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 downsloped and rather accretionary section containing a rich fauna of vertebrates. The whole association is typical of the so-called Upper Bohemian fauna. In one layer of the upper part of the section stone implements were found. Deeper in the layer 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 Bohemian vertebrate fauna — Matuyama-Brunhes boundary.

INTRODUCTION

Jan Woldrich 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 — Woldrich’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 (but also after 1972), was carried out by R. Šmolík, both in the sloping sediments as well as in 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 in, 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 so-called Moravian Karst) is 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 round hills rising slightly above the
surrounding terrain. One of these hills is Stráňská skála, situated about 5 km northeast of the center of Brno.

Stráňská skála is 1.5 km long, almost 400 m wide and lies 310 m above sea level. While the southeastern slope is quite gentle and passes gradually into a plain formed by gravels of the Tušany Terrace (ca. 30 m above the present level) of the Svitavská and Svitava rivers, the northwestern boundary is steep, the limestone rock face falling vertically into the valley. This part of the hill is extensively karstified. 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 Stráňská 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 8 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 cave 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 wide section of the shaft of the monument or sandstone; E. 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*, *Mirynas* 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 silt that the above fauna lived through a long period, comprising warmer and cooler climatic oscillations. From the archeological viewpoint the slope section includes important soil sediments in its...
Coloured patches and orifices perhaps caused by fossils (according to A. Příchystal) and are of low Bulinid, probably of echinoderms. The bone fragments differ from the description by J. Knoupek regarding the horns of the lower limestone level. They were used as a single implement (Fig. 7:2), the rest are little typical flakes, fragments and crushed nodules. Though we cannot say whether the horns, with the description by J. Knoupek fitting for the bottom level. They are light-grey to light-grey-blue and are of pseudolimnic type. It is characteristic that they contain numerous small and also bigger limestone enclaves, eventually alternating thin hornstone and limestone layers. Their concrecences 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 6. The artefacts 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 a transition from pure limestone, one of them is pictured (Fig. 8:4).

On the basis of macroscopic observation we can say that there are four main varieties of hornstones numerous flakes were taken also from others varieties. The flake pictured in Fig. 11:1, coming from Cave No. 5 is dark-grey hornstone of high quality, the upper limestone described by Příchystal. The raw material of the big flake comes according to A. Příchystal from the vicinity of crinoid limestones, since in the limestone layers there are crinoid nodules. Also flake 8:3 from the slope sediments—with its crust and light-blue colour differs from the hornstones coming from the bottom level.

The hafted pebble Fig. 9:1 reminds of the hornstones from the top level. The original hornstone lump was heavily worn by the water, from the projections remained only small nodules. 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 limestone from the sediments excavated from the cave prior to our research. It is difficult to say whether the traces of strokes are artificial. From the same Cave 4, comes also the pebble of brown cretaceous hornstone with several retouches (?) on the edge, and a hafted quartz pebble, in which vestiges of hafting are rather obvious. The pebble with the classification to the crushed cretaceous hornstone pebble from Cave No. 15 cannot be assumed that the quartz 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 meteorites, which are naturally enclosed in the rest of Missin sediments on the top of Stránská skála and in some of its cavities.

Technology of processing and the typology of the stone species.

The technology of hornstones had not yet been stabilized. Most lumps were simply battered, as documented by irregular fragments without bulks. On the other hand the flakes of hornstones with this lumps usually have a well perceptible bulb, only seldom it is little distinct. The striking platform is usually flat, with crust or linear. The lumps 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 hafted hornstone pebble served either as a hammerstone or as an anvil. The collection of artefacts from Stránská skála I with the used raw materials differs from the pebble-tool industries occurring in Europe in that period; I think that we could call it "scraper-tool industry", based on the exploitation of the local source of raw materials.

Before some time six artefacts were subjected to micro-scale analysis. In four of them, smooth flake, e.g. also Fig. 6:2 and 8:2 when enlarging it 200 times typical short parallel linear scratches and grooves were found (Ročná 1972).

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 Podštěná, south of the site, there are rich finds from the Upper Palaeolithic, thus the occurrence 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, 1961, evidently it is layer 14 e). According to Mnis (in Musl, Valoch 1969), layer 536) all layers below the Holocene, including layer 17, contained Lower Pleistocene fauna. The entire Middle and Upper Pleistocene fauna are found there, 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, nØ 55, 110—120, July 29, 1961.

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 the edge. Layer 14, 100—100 cm, June 22, 1966, grey-brown hornstone without patina.
FIGURE 8. Strienski shlica, stone artifacts. Natural size.
Drawings by M. Lutzenmann.

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FIGURE 10. Širovčki Adele, stone artifacts. Natural size.
Drawings by M. Lattemann.

FIGURE 11. Širovčki Adele, stone artifacts. Natural size.
Drawings by M. Lattemann.
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, m, 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 heap crest on the left side (a), the very steep convex right side has been worked (b). Cave 4, coriandel E, layer 4, 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, coriandel E, layer j, 100 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 hornstone. Cave 1, 1966.

Fig. 8:1 A thin scale with a visible point of strike and with linear talon. Cave 4, coriandel 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, coriandel E, layer e1, 50—60 cm, July 5, 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 spalls-like negatives. Cave 4, coriandel E, layer e, 130—140 cm, 1968. Four limestone flakes were found in this layer.

Fig. 8:5 Flakes 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, coriandel E, layer e, 70—80 cm, 1968.

Fig. 9:1 Halved hornstone pebble. On the even flake surface we can see numerous scars caused by stripes: the heavier stripes 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, coriandel E, layer j, 140—150 cm below the caving fall, June 27, 1968.

Fig. 9:2 A massive pointed rock flake with tranversely 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, coriandel D, layer a, 70 cm, June 19, 1967.

Fig. 10:1 Distal part of the flake with several negatives on both sides. Cave 8, 6—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, 1971.

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 6—8a, 1972.

Fig. 10:6 A convex side scraper with an almost stepped 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—10a, 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 both sides chopped off. The hornstone changes into limestone at both ends. Cave 8, 6—10 cm, 1971.

Fig. 12:1 Oval flake pebble, its narrow 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 strongly. 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, 12:6 A block of rock whose left side is formed by limestone, partially eroded, on the right side there are large conch dorsal issues of limestone in the hornstone. It is a hornstone of pseudo-hercian type. The block has been chopped off on both sides as a core that yielded broad flakes. Cave 4, 1969.

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
remains of the big fauna (bovids, cervids, horses, etc), excavated by Wolfdich. The recent research involved there remains of intact sediments. Nevertheless layer 13 of the slop 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 1961). I called the attention to such probable tools found by J. Wolfdich in Cave 8 already in the past (Valex 1972).

Evidence of fire

In layer 13 of the slope sediments (m² 59, 220 to 230 cm), yielding the stone implements and the modified bones, we found also a bone fragment with well perceptible traces of fire (Fig. 14:6). 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. Wolfdich 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
almost symmetrical orifices on the two sides of the central part are evidently of natural (pathological?) origin, the left stamshaped hole was perhaps artificially 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 fowstone 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 flushed 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 indented 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 implements 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 vestige documenting their gnawing or otherwise affecting by animals are missing. On the very contrary, both the radial grooves 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 existentially conditioned function (e.g. by cutting the meat or by butchering the animal, it is a vertebr). 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 Cretaceous. Perhaps they lived on top of Stránská skala and also on the platform of the so-called Stránská skala terrace, whose erosion base was formed by the rock underlying all slope sediments. It was in a period when the river already accumulated the lower, so-called Tuyan 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 skala was evidently not a cave-dweller, but occasionally he might have been looking for shelter in the more spacious 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 skala in Upper Cretaceous 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 Cretaceous complex. To this corresponds also the rather venturesome 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 elephants, pigs, beaver and proconsul. Among the numerous predators let us mention Hesperitherium, the biggest of them. Abundant was also Ursus densus. According to the geomorphological studies (Zeman 1974) the river Svitava flows between Stránská skala and the opposite Bíloch hora hill. Its meadow was full of marshlands and meandering dead arms, as documented by the presence of a large number of waterfowl species.

Stránská skala 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 skala near Březno was settled by the people of the Upper place of Cretaceous 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 tools 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 elephant vertebra document probably the capacity of non-utilitarian activities of these people. The use of fire is documented by charred bone fragments and one cracked hornstone flake. Stránská skala is the oldest reliably dated and stratified campsite of Homo erectus in Moravia.

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REFERENCES


MUSIL R., VALOCH K., 1968: Stránáská skála: Its meaning

for Pleistocene Studies. Current Anthropology, 9:3
Part II, 395—399; Chicago.


PřÍCHOVLÁ J., in print: Geologie a petrografie rohovk a Stránáské skály u Brna. In J. Števoda, Bohrova u Stránáské skály u Brna a jejich vztah k polstrom u zlevačích ramenách. Studia Archeologického ústavu ČSL A v Brně.

VALOCH K., 1952: O čo sa niekaj e akapalusjlkáj jeho aštalnosti

der Stránáská skála? In H. Musil (Hrsg.), Stránáská skála I. Anthropos 29, N. S. 12, 199—204; Brno.


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