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Archaeological sites of the Süttő Travertine Complex (Hungary) and their faunas

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The Süttő Travertine Complex was known in the geological literature as a series of paleontological sites for more than a century ago. The town Süttő is located in northern Hungary, about 60 km northwest of Budapest, close to the right bank of the river Danube (47°44.26' N, 18°26.87' E). Süttő is one of the largest travertine occurrences of the Gerecse Hills. The travertine covers an area of more than 1 km^2. The minimum age of the travertine is Late Pliocene based on fossils like *Anancus arvernensis* and *Tapirus arvernensis* found within the travertine cover (Jánossy & Krolopp 1981). The eroded surface of the travertine is covered by loose Upper Pleistocene eolian sediments: Riss-Würmian loess and Holocene top-soil. In the lower part of the loess section a reddish palaeosol horizon can be found that developed during the last interglacial (Pécsi et al. 1982; Novothny et al. 2009, 2011).

The new researches indicated far younger, Middle Pleistocene age in the case of travertine at Süttő. Based on their uranium-series (^{230}Th/^{234}U) dating, formation of travertine at Süttő was between 310 and 240 ka (Sierralta et al. 2010), but several sites' fossils indicate the older travertine occurrences in two quarries (Pazonyi et al. 2012). In the last three years several papers were published about the loess-paleosoil sequence at Süttő (Novothny et al. 2009, 2011). They examined the loess deposits, which are up to 20 m thick, and contain two greyish, laminated horizons, three brownish steppelike soils and a thick pedocomplex including a dark brown chernozem-like paleosoil and a reddish-brown paleosoil, in many respects (Novothny et al. 2011).

Although there are some vertebrates in the travertine and one important site in the loess-paleosoil sequence (Süttő 6), most of the vertebrate sites are situated in fissures of the travertine. Beside vertebrate sites, two archeological sites also were described from this area (Fleissig & Kormos, 1934).

Kormos and Kubacska found the first human traces at Süttő in 1926 (Kormos 1926; Fleissig & Kormos 1934), further on Fleissig and Komos excavated at this place in 1932 (Fleissig & Kormos 1934). They found a paleolithic fire pit in the road cut of the way, which lead from Süttő to the quarries (Süttő-Diósárok). In the 5–8 m high loess profile in the eastern side of the road cut, about 4 m deep from the surface was found the fire pit, which was 3–4 m length. The thickest part of this one was 10–15 cm. They found lot of charcoal and bone fragments from the red burned loess. The most of charcoal remains were larch/spruce (*Larix–Picea* sp., 107 pcs.), but they also found four pieces of *Pinus* sp., and from these two are probably *P. cembra* (Vértes 1965). Typical loess mollusc fauna was also found from surroundings of the site (Fleissig & Kormos 1934), but it wasn't collected bed-by-bed, and its stratigraphical position is uncleared. The fauna probably represents MIS 2 (30000–14500 cal yr BP), but the composition of the flora doesn't allude to this period, it denotes less continental conditions (Vértes 1965).

Every silex flakes were produced from gravels of the Danube (mainly gray or reddish brown firestones and jaspers), but among these ones few were processed. However, the blades, end-scrapers and borers one and all allude to the Magdalenian (Fleissig & Kormos 1934). In Vértes's opinion, among of the ten silex flakes, which are in collection of Hungarian National Museum, none of them is typical Upper Paleolithic tool, they rather suggest to the tools from Tata. His mind the findings from Süttő-Diósárok are Moustérian (Vértes 1965) was confirmed by the later researches.

Tata is an important middle Moustérian locality, which is connected with the Brørup interstadial (MIS 5c), and it was described, than a warm and dry period (Vértes, 1965). The site age, based on uranium series dates, is ~100 ka BP (Schwarcz & Skoflek 1982). This data is well correlated the ages of a dark brown chernozem-like paleosoil layer of the loess-paleosoil sequence, which luminescence age is 93,7±21,1 ka and which corresponds with MIS 5c (Novothny et al. 2011). Based on their results of soil micromorphology, it is a good marker of a warm, but drier climate with steppe-like vegetation. This paleosoil layer also appeared in the site of Süttő 6 (2–3 layers), and based on the vertebrate and snail faunas and their paleoecological investigations, the fauna of layers well correlated with other fissure faunas (Süttő 3, 9 and 12/A) (Pazonyi et al., 2012). It may be hypothesized, that the tools was collected from same layer of loess-paleosoil sequence.

Another archeological site was found on the northern wall of Diósvölgyi quarry, on the site Süttő 1. The site was a shorter, lenghtwise fissure, which was widen like an cavity. From this small cavity were turned up artifical fractured bones (red deer, deer and bovine bones and teeth, some bear (*Ursus arctos*) teeth and turtle (*Testudo suttoensis*) remains). Part of these bone fragments were worked by humans. In the lowest layer of the cavity they found trace of a paleolithic fire pit, which was a 5–6 cm thick reddish brown burned layer, with charcoal fragments and black burned bones. The complete list of the vertebrates is found in work of Fleissig & Kormos (1934).

From the layer of fire pit, except the bear teeth also were found long bone fragments of greater (ruminants) vertebrates. Among these ones some were adapted for tools or weapons by their shapes. In turn, six pieces were traces of the human work. They thought these finds belong to the Lower Paleolithic era, the Chelles Culture (Fleissig & Kormos 1934). Unfortunately these elaborated bones are wanting. In Vértes's opinion, these findings perhaps were antecedents of the Tata Culture (Vértes 1965).

Althought, in Jánossy's opinion (Jánossy & Krolopp 1981) Kormos collected the fauna of site Süttő 1 from two places, in my opinion the small mammal and snail faunas probably weren't mixed. The paleoecological investigations indicated warm, humid climate and forest vegetation. We know a similar fauna from Süttő (Süttő 7/L), which probably correlated with MIS 5e (Pazonyi et al. 2012), so maybe site Süttő 1 also connected with the Eemian interglacial period. This result confirms Vértes's assumption.

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Quaternary remains of reindeer from the Biśnik Cave and other localities from Poland

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The reindeer *Rangifer tarandus* Linnaeus, 1758 – the most common cervid in cave localities of Poland (Stefaniak et al. 2009, 2012 in press) – is the most abundant cervid in the deposits of Biśnik Cave, and is present in all the layers. The paper deals with osteometric analysis of the reindeer remains from Biśnik Cave against the background of the species' variation in Eurasia. The results were compared with materials from 23 localities in Poland (Stefaniak et al. 2012 in press) and with literature data from Upper Pleistocene of Poland and Eurasia

The results show that the Late Pleistocene reinder from the analysed localities was intermediate between the slender and smaller reindeer from north-western Europe and the larger reindeer from southern and eastern Europe. Some measurements of post-cranial bones (width of distal epiphysis of tibia, talus length, length of phalanges 1 and 2) of the Middle Pleistocene reindeer from Biśnik Cave reached greater values than those from the Upper Pleistocene, and were similar to those from eastern Eurasian sites (fig. 1).

The tooth structure of the reindeer from the analysed caves indicates adaptation to life in a forest-tundra – the wide molars making it possible to crush and masticate the food may suggest hard food (e.g. shrub twigs and some tree bark). Such food probably originated from shrub- or even tree-rich tundra. During their migration, the reindeer herds may have reached the zone of forest tundra where the conditions made it possible to survive winter (Croitor 2010).

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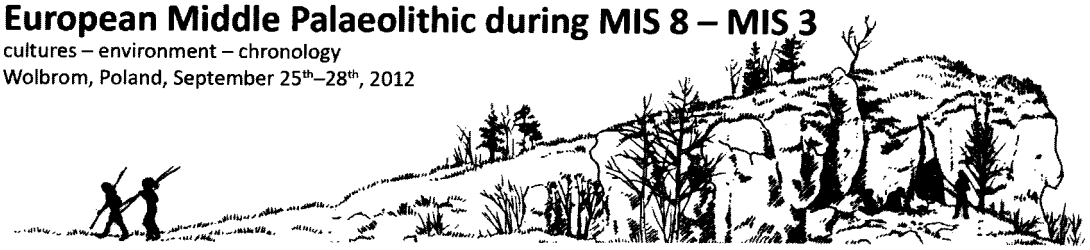

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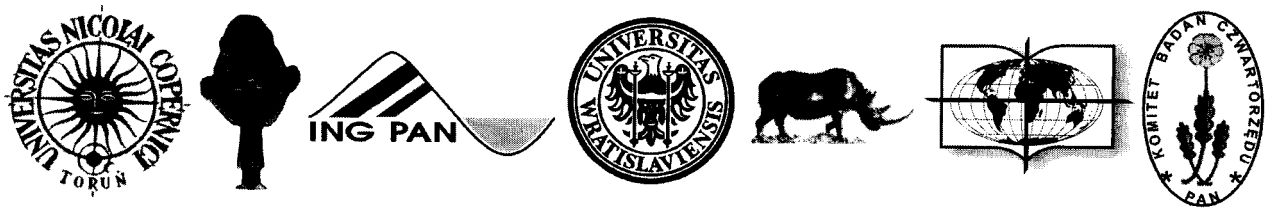

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