Larger Mammals from the Lowermost Pleistocene Fauna, Osztramos, Loc. 7 (Hungary)

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Abstract — Well-preserved large mammal remains in the Osztramos, Loc. 7 occurring together with microstratigraphically defined microvertebrate-fauna give an opportunity for the first time in Hungary and in whole of Europe, to synchronize the stratigraphical significance of both faunal elements. Thereby a more precise characterization of the Pliocene-Pleistocene boundary terrestrial faunae was made possible, along with the establishment of a new stratigraphical unit: the Rákó-Horizon. With 2 photoplates.

During the last few decades the investigation of the Pleistocene microvertebrate faunae has prospered as never before. The evolutionary changes, combined with the dominancephases of small vertebrates often present in statistical quantities, made possible to establish a very detailed microstratigraphical sequence. However, these fine sequences gradually become independent and break away from classical "largemammal stratigraphy". This fact is due to the nature of different fossil-bearing localities: some of them (fissures, rock-shelters, etc.) yield nearly exclusively small vertebrates, others (archeological sites, etc.) almost merly large mammals. Although, it would be absolutely indispensable to link the micro- and macrovertebrate stratigraphy especially in those cases, in which international convention is based on the classical large mammal succession, like the Pliocene-Pleistocene boundary. Independently of this, we can imagine a clearer picture of the fauna of a corresponding time span by the knowing the possible largest sclae of the former world of life.

For this very reason I was delighted to find besides the extremely rich microvertebrates some very significant remains of larger mammals, outlined in the previous papers on the fauna of Osztramos, Loc. 7 (Northern Hungary, JÁNOSSY 1974), which may justly be called as a typical transitional vertebrate fauna between the Pliocene and Pleistocene in Europe.

I give here the whole list of fossil systematical units determined on the basis of the material collected during the years of 1970 to 1977, in the fissure of Osztramos 7:

Celtis sp. (seeds)
Gastropoda indet.
Diplopoda indet.
Anura indet.
Ophidia indet.
Lacertilia indet.
Ophisaurus sp.
Testudinata indet.
Tetrao cf. *conjugens* JÁNOSSY
Francolinus capeki LAMBRECHT
Francolinus minor JÁNOSSY
Bubo sp.
Surnia robusta JÁNOSSY
Athene veta JÁNOSSY
Turdoides sp.
Passeriformes indet.
Talpa sp.
Desmana cf. *nehringi* KORMOS
Erinaceus aff. *samsonowiczi* SULIMSKI
Beremendia fissidens PETÉNYI
Petenyia hungarica KORMOS
Petenyiella cf. *gracilis* (PETÉNYI)
Episoriculus gibberodon (PETÉNYI)
Sorex cf. *subminutus* SULIMSKI

Chiroptera indet.
Estramomys simplex JÁNOSSY
Sciurus sp.
Pliopetaurista dehneli SULIMSKI
Pliopetes hungaricus KRETZOI
Glis minor KOWALSKI
Muscardinus sp.
Dryomimus eliomyoides KRETZOI
Glirulus (Amphidyromys) pusillus (HELLER)
Sminthozapus janossyi SULIMSKI
Prospalax priscus NEHRING
Apodemus sp. I–II
Cricetinus sp. I–II
Baranomys loczyi KORMOS
Germanomys cf. *weileri* HELLER
Mimomys cf. *stehlini* KORMOS
Mimomys sp. div.
Cseria gracilis KRETZOI
Lemmus sp.
Hystrix major GERVAIS
„*Hypolagus beremendensis* PETÉNYI"
Canis aff. *arnensis* FORSYTH MAJOR
Vulpes s.l. sp.
Ursus minimus DEVÈZE et BOUILLET

Ursus etruscus CUVIER
Martes sp.
Putorius stromeri KORMOS
Pannonictis aff. *janossyi* RABEDER
Mustela praenivalis KORMOS
Mustela cf. *plioerminea* STACH

Felis cf. *lunensis* MARTELLI
Dicerorhinus cf. *megarhinus* CHRISTOL
Equus "*robustus* POMEL"
Cervus s.l. sp. I. (*philisi* group)
Cervus s.l. sp. II. (cf. *Cervodama pontoborealis*
FLEROW et PIDOPLICHKO)

This extremely rich fauna allow already in spite of preliminary determinations a very detailed microstratigraphical arrangement. The description of some representatives of the larger mammals[*] to approximate the macro- and micromammal stratigraphy of the corresponding time span is given·

RODENTIA BOWDICH, 1821

Hystrix cf. major GERVAIS, 1859 (Plate II: Fig. 9)

M a t e r i a l: left mandible with the M_2 and M_3, isolated right P_4.

The mandible agrees in size and chief morphological features with that of the geologically considerably younger large porcupine of the Loc. 8 Osztramos, seems to be only slightly smaller. The length and width of the M_2 measure 10×9 mm, that of the M_3 9×7 mm. The P_4 is senile. These remains represent also the size category, which we assign conventionally with the name *Hystrix major* GERVAIS (see JÁNOSSY 1972). Due to the rarity and morphological homogenety of porcupine remains it is not to be hoped that we find in the near future some theoretically assumable morphological or allometrical differences between forms of the same size category and different geological age.

Ferae LINNÉ, 1758

Canis aff. arnensis DEL CAMPANA, 1913 (Plate II: Fig. 8)

M a t e r i a l: proximal half of the right humerus.

The Canids of the rich material of Val d'Arno in Italy, collected during the last century, yielded an opportunity to establish many species, which seemed to be biologically an absurd resolution (FORSYTH MAJOR 1877, DEL CAMPANA 1913). The newest revision of DELLA TORRE (1967) on statistical basis reduced the number of these forms to three: *Canis etruscus* MAJOR the size of a small living wolf, *Canis falconeri* MAJOR, much larger, and *Canis arnensis* DEL CAMPANA, dimensions between those of a jackal and a wolf. Thus we can arrange our remains from Osztramos 7 in the size category of the last one. The fragment is not convenient for taking exact measurements, although comparing with the humerus of *Canis mosbachensis* (the middle-sized wolf of the Middle Pleistocene) from Gombaszög, in the collection of the Hungarian Natural History Museum, Budapest — it seems to be weaker. The fragment is only convenient for establishing the size category and we can identify it only theoretically with the corresponding bone of *Canis arnensis*.

Vulpes s. l. sp.

M a t e r i a l: broken mandible with the fragment of canine and an isolated canine fragment.

The canines agree in size and measurements mostly with those of the recent *Vulpes lagopus*. Thus, the representative of *Alopex preglacialis* KORMOS, 1934 may be present in these very fragmentary remains.

Ursus minimus DEVÈZE et BOUILLET, 1827

(Plate I: Fig. 1–4, Plate II: Fig. 2–3)

M a t e r i a l: Right maxillary fragment with the incisivi, canini, two (small) premolars and, P^4–M^2, left fragment of the same with the canine and P^4–M^2, nearly complete mandible with the canine and the P_4–M_2, juvenile mandible fragment with germs of the I_3 and M_3, distal fragments of the right and left humerus, distal two-thirds of the radius, fragment of the larger part of the pelvis, dist. fragment of the tibia (diaphysis), fragment of the calcaneus, two fragments of phalanx I, fragment of phalanx II.

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[*] The term „larger mammals" is used here for such species, which are not conventionally ranged within the "microfauna" in the strict sense of the word.

This relatively rich and mainly well-preserved material allows a more detailed analysis. The small dimensions of the remains are remarkable at a first glance. I had the opportunity to compare the remains directly with the skull and mandible of "*Ursus ruscinensis* DÉPERET" (University of Lyon) deriving from the brick-works of Chefdebien, Perpignan (see DÉPERET, 1897, planche 3; VIRET, 1954, p. 45). Table I shows that most of the measurements of the teeth in the Osztramos specimen agree with those of the French one. Not even the morphology of molars differ in both specimens, only minor differences exist obviously due to the individual variation. The canines are weaker and the size of the mandibule is smaller in the Osztramos specimen, either due to the sexual dimorphism or individual variation. The mandible of the Perdignan specimen is broken, thus no length measurement is available. The corresponding measurement (from the front margin of the alveolus of the canine to the processus condyloideus) in the Osztramos bone is about 170 mm.

Table 1. Comparative measurements of small Plio-Pleistocene *Ursus* remains (mm)

	"Roussillon" (Perpignan)	Osztramos, Loc. 7
Length × width of the P^4	14×9.5	13×9.5
Length × width of the M^1	18×14	18×14
Length × width of the M^2	24.6×14.5	24×14
Length of upper diastema	cca. 24	cca. 24
Length × width of the P_4	13.3×6.7	11.1×6.1
Length × width of the M_1	20.0×9.2	21.0×9.5
Length × width of the M_2	19.5×12.0	18.0×12.0
Length × width of the M_3	16.0×12.5	(germ: see text)
Height of mandible below the M_1	38	30
Length of lower diastema	30	22

Besides the cranial and tooth material, the humerus fragments are of special interest, owing to their dimensions and by possessing a foramen entepicondyloideum, although no supratrochlear foramen is present. The entepicondylar foramen may be considered as a primitive feature, appearing e.g. in the geologically older Canids, Ursids and Amphicyonids, etc. I have not found it in the recent species *Tremarctos ornatus* and *Selenarctos tibetanus*.

In the Lower Pleistocene material VIRET (1954) found this foramen in the humerus of *Ursus etruscus*, though the dimensions of the bone were considerably larger. The distal width of the humerus in the Saint Vallier material measures cca 94 mm, the smallest width is on the trochlea 61 mm. The same measurements in the Osztramos material are 63 and 43 mm, expressing a considerable difference in size between the two evolutionary lines.

The literature on Lower Pleistocene bears is very vast and puzzling.

Most authors suppose two evolutionary lines: a small one with slender extremity bones: *Ursus boeckhi, minimus, arvernensis, ruscinensis, stehlini-dehmi* etc. and a large one with more robust extremity bones: *Ursus etruscus*. VIRET (1954) does not accept the presence of this two evolutionary lines and speaks only of a homogeneous *Ursus etruscus* with great variation in size. KRETZOI (1954) indicated *Ursus boeckhi* to represent a distinct evolutionary line, possessing in the M_1 a primitive, Canid-like metaconid.

The small bear of Osztramos 7 evolutionarily somewhat higher is represented in the Hungarian Lower Pleistocene (in the collection of the Hungarian Natural History Museum, Budapest) by the following remains:

1. An upper canine from Püspökfürdő. Total length measuring 56 mm (root and crown together); the length of the crown (outer side, unworn) 29 mm, the maximum width on the boundary of the crown and root 16 mm. — 2. A right M_3 from Beremend, with the length and width 17×13 mm. For comparison: the germ of the M_3 in the Osztramos 7 material measures about 16×12 mm.

These two remains were labelled by KORMOS at that time as „*Helarctos böckhi*" (sic!).

I compared the very nice remains of Osztramos 7 with the dentition and humerus of *Helarctos malayanus, Tremarctos ornatus* and *Selenarctos tibetanus*. Neither the dentition of *Helarctos*, nor that of *Tremarctos* can be compared with the fossil material. Only *Selenarctos* resembles in outline the extinct form, though does not possesse an entepicondylar foramen in the humerus. Thus, the designation "*Helarctos*" must be newly refused (STEHLIN 1933).

Summarizing we have to establish, that the two (or more) evolutionary lines in Pleistocene bears seem to be acceptable. The technical name of the small form of Osztramos 7 is, as far as our

present knowledge is concerned, due to the roles of nomenclature *Ursus minimus* DEVÈZE et BOUIL-LET, independent from the fact what this name really covers (*Ursus arvernensis* CROIZET et JOBERT, 1828 and *Ursus ruscinensis* DÉPERET, 1891 are subsequent designations).

Ursus etruscus CUVIER, 1823

M a t e r i a l: right upper canine. — This determination is based on the larger dimensions: the length of the whole tooth is about 75 mm (worn tooth), the length of the crown is about 35 mm, the larger diameter at the boundary of the root and the crown is 22 mm.

KORMOS (1937) mentioned in his list of "preglacial" mammals *Ursus etruscus* from Loc. Villány-Kalkberg. The remains from this locality to be found in the collection of the Hungarian Natural History Museum, Budapest, are the following: fragment of a right mandible with the canine, M_3 and a broken M_2 (length of P_4–M_3 about 86 mm, length and width of M_3: 20×15 mm). Besides them, isolated M^1 and M^2 are also found deriving the same locality (M^1 20×16, M^2 30×17 mm).

These scanty fragmentary remains together with the ones from Kisláng (KRETZOI 1954) prove the uninterrupted successions of the evolutionary line of the *"etruscus"*-bears too.

Putorius stromeri KORMOS, 1934 (Plate II: Fig. 7)

M a t e r i a l: Palatal fragment with the canine, P^3–P^4 and M^1, two mandibles with full dentition and one of them with the ascending ramus.

The more complete mandible is most convenient for comparitive purposes with the type-material of KORMOS (1934). The entire shape of the lower carnassial (M_1), chiefly with its broader talonid against recent forms and lesser dimensions (length about 6.5 mm), agree in all details with the type-specimen. The morphology of the upper dentition is also in all particulars Putorius-like; chiefly the shape of the upper M^1, with its characteristical outlines and cusps. The specific identity with *Putorius stromeri*, or at least the presence of close evolutionary form is highly probable.

Mustela praenivalis KORMOS, 1934

M a t e r i a l: Viscerocranium with the P^3 and P^4 of both sides and the fragments of the canine, P^2 and M^1; isolated P^4 and a diaphysis of a humerus.

Due to their dimensions the three pieces are relegated in the above given taxonomical unit. The length of the upper carnassials (P^4) measures 3.8 and 3.9 mm.

The recent revision of Mustelids by RABEDER (1976) clearly shows the systematical independence of this form

Mustela aff. plioerminea STACH, 1959

M a t e r i a l: Mandible fragment with the carnassial (M_1), another fragment with the P_4, fragments of isolated *Pm* inferior, M_1 and canine, proximal fragment of the femur and dist. fragment of the tibia.

It is a strange form: the dimensions and the morphology of all pieces place it near the recent stoat *(Mustela erminea)*. The length of the M_1 is 6.1 mm, the width 2.4 mm. Thus, the size and proportions agree more with those of recent plus-variants of stoat, than with the Lower Pleistocene fossil from (see RABEDER 1976, diagram 3). The hinder part of the tooth constitute a more talonid-like form, than in the hitherto known recent or fossil species. In this feature this tooth agrees in some aspects with that of *Lutreola*, although being considerably slender. The proximal width of the femur is about 7 mm, the distal width of the tibia about 5 mm.

More complete remains of this interesting form will most certainly clarify its exact systematical position. A relation with *Mustela plioerminea* STACH, 1959, may be supposed, although an immediate comparison is not possible, since other anatomical units are present (there a cranium only).

cf. Pannonictis? janossyi RABEDER, 1976 (Plate II: Fig. 6)

M a t e r i a l: Fragment of viscerocranium with the P^3–P^4–M^1.

A comparison of the remain with the hitherto described Mustelid remains of the similar size-category and age, we find the most common features with the Lower Pleistocene Grisonines and among them with *Pannonictis ? janossyi*. However, the teeth in the Osztramos-specimen are some-

what smaller and the "trigonid shape" of the P^4 is not so distinct as in the true *Pannonictis*-types (more *Pliovormela*-like), although a frontal cingulum is present. The whole shape and the position of the tubercles of M^1 well agree in the two specimens. Some measurements given in Table II show the differences in size.

Table 2. Comparative measurements of the upper teeth of *Pannonictis* aff. *janossyi* (mm)

	Villány, Loc. 3	Osztramos, Loc. 7
Outer length of the P^4	7.1	6.1
Thickness at the paracone of the P^4	3.1	2.2
Medio-lateral width of the M^1	6.1	5.4

Obviously this material is too scanty for making a decision as far as unambiguous systematical position is concerned.

Martes sp.

M a t e r i a l: left mandible with the P_3, P_4 and M_1; left mandible with the germ of the P_4.

Considering the fact that, from the older Pleistocene hitherto only one species of the genus was described: *Martes vetus* KRETZOI, 1956 (new name for the homonym *Martes intermedia* HELLER, 1933) from the German locality Sackdilling-Cave, we can compare our remains only with those ones. The Osztramos-speciem differs from *Martes vetus* and also from the recent *Martes martes* and *Martes foina* in having perceptibly slender premolars and molar. The length and talonid-width of the M_1 are in the Osztramos-remain 10.0×3.7 mm, in *Martes vetus* from Sackdilling (Hungarian Natural History Museum, Budapest) 9.0×3.5 mm. Thus, an allometrical difference seems to be probable, although the proof of this fact needs further comparative material.

Felis aff. lunensis MARTELLI, 1906

M a t e r i a l: proximal fragment of a right (pathological!) metatarsal bone (Mt_3), phalanx II and phalanx III.

The three remains agree in all morphological features with the corresponding anatomical elements of the European Wild Cat. Considering the fact that, there is up to the present *Felis lunensis* MARTELLI the unique Felid of this size-category, described from the Lower Pleistocene (in its geological age seemingly very near too), we may provisionally identify our remains with this form. The length of the only measurable phalanx II is about 15 mm (proximal epiphysis lacking).

PERISSODACTYLA OWEN, 1848

Dicerorhinus cf. megarhinus CHRISTOL 1835 (Plate II: Fig. 4)

M a t e r i a l: distal two-thirds of the left tibia.

This fragment, in spite of its very good condition would not be convenient for the above given taxonomical designation. However, from a rhinoceros bone of this size-category found in the corresponding, microstratigraphically significant Microvertebrate level we may draw the conclusion only that this array of species was present (incl. *Dicerorhinus jeanvireti* GUÉRIN, 1972).

We may consider owing to the stratigraphical position, only two forms: *Dicerorhinus megarhinus-jeanvireti*-group and the *D. etruscus*-group. Although the latter is on the average smaller than the former and the dimensions of our fossil from the Loc. 7 Osztramos speak rather for a plus-variant of the larger group. The proof for this statement may be the largest diameter of the distal epiphysis of the tibia: 117 mm (its width about 94 mm). The largest diameter ranges according to literary data in the *D. etruscus*-group between 66 and 106 mm (n = 15, KAHLKE 1965, 1969; BONIFAY 1973 etc.), in the *D. megarhinus-jeanvireti*-group between 101 and 127 mm (n = 20). Thus, our remain clearly surpasses the hitherto known plusvariants of the smaller group.

   Dicerorhinus megarhinus is said to be as a typical Upper Pliocene ("Astian") form in the litera-
ture. This species was described from the (older) sands of Montpellier by CHRISTOL and occurs also
in the younger marine sands of the corresponding territory ("Roussillon", DÉPERET 1897). We know
their remains in Europe hitherto only from Upper Pliocene (Postpannonian Pliocene) localities be-
sides Roussillon: Wölfersheim too. GUÉRIN (1972) separated newly a form of the same size category
from layers of transitional position between the Pliocene and Pleistocene (Vialette, "Villafranca",
Etouaires, etc.) under the designation *D. jeanvireti*. The distinction from *megarhinus* does not seem
to be clear on the basis of fragmentary remains.
   The stratigraphical position of all known remains of this group in the Carpathian Basin: the
gravels of Rákoskeresztúr and Maglód (both east from Budapest; the latter one has not been pub-
lished, preserved in the Hungarian Natural History Museum, Budapest), and one from Gödöllő
(MOTTL 1939) is hitherto uncertain. The similar fossils originating from Ajnácskő (Hajnačka) are
according to FEJFAR (1964) of Lowest Pleistocene age. As we will come back later to that, from our
point of view it is the most important establishment that the stratigraphically very well defined Oszt-
ramos finds proves the presence of the larger rhinoceros and not that of the smaller *D. etruscus*.

Equus ,,robustus POMEL, 1853''
(Plate I: Fig. 5–8; Plate II: Fig. 1)

   M a t e r i a l: Fragment of an upper (milk) incisor; D^2, D^3 and D^4 from the left tooth row;
left and right D_2; mandible fragment with a part of a milk molar; left and right complete femora
(without epiphysis); fragment of (a young) radius; fragment of vertebra caudalis.
   All remains seem to originate from the same foal, possessing well-developed (nearly erupted)
germs of milk molars. It is not possible to discuss here the patterns of the teeth due to their unworn
condition. Although some measurements prove the large dimensions of this horse unequivocally:
the length of the D_2 is about 38 mm (in Saint-Vallier, the only locality in which I found an exact
description and figures of milk molars, VIRET, 1954: this measurement is 36.7 mm), the length of
D^2 is about 50 mm (in Saint Vallier, measured on the figure: 48 mm), the length and width of D^4 is
about 38×26 mm.
   All these dimensions suggest a heavy-built Lowest- to Lower-Pleistocene caballine horse, very
widespread at that times in Europe. It is quite unambiguous to establish the presence of this evolu-
tionary lineage, as is difficult the taxonomical designation. The correct name of this form is very dis-
puted in literature (*Equus stenonis* race *major-vireti-senezensis*, *bressanus?*, *sylvarum*, *robustus*, — see
STEHLIN 1933; KRETZOI 1938, 1954; VIRET 1954; PRAT 1969 etc.). For that very reason I use here
provisionally the name *"robustus"* being conscious of the fact, that this is not the taxonomically
correct designation.
   We can establish in this place the same as for the large rhinoceros, but with an opposite sign
thus, we have before us one of the stratigraphically best confined remains of our territory of a Plio-
cene relict evolutionary line, here the large caballine horse as a species of the hitherto known oldest
ones in Europe.

ARTIODACTYLA Owen, 1848
Cervus s. l. sp. I (aff. *philisi* SCHAUB)

   M a t e r i a l: three fragments of molars, two small fragm. of antlers (tines only), two fragm.
of corpora vertebrae, C_{2-3}: (capitatum + trapezoideum), *Cr* (naviculare), *Cu* (triquetrum), *Ci* (luna-
tum), metacarpale (nearly complete, distal. ep. lacks) and prox. fragment of the same; prox. and dist.
fragments of a juv. femur; astragalus, prox. and dist. fragment of metatarsalia, trochlea of a meta-
podial, fragment of a phalanx I., lateral phalanx I., phalanx II.
   As it is well known from the literature, the morphological-systematical relegation of deer of
Lowest viz. Lower Pleistocene does not seem very hopeful. Most of the pieces are so fragmentary
that, it is hardly possible to take comparable measurements of them. Nevertheless I give in this
place some measurements to show the relatively small dimensions of the fossil species. The proximal
width of the metacarpal bone measures 33 and 34 mm, that of the metatarsal 26 and 31 mm. The
length and width of astragalus amount 42×25 mm, the length and distal width of the phalanx II.
35×12 mm. All these measurements fall into the variation of the group of smaller deer of the Lower
Pleistocene, described from Western Europe *(Cervus cusanus, ramosus, pardinensis, perolensis, philisi,
perrieri, ardei)*. As it is well known, the most important differences among these species represent
the configuration of the whole antler. As the anatomical list shows, antlers are not present viz. since
we have only indifferent fragments of tines.

In spite of the fact that the excellent monograph of Villafranchian Cervids of Western Europe by HEINTZ (1970), who analyses all extremity bones in detail, we cannot come much nearer the solution of this problem. The morphological homogeneity of the bones is so great that, we can speak on the basis of the measurements, viz. ratio of the width and height of the proximal epiphyses of the metapodials that the group of *"Cervus philisi"* (as the best known representative) is present.

Cervus s. l. sp. II.

(aff. *Cervodama pontoborealis* PIDOPLICHKO et FLEROW, 1952)
(Plate II: Fig. 5)

M a t e r i a l: basal fr. of a shed antler, four upper molar-fragments, fragment of an incisor, lunatum *(Ci)*, two proximal and one distal fragments of metacarpals.

Pidoplichko and FLEROW described from the "Pliocene" gravels of Southern Ukraine a 60 cm long, somewhat fragmentary shed, widely palmated antler under the name *Cervodama pontoborealis*. The antler agrees according to the description and illustrations in his whole shape and size (the greatest diameter of the burr, coronet, in both about 56 mm, the largest thickness of the beam in both about 35 mm) in such degree with the Osztramos specimen that we may suppose an identity or at most a close relation. Palmated antlers are widespread in the otherwise very homogeneous evolutionary lines in Cervids, although there are a lot of convergences in this case, too. The teeth and extremity bones are only provisionally ranged within this form on the basis of their size, being larger than the other ones from the same locality determined as *"Cervus philisi"*-group.

Thus, the systematical position of the larger Cervid of the Loc. 7 Osztramos remains questionable, too.

Conclusions

Until the late 1930s the distinction between the Villafranchian and Cromerian terrestrial stratigraphical units, was very uncertain and disputed (KORMOS 1937, SCHAUB 1932, STEHLIN 1933). The first step in the solution of this problem signified the discovery of the fact the "Cromerian" microfauna was accompanied by large mammals, fundamentally different from the classical "Villafranchian" in Gombaszög (KRETZOI 1938). The "counter-proof" of this recognition was the discovery and right interpretation of the "typical" Villafranchian-Calabrian vertebrate fauna containing both micro- and macrofauna, also in the territory of the Carpathian Basin: Kisláng (KRETZOI 1954).

At last the third step represented by Osztramos 7 proves the possibility of the stratification of the latter one by its rich small and well-represented large mammal fauna.

A comparison presents itself primarily with Kisláng. Unfortunately, all comparisons make difficult the nature of selective fossilization viz. different facies. Thus e. g. in Osztramos 7. we find nice representatives of Mustelids, almost entirely lacking in Kisláng, the *Proboscidea* well represented in the latter locality, absent from the former one, etc. In any case we can establish that the microfauna differs much more in this two localities, than the large mammals. As analyzed in detail in a previous paper (JÁNOSSY 1974) the Pliocene elements predominate in the small mammal fauna of Osztramos 7. Ancestral insectivores, as *Petenyiella gracilis* or *Blarinoides mariae*, Rodents as *Sminthozapus janossyi, Glirulus pusillus, Dryomimus eliomyoides, Baranomys* and before all *Mimomys "stehlini"* and *Cseria gracilis* speak for this designation. All these forms are entirely absent from Kisláng. On the other hand, the larger part of macromammals lived through this period seemingly nearly unchanged. We cannot establish any ascertainable morphological differences e. g. in *Ursidae, Equus* or *Cervidae*. On the level of our present knowledge only the rhinoceros of both faunas (and levels) differs fundamentally. Instead of the large rhinoceros (*Dicerorhinus megarhinus-jeanvireti*) in Osztramos 7. the smaller *Dicerorhinus etruscus* in Kisláng appears. Thus, we can establish by reason of *Perissodactyles* three stages in this period, being transitional between the Pliocene and Pleistocene:

1. *Hipparion* alone among Equids together with a typical *Dicerorhinus megarhinus:* the classical faunas of Roussillon and Montpellier, as well as perhaps Wölfersheim.

2. The appearence of *Equus* (theoretically together with *Hipparion*) still *Dicerorhinus megarhinus-jeanvireti* too: Osztramos 7.

3. *Hipparion, Equus* associated with *Dicerorhinus etruscus:* Kisláng.

Further comparisons are made more difficult by the mentioned selective nature of fossilization or zoogeographical differences. The key-fauna of Csarnóta lacks e. g. the Perissodactyls, of Wölfersheim the Equids entirely and if we consider animal assemblages from more eastern territories e. g. Odessa with the absolute dominance of *Camelus* (also no rhinoceroses or Equids), the problem of a real comparison being much more greater, not to mention that most of contemporaneous faunas seems to be stratigraphically mixed.

In this case we have to return, — at least in the Holarctic, if they are present (!) — to the small mammals and especially to the voles with quick evolutionary rates and large distribution. The "*Mimomys stehlini*"-stage, — analyzed in other places in detail —, is rather an evolutionary stage than a species, although seems to be a good guide fossil from Western Europe to Eastern Asia. As I mentioned elsewhere (JÁNOSSY 1974) the material of Osztramos 7 stands very near the *Mimomys stehlini* of the type locality (San Giusto) although being more brachyodont, but a little more hypselodont, than that of Wölfersheim. The evolutionary stage of the Odessa-*Mimomys* does not seem to be very different, representing of course other morphological forms.

All in all we have to come back to the stratigraphical position of Osztramos 7. Remaining in Hungarian relation, we may establish that there is a considerable faunistical gap betwen the Csarnóta and Villány-stage, perhaps the Beremendian stage should be stratisfied more in detail. Therefore, I propose to establish a new stratigraphical unit to intercalate between the Csarnotanum and the first substage of the Villanyian, within the Beremendian-stage (see KRETZOI 1969). Although, we find paradoxically within this territory a zoogeographical difference: *Dolomys* being absent and *Mimomys* predominates. This horizon was characterized above in detail: the Pliocene relics predominate both in the micro- and macrofauna, although the first Pleistocene forms are present. The contemporaneous presence of *Equus* and the large rhinoceros, *Mimomys* "*stehlini*" and *Lemmus* is especially characteristic. I propose for this horizon the new name Rákó-Horizon from Bódvarákó, a village near Osztramos.

References

BONIFAY, M.-FR. (1973): Dicerorhinus etruscus Falc. du Pleistocène Moyen des grottes de Lunel-Viel (Hérault). — *Ann. Paléont.* **59** (1): 1–31.

CROIZET, J. B. & JOBERT, A. CL. (1828): Recherches sur les ossements fossiles du département du Puy de Dôme. — Paris, p. 1–224, 57 pls.

DEL CAMPANA, D. (1913): I cani pliocenici di Toscana. — *Paleont. Italica,* **19:** 189–254.

DÉPERET, CH. (1897): Les animaux pliocènes du Roussillon. — *Mém. Soc. Géol. France* (Pal.), **3:** 1–164.

DEVÈZE, CH. & BOULLET, J. B. (1827): Essai géologique et minéralogique sur les environs d'Issoire départment du Puy de Dome, et principalement sur la montagne de Boulade. — Clermont-Ferrand, p. I–XII + 1–104.

FEJFAR, O. (1964): The Lower Villafranchian Vertebrates from Hajnacka near Filákovo in Southern Slovakia. — *Rozpravy, Ust. Ust. Geol.,* **30:** 1–115.

GUÉRIN, CL. (1972): Une nouvelle espèce de Rhinoceros (Mammalia, Perissodactyla) a Vialette (Haute-Loire, France) et dans d'autres gisements du Villafranchien Inférieur Européen: Dicerorhinus jeanvireti n. sp. — *Doc. Labor. Géol. Fac. Sci. Lyon. Notes et Mém.,* **49:** 53–150.

HEINTZ, E. (1970): Les Cervidés villafranchiens de France et d'Espagne. Vol. I–II. — *Mém. Mus. Nat. d'Hist. Natur.,* N. S., **22:** 1–303 + 1–206.

JÁNOSSY, D. (1974): The boundary of the Plio-Pleistocene based on the Microvertebrates in North Hungary (Osztramos Locality 7). — *Vertebr. Hung.,* **14:** 101–112.

KAHLKE, D. (1965): Die Rhinocerotiden-Reste aus den Tonen von Voigtstedt. — *Paläont. Abhandl. Abt. A. Paläozoologie*, **2** (2/3): 453–518.
KAHLKE, D. (1969): Die Rhinocerotiden-Reste aus den Kiesen von Süssenborn bei Weimar. — *Paläont. Abh. Abt. A. Paläozoologie*, **3** (3/4): 667–708.
KORMOS, T. (1934): Neue und wenig bekannte Musteliden aus dem ungarischen Oberpliozän. — *Folia Zool. Hydrobiol.*, **5** (2): 129–158.
KORMOS, T. (1937): Zur Frage der Abstammung und Herkunft der quartären Säugetierfauna Europas. — *Festschr. 60. Geburtstage v. Prof. Dr. Embrik Strand.*, Vol. **3**: 287–328.
KRETZOI, M. (1938): Die Raubtiere von Gombaszög nebst einer Übersicht der Gesamtfauna (Ein Beitrag zur Stratigraphie des Altquartärs). — *Ann. Mus. Nat. Hung.*, **31**: 88–157.
KRETZOI, M. (1954): Bericht über die calabrische (villafranchische) Fauna von Kisláng, Kom. Fejér. — *Jahresber. Geol. Inst. von 1953;* 239–265.
KRETZOI, M. (1969): Sketch of the Late Cenozoic (Pliocene and Quaternary) terrestrial stratigraphy of Hungary. — *Földr. Közl.*, **3**: 179–204.
MAJOR–FORSYTH, C. J. (1877): Considerationi sulla fauna dei mammiferi pliocenici e post-pliocenici della Toscana. — *Atti Soc. Toscana Sci. Nat. Mem.*, **3**: 207–227.
MOTTL, M. (1939): Die mittelpliozäne Säugetierfauna von Gödöllő bei Budapest. — *Jahrb. Geol. Anst.*, **32** (3): 257–350.
PIDOPLICHKO, I. G. & FLEROW, K. K. (1952): Nowaja forma olenija is Pliocena juga Ukraini. — *Doklady Akad. Nauk. SSSR.*, **84** (6): 1239–1242.
PRAT, F. (1969): Recherches sur les Equidés Pleistocènes en France. — *Thèse Sci. Bordeaux.*, no. 226. Vol. I. et II.: 1–694.
RABEDER, G. (1976): Die Carnivoren (Mammalia) aus dem Altpleistozän von Deutsch-Altenburg 2. Mit Beiträgen zur Systematik einiger Musteliden und Caniden. — *Beitr. Paläont. Österr.*, **1**: 5–119.
STEHLIN, H. G. (1933): In DUBOIS A. & STEHLIN, H. G.: La Grotte, de Cotêncher, Station moustérienne. — *Mém. Soc. Paléont. Suisse*, **52–53**: 1–292.
TORRE, D. (1967): I cani villafranchiani della Toscana. — *Palaeont. Italica* (Pisa), **63**: 113–138.
VIRET, J. (1954): Les loess a bancs durcis de Saint-Vallier etc. — *Nouv. Arch. Mus. Hist. Nat. Lyon.*, **4**: 1–183.

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Plate I.
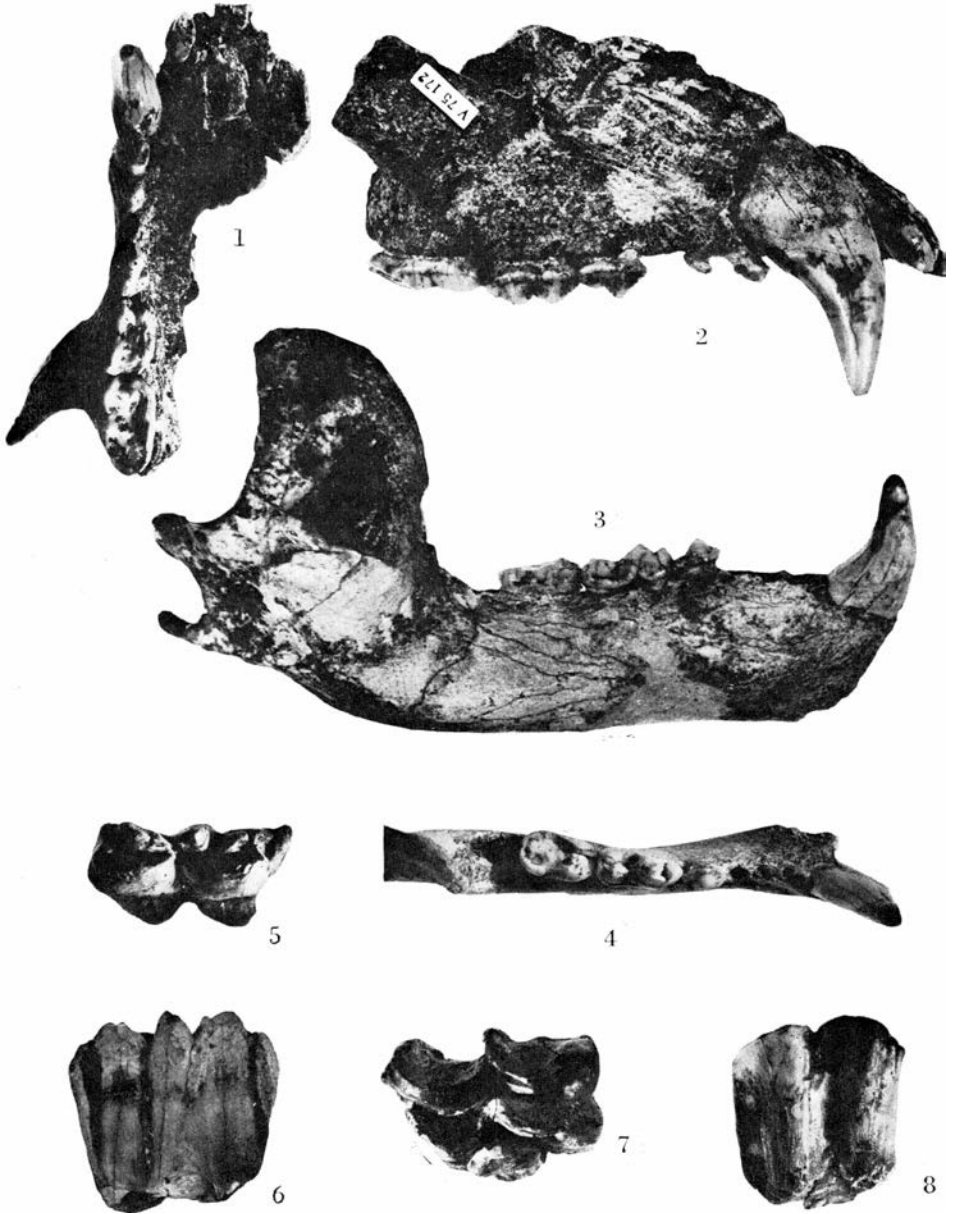
Osztramos, Loc. 7: Figs. 1–4. *Ursus minimus* DEVÈZE et BOUILLET: 1 = right maxilla fragment, palatal view, 2 = same, outer view, 3 = right mandible, outer view, 4 = same (lower dentition) occlusal view. — Figs. 5–8. *Equus „robustus* POMEL": 5 = right D_2, occlusal view, 6 = same, outer view, 7 = left D^3, occlusal view, 8 = same, outer view

Plate II.
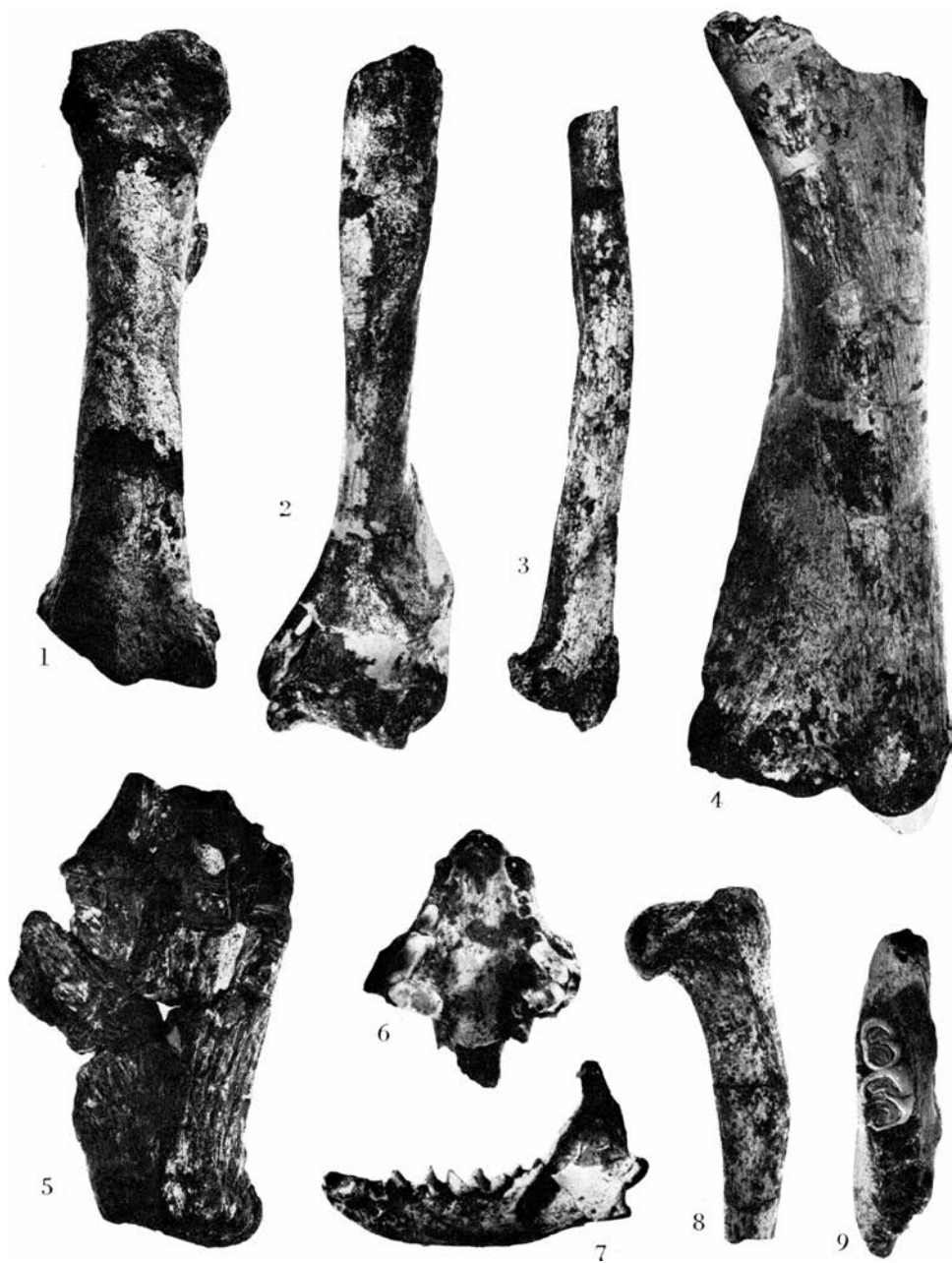
Osztramos, Loc. 7: Fig. 1. *Equus "robustus* POMEL": left juvenile femur (without epiphyses). — Figs. 2–3. *Ursus minimus* DEVÈZE et BOUILLET: 2 = distal two-thirds of the left humerus, anterior view; 3 = proximally broken left radius, anterior view. — Fig. 4. *Dicerorhinus* cf. *megarhinus* CHRISTOL: distal two-thirds of the right tibia, anterior view. — Fig. 5. *Cervus* sp. (aff. *Cervodama pontoborealis* FLEROW et PIDOPLICHKO): basal fragment of the left antler. — Fig. 6. aff. *Pannonictis*? *janossyi* RABEDER: viscerocranium, palatal view. — Fig. 7. *Putorius stromeri* KORMOS: left mandible, outer view. — Fig. 8. *Canis* aff. *arnensis* DEL CAMPANA: proximal fragment of the right humerus, lateral view. — Fig. 9. *Hystrix* cf. *major* GERVAIS: left mandible with the M_1–M_2, occlusal view.