

RESULTS OF PALEONTOLOGICAL INVESTIGATIONS IN THE CAVES OF HUNGARY — WITH SPECIAL REFERENCE TO THE LAST DECADE

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The beginnings of the scientific vertebrate paleontological excavations in the caves of Hungary can be said to have started with the activity of S.J. PETÉNYI (1864) and later with the compilation of a list of vertebrate paleontological finds in Hungary, mostly originating from caves, by A. KOCH (1900). Systematic excavations achieving both paleontological and archaeological results began with the work of O. KADIĆ in the Eastern Bükk Mountains (Szeleta Cave, 1906).

A series of excavations made before the First World War and in the twenties and thirties brought paleontological as well as archaeological results (O. KADIĆ—M. KRETZOI 1930, M. MOTTL 1940). At that time the most important locality was the Subalyuk Cave, Southern Bükk Mountains, not only because of its remnants of Neandertal Man and rich Paleolithic material, but also because of major vertebrate paleontological finds. This cave later became the type locality of the Subalyuk Phase, the so-called 'Old Würm' of the Upper Pleistocene in Hungary.

The results of paleontological excavations in the caves of Hungary up to 1976 were summarized by D. JÁNOSSY (1977, 1986).

More recently further excavations for paleontological purposes in a series of caves and karst hollows have paralleled the investigations and revision of previously collected material. Several comprehensive papers have been written about the cave faunae of Hungary, relying partly or totally on the above studies.

Below the achievements of the last decade are described in a geological order.

1. Neogene

In the karst areas of Hungary deposits with older than Lower Pleistocene fauna are rather infrequent. Therefore it is fortunate that three such faunae have been found recently. One was gathered by D. JÁNOSSY from the red limestone quarry of Tardosbánya, Gerecse Mountains, in 1975. From the group of localities in the Polgárdi limestone quarry which have been known from early this century, L. KORDOS and co-researchers have recently



*The most important localities of the vertebrate paleontological finds in Hungary between 1977—1988.
A = Neogene, B = Lower Pleistocene, C = Middle Pleistocene, D = Upper Pleistocene, Holocene*

collected D. JÁNOSSY (1988) and L. KORDOS (1985b, 1987b, 1987c) have published partial results.

M. KRETZOI (1985a) described the fauna of the Sümeg stone quarry and constructed a biostratigraphical unit, the Sümegium. He published widely his synthesis on evolution and fauna history (KRETZOI, M. 1985a, b; 1987; M. KRETZOI—M. PÉCSI 1979, 1982a, b), in which he summarized the history of Upper Neogene to Quaternary events, primarily relying on cave and open surface vertebrate faunae.

2. Lower Pleistocene

In the classic Villány—Beremend region which has been studied for more than a hundred years, localities exceptionally rich in finds have been discovered recently. Most of them were examined by D. JÁNOSSY.

During stone quarrying, in 1981 a Lowermost Pleistocene locality, Beremend 15, was exposed. It provided five species of bats (TOPÁL, GY. 1985) and 53 other vertebrate species (JÁNOSSY, D. 1987).

From localities nos 16 and 17 in the Beremend crystal cave, discovered in 1984, a late Lower Pleistocene 'Allophaiomys fauna' was recovered with interesting large mammals (antelopes and sabre-teeth tiger). The small mammal fauna is equally rich and allows precise dating (TAKÁCS-BOLNER, K. 1985).

On the Somssich hill, Villány Mountains, D. JÁNOSSY conducted excavations between 1975 and 1986. The locality Somssich hill 2 is of special importance. Like the other localities in the Villány Mountains, it is a karst hollow fill, but it was not opened by stone quarrying, extraction proceeded from the surface downwards in 20–30 cm deep layers. The uppermost five metres were constituted of loess sand, then, after a calcitic intercalation, beginning from sample no 28, reddish-brownish clay followed. D. JÁNOSSY (1983) published the list of species recovered from the upper 36 layers and a vole species diagram. By the end of the excavation the total number of samples reached 50. This is a locality of incomparable abundance of species and the expected total specimen number is several hundred thousand. The fauna can be dated as Nagyarsány Phase (late Lower Pleistocene). It includes the first lemming occurrence in the Villány Mountains. The processing of the material from these three sites will probably take several years.

A typical 'Allophaiomys fauna' was also recovered from the stone quarry of the Ujlaki-hegy, Buda, in 1981, from a cave formed in Eocene Nummulitic limestone (JÁNOSSY, D.—TOPÁL, GY. 1989).

In the Hajnóczy cave, Bükk Mountains, L. KORDOS and J. HIR collected finds on several occasions between 1975 and 1982. The fauna presently under study is probably also of the late Lower

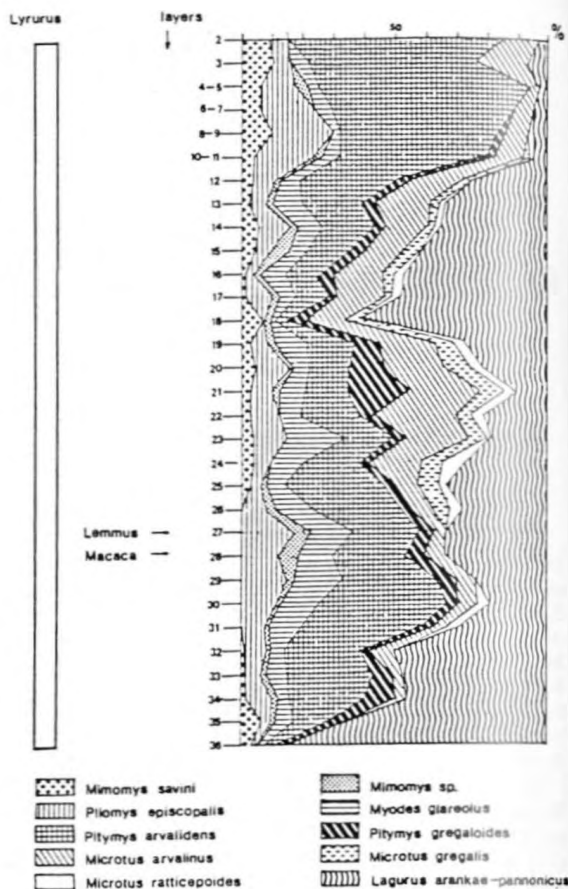


Diagram illustrating changes in relative frequency of different vole species in profile of locality Somssich Hill 2. Occurrence of black grouse, lemming and ape on the left side.

Pleistocene (Templomhegy fauna phase — HIR, J. 1982, 1985).

The first faunistic and morphological overview of the Osztramos localities, found in the early seventies, was published by D. JÁNOSSY and L. KORDOS (1977).

D. JÁNOSSY published a monograph of great importance first in Hungarian (1979) and then in English (1986) on the vertebrate faunae of the Pleistocene in Hungary including numerous cave faunae and its biochronological importance.

3. Middle Pleistocene

The first works in this section are the revisions of previously collected faunae using a novel approach and stratigraphical re-evaluations, concerning the Hór valley cave, Bükk Mountains, and the Várhegy, Hotel Hilton, Buda Mountains, localities. The latter supplied the material for D. JÁNOSSY's identification of the Castellum horizon (1978, 1979, 1986) as a new stratigraphical unit. Investigating the

metric features of the species in this horizon, statistical deviations were found in comparison to both the Lower and the Upper Pleistocene related species. Also detailed statistical analyses motivated the re-evaluation of the fauna of Szuhogy—Csorbakő (JÁNOSSY, D.—VÖRÖS, I. 1985) and the Hungária-hegy of Dorog (JÁNOSSY, D.—VÖRÖS, I. 1987), previously regarded Würm, and their reclassification as Middle Pleistocene. It is also important that I. VÖRÖS (1985) studied the *Alces brevirostris* finds recovered from the Ördög-lyuk of Solymár in 1943.

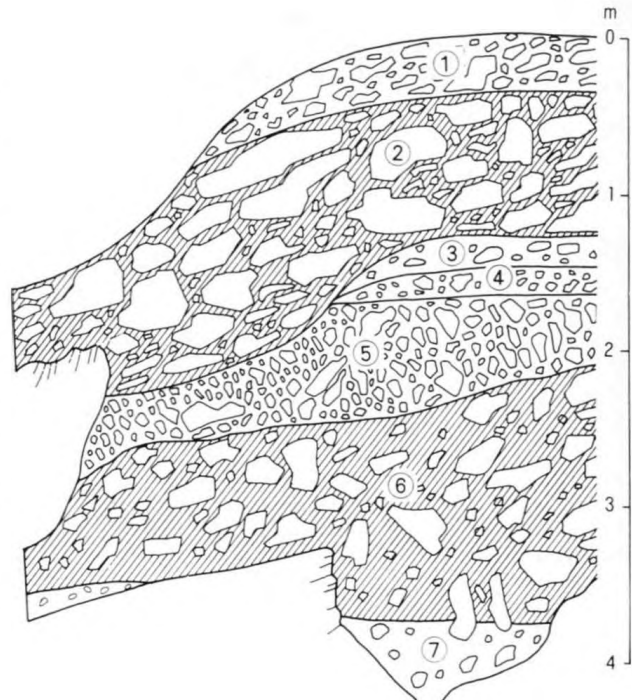
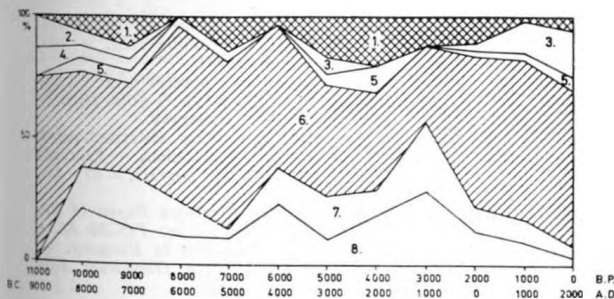
A recent Middle Pleistocene vertebrate fauna was recovered from the Pongor-lyuk of Répáshuta. This small cave lies only 30 m from the locality 'Kövesvárad' described by D. JÁNOSSY (1979, 1986). The Würm is totally absent from its profile. The Holocene layers are immediately underlain by Middle Pleistocene sediments, the lower 60 cm of which provided 725 specimens of 56 species. Most of the fauna consists of characteristically late Middle Pleistocene elements. Subordinately, however, some typical forms from the older phase of the Middle Pleistocene also occur (HIR, J. 1984, 1986, 1987).

4. Upper Pleistocene — Holocene

The small ruin cave, Horváti-lik, is located on the N side of the Uppony gorge which also exposes several other caverns. The excavations here were conducted by L. FÜKÖH and L. KORDOS (1977, 1980). The 4 m profile can be subdivided into two main complexes: the stratigraphic position of the lower can be placed in the Varbó Phase (sensu lato — 'Riss-Würm'), while the upper complex is of Holocene age.

In 1976 two hollows were opened up in the travertine under the Dobó ramparts of the Eger Castle. The rich mollusc and small vertebrate fauna recovered from the fill was analysed by L. KORDOS and E. KROLOPP (1980). A faunistic curiosity is the first occurrence of *Hygromia transylvanica* in the Hungarian Pleistocene. The vertebrate fauna

Frequency of the rodent faunae in the Hungarian Central Mountain Range. 1 = Sciurus, 2 = Citellus citelloides, 3 = Citellus citellus, 4 = Castor, 5 = Eliomys, 6 = Glis, 7 = Dryomys, 8 = Muscardinus

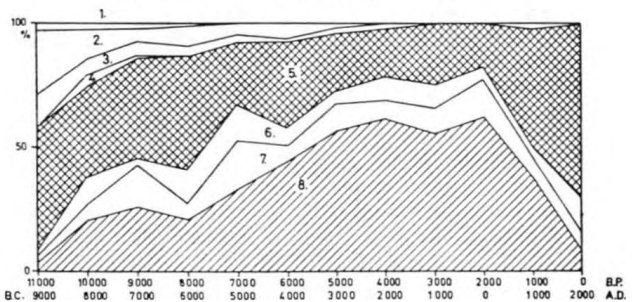


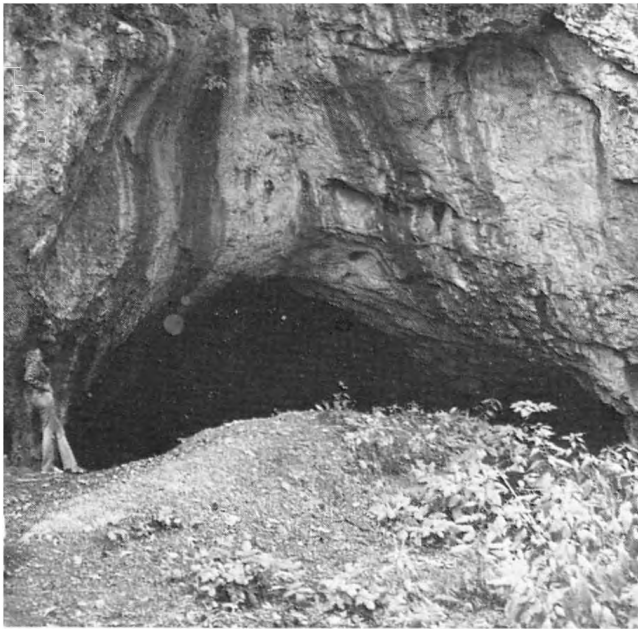
The profile of Pongor-lyuk excavations. Holocene: 1 = grey debris, 2 = rendzina with debris, 3 = grey debris, 4 = brown debris; Middle Pleistocene: 5 = yellow debris, 6 = brown debris, 7 = ochre clay with calcareous debris

of 29 taxa shows affinity to layers 5—8 at the locality 6 of Süttő (JÁNOSSY, D. 1979, 1984).

At the localities Giants' Hall 1 and Big Hall 2 in the Hajnóczy cave J. HIR (1982, 1985) also collected 'Riss-Würm' faunae. They, however, showed clear signs of climatic deterioration. A common feature of the materials from all the four localities is that they are slightly different

Changes in frequency of different vole species in the Holocene ground faunae in Hungary. 1 = Microtus nivalis, 2 = Microtus gregalis, 3 = Microtus oconomus, 4 = Microtus agrestis, 5 = Microtus arvalis, 6 = Pitymus subterraneus, 7 = Arvicola terrestris, 8 = Myodes glareolus





Entrance to the Kőlyuk Cave

from the typical animal communities described for the last interglacial in Hungary (Suba-lyuk and Varbó — JÁNOSSY, D. 1979, 1984). In summary it can be claimed that the systematization and stratigraphic evaluation of the fauna of the minimum 50,000 years between the 'Riss-Würm' warm peak and the 'Würm I' pleniglacial is still partly a task of the future.

The importance of the Fügő-kő cave primarily lies in its geographical position, since it was formed in andesite in the eastern Cserhát Mountains. Until recently the volcanic area between the Transdanubian and the NE-Hungarian karst regions has been regarded a 'terra incognita' from Quaternary paleontological aspect. The fauna of the rock niche was studied by D. JÁNOSSY, L. KORDOS and E. KROLOPP (1983).

The first phase of its fill represents the Subboreal and early Subatlantic Phases of the Holocene. The vertebrate material of the lower horizons characteristically reflects an Upper Pleistocene cold climate. Also at this site a small part of the mollusc fauna consists of cold indicators or eurytherm species.

In the Bükk Mountains, in the Csunya valley, SE of Répáshuta, the excavations by L. FÜKÖH and E. KROLOPP (1983, 1986) began in 1980. From the two profiles of the Muflon cave a total of 5935 specimens of 50 mollusc species were found. The profiles cover most of the period from the late Pleistocene to the present. A faunistic curiosity is the new species described from this locality: *Daudebardia helenae* (FÜKÖH, L. 1985).

L. FÜKÖH performed the malacofaunistic analysis of some previously collected material: from the Kis-kőhát aven (1981), Rejtec I rock niche and Petény cave (1987b). L. FÜKÖH and E. KROLOPP (1985) processed the mollusc fauna of the Kőlyuk II. cave, Bükk Mountains. This profile

includes the Boreal and Atlantic Phases of the Holocene (FÜKÖH, L. 1979, 1986) and as a whole reflects the process of forest spreading only interrupted by the clearances of the Neolithic cultures.

Generalizing the results from these excavations, L. FÜKÖH (1979, 1983 and 1987a) has also set up a malacostratigraphical system for the Holocene.

It was also in the last decade that L. KORDOS published the results of his excavations made in the seventies in the Hosszú-hegy aven (1983), Kis-Kőhát aven (1980) and the Rigó-lyuk of Bodajk (1984).

Based on 62 investigated layers of 12 caves in the Hungarian Mountains, L. KORDOS elaborated a complex stratigraphic, climatic and fauna evolution synthesis for the Holocene (1978a, b, 1981, 1982, 1984b, 1985a, 1987a).



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