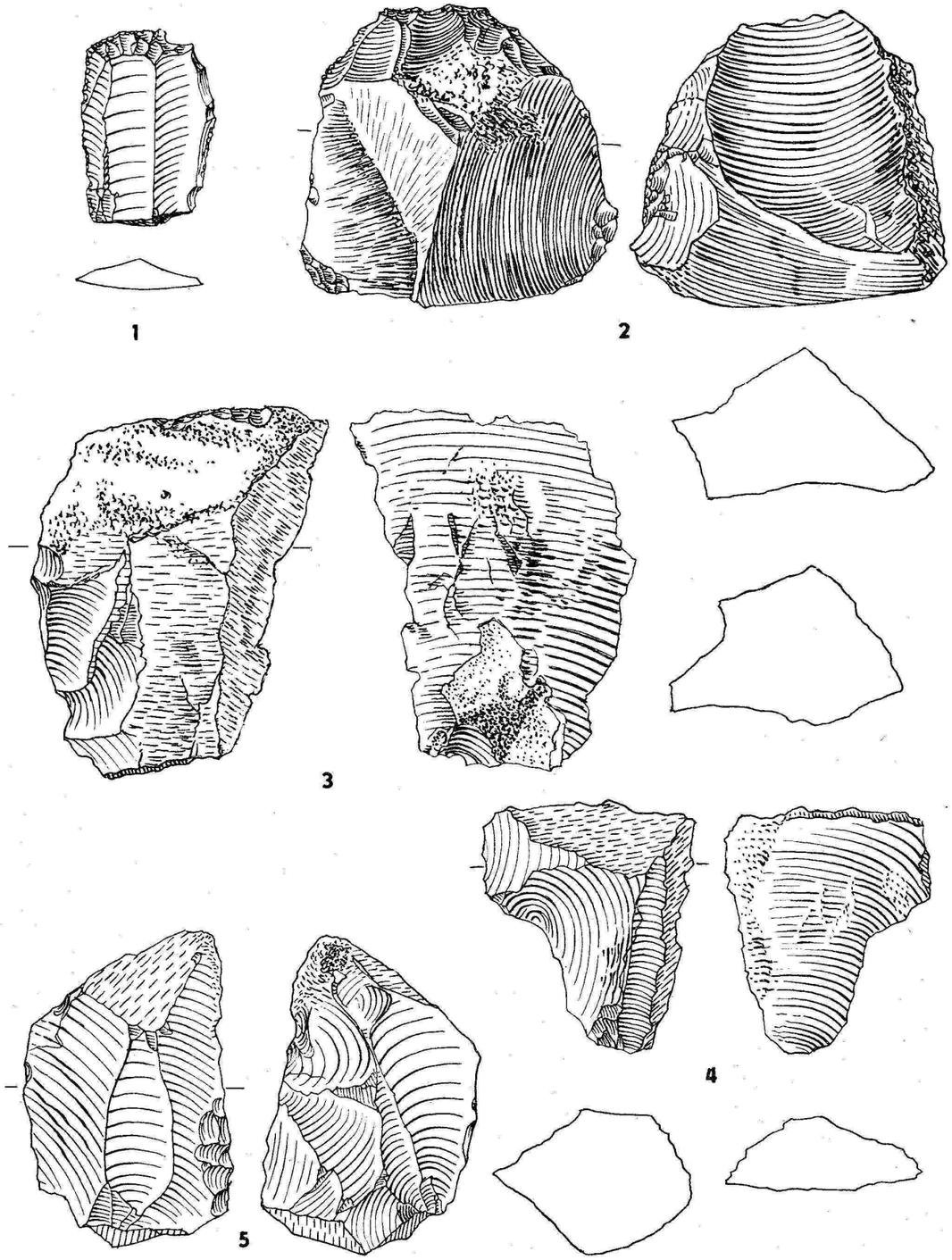


FIGURE 6. *Stránská skála, stone artifacts. Natural size. Drawings by M. Latzmann.*

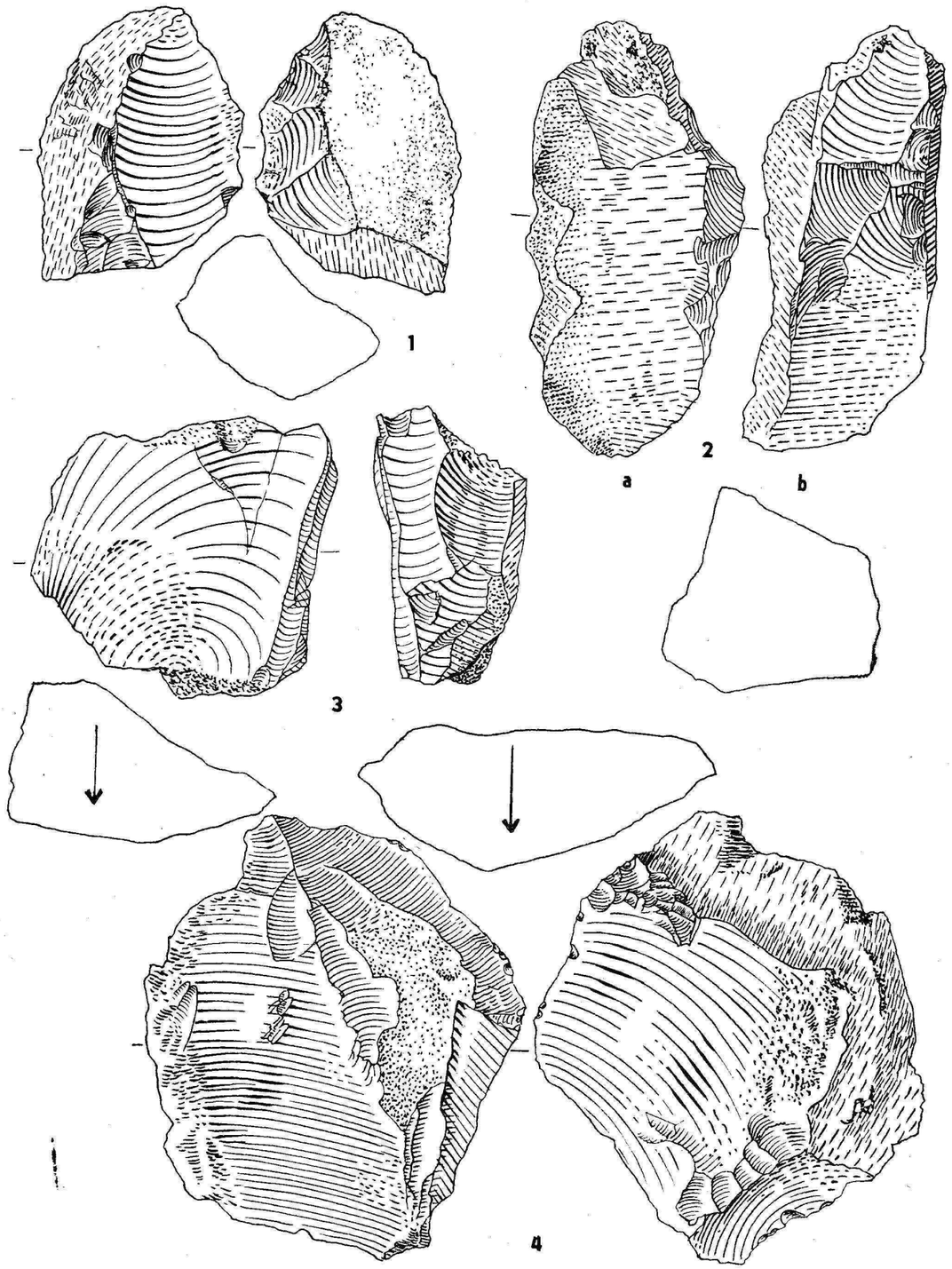


FIGURE 7. *Stránská skála, stone artifacts. Natural size. Drawings by M. Latzmann.*

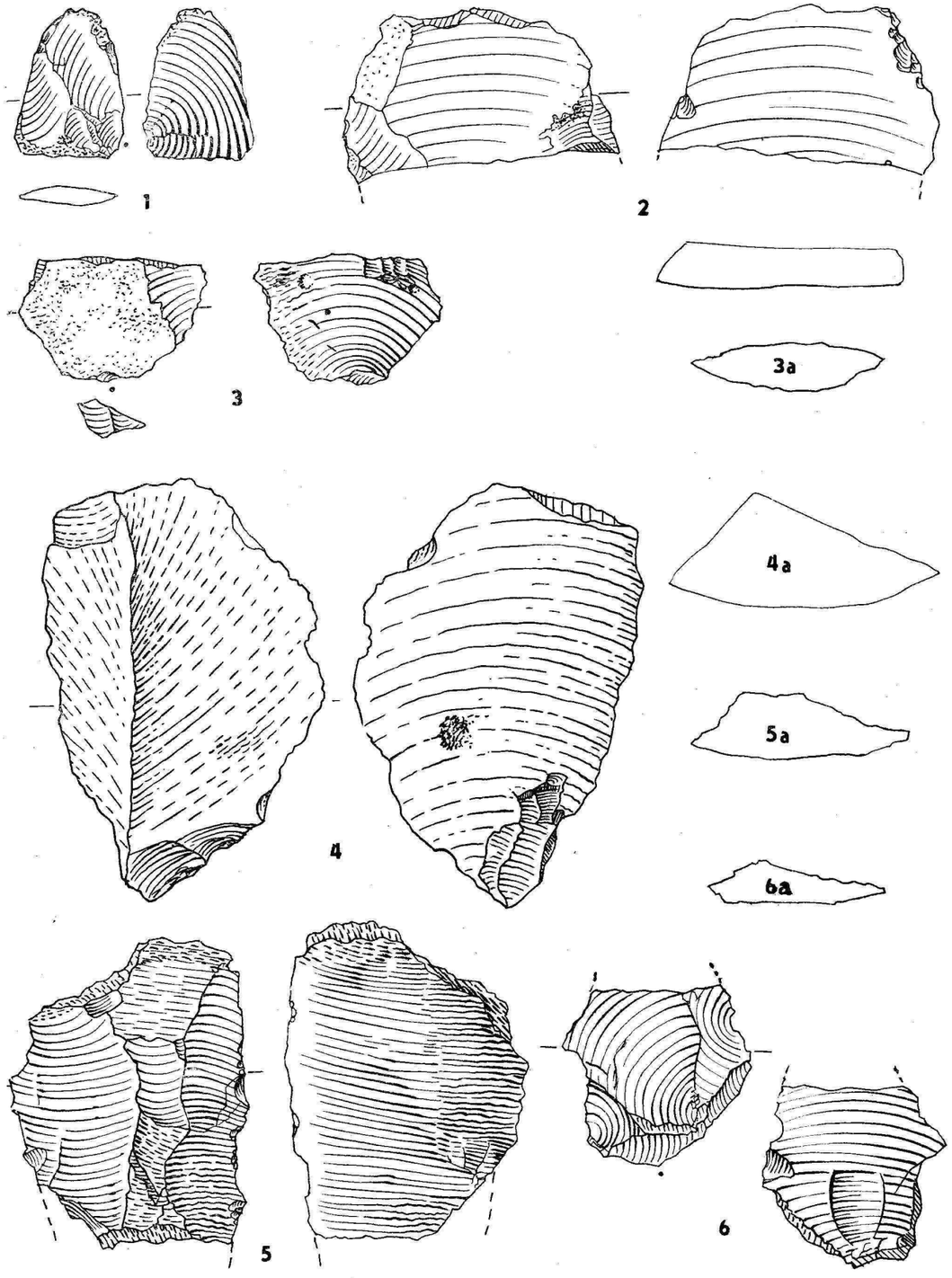


FIGURE 8. *Stránská skála, stone artifacts. Natural size. Drawings by M. Latzmann.*

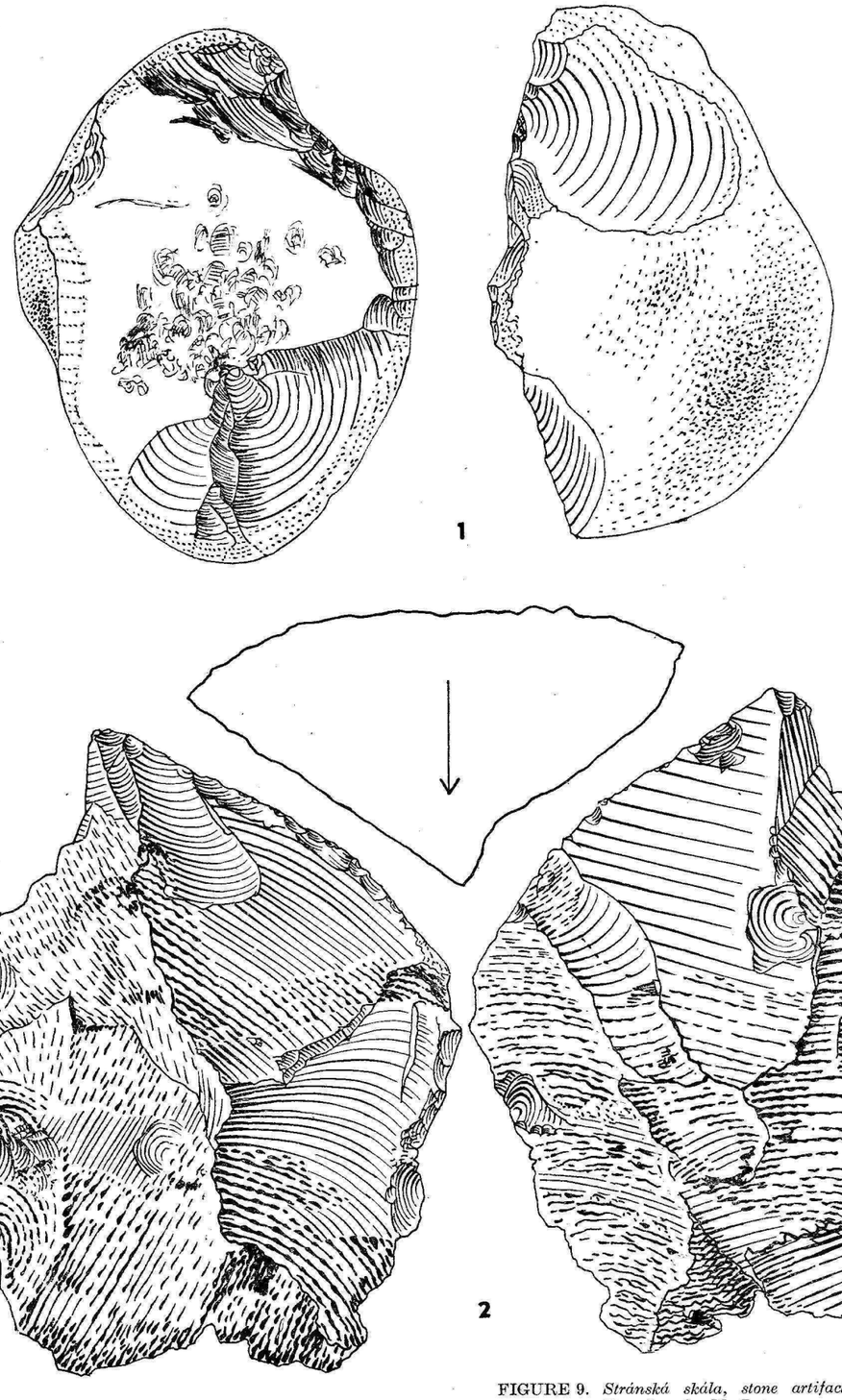


FIGURE 9. *Stránská skála, stone artifacts. Natural size. Drawings by M. Latzmann.*

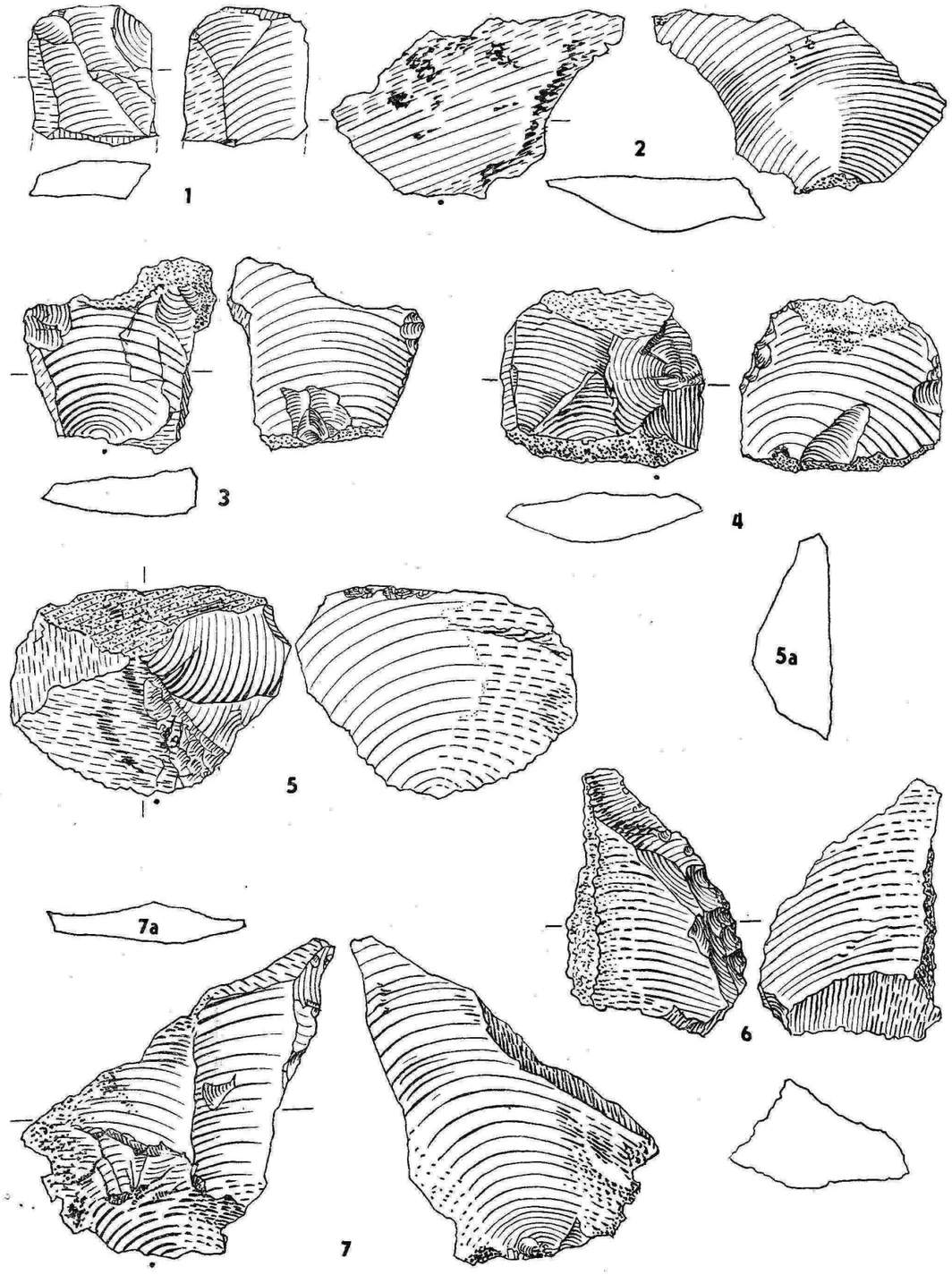


FIGURE 10. *Stránská skála, stone artifacts. Natural size. Drawings by M. Latzmann.*

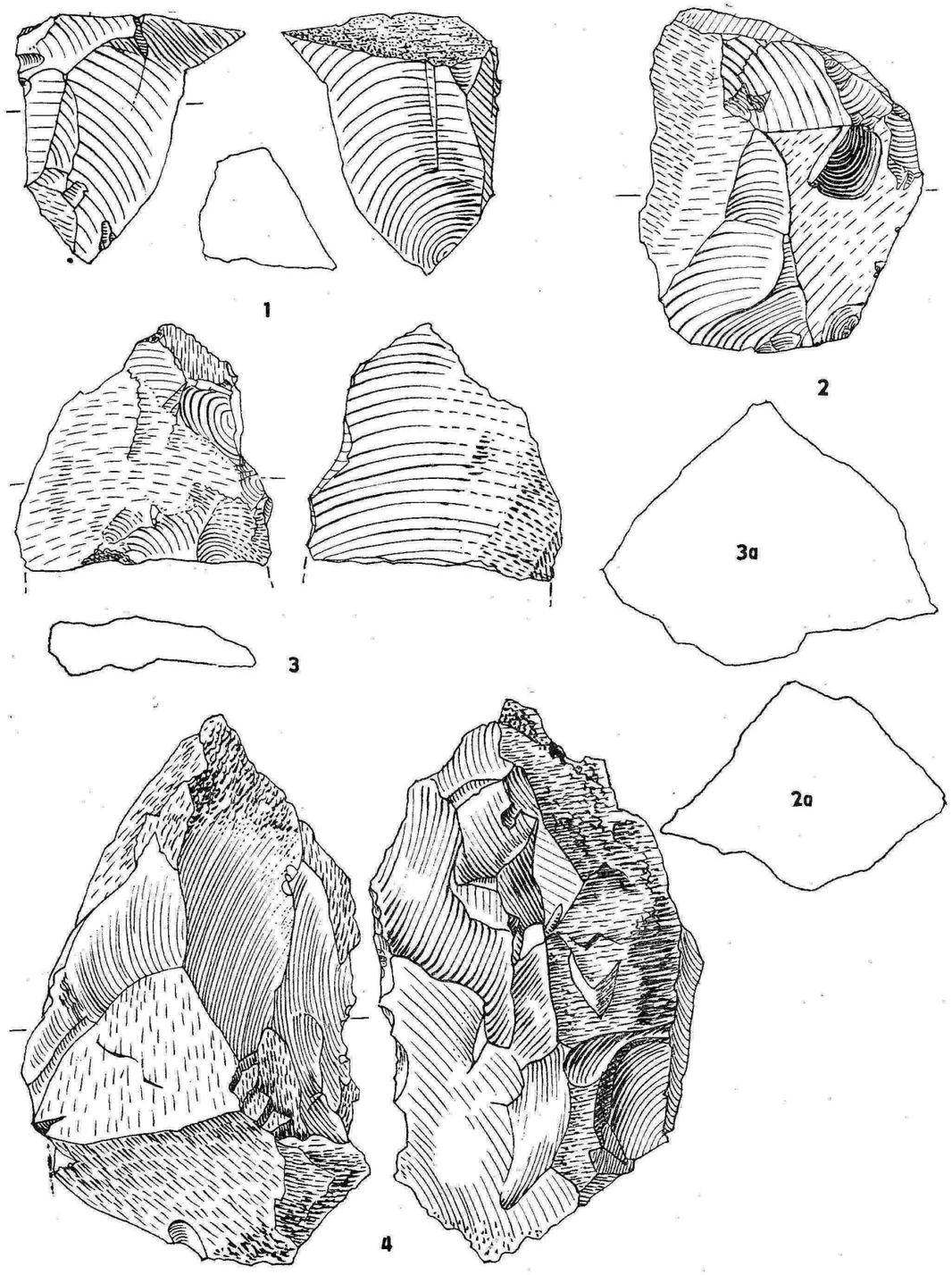


FIGURE 11. *Stránská skála, stone artifacts. Natural size. Drawings by M. Latzmann.*

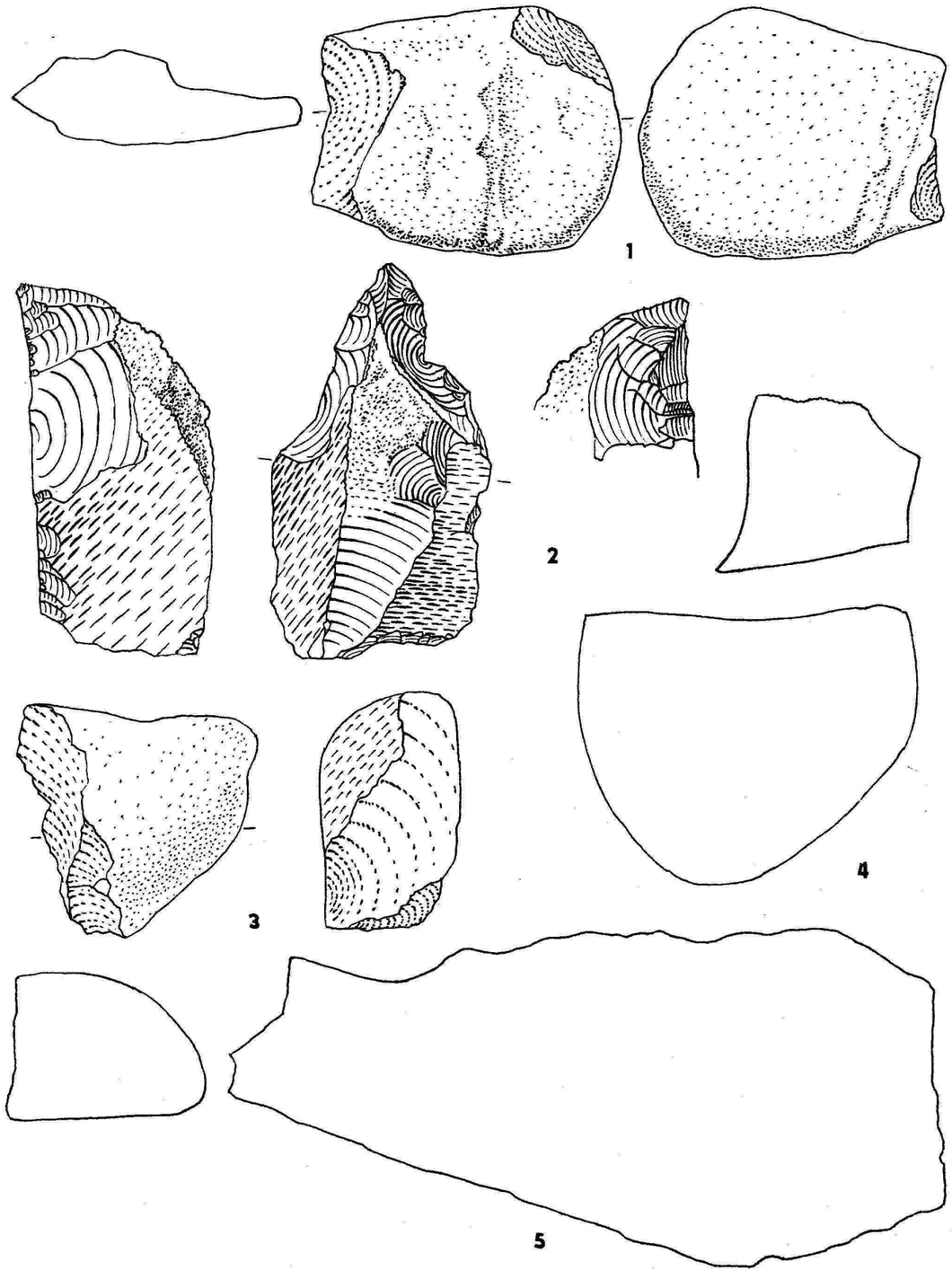


FIGURE 12. *Stránská skála, stone artifacts. Natural size. Drawings by M. Latzmann.*

Fig. 6:3 Thick flake of a grey-blue hornstone without patina, the left side is dorsally arranged and on the distal edge there are several retouches. Layer 14, m² 59a, 100—110 cm, July 31, 1964.

Fig. 6:4 Non-retouched flake of grey-blue hornstone, with a well visible striking point and linear talon.

Fig. 6:5 Core-tool, worked bilaterally, with several retouches on the right side at the bottom; grey-blue hornstone.

Fig. 7:1 Core-tool of grey-blue hornstone. Dorsally situated large flaked area on the right and several smaller negatives on the base on the left.

Fig. 7:2 Natural fragment of a dark-blue hornstone with rough lump crust on the left side (a), the very steep convex right side has been worked (b). Cave 4, corridor E, layer i, August 15, 1967.

Fig. 7:3 A massive rock flake with hornstone and limestone alternating in it. The dorsal side is formed by a single surface. The bulb on the ventral side is in limestone and is little perceptible. On the side there are several burin spalls-like negatives. Cave 4, corridor E, layer j, 160 cm deep beneath the caving fall, June 27, 1968.

Fig. 7:4 Tetrahedral flake with the bulb not preserved. The retouches are visible only at one place of the upper part of the left edge ventrally. The left edge dorsally and the right part ventrally are formed by limestone. Cave 4, 1966.

Fig. 8:1 A thin scale with a visible point of strike and with linear talon. Cave 4, corridor E, layer e1, 40—50 cm, July 5, 1967.

Fig. 8:2 The distal part of the flake has fine retouches ventrally on the right edge. Cave 4, corridor E, layer e1, 80—100 cm, July 7, 1967.

Fig. 8:3 Small flake with expressive bulb and broken talon, several retouches ventrally on the transverse edge. Cave 4, 1967.

Fig. 8:4 Limestone flake with several flat retouches on the base on the right side, ventrally the bulb has been removed, two burin spall-like negatives. Cave 4, corridor E, layer o, 130—140 cm, 1968. Four limestone flakes were found in this layer.

Fig. 8:5 Flake with its bottom part broken off, in the upper part there is a transition of hornstone into limestone, on the right sharp edge there are bilaterally small traces of use. Cave 4, 1966.

Fig. 8:6 The proximal part of the flake with a visible bulb on the central side and with a flat talon. Cave 4, corridor E, layer o, 70—80 cm, 1968.

Fig. 9:1 Halved hornstone pebble. On the even flake surface we can see numerous scars caused by strikes; the heavier strikes flaked small surfaces in the bottom part. The right edge is also full of strike traces and a larger flake has been taken from the side. Cave 4, corridor E, layer j, 160—170 cm below the caving fall, June 27, 1968.

Fig. 9:2 A massive pointed rock flake with transversly alternating bands of hornstone and limestone (hatched in the drawing). The bulb is poorly visible. Traces of wear are perceptible on the oblique and vertical edge, dorsally on the right, and on the point ventrally. Cave 4, corridor D, layer a, 70 cm, June 19, 1967.

Fig. 10:1 Distal part of the flake with several negatives on both sides. Cave 8, 0—10 cm, July 21, 1971.

Fig. 10:2 Flake of irregular shape with an expressive bulb, the talon is formed by the rough crust of the nodule. Cave 8, 1971.

Fig. 10:3 Trapezoidal flake whose bulb has been removed with several surface retouches, the talon is formed by the crust of the nodule. Cave 8.

Fig. 10:4 Tetrahedral flake, with a cone on its dorsal side on the right (formed by a heavy strike), the bulb is situated ventrally, on the left side, the talon is formed by the crust of the edges. There are several retouches on both nodules ventrally. Cave 8, 1971.

Fig. 10:5 Oval flake, its left half is of limestone the crust of the nodule has been preserved distally. There are traces of use ventrally on the transverse edge, the bulb is little pronounced and the talon is linear. Cave 8, layer 8—8a, 1972.

Fig. 10:6 A convex side scraper with an almost steped retouch; the proximal part with the bulb seems to be broken off. Cave 8, 1971.

Fig. 10:7 Elongated and pointed flake with little pronounced flat bulb, linear talon. Cave 8, 1971.

Fig. 11:1 A flake with pronounced bulb and point-shaped talon. Cave 8, layer 8+8a, 1972.

Fig. 11:2 The core is partially flaked off on one side only. On the ventral side we can see a transition of the hornstone into limestone. Cave 8, 1971.

Fig. 11:3 Distal part of the flake whose left side is formed by limestone. On the point on the left there is a small retouched notch. Cave 8, 1971.

Fig. 11:4 Core tool with its both sides chopped off. The hornstone changes into limestone at both ends. Cave 8, 0—10 cm, 1971.

Fig. 12:1 Oval flat pebble, its narrower end has been alternatingly chopped off so that it forms a zigzagging edge. It can be regarded therefore as a chopping-tool. Brown quartzite scaling-off in layers. Cave 4, 1967.

Fig. 12:2 Massive fragment of hornstone with remainder of crust. In the distal part both sides are retouched very steeply. The rest of the other surfaces arose in a natural way, without being changed by man. It is a keel-shaped tool. Cave 8, 1971.

Fig. 12:3 A chopper formed by two very steep negatives, its edge shows traces of use. It is a coarse-grain quartz pebble. Cave 8, 1971.

Fig. 12:4 Cross section of pebble presented in Fig. 9:1.

Fig. 12:5 Cross section of core. Fig. 13.

Fig. 13:1, 12:5 A block of rock whose left side is formed by limestone, partially crinoid, on the right side there are larger enclaves of limestone in the hornstone. It is a hornstone of pseudo-breccia type. The block has been chopped off on both sides as a core that yielded broad flakes. Cave 4, 1966.

Modified animal bones

The osteological material found in the slope sediments and also in Cave 4 was formed mostly by microfauna: only few bones of bigger animals were found. Only the small Cave No. 8 yielded a number of

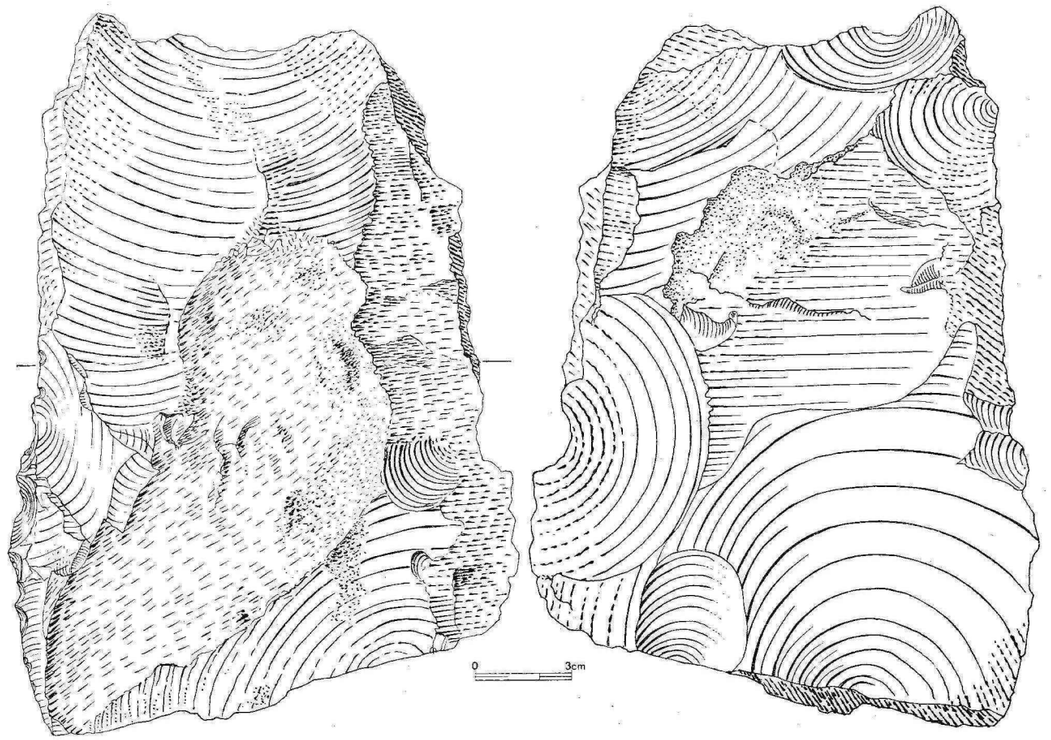


FIGURE 13:1. *Stránská skála, stone artifact. Reduced. Drawings by M. Latzmann.*

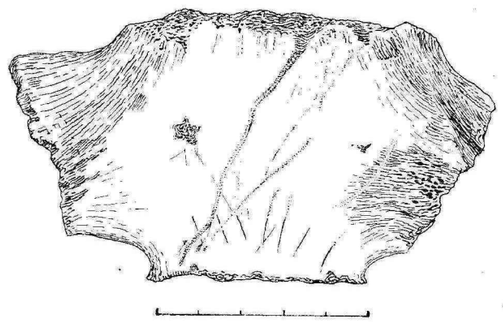


FIGURE 13:2. *Stránská skála. Vertebra of an elephantid with various scratches and grooves on it. (Drawing by M. Latzman).*

remains of the big fauna (bovids, cervids, horses, etc), excavated by Woldřich. The recent research involved there remains of intact sediments. Nevertheless layer 13 of the slope sediments yielded several fragments of bigger bones modified in such a way that we can fully exclude natural processes, including the activities of predators. We have taken into account also the critical objections regarding Lower Palaeolithic bone tools (Binford 1981). I called the attention to such probable tools found by J. Woldřich in Cave 8 already in the past (Valoch 1972).

Fig. 14:6 Fragment of a split hollow bone. Layer 13, m² 80a, 230—240 cm, Aug. 22, 1966.

Fig. 14:7 Fragment of a hollow bone split at both ends. Layer 13, m² 96, 200—210 cm, Aug. 24. 1966.

Fig. 14:8 Fragment of a hollow bone whose left side has been worked with flat retouches. Layer 13, m² 94, 250—280 cm, June 1, 1967.

Fig. 14:9 Fragment of a hollow bone. Its narrower end is alternatingly split at both sides; on the ventral side there are small retouches on the right edge. Layer 13, m² 90a, 210—220 cm, Sept. 2, 1966.

Evidence of fire

In layer 13 of the slope sediments (m² 50, 220 to 230 cm), yielding the stone implemets and the modified bones, we found also a bone fragment with well perceptible traces of fire (*Fig. 14:4*). Similar traces can be seen also on two small bone fragments from the year 1969, without accurate localization of the site whence they come (*Fig. 14:2, 3*). Most interesting is the hornstone flake, heavily cracked due to the effects of the fire and coming from Cave 8 (layer 8 + 8a, 1972) (*Fig. 14:1*).

Evidence of other activities

From the excavation realized by J. Woldřich in Cave 8 comes the body of the vertebra of a juvenile elephantid (*Figs. 13:2, 14:5*); on its flat ventral side we can see a number of various interventions. The two

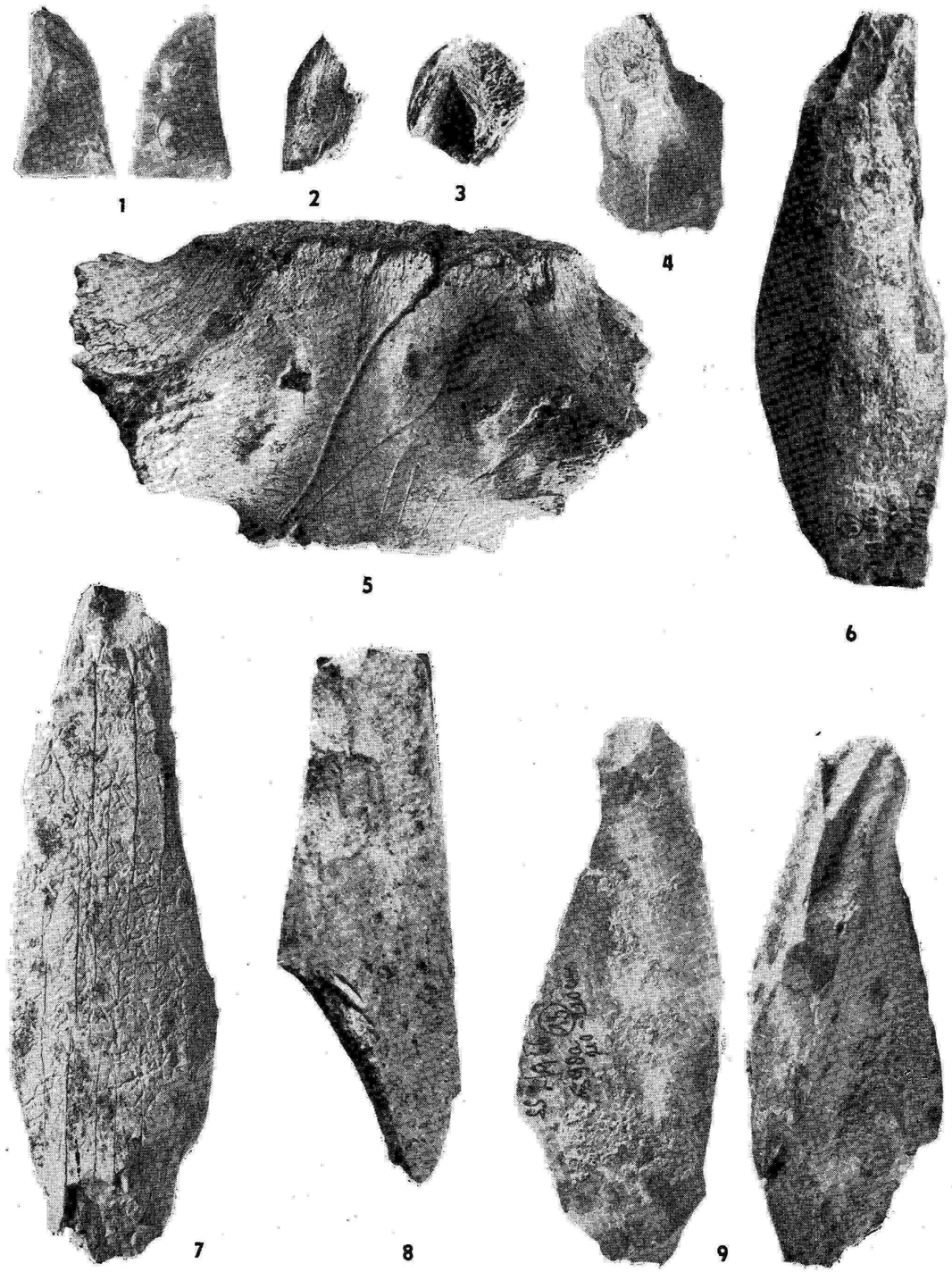


FIGURE 14. *Stránská skála. 1—burnt and crackled hornstone flake, 2—4 burnt bone fragments, 5 vertebra of an elephantide with grooves, 6—9 split (flaked?) animal bones. Nat. size. (Photo by L. Pichová).*

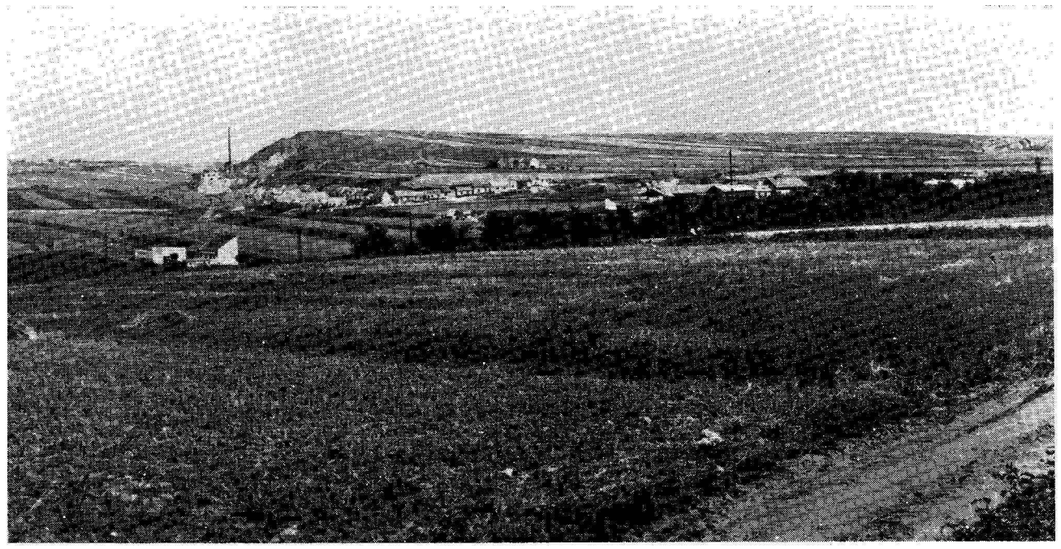


FIGURE 15:1. *Stránská skála. General view from the early nineteenthirties.*

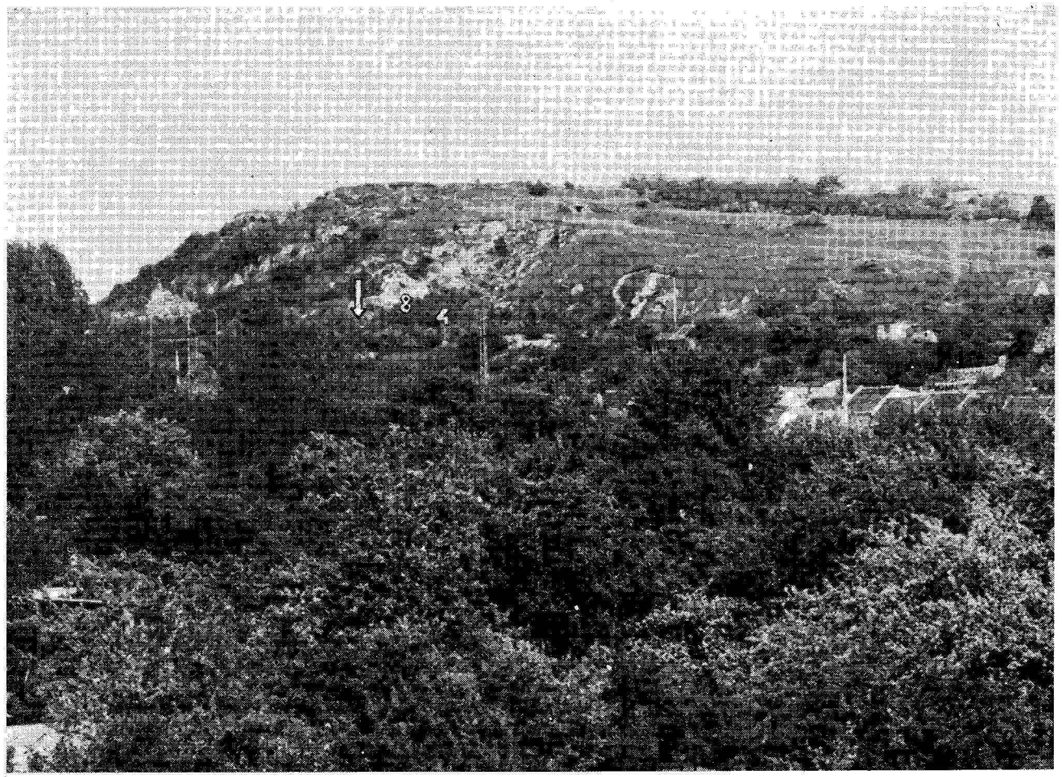


FIGURE 15:2. *Stránská skála 1986. The arrow indicates the site where the excavations took place, No. 4 and 8 indicate the position of the small caves. (Photo by L. Pichová).*

almost symmetrical orifices on the two sides of the central part are evidently of natural (pathological?) origin, the left starshaped hole was perhaps artifically extended.

Most conspicuous are the two U-shaped grooves, situated opposite and running from the upper edge obliquely to the bottom. They are quite wide, but shallow. The left groove is wider and is broken into the bone. Both edges are rounded, at places we can see on their bottom fine parallel scars, in some places with a slight flowstone film on it. Near the right groove, in its upper part, we can see a similarly formed thinner and shorter groove. A further archy groove can be seen on the right side of the bone, at the place, where part of the compact bone has been flaked off.

Other important and dominating feature are the seven radial grooves on the bottom edge of the bone. In contrast to the above grooves their upper part is wider and they are narrowing toward the bottom, so that their cross section is V-shaped. Besides that the bottom part of the surface between the two transverse grooves and also in the vicinity of the hole in the left part of the bone there is a number of sharp, with the naked eye almost invisible grooves running in various directions.

None of these grooves, including the broad transverse one, were inflicted on the bone in its fossil state, i.e. in no case are they recent defects. Their hue and the rounded edges are identical with the rest of the bone surface. Fresh traces caused e.g. by metal implemets would have frayed, and not smoothly rounded off edges, as is the case with broad grooves. Neither can they be explained by the activities of predators, i.e. caused with their teeth or claws, since any opposite traces of biting or any other vestiges documenting their gnawing or otherwise affecting by animals are missing. On the very contrary, both the radial groves and the numerous fine grooves are fully identical with the traces inflicted by stone cutting tools, very frequent on the bones in the Middle and Upper Palaeolithic.

The only explanation remains that all these traces were caused by the activities of *Homo erectus*. The radial grooves cannot be explained by any existencially conditioned function (e.g. by cutting the meat or by butchering the animal, it is a vertebra!). We should therefore assume that the grooves have been caused by completely other, non-utilitarian motifs. We shall hardly ever discover their meaning, but it is almost surely in the psychical sphere, probably somewhere in the region of the first attempts of aesthetic-symbolical manifestations.

The Settlement Area

The entire north-western slope of Stránská skála has been so disturbed with quarrying activities that we are almost unable to imagine its original natural looks. It is therefore very difficult to limit the area probably settled by the people of the Upper Cromerian. Perhaps they lived on top of Stránská skála and also on the platform of the so-called Stránská skála terrace, whose errosion base was formed by the rock underlying all slope sediments. It was in a period when the river already accumulated the lower, so-called Tuřany terrace at the altitude of 30 m above the present fluvial plane. It is sure that people lived in the vicinity of places where the finds documenting their activities were discovered. It was hardly possible to settle the oblique surface of the slope sediments. The present areas of Cave 4 were never used as shelter. Besides the low horizontal corridor D, very rich in artifacts, was also vertical corridor E. The only possible way of their getting into the corridor was by washing them down. We do not know, however, anything about the shape of the original entrance destroyed by quarrying, whether there was a cavity suitable for sheltering people. It seems that there was such an area in Cave 8. The *Homo erectus* living on Stránská skála was evidently not a cave-dweller, but occasionally he might have been looking for shelter in the more spatious entrance parts of the caves.

Ecology

The character of sediments and the rich fauna make it possible to draw quite an accurate picture of the natural environment of Stránská skála in Upper Cromerian times. The main components of the 6—14 layers are interglacial soil sediments. Layer 13 with the artifacts presumably arose towards the end of the Interglacial. The fauna found in the caves is identical with the fauna of the complex. The settlement can be put probably at the late Interglacial of the Cromerian complex. To this corresponds also the rather versatile fauna. The early excavations comprise almost 90 species of mammals and roughly the same number of bird species. The game was represented by horses, bovids, cervids, present were also elephantids, pigs, beaver and *Trogontherium*. Among the numerous predators let us mention *Homotherium*, the biggest of them. Abundant was also *Ursus deningeri*. According to the geomorphological studies (Zeman 1974) the River Svitava flew between Stránská skála and between the opposite Bílá hora hill. Its meadow was full of marshlands and meandering dead arms, as documented by the presence of a large number of water fowl species.

Stránská skála was a very suitable camping site taken all the complex morphology of the surrounding terrain, enabling maximum concentration of big game and of birds.

CONCLUSION

The Jurassic rock Stránská skála near Brno was settled by the people of the Upper phase of Cromerian some 600 000 to 700 000 years ago, alongside with the fauna of the Upper Biharian Complex. The presence of these people is documented by finds of simple stone tolls made mostly of local hornstones and of split and modified animal bones. Four artifacts show micro-wear traces caused by their use. The radially situated grooves on the elephantid vertebra document probably the capacity of non utilitary activities of these people. The use of fire is documented by charred bone fragments and one cracked hornstone flake. Stránská skála is the oldest reliably dated and stratified campsite of *Homo erectus* in Moravia.

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