

ANDRZEJ SULIMSKI

PLIOCENE INSECTIVORES FROM WĘŻE

Study on the Tertiary bone breccia fauna from Węże
near Działoszyn in Poland

PART XI*

Abstract. — This paper contains a description of 18 insectivore species recovered from the bone breccia at Węże near Działoszyn (province of Łódź). The described forms include four new species and one new genus: *Erinaceus samsonowiczi* n. sp., *Blarinoides mariae* n. gen., n. sp., *Neomys soriculoides* n. sp., *Suncus zelceus* n. sp. The writer explains his methods of work and discusses the age and origin of the breccia, as well as the problem of the palaeogeographic distribution of some species found in the Węże bone breccia.

INTRODUCTION

The insectivore bone material entrusted to the writer to be described comes from the bone breccia discovered at the village of Węże near Działoszyn. Work on the preparation of this material has been carried out during the last three years in the Palaeozoological Laboratory of the Polish Academy of Sciences in Warsaw. It has been supplemented by material from the same locality, handed over to the writer in 1955 by the late Professor E. Wilkus of Lublin University, also by that prepared in the Department of Palaeozoology of the Wrocław Institute of Zoology.

The writer's most sincere thanks are here conveyed to Professor Roman Kozłowski for his valuable advice and suggestions throughout the preparation of this paper, also for his critical comments after its completion; to Professor Jan Samsonowicz for reading through the chapter

* Parts I-V — see *Acta Geol. Pol.*, vol. II-V/1952-55; parts VI-X — *Acta Palaeont. Pol.*, vol. I-IV/1956-59.

concerned with the stratigraphy and origin of the Węże breccia; to Professor Zbigniew Ryzewicz and his co-workers in Wrocław for help in providing supplementary materials and information about new finds in Węże; to Professor August Dehnel for the permission to examine the rich Białowieża collection of recent shrews, and for discussing many variation problems in this animal group; to Professor Claude W. Hibbard of the Michigan University for the generous gift of comparative material consisting of recent and fossil American shrews, also for his valuable comments on the new species and genus *Blarinoides mariae*. The author expresses his sincere gratitude to Prof. A. Halicka, Director of Museum of the Earth in Warsaw, for the loan of material for investigations.

Warmest thanks are also due to Dr. K. Kowalski for suggestions concerning fossil insectivores and for the access to his rich library in Kraków; to Dr. W. Serafiński for kindly lending comparative materials of recent hedgehogs; to Dr. J. Kulczycki for help in analysing problems of dental terminology and structure of cranial and mandibular elements, as well as for providing the missing literature items; to Mrs. J. Humnicka for doing the English translation of the paper, and finally to Miss M. Czarnecka for the photography.

CONDITIONS OF THE DEPOSIT

The bone breccia from which so many insectivore remains have been recovered comes from a karst doline in the side of a hill, called Zelce, at the village Węże near Działoszyn. This is the northernmost point of the Kraków—Wieluń Jurassic Highlands. Papers by J. Samsonowicz (1934) and K. Kowalski (1951) give a detailed geological description, section of the karst doline with the breccia, and topography of the neighbourhood of the Zelce hill.

The karst doline with Tertiary fauna, about 4 m in depth and 5-6 m in diameter, was filled in by layers of two types: red beds with a large admixture of weathered clay and bean ore (terra rossa), and light beds, the so-called "grey" breccia, strongly calcified. These beds, about 0.5 to 1.6 m in thickness, were repeated alternately. The upper part of the doline was filled by cinereous soil and about 1 m of calcareous rock debris containing a mixed Plio-Pleistocene fauna. The lower portion consisted of thin lenticular, red and "grey" breccia beds, and of barren beds of limestone crust and calcite. The bottom breccia layer, probably of red colouration, rested directly on Jurassic limestone (section fig. 1).

The bulk of the breccia (ca. 11 tons), excavated in 1933 by Professor Samsonowicz, is now deposited in the Muzeum Ziemi (Museum of the Earth) in Warsaw. The materials, at first systematically sorted and stored

under the guidance of Professor Samsonowicz, are now badly mixed up, owing to conditions prevailing during the war and immediately after it. The remainder of the Węże breccia was excavated in 1955, and deposited in the Institute of Palaeozoology in Wrocław.

A part of carnivorous remains yielded by the Węże breccia have been worked out by J. Stach (1951, 1952, 1954, 1957), those of reptiles — by

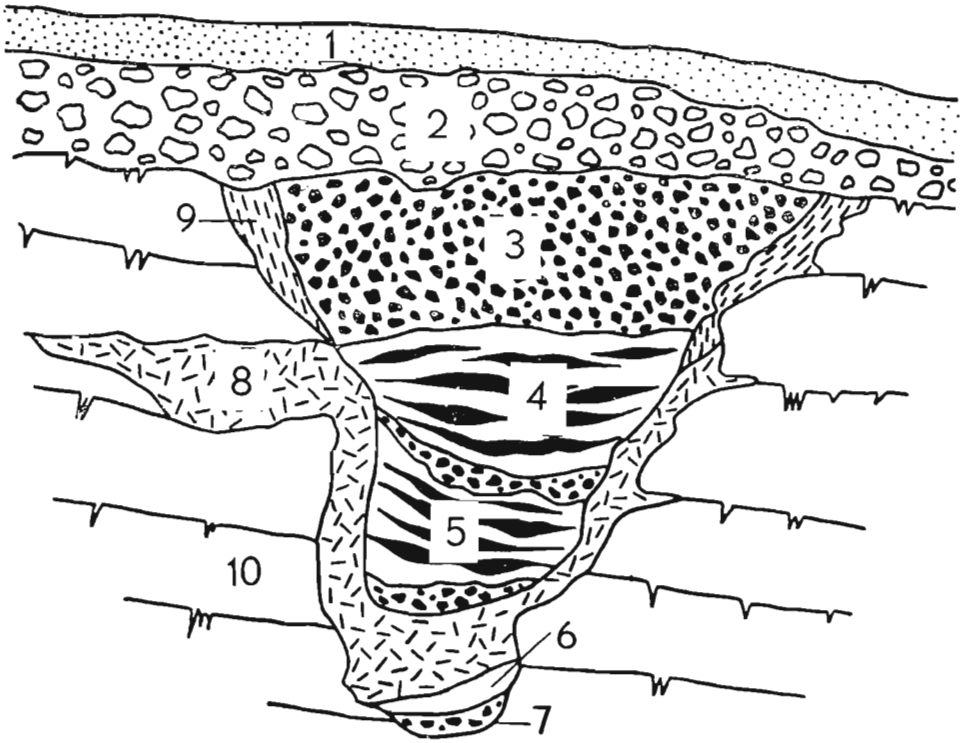


Fig. 1. — Longitudinal section of karst doline with bone breccia (after J. Samsonowicz, 1934)

1 soil, 2 limestone debris, 3 red breccia with bean ore (terra rossa), 4 & 5 "grey" breccia, between "grey" breccia beds thin lenticular red breccia layers, 6 pinkish-yellowish calcareous crust, 7 red clay with bone breccia and bean ore, 8 calcite, 9 limestone incrustations and calcite, 10 Jurassic limestone.

M. Młynarski (1953, 1955, 1956), while T. Czyżewska has published note on some ungulate (1958). The remaining mammalian fauna, including insectivores and rodents, is being worked out in Warsaw, the other ungulates — in Wrocław. Studies on carnivores and bats are carried on in the Zoological Institute of the Polish Academy of Sciences in Kraków.

AGE OF THE WĘŻE BRECCIA

The first geological investigations of the Węże breccia (Samsonowicz, 1934) have shown the occurrence there of a nearly complete Pliocene section. The lower beds of the breccia have been dated as Lower Pliocene, perhaps the Upper Miocene; the upper beds weathered and calciferous rock debris — as Upper Pliocene, possibly as early Pleistocene.

The supposition of Samsonowicz (*l. c.*) are, on the whole confirmed by later, palaeontological investigations. The carnivorous *Arctomeles pliocaenicus* Stach is never recorded from the Miocene. Stach (1951) believes that form to have become extinct at the close of the Pliocene owing to the cooling down of climate. The small bear *Ursus wenzensis* Stach, 1952 has been referred to the Middle or Lower Pliocene, while the position of *Nyctereutes* sp. (Stach, 1954) has likewise been placed in the Pliocene. Finally, *Agriotherium intermedium* Stach, 1957 must have lived from the Upper Miocene to the Upper Pliocene. Studies on turtles and lizards (Młynarski, 1953, 1955, 1956) have provided evidence for the Pliocene age of our breccia. Teeth of a young rhinoceros *Dicerorhinus megarhinus* (Christol), described by Czyżewska (1958), end up the present list of publications on the Węże fauna and provide additional suggestions to confirm the early Pleistocene age of the upper breccia layers.

The insectivores, here reported upon, cover three families, with 10 genera and 18 species. Though age determination of the breccia on insectivore evidence only, is inadequate, yet it permits the confirmation of earlier inferences and the assignment of Pliocene age to the greatest part of the Węże breccia. At the same time it seems reasonable to conclude that its lower layers reached into the Upper Miocene.

On the one hand this is indicated by species which exhibit many features in common with Miocene species and belong to that group of xerophilous forms existing in arid steppe environment: *Erinaceus samsonowiczi* n. sp., partly *Desmana nehringi* Kormos, remains of *Galemys*(?) sp., *Blarinoides mariae* n. gen., n. sp., extensively *Neomys soriculoides* n. sp., partly *Beremendia fissidens* (Petényi), remains of *Crocidura* sp., and both species *Suncus pannonicus* (Kormos) and *Suncus zelceus* n. sp. On the other hand, the remaining species, characteristic of moist palaeartic belts, with an admixture of some of the above mentioned species, distinctly date the breccia as Upper Pliocene or early Pleistocene.

As regards the new genus *Blarinoides*, it is most likely a Miocene relict. It probably became extinct owing to the cooling of climate towards the close of the Middle Pliocene, and did not leave descendants. A similar situation must have occurred for *Suncus zelceus* n. sp.

Out of the 18 species here reported upon only three have survived thus far, the others are extinct. Of the genera only three are extinct, the other seven are still living. The latest species of the extinct genera most likely survived as late as the first Interglaciation period.

PALAEOGEOGRAPHIC DISTRIBUTION OF SOME OF THE WĘŻE INSECTIVORES

Genus *Erinaceus* L. is to-day encountered within Eurasia only, and the Węże form *E. samsonowiczi* n. sp. has an Asiatic affinity. A similar situation is noted in the case of fossil species belonging to genus *Talpa* L. The subfamily Desmaninae Thomas is now encountered within a restricted area: *Galemys* Kaup in the French Pyrenees and the Iberian Peninsula; *Desmana* Güld. in the south-eastern parts of European Russia. During the Pliocene they must have ranged over considerably wider areas, including central Europe.

Genus *Neomys* Kaup, though recorded already from the Pliocene, does not seem to have been very abundant during that period, as is suggested by the few finds and publications. But copious populations of *N. soriculoides* n. sp. from Węże distinctly contradict them. It is not out of the question that this species, related with the south Asiatic genus *Soriculus* Blyth, may have its representatives also in other European sites.

Genus *Beremendia* Kormos occurred in great abundance during the Plio-Pleistocene over vast expanses of southern Europe, reaching as far north as about 51st or 52nd degree of latitude. Its western range was roughly limited by the river Rhine and the western Alps.

The subfamily Crocidurinae Milne-Edwards comprises a diverse group, at present chiefly inhabiting African regions. Remains of *Crocidura* Wagler are not numerous in the Węże breccia, similarly as in Plio-Pleistocene beds of southern Europe. Among others they confirm the supposition with regard to the occurrence — during the formation of the breccia — of repeated periods with hot climate favouring the weathering processes of limestone and the formation of red clay (terra rossa). Species of genus *Suncus* Ehrenb. likewise support this supposition.

The geographic distribution of both species: *Suncus pannonicus* (Kormos) and *S. zelceus* n. sp. in the Pliocene was wide enough to include all southern and central Europe.

The extinct genus *Petenyia* Kormos, occurring in equal abundance as *Neomys soriculoides* n. sp. and *Beremendia fissidens* (Petényi) must have lived in the Pliocene over considerable areas of south-eastern Europe, but not passing beyond the upper Rhine and western Alps.

The new genus *Blarinoides* here reported is probably Lower Pliocene; the Węże find being its first recorded locality. Genus *Blarina* Gray, related

to it, now lives in Central and North America only, without, as a rule, passing to the north of the Great Lakes line.

The most interesting of all the insectivore Weže forms are *Blarinoides mariae* n. sp. and *Beremendia fissidens* (Petényi). In the Plio-Pleistocene of North America these species have their equivalents in *Blarina brevicauda* (Say) and *Paracryptotis rex* Hibbard. The striking morphological resemblance between these species suggests two alternatives. One is that of convergence, the other of faunal exchange due to the repeated connections of Asia with North America, nearly throughout the Tertiary. G. E. A. Dobson (1882-1890) was the first to advance these suggestions. He did not attach great significance to the last early Pleistocene connection of these continents and to the faunal migration of that period; but rather postulated the possibility of an earlier faunal exchange during the Tertiary. J. S. Ognev's conception (1930-34) ran along a similar line. However, he rather strongly favoured the supposition that convergence was chiefly responsible for the morphological similarities in many species of both continents.

Resemblances of cranial and mandibular structure in *Blarinoides mariae* n. sp. and *Blarina brevicauda* (Say) together with differences of the time of occurrence — the former being recorded from the Upper Miocene to Middle Pliocene, the latter from the Upper Pliocene up to recent times — are distinctly suggestive of their common origin. Eurasia must have been their birth-place while the migration of this primitive stock towards North America and Europe may have occurred as early as the Miocene. This supposition will, however, remain merely hypothetical until palaeontological evidence may be forthcoming from Asia, whence these forms have not as yet been reported. Both these genera may possibly be genetically related with genus *Heterosorex* Gaillard from the Miocene of France (Piveteau, 1958).

Early Pleistocene migration of these forms was not possible during the last connection of the continents owing to considerable cooling of climate.

A similar phenomenon is observable in the case of the European Plio-Pleistocene *Beremendia fissidens* (Petényi) and *Paracryptotis rex* Hibbard, on account of very close similarities in structure of the skull and mandible and on contemporaneity of occurrence as well. The former is known from the Lower Pliocene, probably up to the Günz-Mindel Interglacial, the latter — from the Upper Pliocene to Middle Pleistocene. The dating of the only intermediate link connecting these two species, i. e. *B. sinensis* (Zdansky) from Choukoutien, is not sufficiently reliable to determine an analogous migration route for these species as that followed by genera *Blarina* Gray and *Blarinoides* n. gen.

Upon comparing the ecology and geography of living and fossil insectivores with those described from the Weże fauna, two distinct groups may be distinguished which correspond fairly well with the twofold character of the Weże breccia. The first group comprises species existing in arid steppe environment and under continental climatic conditions; the other group those thriving in warm, moist palaeoartic zones with diversified land relief, probably resembling conditions now prevailing in Eurasia.

This division of the insectivores fits quite well into the concepts of Stach (1952, p. 155-156; 1953, p. 133-134) and Młynarski (1955, p. 202-203) concerning similar duality in the palaeoecological and palaeogeographical character of the reptile and carnivore fauna.

ON THE ORIGIN OF THE WEŻE BRECCIA

The bone material in the Weże breccia has accumulated in a haphazard fashion, without traces of sorting. Bones belonging to one or more individuals are very rarely discovered in the place where they were buried. As a rule they are fragmentary, fortuitously dispersed in the form of highly characteristic bone detritus (pl. I, fig. 1). The most common colouration of bones is dark or black. Complete, undamaged skulls of Soricidae are an exception. The rostral fragments are those most abundant.

The red layer of the breccia, with the exception of beds strongly impregnated by calcite carbonate, may be ascribed to the residual cave slime. The light coloured ("grey"), strongly calcified breccia, was formed during a period when bone remains were deposited on the cave floor by flood waters. This may appear a simplified solution of the problem, but just this character of the breccia is actually suggested by the state of preservation of bones.

The cracks and potholes due to the erosion of Jurassic limestone were sometimes overflowed by water. Besides rock debris the water carried also remains of animals that had died in the close neighbourhood, or that may have fallen into the cracks by accident, still others inhabited the cracks and fissures. Some bones of rodents and insectivores — *Erinaceus* excepted, since it is known to have no foes — may have been brought into the cave by carnivores inhabiting it. The hedgehog's presence in the cave is either accidental, or more probably due to its permanent inhabitation there. The main part of insectivore remains, however, must have been transported by action of water. Possibly too, birds of prey may have, in

part, accumulated the small mammalian remains. This is suggested by the absence of brain cases in soricides and many rodents¹.

Taking account of these data the Węże fauna may be arranged into the following groups: a) permanent or seasonal fauna of the cave, b) forms brought into the cave by predators, c) forms accidentally fallen into the cave, and d) animal remains, complete or fragmentary, carried into the cave by water during tempestuous rainfalls.

The presence in the cave of teeth remains belonging to a young rhinoceros *Dicerorhinus megarhinus* (Christol) is accidental. They may represent the remnants of a feast held by its carnivore-inhabitants.

METHODS OF WORK

The character of the breccia and of its calcareous cement made difficult the mechanical preparation of the material. The only here applicable technique is that of chemical preparation. 10-15 per cent acetic acid solution was used by the writer. Often, however, when preparing minute and delicate elements, it was only an 8 or even 5 per cent solution. For protection against injury by the acid during maceration the bones were coated with paraffine, after each drying of the block. Bones thus separated, washed and dried, were soaked in saturated solution of shellac in alcohol.

Specimens belonging to Soricidae and Talpidae were measured with a micrometer scale under a binocular microscope, and the obtained numerical data rounded to 0.1 mm. Larger elements were measured, using fine calipers, with accuracy up to 0.1 mm. Small specimens were measured under approximately tenfold magnification; in the case of larger specimens the magnification was fivefold.

In addition to the standard length measure the total and the cardinal jaw length measurement was constantly used. The total jaw measurement was taken from the end of the incisor to the furthestmost posterior point of the upper articular surface of the condyloid process, and the cardinal length on the lingual side of the jaw only, from the anterior border of the mandibular bone to the same point, as in the total measurement (fig. 2A). In order better to indicate the relation of condyloid process to the coronoid process, measurement tables are done giving the height of the condyloid process from its base at the contact with the angular process to the uppermost point of the articular surface in the condyloid process (fig. 2B).

¹ According to a personal communication of Professor Ryziewicz, the breccia has recently also yielded remains of birds probably belonging to the Falcones or Galliformes.

The measurement of the total jaw length is here less important owing to the variable incisor length changing with individual age. Cranial measurements were made according to common standards. In view of strong length, width and height variations in the skull of fossil soricides,

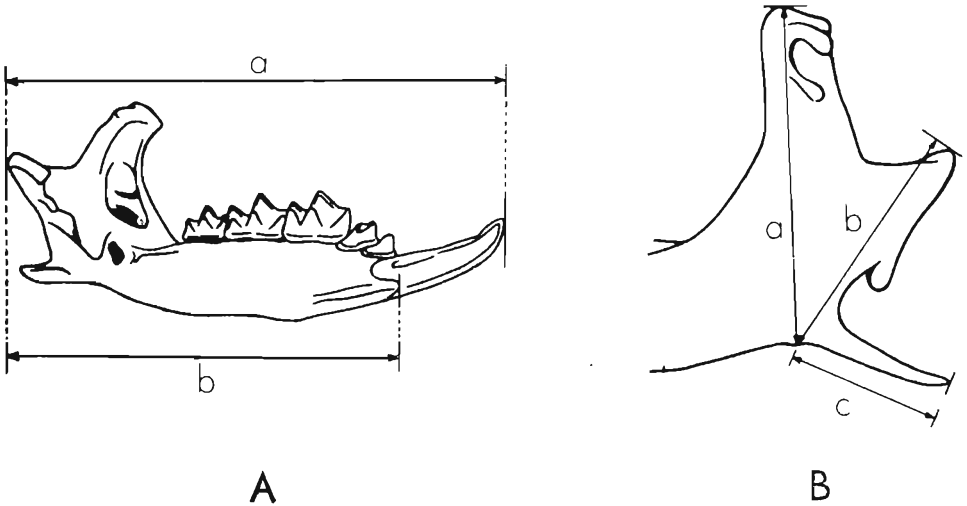


Fig. 2. — Schematic illustration of measurements

A length of mandible, *a* total, *b* cardinal; B height of articular processes, *a* coronoid process, *b* condyloid process, *c* length of angular process.

the numerical measurement data are only roughly approximate. The length measurements of the maxillary tooth-row, the length and width measurements of the palate, as well as proportions of teeth were done at the ventral side of the skulls.

The illustrations were prepared with the help of the same optical instruments as those used for measurements, and with camera lucida for the skulls and jaws of *Erinaceus* and *Desmana*. A constant 10 mm measurement scale accompanies the attached plates and photographs.

DENTITION, TOOTH-COLOURATION, AGE CLASSES AND MORPHOLOGY OF JAW ELEMENTS IN SORICIDAE

Some subjectivity in studies on fossil soricides, particularly when carrying out measurements or in the determination of diagnostic characters, seriously hinders reliable inferences. Differences in measurement data due to different measurement technique may be erroneously interpreted as an expression of geographic variation (H. Schaeffer, 1935).

In view of the mentioned difficulties which, as a rule, tend to individual interpretation by the writers, the need seems obvious for the

introduction of detailed descriptions of measurement methods, of complete and universal numerical data on new species and, if possible, of their variation graphs.

The identification of the penultimate unicuspid tooth as P^2 in *Sorex* L. and *Blarinoides* n. gen., and as P^1 in genera *Beremendia* Kormos, *Petenya* Kormos and *Neomys* Kaup, is suggested by the supposition that the numerical reduction of unicuspids must have progressed from P^3 to P^1 . This reduction is also associated with the rostral shortening of the skull, and with the simultaneous overgrowth of the 2nd and 3rd upper incisors in genera of the Crocidurinae group.

As compared to the individual age classification of Soricidae given by H. T. Jackson (1928), that accepted by the present writer has been simplified. It resembles the classification recognized by A. Dehnel (1949) who distinguishes two cardinal classes: the young (adult) and the old.

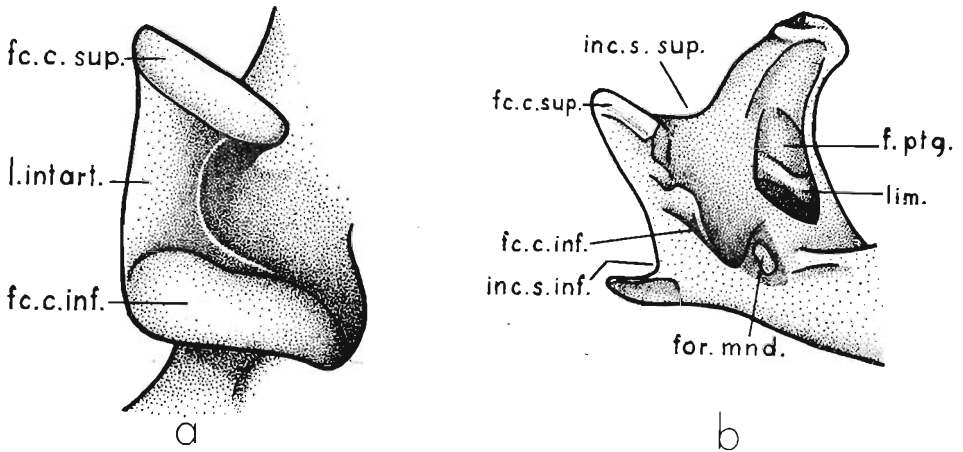


Fig. 3. — a Morphology of condyloid process (articular)
fc. c. sup. facies condyli superior, *fc c. inf.* facies condyli inferior, *l. intart.* lamina inter-articulares.

b Morphology of articular processes and posterior part of mandible
inc. s. sup. incisura sigmoidea superior, *inc. s. inf.* incisura sigmoidea inferior, *f. ptg.* fossa pterygoidea, *for. mnd.* foramen mandibulae, *lim.* limula.

This simplification results from the character of some remains preserved in the breccia where these two classes are easily recognizable on the extent of the wear of teeth.

One of the problems now under consideration is the diagnostic significance assignable to teeth colouration in Soricidae. Data obtained by research work of several authors (Dehnel, 1949, 1950, 1952; Kubik, 1951; Schaeffer, 1935, and others) show that the occurrence and the intensity of colouration vary in the limits of one species. On the other hand, in

some fossil forms of subfamily Crocidurinae, the colouration occurs (Hibbard, 1950) but has apparently no important taxonomic significance. This remains an open question calling for more precise observations. Dental colouration in species *Suncus pannonicus* (Kormos) and *S. zelceus* n. sp. may be cited in support of Hibbard's (*l. c.*) suggestion for the eventual unification of the two subfamilies of Soricinae and Crocidurinae into one taxonomic group.

Another open question is the influence of the habitat on changes in teeth colouration. Studies by M. G. Allen (1938) are interesting but require additional confirmation and more detailed investigation.

The following new terminology has been introduced by the writer in systematic descriptions on specific level:

a) *incisura sigmoidea superior* and *incisura sigmoidea inferior* — for the upper and lower interprocessal sigmoid notches of the jaw (fig. 3a);

b) *lamina interarticularis* — for the interarticular list of the condyloid process, usually called "bone bridge" (fig. 3b) — a name that does not adequately interpret the structure of this jaw element.

SYSTEMATIC DESCRIPTIONS

Order **Insectivora** Bowdich, 1821
 Family **Erinaceidae** Bonaparte, 1838
 Subfamily **Erinaceinae** Gill, 1872
Genus Erinaceus Linnaeus, 1758
Erinaceus samsonowiczi n. sp.

(pl. II, fig. 1 a-c & 2)

Holotypus: specimen No. 1051¹, left lower jaw bearing P₃-M₃ and fragmentary articular processes.

Paratypus: specimen No. 1052, left mandible with P₃-M₃ and condyloid process.

Derivatio nominis: *samsonowiczi* — in honour of Professor Jan Samsonowicz, discoverer of Węże breccia.

Material. — 8 lower jaws represented by fragments of ascending ramus and horizontal ramus with incomplete dentition; fairly numerous detached, lower and upper teeth and two rostral fragments of skulls: one with right portion of maxilla, and incomplete dentition probably belonging to this species.

Description. — Horizontal ramus set at an approximately right angle to ascending ramus, tapering anteriorly from P₄. Position of mental foramen between P₄ and M₁ lower than in the living hedgehog. Height

¹ All the here figured and described specimens are housed in the Muzeum Ziemi (Museum of the Earth) in Warsaw, and numbered provisionally by the present author.

of jaw branch in P_4 to M_2 more or less uniform, but lower beyond M_3 . Condylloid process strong, articular facet broad and nearly vertical to ascending ramus. Shape of articular facet nearly regularly elliptical, lingually slightly expanded. Upper portion of coronoid process curved to the rear, blunt. Angular process broad and massive at the base. An oblique crest placed labially to ascending ramus extends to the condylloid process. Mandibular fossa small, oval. First lower incisor basally broad, elongated, with a conspicuous, slender and pointed cutting edge. Cingulum of incisor strong, but anteriorly almost vestigial. Alveoles of 2nd incisor notably smaller than the preceding one. Alveole of canine large, nearly round, slightly labially pushed. P_3 one-cusped, with cone very blunt, cingulum conspicuous, raised in posterior part to form a kind of cusp. P_4 three-cusped, paraconid high, pointed, rising almost vertically; protoconid higher, fairly pointed, directed posteriorly; metaconid more or less conspicuous. Anterior edge of paraconid slightly pointed. Labially cingulum less well developed. First molar with trigonid narrower than the talonid, bearing three well developed cusps — all notably blunt, the protoconid excepted — and a talonid also bearing two rather blunt cusps. Structure of crown in the next molar resembles that of M_1 , all its cusps being markedly blunt. In M_1 and M_2 cingula labially better marked. M_3 is the smallest molar, consisting only of the strongly reduced trigonid with not more than one or two cusps and one root. In this molar the paraconid is either very much reduced or absent. Mandibular symphysis oblique, broad. Tooth pigmentation dark brown or nearly black. Skull (rostral fragment with right-side dentition), comprising also right portion of palate, nasal bones, some premaxillary bones, frontal bones and part of the zygomatic arch. Premaxilla not joint with frontal bones. Lacrimal foramen similarly placed as in the living hedgehog. Nasal bones narrow, slender, frontal bones relatively broad, nasal foramen wide, with probably elongated contour. Maxillar foramen pushed somewhat anteriorly above the anterior canine root.

Dimensions — see Table 1.

Remarks. — The Węże specimens are rather smaller than any species of *Erinaceus* L. thus far described from the pre-Glacial of Europe, with the exception of *Erinaceus lechei* Kormos. On their morphology and dimensions it has been ascertained that the here considered remains resemble the Chinese Plio-Pleistocene form from Choukoutien *E. olgae* Young and the living *E. europaeus amuriensis* Schrenk (C. C. Young, 1934). Specimens of *Erinaceus* sp. described by C. W. Pei (1940) and Teilhard de Chardin (1940) belong to another group of hedgehogs (*dealbatus*) and markedly differ from the Węże specimens. Our specimens are smaller than the Miocene *Palaeoerinaceus* cf. *rectus* Matthew & Granger (B. Boh-

Table 1
Eripaceus samsonowiczi n. sp. — dimensions of mandibles (in mm)

Mandibles →	1	2	3	4	5	6	7
Specimen Nos. →	1051	1052	1057	1054	1053	1056	1055
Total length of mandible	—	—	—	ca.38.4	—	—	—
Cardinal length of mandible	33.8	36.1	—	ca.35.5	—	—	—
Length of:							
I ₁ -M ₃	—	—	—	24.1 a*	—	—	—
C-P ₄	18.0 a	—	—	18.8 a	—	17.7 a	—
I ₂ -M ₃	18.8 a	—	—	20.0 a	—	19.8 a	—
P ₃ -M ₃	16.0 a	17.3	16.3	16.4	—	16.1 a	—
P ₄ -M ₃	14.1 a	14.7	14.0	14.2	14.3	14.4 a	14.6
M ₁ -M ₃	11.8 a	12.1	11.5	11.5	11.8	11.8 a	12.2
M ₁ -M ₂	10.5	9.8	10.0	9.8	10.1	10.1	10.2
M ₂ -M ₃	6.5 a	6.6	6.6	6.7	6.7	6.6 a	6.7
I ₂ -P ₄	7.4 a	—	—	8.6 a	—	7.5 a	—
Length of P ₃	2.2	2.2	2.4	2.2	—	—	—
Breadth of P ₃	2.0	2.0	2.0	2.0	—	—	—
Length of P ₄	2.9	2.8	2.9	3.0	2.8	2.8	3.1
Breadth of P ₄	2.2	2.4	2.1	2.3	2.2	2.3	2.3
Length of M ₁	5.4	5.5	5.0	5.4 a	5.1	5.4 a	5.5
Breadth of M ₁ at trigonid	3.3	3.1	3.2	—	3.2	—	3.2
Breadth of M ₁ at talonid	3.5	3.5	3.5	—	3.4	—	3.3
Length of M ₂	4.9	5.0	4.7	4.9	5.2	5.0	5.0
Breadth of M ₂ at trigonid	3.3	3.0	3.2	3.0	3.3	3.0	3.1
Breadth of M ₂ at talonid	3.3	3.2	3.3	3.0	3.3	3.0	3.3
Length of M ₃	2.3 a	2.0	1.9	2.0	2.2	1.8 a	2.0
Breadth of M ₃	1.7 a	1.8	1.6	1.8	1.8	1.5 a	1.5
Height of mandible behind:							
M ₁	7.2	7.2	6.9	7.1	6.9	7.2	7.0
M ₂	6.6	7.1	6.5	6.8	6.7	6.9	—
M ₃	6.2	6.7	6.0	6.3	6.2	6.2	6.3
Thickness of mandible below:							
M ₁	3.2	3.2	3.2	3.0	3.0	3.2	3.2
M ₃	3.1	3.4	3.1	3.2	3.3	3.4	3.3
Breadth of condyloid process	5.6	5.0	—	—	—	—	—
Height of ascending ramus	17.6 ?*	—	—	—	—	—	—
Length of angular process	9.6	—	—	—	—	—	—
Distance between condyloid and angular processes	11.4	—	—	—	—	—	—

* a — measured along the alveoles, ? — measurement uncertain.

lin, 1942; J. Viret, 1938) and their dental proportions exhibit marked dissimilarities. Neither is a closer correlation possible between the Weże species and *E. prae-glacialis* Brunner, 1934, owing to inadequate knowledge of the latter.

Some mandibular fragments of this newly recorded hedgehog from Weże resemble *E. sansaniensis* Depéret, 1887 described from the Miocene of France. The position of the mental foramen is similar, the lower mandibular edge is arcuately bent down in both forms, ascending ramus likewise placed at a right angle to horizontal ramus. Similar conditions are noted in conspecific specimens described by C. Gaillard (1899) from Grive-Saint-Alban. The Weże specimens, however, differ not in size only, but also in arrangement of teeth, larger dimensions of I_2 , position of cusps on P_4 , lower depression of mental foramen and more robust articular processes of ascending ramus.

The separation of the Weże specimens into a new species of hedgehogs is suggested on the following features: characteristic low position of mental foramen, smaller length of the tooth-row I_1-M_3 , strong structure of the whole lower jaw, smaller dimensions of cardinal length, differences of length in tooth-rows P_3-M_3 and P_4-M_3 , shape of P_3 and P_4 which, as a rule, are with a slightly posteriorly curved protoconid, finally frequent strong reduction of trigonid in M_3 .

Erinaceus sp.

(pl. IV, fig. 11)

Material. — Two left mandibular fragments lacking dentition and with strongly injured articular processes. One fragment with the I_1-M_3 alveoles, the other with M_2-M_3 alveoles.

Dimensions of two mandibles (in mm):

Mandibles →	1	2
Specimen Nos. →	1060	1061
Length of tooth-row:		
C- M_3	16.4	—
M_1-M_3	11.8	—
M_2-M_3	6.6	6.2
Height of mandible below:		
M_1	5.5	—
M_2	5.7	5.2
M_3	5.3	5.0
Thickness of mandible below:		
M_1	2.9	—
M_2	3.0	2.9
M_3	3.3	3.0

Remarks. — In dimensions both fragments approach *Erinaceus lechei* Kormos, 1934, described from Hungary. But the unsatisfactory state of preservation and meagre materials do not allow its specific identification.

Family **Talpidae** Gray, 1825
 Subfamily **Talpinae** Murray, 1866
 Genus *Talpa* Linnaeus, 1758
Talpa minor Freudentberg, 1914
 (pl. IV, fig. 10)

1914. *Talpa europaea* var. *minor* Freudentberg; W. Freudentberg, Die Säugetiere..., p. 209, pl. 19, fig. 7, 32, 35-37.
 Further synonymy in:
 1956. *Talpa minor* Freudentberg; K. Kowalski, Insectivores..., p. 341-342, pl. 1, fig. 1, and
 1953. *Talpa minor* Freudentberg; M. Kretzoi, Die Altpleistozäne..., p. 162, 192, 197-200, 232.
 1958. *Talpa minor* Freudentberg; K. Kowalski, An early Pleistocene..., p. 8, 9.

Material. — About 15 mandibular fragments, in various state of preservation and with incomplete dentition. Several specimens with M₁-M₃ or C-P₄, a few detached molars, canines and incisors, also long bones of limbs. A dozen or so of humeral bones. Skulls unknown.

Dimensions of 5 mandibles (in mm):

Mandibles →	1	2	3	4	5
Specimen Nos. →	518	565	567	569	300
Length of:					
I ₁ -M ₃	10.8 a*	11.2 a	—	—	—
M ₁ -M ₃	5.4	5.2	5.3	5.6	5.0
M ₁	2.0	1.9	1.9	2.0	1.9
Breadth of M ₁	1.2	1.1	1.2	1.3	1.2
Length of M ₃	1.5	1.4	1.5	1.6	1.4
Breadth of M ₃	0.8	0.7	0.7	0.8	0.6
Height of mandible below M ₂	1.7	1.7	1.7	1.7	1.6
Thickness of mandible below M ₂	1.0	1.1	1.0	1.1	1.0
Height of coronoid process	5.2 ?*	5.1 ?	—	—	—

* a — measured along the alveoles, ? — measurement uncertain.

Humerus (in mm)

Length	10.6 to 11.5
Smallest breadth	3.1 to 3.5

Remarks. — The appearance of horizontal ramus on the whole agrees with those described by W. Freudenberg (1914) and K. Kowalski (1956, 1958). Ascending ramus set at right or slightly obtuse angle to horizontal ramus. Posterior mental foramen approximately between the roots of M_1 , but more often below the posterior root of that tooth. Teeth and humeral bones structurally approaching *T. europaea* L., but smaller and more delicate.

Talpa fossilis Petényi, 1864

(pl. IV, fig. 9 a-b)

1864. *Talpa vulgaris fossilis* Petényi; J. S. Petényi. Hátragyott Munkai..., p. 53-58, pl. 1.

Further synonymy in:

1958. *Talpa fossilis* Petényi; K. Kowalski, An early Pleistocene... p. 9-10, fig. 1.

Material. — About 10 incomplete lower jaws, also fragmentary maxillae in various state of preservation; numerous detached molars, several canines and incisors; fragmentary humeral bones.

Dimensions of 3 mandibles (in mm):

Mandibles →	1	2	3
Specimen Nos. →	951	952	953
Length of:			
C-M ₃	12.6 a*	—	—
M ₁ -M ₃	6.8	6.3	6.8
M ₁	2.5	2.3	2.4
Breadth of M ₁	1.5	1.4	1.5
Length of M ₃	2.0	1.9	2.1
Breadth of M ₃	1.0	0.9	1.0
Height of mandible below M ₂	2.2	2.1	2.0
Thickness of mandible below M ₂	1.3	1.2	1.1

* a — measured along the alveoles.

Humerus (in mm):

Maximum length	13.6 to 14.0
Minimum „	3.9 to 4.1
Proximal breadth	11.4 to 12.2
Distal „	8.8 to 9.2

Remarks. — Morphologically this mole closely resembles living *Talpa europaea* L. It is only on stronger structure of teeth and of the mandibular horizontal ramus, and some differences in individual molars that these fossil remains can be distinguished from recent moles. In the Węże

specimens the protoconids and hypoconids are somewhat extended anteriorly. Cingulum of molars is more conspicuous and better developed anteriorly. In recent moles the molar talonids are narrower and the row with molars distinctly shorter. Posterior mental foramen is, as a rule, below the anterior root of M_1 . Along M_1 - M_3 horizontal ramus of nearly uniform height. The same applies here to thickness of mandible. The canine distinctly higher than the premolars, one-topped, narrow, with spicule directed somewhat posteriorly. Premolars (P_1 - P_4) are with distinct cingulum, posteriorly stretched out so as to form small cusps. The coronoid process relatively low, similarly as in *T. praeglacialis* Kormos (Kormos, 1937 *a, b*; Heller, 1936 *a*, 1954). Structure and dimensions of humeral bones usually typical of this genus.

The Weže specimens are notably larger than *T. minor* Freudenberg, but only slightly so than *T. episcopalis* Kormos (Kretzoi, 1956). In size they nearly agree with *T. strömeri* Brunner, 1950. In a strong anterior curvature of the tooth tips the latter form differs distinctly from *T. fossilis* Petényi. The structure and size of humeral bones are similar in these two species.

Talpa europaea fossilis L. described by A. Pasa (1950) is only slightly smaller than the here studied species and is probably conspecific. *Talpa* sp. recorded by C. W. Pei (1931) from the early Pleistocene of Choukoutien exhibits many features in common with *T. fossilis* Petényi. Its humerus, however, is smaller, while the vast geographical distance of their occurrence does not suggest a closer relationship.

Talpa sp.

Material. — Some incomplete lower jaws and articular processes, one incomplete humerus, a few detached molars.

Remarks. — The here represented specimens do not permit more exact specific classification. Nevertheless in size of horizontal ramus they approach nearer to the living *Talpa europaea* L. This is moreover suggested by the shape and size of the humeral bone, morphology of molars and character of the preserved fragments of articular processes. These mole remains have been recovered from calcareous rock debris in the upper portion of the karst doline, probably referable to the final period of formation of the Weže breccia.

Subfamily **Desmaninae** Thomas, 1912Genus *Desmana* Gldenstaedt, 1777*Desmana nehringi* Kormos, 1913

(pl. II, fig. 3 a-d)

1913. *Desmana* (?) *Nehringi* Kormos; T. Kormos, *Trois nouvelles espces...*, p. 138, pl. 6, fig. 1 a-f.

Further synonymy in:

1956. *Desmana nehringi* Kormos; K. Kowalski, *Insectivores...*, p. 342-344, pl. 1, fig. 2 a-b, 3 a-b.

Material. — Several lower jaws, fairly well preserved; one represents the right mandible with I_2 , P_2 - M_2 and damaged articular processes; also a nearly complete skull lacking the zygomatic arches, with the skull roof partly damaged, with dentition more or less complete on both sides of the jaws.

Description. — *Mandible.* The mandibular structure does not essentially differ from the type described by Kormos (1913). The differences consist in certain morphological features which may be assigned to individual variation. The more important differentiating features of the Weze specimens are: position of anterior mental foramen (between roots of P_1 and P_2 or below P_2), also that of posterior mental foramen (below the protoconid of M_1 or below the anterior root of that tooth), structure of P_2 with well developed cingulum lacking the paraconid, structure of P_3 with the labial cingulum more distinct and a kind of posterior cusp, structure of P_4 with distinct paraconid and a conspicuous labial cingulum strongly curved over the branching roots. In the Weze specimens the molars are with higher protoconids, while the talonids are broader than the trigonids which have a strong labial cingulum. Last molar is the lowest with unreduced talonid. The two jaw branches of the Weze specimens meet at right angle, as in Hungarian specimens. The condition is similar in P_3 alveoles where the posterior root of that tooth has been pushed somewhat lingually. The articular processes here are probably shaped as in typical forms from Hungary.

Skull satisfactorily preserved, strongly elongated, with occipital part broad and domed. Foramen magnum oval, horizontally expanded. The remnants of the zygomatic arch suggest that the arches were delicate and slender. In the upper orbital part the skull strongly constricted, nasal bones long and narrow, sharply terminating within the suture with frontal bones. Upper incisors I^{1-1} large, broad at the base, in section subtriangular. Their anterior and posterior edges sharp. These teeth are more or less depressed posteriorly, their talonids low. The outer tooth surface covered by delicate enamel mosaic. Nasal foramen horizontally

Table 2

Desmana nehringi Kormos — dimensions of skulls (in mm)

Skulls →	1	2	3
Specimen Nos. →	1201	1202	1203
Total length of skull	45.7	—	—
Maximal breadth of skull	20.1	—	—
Minimal breadth of skull	8.5	8.0	—
Anterior breadth of palate	5.5	5.2	—
Posterior „ „ „	13.2	13.5	—
Nasal height of skull in P ¹	5.0	4.8	—
Rostral height of skull in M ²	8.0	7.6	—
Maximal breadth of alveole I ¹	2.9	2.5	2.8
Minimal „ „ „ „	1.1	1.0	1.2
1. Length of C	1.2	1.1 a*	1.0
2. Breadth of C	1.3	1.3 a	1.1
1:2	0.92	ca. 0.84	0.99
1. Length of P ¹	2.0	1.8 a	1.9
2. Breadth of P ¹	1.3	1.3 a	1.2
1:2	1.53	ca. 1.38	1.58
1. Length of P ²	2.1	2.1 a	2.2
2. Breadth of P ²	1.5	1.6 a	1.6
1:2	1.40	ca. 1.31	1.38
1. Length of P ³	1.3	1.3	1.4
2. Breadth of P ³	1.6	1.5	1.6
1:2	0.81	0.90	0.87
1. Length of P ⁴	2.5	2.2	2.5
2. Breadth of P ⁴	2.3	2.3	2.5
1:2	1.08	0.95	1.00
Length of M ¹	2.8	2.7	—
Breadth of M ¹	3.3	3.3	—
Length of M ³	1.8	2.0	—
Breadth of M ³	2.0	2.1	—
Length of:			
I ¹ -M ³	22.0	22.5 a	—
C-P ⁴	9.1	8.6 a	9.0
M ¹ -M ³	7.2	7.0	—
Breadth of bridge over infraorbital foramen	0.8	0.9	—
Breadth of nasal part for I ¹⁻¹	6.2	6.4	—

* a — measured along the alveoles.

T a b l e 3
Desmana nehringi Kormos — dimensions of mandibles (in mm)

Mandibles →	1	2	3
Specimen Nos. →	1204	1205	1206
Total length of mandible	ca. 26.3	—	—
Length from the anterior border of mandible bones to the posterior border of M ₃	ca. 16.3	—	—
Length of:			
I ₁ -M ₃	20.0 a*	—	—
C-M ₃	14.3 a	—	—
M ₁ -M ₃	7.5 a	7.5	7.3
Length of M ₁	2.8	2.6	2.8
Breadth of M ₁ at talonid	2.5	2.2	2.0
Breadth of M ₁ at trigonid	1.8	1.8	1.8
Length of M ₃	—	2.2	2.0
Breadth of M ₃ at talonid	—	1.6	1.5
Breadth of M ₃ at trigonid	—	1.6	1.6
Height at protoconid of:			
P ₄	1.8	1.8	—
M ₁	2.1	2.1	1.6 ?*
M ₂	2.5	2.5	1.8 ?
M ₃	—	1.6	1.2 ?
Height of mandible below M ₂	3.5	3.6	3.3
Thickness of mandible below M ₂	2.1	2.2	2.0
Breadth of condyloid process	—	2.6	—
Height of ascending ramus	—	ca. 11.3	—
Distance between the anterior and posterior mental foramens	6.5	6.2	—

* a — measured along the alveoles, ? — measurement uncertain.

expanded. Anterior edge of nasal bones — over nasal foramen — slightly convex anteriorly. Bridge over infraorbital foramen narrow, faintly oblique; its lower end is between M₁ and M₂. Second and third incisors somewhat smaller than the talon of I¹, one-topped, one-rooted, with distinct labial cingulum. C higher than incisors, two-rooted, one-topped, and a more or less conspicuous postero-lingual cusp. P¹ lower than the canine, with one root and the cingulum labially more distinct. The next premolars of similar structure, with two roots, with labially distinct cingulum and posterior small heels. Last premolar high, with a strong protocone. In structure this tooth does not essentially differ from P⁴, as has been observed in a type form from Hungary and in specimens from Podlesice. First molar with subtriangular outline at top and with elongated talon. Metacone and metastyle of M¹ joint by a sharp edge. Posterior

mesostyle also joint to the metacone along a short edge which curves out anteriorly. Parastyle with a conspicuous knob. Anterior molar cingulum strong. Next molars of similar structure. Last molar strongly reduced, shorter and narrower.

Dimensions of 3 skulls and 3 mandibles — see Tables 2 & 3.

Remarks. — Differences in proportions between C and P³ of the Weže specimens and those described by A. Schreuder (1940) may, possibly, result from different measurement methods. These differences suggest that the skull belonged to another species. Nevertheless the study of other teeth permits to ascertain that these characters are subject to variation and may not be regarded as diagnostic features. Indices noted in these forms have not been reported in any other species of *Galemys* Kaup and *Desmana* Güld. The characteristic arrangement of teeth and their structure, breadth of bridge over infraorbital foramen and the mandibular morphology — all indicate genus *Desmana* and species *D. nehringi* Kormos. On the other hand, a relatively wide bridge over infraorbital foramen, sharp anterior edge of protocone in P⁴, and the weakly developed cingula of lower molars exclude genus *Galemys* Kaup.

Genus *Galemys* Kaup, 1829

Galemys (?) sp.

Material. — Fragments of skulls (rostral parts) with many gaps in dentition, also fragments of lower jaws either with or without teeth. Few detached teeth of the upper and lower jaw.

Dimensions of 3 skulls and 2 mandibles — see Table 4.

Remarks. — The fragmentary condition of the recovered remains does not permit their sure specific identification, neither is their generic identification quite doubtless. On measurements it may be ascertained that these forms are notably smaller than *Desmana* Güld., in size coming nearer *Galemys* Kaup, possibly one of the Hungarian forms: *G. semseyi* Kormos or *Mygalina hungarica* (Kormos) (Schreuder, 1940). Differences in shape of maxillar teeth, and the smaller breadth of bridge over infraorbital foramen, do not permit their definite assignment to one of these species.

The presence in Weže of genus *Galemys* Kaup may indicate a farther northern range of the Pliocene occurrence of this genus. It has been actually recorded from Plio-Pleistocene formations nearly all over Europe. In central and eastern Asia it is not known either as a living or extinct form.

T a b l e 4
Galemys (?) sp. — dimensions of skulls and mandibles (in mm)

Skulls →	1	2	3
Specimen Nos. →	1301	1302	1303
Anterior breadth of palate	4.4	5.0	—
Posterior breadth of palate	10.6	11.6	—
Length of tooth-row with:			
M ¹ -M ³	6.3	6.5	6.3
M ¹ -M ²	4.5	5.0	4.8
M ² -M ³	4.0	3.8	3.8
Thickness of bridge over infraorbital foramen	0.6	0.7	0.6

Mandibles →	1	2	3
Specimen Nos. →	1304	1305	1306
Length of tooth-row with:			
M ₁ -M ₃	—	6.8	7.0?*
M ₂ -M ₃	4.5?	4.5	4.7
Length of M ₁	—	2.5	—
Breadth of M ₁ at talonid	—	1.1	—
Breadth of M ₁ at trigonid	—	1.0	—
Length of M ₃	2.0	2.1	2.1
Breadth of M ₃ at talonid	1.4	1.0	1.5
Breadth of M ₃ at trigonid	1.4	0.8	1.4
Height of mandible below M ₂	3.0	3.1	3.0
Thickness of mandible below M ₂	1.6	1.6	1.7

* ? — measurement uncertain.

Family **Soricidae** Gray, 1821
 Subfamily **Soricinae** Murray, 1866
 Genus **Sorex** Linnaeus, 1758

Sorex runtonensis Hinton, 1911
 (pl. IV, fig. 5 a-b)

1911. *Sorex runtonensis* Hinton; M. A. C. Hinton, The British Fossil..., p. 532, pl. 25, fig. 8, 9; textfig. 8-a.
1930. *Sorex runtonensis* Hinton; F. Heller, Eine Forest-Bed-Fauna..., p. 259, pl. 15, fig. 5 a-b; textfig. 6.
1933. *Sorex runtonensis* Hinton; G. Brunner, Eine praeglaziale Fauna..., p. 309, pl. 6, fig. 1-3; textfig. 1, 2.
1933. *Sorex runtonensis* Hinton; F. Heller, Ein Nachtrag..., p. 62.

1937. *Sorex runtonensis* Hinton; T. Kormos, Revision der Kleinsäugetiere..., p. 31-33, fig. 3.
 1949. *Sorex runtonensis* Hinton; M. Friant, Les Musaraignes..., p. 239, fig. 3.
 1958. *Sorex* cf. *runtonensis* Hinton; K. Kowalski. An early Pleistocene..., p. 11-12, fig. 2.

Material. — About 25 mandibular fragments, variously preserved; numerous detached incisors and molars, long limb bones, also fragmentary upper jaws, probably conspecific.

Description. — Morphologically the preserved mandibular remains come nearest to forms described from West-Runton (Hinton, 1911). The lower incisor has three lobes, separated by two distinct notches. The two posterior lobes are stronger than the anterior one. The premolar is two-topped, with the hypocone not so well developed as in the remaining soricids. M_3 with five cusps. The coronoid process slender, basally broad. Ascending ramus meets horizontal ramus at right or slightly obtuse angle. Articular facet of the coronoid process smooth, without narrowings. Masseter crest as in living *Sorex araneus* L. In the condyloid process the articular facets resemble those in *S. araneus* L., with the lingual end of the lower facet extending farther down. Upper and lower sigmoid notches emarginated, conspicuous. Pterygoid fossa high, deep, triangular. Mental foramen in front of the anterior root of M_1 or below P_4 . Tips of teeth discoloured or distinctly pigmented.

In one cranial fragment lacrimal foramen placed between the roots of M^1 . Five unicuspid teeth. Other features as in the living Common Shrew.

Dimensions of 5 mandibles (in mm):

Mandibles →	1	2	3	4	5
Specimen Nos. →	1	55	15	136	148b
Total length of mandible	11.2	12.0	12.4	—	—
Cardinal length of mandible	9.0	8.6	9.1	8.8	8.8
Length of I- M_3	7.3	7.1	7.1	7.0	6.9
Length of M_1 - M_3	3.8	3.6	3.7	3.3	3.8
Height of mandible below M_2	1.4	1.3	1.3	1.3	1.3
Thickness of mandible below M_2	0.9	0.8	0.8	0.8	0.8
Height of coronoid process	4.0	4.0	3.9	3.8	4.1
Individual age of specimen	y	o	u	n	g

Remarks. — Among recent European shrews *Sorex caecutiens* Laxmann occupies an intermediate position in what size is concerned between *S. araneus* L. and *S. minutus* L. Hence, *S. runtonensis* Hinton ought to be nearest to that species. The height of the coronoid process is analogous with that in *S. caecutiens* Laxmann, but the other characters fit into the variation of *S. araneus* L.

In forms from Hundsheim known as *S. pygmaeus* Pallas (Freudenberg, 1914) and definitely identified by Kormos (1937b) as *S. runtonensis*, the total length of the lower jaw is about 15 mm. The length of the Weże specimens supposed to be 12.4 mm, but probably ranges from 11 to 13 mm.

S. praearaneus described by Kormos (1934) may possibly be a synonym of *S. runtonensis* Hinton.

Sorex araneus Linnaeus, 1758

(pl. IV, fig. 8 a, b)

Material. — A score or so of fairly well preserved mandibles, among them one nearly complete with slightly damaged articular processes; detached upper and lower teeth. Cranial fragments represented by rostral parts with unicuspid teeth typical of this species.

Dimensions of 6 mandibles (in mm):

Mandibles →	1	2	3	4	5	6
Specimen Nos. →	500	85	305	2	633	481
Total length of mandible	11.8	11.8	11.1	11.4	11.4	11.7
Cardinal length of mandible	9.3	9.3	9.2	9.2	9.4	9.5
Length of I-M ₃	8.1	8.2	8.5	8.3	8.5	—
Length of M ₁ -M ₃	4.0	4.1	4.0	4.0	3.9	4.1
Height of mandible below M ₂	1.5	1.6	1.5	1.4	1.5	1.5
Thickness of mandible below M ₂	0.8	0.9	0.8	0.9	0.9	0.8
Height of coronoid process	—	4.6	—	—	—	—
Individual age of specimen	y o u n g		o l d		y o u n g	

Remarks. — Craniometric dimensions and mandibular morphology almost identical as in the Common Shrew. Slight differences, consisting in somewhat greater length of the tooth-row M₁-M₃, have no significance here and fit into the rather strong individual variation displayed by this species. This also applies to the position of mental foramen, shape of articular facets in the condyloid process, and the morphology of the incisor and other mandibular teeth.

The presence in the breccia of this species confirms the supposition that the material was mixed after excavation. This is a form recorded from the earliest Pleistocene and, so far, never reported from the Pliocene.

Sorex cf. minutus Linnaeus, 1766

(pl. IV, fig. 3 a, b)

Material. — Several fragments of mandibles with incomplete dentition and partly damaged articular processes; numerous long bones of

limbs, detached upper and lower teeth, also a dozen or so of fragmentary maxillae, probably of the same species; complete skull not known.

Dimensions of 6 mandibles (in mm):

Mandibles →	1	2	3	4	5	6
Specimen Nos. →	207	325	179	335	331	327
Total length of mandible	8.3	8.8	8.9	8.7	—	—
Cardinal length of mandible	6.6	7.2	7.4	7.1	—	—
Length of I-M ₃	5.7	6.1	6.2	—	—	—
Length of M ₁ -M ₃	3.0	3.2	2.8	—	—	—
Height of mandible below M ₂	1.0	0.8	0.8	1.0	0.8	0.6
Thickness of mandible below M ₂	0.6	0.5	0.6	0.5	0.6	0.6
Height of coronoid process	3.0	2.9	3.0	3.1	3.3	—
Individual age of specimen	y o u n g					old

Remarks. — Very small mandibles, with teeth and articular processes, so characteristic of this species, are not abundant in the breccia. From *Sorex minutissima* Heim de Balsac (1940) they differ in arrangement of lower molars. The molars of the Węże specimens are with relatively low crowns and with cusps not so distinctly anteriorly extended as in *S. minutissima*. From the living shrew they differ in somewhat smaller size.

Sorex sp.

(pl. IV, fig. 6 a-c, 7 a-c)

Material. — More than ten mandibles with incomplete dentition; numerous detached lower molars, also lower incisors.

Dimensions of 5 mandibles (in mm):

Mandibles →	1	2	3	4	5
Specimen Nos. →	1100	1101	1102	1103	1104
Length of I-M ₃	7.8	8.2	7.7	6.9	7.5
Length of M ₁ -M ₃	4.2	4.0	4.1	3.8	4.2
Height of mandible below M ₂	1.6	1.7	1.6	1.6	1.6
Thickness of mandible below M ₂	1.1	1.0	1.2	1.1	1.2
Height of coronoid process	5.3	5.7	—	5.2	—
Individual age of specimen	y o u n g		old	y o u n g	

Remarks. — The incomplete state of preservation of these remains bars its comparison with thus far described species. In size they approach *Sorex savini* Hinton (Hinton 1911; Kormos, 1937b) and *S. dehneli* Kowalski, 1956. The morphology of teeth and articular processes, also of the

horizontal ramus, agrees fairly well with analogous characters in the two above named species. The determination of their systematic position calls for additional materials. Some fragments may belong perhaps to *S. margaritodon* Kormos, 1935.

Genus *Blarinoides* n. gen.

Genoholotypus: *Blarinoides mariae* n. sp.

Derivatio nominis: *Blarinoides* — after its resemblance to the American genus *Blarina* Gray.

Diagnosis. — A large shrew with dental formula

$$\frac{3 \ 1 \ 3 \ 3}{1 \ 1 \ 1 \ 3} = 32.$$

Ascending ramus and horizontal ramus of mandible massive. Lower mandibular incisor long, massive, with two distinct lobes on the cutting edge and a small accessory lobe just beyond the tip of that tooth. The canine small, flattened. P_4 large, with indistinct two cusps, with a well developed posteriorly extended cingulum. M_3 three times smaller than M_1 , with five cusps (entoconid small, visible). Coronoid process broad, gently anteriorly flexed. Masseter crest with spine. Condylod process massive, interarticular list broad, slightly linguallly notched. Upper articular facet of condylod process inclined at an angle of about 45° . Ascending ramus meets horizontal ramus at an obtuse angle.

Profile of skull gently sloping, typical of genera *Sorex* L. and *Blarina* Gray. Nasal foramen high, of nearly uniform width throughout its height. Strong external flexions observable next to the roots of P^4 . Lacrimal foramen above the posterior root of M^1 . Infraorbital foramen above P^4 . Anterior palate foramens between I^{2-2} , posterior palate foramens just in front of anterior roots of M^{1-1} . I^2 and I^3 large (the third somewhat larger than the second) with postero-lingual cusps. C and P^1 about half the size of incisors, similar in structure. P^2 minute, pushed below P^4 , laterally not visible. Molars slightly posteriorly excavated. M^3 three-cusped with reduced talon.

Blarinoides mariae n. sp.

(pl. II, fig. 4 a-b; pl. III, fig. 6 a-c; text-fig. 4, 2 a-f)

Holotypus: specimen No. 803, rostral part of skull with M^{1-1} — M^3 3 , and an incomplete row of incisors and premolars.

Paratypus: specimen No. 178, left mandible with articular processes and I- M_3 . Mandible and skull probably belonging to the same individual.

Derivatio nominis: *mariae* — from Maria, the name of the author's mother.

Material. — Five complete mandibles and 10 rostral parts of skull with incomplete dentition. Also about 40 mandibular and cranial fragments,

variously preserved; numerous detached upper and lower teeth and long bones of limbs.

Description of holotype. — Mandible. Incisor massive, thick, long, slightly upcurved. Cutting edge with three lobes, the anterior lobe low, often indiscernible in old individuals. Distinct, thick cingulum at the base of the incisor. Canine small, compressed and overlapped by a large, indistinctly two-topped P_4 . Premolar with cingulum strongly posteriorly extended (almost below the protocone of M_1). M_1 large, with cingulum extremely strong, protruding and expanded downwards (below the protoconid). Cusps conspicuous, pointed, talonid distinctly with three cusps. M_2 smaller than M_1 , similar in structure. M_3 nearly three times smaller than M_1 , with entoconid small but distinct. The coronoid process proximally broad, spade-like, with a well marked step. Articular facet of the process smooth, elongate. Masseter crest stout, irregularly semi-lunar; its lower end directed towards the upper articular facet of the condyloid process. Spine present, protruding. Condyloid process strong, interarticular list wide, slightly linguallly notched, labially more or less rectilinear. The upper articular facet set obliquely in relation to the lower, at an angle of about 45° , or less. The lower facet with the lingual end slightly downcurving; its upper line centrally depressed. The angular process basally broad, relatively short, terminally somewhat pointed, at the base slightly thickened. Upper sigmoid notch broad, subrectangular, lower sigmoid notch as a rule not distinct. Pterygoid fossa small, quadratic, with a small transverse sill, which is barely visible. Mandible fossa oval, not overgrown. Mental foramen between roots of M_1 and the adjoining depression. Tooth pigmentation marked by lighter coloured tips. Horizontal ramus massive, high, of about uniform height below the molars. Ascending ramus at the base posteriorly flexed, the distal end rising vertically or anteriorly bent. The jaw branches meeting at an obtuse angle.

Skull. Five unicuspid in the row I^1-P^4 . In profile rostral part of skull gently sloping, relatively narrow. Nasal foramen more or less uniformly wide throughout its height, tapering sometimes in the lower part. Slight thickenings noted on surface of nasal bones near the roots of I^{1-4} . A similar condition occurs near the anterior root of P^4 . The zygomatic process slightly outcurved, vestigial. Infraorbital foramen usually above P^4 , sometimes slightly pushed towards the anterior root of M^1 . Lacrimal foramen above the posterior root of M^1 , sometimes between the roots of that tooth. Anterior palate foramens between I^{2-2} . A small elongate and narrow fissure present behind and between these foramens. Posterior palate foramens just in front of the anterior roots of M^{1-4} . I^1 hooked down and towards the centre of the jaw, with a distinct talon. Next incisors

large, with distinctly thick cingulum and postero-lingual cusps. I^2 and I^3 of about equal size, the latter more often slightly larger than the former. C and P^1 smaller than incisors. P^2 the smallest and wedged in below P^4 . P^4 trapezoid, with somewhat reduced posterior part of the protocone. Molars (M^1 and M^2) quadratic in contour at the base, posteriorly excavated. M^3 three-cusped with strongly reduced talon.

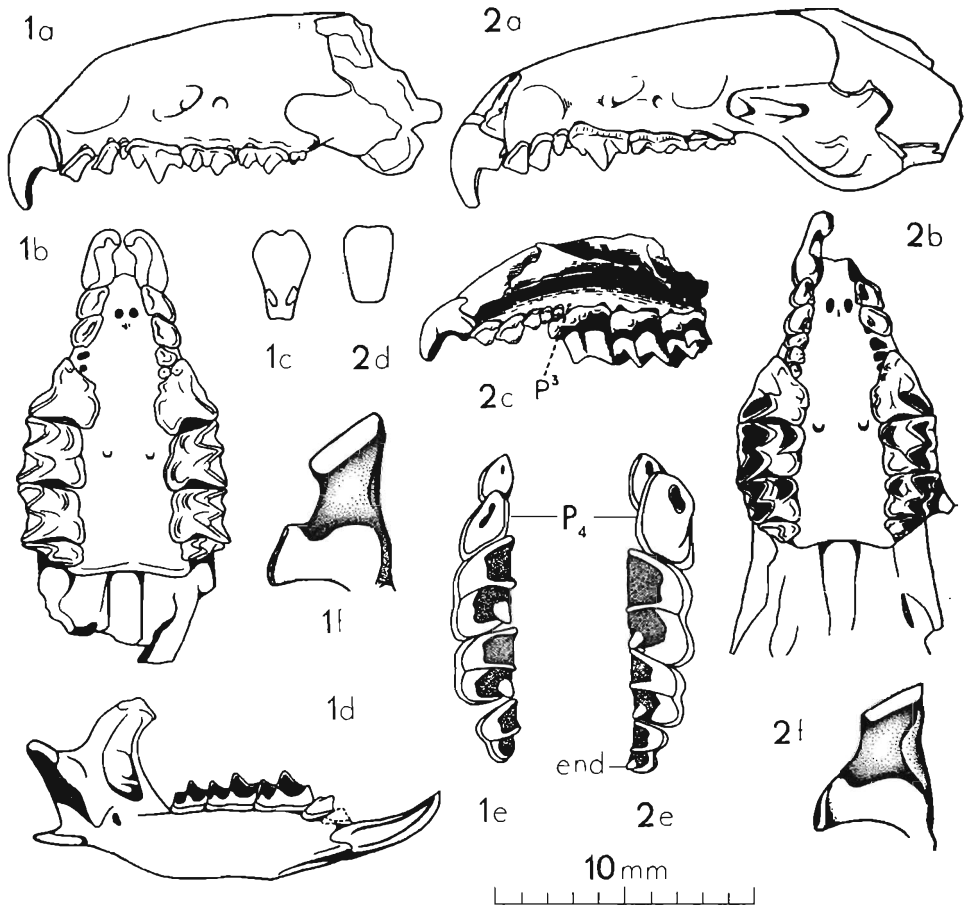


Fig. 4. — 1 *Beremendia fissidens* (Petényi)
 a specimen No. 710, rostral fragment of skull, side view, b ventral view, c outline of nasal foramen, d inner view of left mandible (spec. No. 80), e lower tooth-row without I, f condyloid process from behind.

2 *Blarinoides mariae* n. sp. paratype
 a specimen No. 800, rostral fragment of skull, side view, b ventral view, c right half of maxilla with tooth-row I^1 — M^2 and sixth alveole (P^3), d contour of nasal foramen, e lower tooth-row without I, end entoconid, f condyloid process from behind.

Remark: Condyloid processes and lower tooth-row enlarged twice as much as the other illustrations.

Dimensions of 5 skulls (in mm):

Skulls →	1	2	3	4	5
Specimen Nos. →	803	800	804	801	802
Length of:					
I ¹ -M ³	15.0	15.4	—	—	—
I ¹ -M ²	14.0	14.2	—	—	—
P ⁴ -M ¹	—	5.7	5.7	5.6	5.6
P ⁴ -M ³	9.0	—	—	—	—
M ¹ -M ³	6.0	6.0	6.0	5.8	—
M ¹ -M ²	—	5.0	—	—	—
M ² -M ³	3.5	3.3	3.3	3.2	—
M ³	1.0	—	1.1	1.0	—
Interorbital distance	7.7	8.0	7.8	—	—
Infraorbital distance	6.6	6.5	6.6	—	6.4
Distance between interorbital fossa and infraorbital foramen	3.8	3.8	4.3	—	3.7
Length of nasal bone	10.6	—	—	—	—
Individual age of specimen		y o u n g		old	young

Dimensions of 14 mandibles — see Table 5.

Remarks. — Slight differences in size between *Blarinoides mariae* n. sp. and *Beremendia fissidens* (Petényi) may suggest their identity. Nevertheless such morphological differences as the three-cusped lower incisor, differently shaped condyloid process, number of unicuspid upper teeth, size of P₄ and M₃; with five cusps bar the assignment of our specimens to genus *Beremendia* Kormos. The same characters make necessary the erection of a new genus for the Weże form. A comparative study of the Weże specimens with the recent and fossil *Blarina brevicauda* (Say) and *Bl. brevicauda kirtlandi* Bole & Maulthrop (Hibbard, 1950, 1953) has shown considerable structural analogies of the particular mandibular and cranial elements, i. e. the arrangement of unicuspid teeth, structure of lower incisor, morphology of articular facets of the condyloid process, also structure of the coronoid process. Living species of genus *Blarina* Gray differ, however, in smaller dimensions, presence of a stronger marked spine in masseter crest, less developed P₄, larger I³ in relation to I², minute P², laterally hardly visible, and finally the usual absence on M₃ of the entoconid.

The presence is noteworthy in some of our specimens of an accessory P³ alveole placed immediately below P⁴. This alveole is not associated with a functional tooth and it has not been encountered simultaneously in both jaws. Similar anomalies of dentition have already been pointed out by Kormos (1934) in the description of *Sorex margaritodon*. This is certainly an atavistic feature, rarely noted in shrews.

T a b l e 5
Blarinoides mariae n.sp. — dimensions of mandibles (in mm)

Mandibles →	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
Specimen Nos. →	178	342	180x	151	69x	51	47	343	200	1	66	84	62	360		
Total length of mandible	15.0	16.2	—	—	—	—	—	—	—	—	—	—	—	—		
Cardinal length of mandible	10.7	11.8	11.6	10.8	10.8	10.8	11.5	—	—	—	—	—	—	—		
Length of:																
I-M ₃	10.7	10.6	—	—	—	—	—	—	10.7	11.3	—	—	—	—		
C-M ₃	7.3	7.2	7.1	7.2	—	—	—	7.5	7.4	7.8	—	—	—	—		
P ₄ -M ₃	6.6	6.6	6.3	—	—	—	—	6.8	6.5	7.0	6.8	6.6	—	—		
M ₁ -M ₃	5.3	5.5	5.3	5.5	5.7	5.7	5.3	5.5	5.3	5.8	5.3	5.5	—	—		
M ₁ -M ₂	4.0	4.3	3.8	4.2	4.2	4.3	4.2	4.3	4.2	4.5	4.0	—	—	—		
M ₂ -M ₃	3.2	3.2	3.3	3.3	3.3	3.3	3.0	3.2	3.0	3.3	3.0	3.2	3.1	—		
M ₃	1.5	1.3	1.3	1.3	1.3	1.4	—	1.5	1.2	—	1.5	—	1.3	1.2		
Height of mandible below M ₂	2.2	2.3	2.5	2.5	2.3	2.5	2.2	2.6	2.3	2.7	2.0	2.5	2.1	2.5		
Thickness of mandible below M ₂	1.5	1.4	1.3	1.5	1.5	1.5	1.5	1.4	1.6	1.5	1.5	1.6	1.3	1.5		
Height of coronoid process	6.3	—	6.3	—	6.3	6.5	—	—	—	—	—	—	6.3	6.8		
Height of condyloid process	4.3	4.5	—	4.0	4.2	4.5	4.3	4.6	—	—	4.0	—	4.0	4.8		
Height between articular facets of condyloid process	3.6	—	—	3.3	3.5	3.6	3.8	—	—	—	3.3	—	3.6	3.8		
Individual age of specimen	y o u n g						o l d			y o u n g			o l d		y o u n g	

Genus *Neomys* Kaup, 1892*Neomys soriculoides* n. sp.

(pl. III, fig. 4 a-c; text-fig. 5 C, D)

Holotypus: specimen No. 160-left and specimen No. 700-right mandibles with complete dentition and articular processes. Specimen No. 1109, rostral part of skull with complete maxillary teeth. Mandibles and skull belonging to the same individual.

Derivatio nominis: *soriculoides* — after its resemblance with genus *Soriculus* Blyth.

Material. — About 130 specimens, mostly left and right mandibles with incomplete dentition, rostral fragments of skulls in various state of preservation, numerous detached lower and upper teeth, also long bones of limbs and vertebrae.

Description of holotype. — *Mandible*. Incisor relatively short, with the end somewhat blunt, two lobes just behind the tip, cingulum broad at the base. Canine small, very closely applied to I and P₄, one-cusped. Premolar distinctly two-cusped, with cingulum more or less postero-lingually extended. M₁ and M₂ with five cusps. M₃ half the size of M₁, with four cusps and with strongly reduced talonid. In all molars cingulum well developed, delicate, labially more conspicuous. Protoconids and hypoconids directed to the front of the mandible. Coronoid process low, slender, with a small step. Masseter crest subcircular, lower end closely applied to ascending ramus, without producing an outwardly flexed spine. An arcuate thickening extends downwards and towards the upper articular

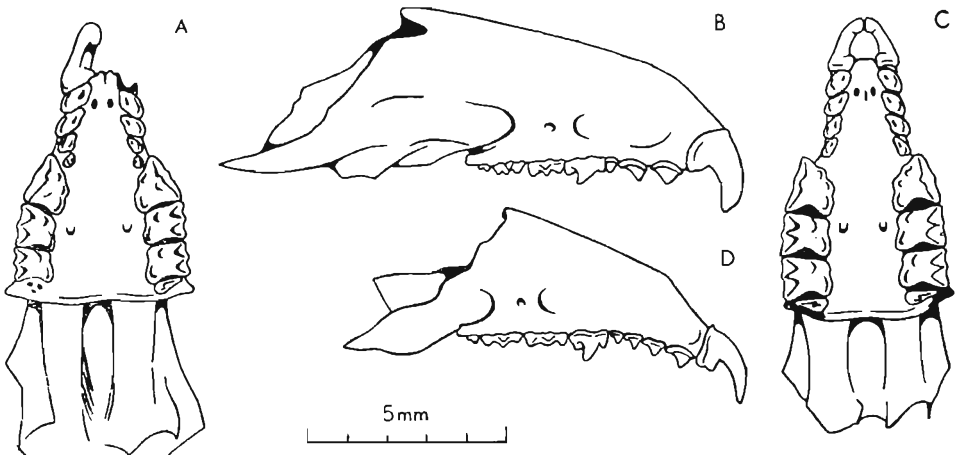


Fig. 5 — A & B *Petenyia hungarica* Kormos (spec. No. 1009): A ventral view of rostral fragment of skull, B side view. C & D *Neomys soriculoides* n. sp., holotype (spec. No. 1109): C ventral view of rostral fragment of skull, D side view.

facet of the condyloid process from the lower end of the crest. The condyloid process of "Neomys" type, with upper articular facet oblique, narrow, slightly lingually elongated; the lower facet broad, labially narrower, lingually swollen out and downcurving. The upper line of this facet somewhat depressed centrally. The interarticular list distinctly narrower than lower surface, labially nearly rectilinear, lingually strongly excavated. Upper and lower sigmoid notches strongly excavated, the inferior less so. The angular process slender, pointed. Pterygoid fossa small, oval, at the top delimited by a transverse small sill. Over the sill the pit groove gradually shallowing towards the top. Mental foramen between the proto- and the hypocond of M_1 , occasionally between roots of P_4 and M_1 . Tips of teeth with a dark reddish-brown pigmentation, more often as lighter spots. Horizontal ramus high, slightly tapering below M_2 . Ascending ramus meets horizontal ramus at an obtuse angle. Upper part of ascending ramus slightly inclined towards the front of the mandible.

Skull. In profile nasal area of skull similar to that in the living *Neomys fodiens* Pennant. Lacrimal foramen above the contact of M^1 with M^2 . Infraorbital foramen large, oval, placed over M^1 . Anterior palate foramens not discernible, probably between I^{2-2} . Posterior palate foramens between roots of M^{1-1} . I^2 and I^3 somewhat larger than the canine. P^1 pushed below by P^4 , laterally barely visible. All the unicuspid with tiny knobs in the posterior part of the cingulum. P^4 distinctly higher than the other teeth, with protocone slightly extended posteriorly. M^1 and M^2 trapezoidal at the base, without structural differences. Posterior edges of these teeth usually distinctly excavated. M^3 small, with two or three cusps and reduced talon.

Dimensions of 3 skulls (in mm):

Skulls ———→	1	2	3
Specimen Nos.→	1109	1110	1111
Length of:			
I ¹ -M ³	7.2	7.0	7.3
I ¹ -P ⁴	3.4	3.2	3.4
M ¹ -M ³	3.9	4.1	4.2

Dimensions of 10 mandibles — see Table 6.

Remarks. — The morphology of horizontal ramus and articular processes in the Węże specimens is similar to that of recent *N. anomalus milleri* Mottaz (Dehnel, 1950). These specimens, however, differ from all known living forms of genus *Neomys* Kaup in smaller cardinal length of the mandible, more massive mandible and absence of entocond on the

Table 6
Neomys soriculoides n. sp. — dimensions of mandibles (in mm)

Mandibles →	1	2	3	4	5	6	7	8	9	10
Specimen Nos. →	160	700	87	600	S	18	60	57	332	100
Total length of mandible	10.2	10.3	9.6	10.2	11.2	10.2	9.8	10.1	10.0	9.6
Cardinal length of mandible	8.1	8.0	8.2	8.0	7.8	8.0	7.6	8.2	8.2	7.8
Length of:										
I-M ₃	6.5	6.6	5.2	6.5	6.3	6.6	6.3	6.6	6.5	6.3
C-M ₃	4.6	4.7	4.5	4.6	4.6	4.6	—	4.5	—	—
P ₄ -M ₃	4.2	4.3	4.2	4.0	4.2	4.0	—	4.0	—	—
M ₁ -M ₃	3.6	3.6	3.5	3.6	3.6	3.5	3.5	3.6	3.8	3.5
M ₁ -M ₂	2.7	2.8	2.6	2.7	2.6	2.8	2.6	—	2.6	2.8
M ₂ -M ₃	2.2	2.2	2.2	2.3	2.3	2.2	2.2	—	2.6	2.2
M ₃	1.0	1.0	1.0	1.0	1.0	—	1.0	—	1.0	1.0
Height of mandible below:										
M ₁	1.5	1.5	1.6	1.5	1.3	1.3	1.3	1.5	1.4	1.3
M ₂	1.3	1.3	1.5	1.3	1.3	1.3	1.4	1.4	1.3	1.3
M ₃	1.3	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Thickness of mandible below M ₂	0.8	0.8	1.0	0.8	0.8	0.8	0.8	0.8	0.9	0.8
Height of coronoid process	4.1	4.0	4.1	3.8	—	3.8	4.0	4.0	4.2	3.8
Height of condyloid process	3.0	2.9	2.9	2.8	3.0	2.5	2.8	3.1	3.0	2.3
Distance between articular facets of condyloid process	2.5	2.4	2.3	2.2	2.0	2.5	2.1	2.3	2.3	2.2
Individual age of specimen	young		old	young		old	young		old	

M₃ talonid. The skulls are likewise different inasmuch that their rostral parts are more reduced; I² and I³ larger than the canine and P¹, while M³ has a very much reduced talon.

The Upper Pliocene *N. newtoni* Hinton and *N. browni* Hinton (Hinton, 1911) differ from the here studied remains in that their mandibular incisor is longer and with one lobe, the interarticular list more strongly notched, the entoconids on M₁ less conspicuous.

The most striking resemblance is noted between the Węże specimens and *Soriculus kubinyii* Kormos, 1934. The latter, however, has a distinct entoconid on M₃ (Kowalski, 1956, p. 354), faintly indicated posterior lobe on the cutting edge of the lower incisor, lacrimal foramen placed over

the mesostyle of M^1 , the articular facet of the coronoid process smooth, without a step; P^1 strongly reduced and not closed in by C and P^4 . Features common to both these species are: general morphology of the horizontal ramus, pattern of articular facets of the condyloid process and interarticular list, also proportions of lower molars. Owing to inadequate descriptions and meagre measurement data of forms from Villány and Podlesice, their closer correlation with the here described Węże specimens is not possible.

Certain resemblances are also observable in forms from Choukoutien (Zdansky, 1928) and Sackdillinger Höhle (Heller, 1930a), described as *Neomys* sp. only. Their incomplete descriptions, however, do not permit closer comparison with the Węże specimens. *Neomys bohlini* Young (Young 1934; Pei, 1936), in spite of the reduced talonid in M_3 , differs in a more slender mandible and strongly shortened lower incisor, with one lobe on the cutting edge only.

Genus *Beremendia* Kormos, 1934

Beremendia fissidens (Petényi, 1864)

(pl. III, fig. 7; text-fig. 4: 1 a-f)

1864. *Crossopus fissidens* Petényi; J. S. Petényi, Hátragyott Munkai..., p. 60, pl. 5 a-p.
1955. *Blarina ucrainica* Pidopličko; J. G. Pidopličko, Novye danye..., p. 990-991.
1956. *Blarina ucrainica* Pidopličko; J. G. Pidopličko, Materiali..., p. 133.
1958. *Blarina ucrainica* Pidopličko; K. A. Tatarinov, Znachidki..., p. 81-84, fig. 1-2b, 3-a.
1958. *Beremendia fissidens* (Petényi); K. Kowalski, An early Pleistocene..., p. 13-14, fig. 4 (here further synonymy).

Material. — About 200 complete and fragmentary specimens; 24 well preserved mandibles, 14 rostral parts of skulls with more or less complete dentition; numerous detached lower and upper teeth; numerous long bones of limbs, also other skeletal elements.

Dimensions of 7 skulls and 7 mandibles — see Table 7.

Remarks. — Morphologically the Węże specimens do not differ from conspecific forms described from the early Pleistocene of central Europe. The slight differences in size that have been noted are probably due to different measurement methods, as well as to strong individual variations. The more significant dissimilarities consist in the somewhat different structure of the coronoid process (its proximal part is with a step and an oblong sill running parallel to the posterior edge of the process), in slightly different pattern of masseter crest, structure of the condyloid

Table 7
Beremendia fissidens (Petényi) — dimensions of skulls and mandibles (in mm)

Skulls →	1	2	3	4	5	6	7
Specimen Nos. →	710	700a	712	701	707	706	704
Length of I ¹ -M ³	16.2	15.4	—	—	—	—	—
Length of M ¹ -M ³	6.2	6.5	6.3	6.6	6.2	6.2	6.3
Interorbital breadth	7.5	7.5	8.1	7.8	7.2	—	7.0
Infraorbital breadth	6.2	6.3	6.6	6.3	6.2	6.2	5.8
Length of nasal bones	—	—	10.0	—	10.6	—	—
Individual age of specimen	young			old	young		

Mandibles →	1	2	3	4	5	6	7
Specimen Nos. →	80	36	81	146	3	40	83
Total length of mandible	16.5	16.2	16.3	17.0	16.0	—	—
Cardinal length of mandible	13.2	12.8	13.0	13.6	13.2	13.0	13.3
Length of I-M ₃	10.6	10.5	10.8	11.2	—	—	—
Length of M ₁ -M ₃	5.8	5.4	5.8	6.0	—	6.0	5.9
Height of mandible below M ₂	2.6	2.4	2.4	2.3	2.5	2.3	2.3
Thickness of mandible below M ₂	1.6	1.5	1.5	1.5	1.6	1.5	1.5
Height of coronoid process	6.3	5.8	6.2	—	—	6.0	6.2
Height from base of mandible to apex of protoconid in M ₂	4.0	4.1	4.1	3.9	4.1	4.1	4.0
Individual age of specimen	young			old	young		

process with its articular facets, finally in a different position of mental foramen dependent on the individual age of the specimen. Anterior palate foramens are placed between the roots of I²⁻², but not between the canines as stated by Kormos (1934, p. 299). The nasal foramen, as compared to that in *Blarinoides mariae* n. sp., is distinctly narrow at the base, expanding towards the top, also about twice as high as wide.

The occurrence is noteworthy in the mandibular tooth-row of an accessory P² alveole not accompanied by a functional tooth. Similarly as in *Blarinoides mariae* n. sp. this alveole does not occur simultaneously in both halves of the jaws.

The remains of a large shrew have been described from China (Zdansky, 1928) under the name of *Neomys sinensis*. Close similarities noted in its structure and mandibular dimensions to the European genus *Beremendia* Kormos indicate that we are dealing here with a congeneric form. This agrees with the statement of Kretzoi (1956) assigning this species to genus *Beremendia* and identifying it as *B. sinensis* (Zdansky).

Specimens of a large shrew discovered at Czortków (Pidopličko, 1955,

1956) and in Gorishna Vygnanka (Tatarinov, 1958) have been identified as *Blarina ucraïnica* Pidopličko. On their structure and dimensions, however, they are doubtlessly referable to genus *Beremendia* and species *B. fissidens* (Petényi). Inadequate descriptions and meagre statistical information do not permit their separation into a new species of *Beremendia* Kormos.

Close resemblances are observable between the European species *B. fissidens* (Petényi) and the Pliocene *Paracryptotis rex* Hibbard, 1950 from America. On the same number of unicuspid, similar mandibular incisors without lobes, and M_2 with four cusps, it is supposed that these two species are related. They differ in general size (*Paracryptotis rex* Hibbard being smaller than *Beremendia fissidens* (Petényi)) and in structure of maxillar molars (posterior edges of teeth in first species are more weakly emarginated than in second species).

Genus *Petenyia* Kormos, 1934

Petenyia hungarica Kormos, 1934

(pl. III, fig. 3 a-c; text-fig. 5 A-B)

1930. *Petenyia hungarica* Kormos; T. Kormos, Beiträge..., p. 57, nomen nudum.
 1934. *Petenyia hungarica* Kormos; T. Kormos, Neue Insektenfresser..., p. 301-303, fig. 34-35.
 1943. *Petenyia neglecta* Kretzoi; M. Kretzoi, Bemerkungen..., p. 607-608, fig. 1.
 1956. *Petenyia hungarica* Kormos; K. Kowalski, Insectivores..., p. 352-353, pl. 1, fig. 9, 10; textfig. 1-b (here further synonymy).
 1958. *Petenyia hungarica* Kormos; K. Kowalski, An early Pleistocene..., p. 14-15.

Material. — About 50 mandibles, often lacking the canine and P_4 , and articular process; several fragmentary maxilla; numerous detached lower and upper teeth, also long bones of limbs.

Dimensions of 5 skulls and 8 mandibles — see Table 8.

Remarks. — Mandibular structure in the Węże specimens is analogous to that in Hungarian forms (Kormos, 1934). In our specimens, however, the lower articular facet of the condyloid process is stronger and wider, while its interarticular list is lingually less conspicuously notched. Skull morphology in these species is essentially similar to that in *Beremendia fissidens* (Petényi) though the skulls in *P. hungarica* are notably smaller. Other characters, such as the coronoid process with a well marked posterior step, masseter crest provided with a peculiar outwardly protruding spine and an elongate sill on the lingual side of the process, are all features distinguishing the Węże specimens.

Table 8

Petenya hungarica Kormos — dimensions of skulls and mandibles (in mm)

Skulls →	1	2	3	4	5
Specimen Nos. →	1009	1010	1011	1012	1013
Length of I ¹ -M ³	7.4	7.0 a*	7.1	7.3 a	—
Length of M ¹ -M ³	3.6	3.8 a	3.7	3.6 a	3.7
Interorbital breadth	4.6 ?*	—	—	—	—
Infraorbital breadth	3.8 ?	—	—	—	—
Individual age of specimen	y o u n g			o l d	y o u n g

Mandibles →	1	2	3	4	5	6	7	8
Specimen Nos. →	48	9	88	303	314	165	345	156
Total length of mandible	10.2	10.2	10.2	10.2	10.3	10.4	10.6	10.2
Cardinal length of mandible	8.2	8.0	8.0	8.3	8.3	8.5	8.4	8.2
Length of I-M ₃	6.5	6.5	6.6	6.6	6.5	6.5	6.6	6.4
Length of M ₁ -M ₃	3.5	3.3	3.5	3.3	3.3	3.4	3.3	3.3
Height of mandible below M ₂	1.5	1.5	1.6	1.6	1.5	1.5	1.5	1.6
Thickness of mandible below M ₂	0.8	0.8	0.8	0.9	0.9	0.8	0.9	0.9
Height of coronoid process	4.5	4.3	4.5	4.5	4.5	4.3	4.3	4.2
Individual age of specimen	y o u n g			o l d		y o u n g	o l d	y o u n g

* a — measured along the alveoles, ? — measurement uncertain.

During the examination of fairly copious and well preserved con-specific material the writer has been able to ascertain that the mental foramen always occurs singly, not in pairs, as stated by Kowalski (1956), and is placed between the para- and protoconid of M₁; last molar has four cusps, its talonid being provided with a hypoconid but not with a hypoconulid, as described by Kormos (1934); height figures for the horizontal ramus of the mandibles are greatly overestimated by Kormos, actually being 1.3 to 1.6 mm; total length of tooth-row, computed by Kowalski (1956, p. 353) as 8.4 mm, is likewise exaggerated. It probably refers to the cardinal length of mandible.

Species *P. stehlini* described by Kretzoi (1943) most likely belongs to a different genus, while a mandible of *P. neglecta* (Kretzoi, l. c.) is identical in structure and dimensions with *P. hungarica* Kormos. Owing to inadequate descriptions and meagre measurement data it is not possible reliably to identify it as a new species. Analogous specimens also occur among the Węże material within the rich population of *Petenya hungarica* Kormos. Hence, the inclusion of species *P. neglecta* into the synonymy of *P. hungarica* seems more correct.

Subfamily **Crocidurinae** Milne-Edwards, 1864-1874Genus *Crocidura* Wagler, 1832*Crocidura* sp.

(pl. IV, fig. 4 a-e)

Material. — Five fragmentary mandibles with incomplete dentition; fragments of articular processes and fairly numerous detached upper and lower teeth; skulls not known.

Description. — Lower incisor relatively short, with smooth cutting edge, occasionally with faintly marked lobes. Tip of tooth upcurved and somewhat blunt, probably owing to strong wear. Cingulum at the base of tooth, not very distinct. Canine one-cusped, „flat“, basally broad. Premolar likewise one-cusped, narrow, with cone higher than that in the canine. Both these teeth with distinct cingula. M_1 and M_2 five-cusped, with high protoconids extending to the distal part of the mandible. M_3 has a talonid reduced to one cusp. In molars the cingulum labially more conspicuous. Coronoid process broad at the base, slender proximally, gradually tapering towards the top. Anterior edge of the process gently anteriorly flexed. Masseter crest reduced to a small labial knob at top of coronoid process. Condylod process low, distinctly protruding towards the distal part of the mandible. Upper articular facet slightly obliquely set in relation to the lower facet, narrower and shorter. The lower facet gently lingually curved downwards. Interarticular list broad, slightly lingually notched. Pterygoid fossa large, triangular, broad, delimited in its apical part. Upper and lower notches strongly depressed. Mental foramen between P_4 and M_1 . Pigmentation of teeth uniformly yellowish-brown from base to tip. Horizontal ramus mostly lower than the height of dental crowns. Jaw branches meet at a slightly obtuse angle.

Dimensions of two mandibles (in mm):

Mandibles →	1	2
Specimen Nos. →	334	428
Total length of mandible	ca. 11.1	ca. 10.6
Cardinal length of mandible	ca. 9.1	ca. 8.7
Length of I- M_3	7.2	6.4
Length of M_1 - M_3	3.8	3.3
Height of mandible below M_2	1.5	1.3
Thickness of mandible below M_2	0.8	0.8
Height of coronoid process	from 3.8 to 4.1	
Individual age of specimens	probably young	

Remarks. — Morphologically the Weże specimens do not differ from the essential type of mandibular structure in the living *Crocidura leucodon*

Hermann. In size, however, they are smaller than this species. In structure of the coronoid process and shape of the canine they seem to approach the Chinese late Pliocene species *C. wongi* Pei, 1936. From the latter they differ in arrangement of teeth and structure of tooth tips. In some features of the mandible the Węże specimens likewise resemble *C. kormosi* Schlosser (Miller, 1927), *C. kornfeldi* Kormos, 1934, and *Crocidura* sp. (Pei, 1931). Incomplete measurements and inadequate descriptions, however, do not allow closer comparative studies. The fragmentary condition of the discussed fossil remains provides no reliable evidence for their separation into a new species. Genus *Crocidura* Wagler has been recovered from the lower layers of the Węże breccia and probably belongs to an early Pliocene form. This genus has been recorded already from the Miocene of Europe.

Genus *Suncus* Ehrenberg, 1832-1833

Suncus pannonicus (Kormos, 1934)

(pl. III, fig. 1 a-b; pl. IV, fig. 2 a-b)

1934. *Pachyura pannonica* Kormos; T. Kormos, Neue Insektenfresser..., p. 306, fig. 38.
 1937. *Pachyura hungarica* Kormos; T. Kormos, Zur Frage..., p. 320, nomen nudum.
 1949. *Pachyura pannonica* Kormos; M. Friant, Les Musaraignes..., p. 19.
 1956. *Suncus* cf. *pannonicus* Kormos; K. Kowalski, Insectivores..., p. 354-356, pl. 2, fig. 2; textfig. 1-e.

Material. — Five right and left mandibles with incomplete dentition, mandibular fragments lacking C and P₄; also fragmentary articular processes; numerous detached teeth and long bones of limbs.

Dimensions of 5 mandibles (in mm):

Mandibles →	1	2	3	4	5
Specimen Nos. →	183	130	188	223	325
Total length of mandible	7.0	7.0	7.0	6.8	—
Cardinal length of mandible	5.5	5.3	5.3	5.4	—
Length of I-M ₃	4.6	—	4.6	4.8	—
Length of M ₁ -M ₃	2.5	2.8	2.5	2.6	2.7
Height of mandible below M ₂	0.6	0.8	0.7	0.7	0.8
Thickness of mandible below M ₂	0.6	0.6	0.5	0.6	0.7
Height of coronoid process	2.6	2.8	2.5	2.6	2.6
Individual age of specimens	y o u n g		o l d	y o u n g	

Remarks. — Slight differences in shape of coronoid process (narrow and vertically ascending), in shape and course of masseter crest and of the interarticular list, suggest very strong individual variability of this small animal. Other characters, such as pterygoid fossa, shape of molars

and the premolar, position of mental foramen, are all analogous with those in Hungarian specimens. The differences consists in the incisor being with indistinct lobes on the cutting edge, the canine lower, M_3 less reduced, the talonid with one cusp only.

Suncus zelceus n. sp.

(pl. III. fig. 2 a-b; pl. IV. fig. 1 a-c)

Holotypus: specimen No. 502, right mandible with complete dentition and damaged coronoid process.

Derivatio nominis: *zelceus* — after Zelce, the name of the hill near Weże, where the Tertiary bone breccia has been discovered.

Material. — 20 more or less satisfactorily preserved specimens, mostly fragmentary; the only cranial fragment (rostral part) is probably referable to this species.

Description. — Mandibles minute, delicate, shorter than in *S. pannonicus* Kormos, 1934. Incisor short, with two very faintly indicated lobes on the cutting edge. Canine small, one-cusped. Premolar higher than the canine, one-cusped. Both teeth of about equal length very closely applied to each other. M_1 and M_3 similar in structure to those in *S. pannonicus*, of smaller size, with broader and rather bluntly terminating tips. M_3 has a strongly reduced talonid with poorly recognizable hypoconid. Teeth seemingly "white", but lightly pigmented at tips. Cingulum quite distinct in all teeth, delicate, slightly swollen below the protoconids. Coronoid process basally broad, gradually tapering towards the top, in the proximal portion slightly anteriorly flexed. Masseter crest of semicircular shape, as in the living *Sorex minutus* L. Articular facet of the process with a small step. The condyloid process low; the upper articular facet very short, slightly oblique, the lower strongly lingually developed, parallel to the upper facet. Interarticular list narrow, strongly expanding towards the lower articular facet, lingually distinctly notched. Angular process short, needle-like. Pterygoid fossa triangular, fairly deep, at top delimited by a sill. Mental foramen below the anterior root of M_1 , occasionally between roots of P_4 and M_1 . Mandibular rami meet at a nearly right angle. Height of horizontal ramus below M_1 somewhat greater than below the other molars. Upper and lower sigmoid notches quite distinct and depressed.

Dimensions of 6 mandibles — see Table 9.

Remarks. — Strong reduction of the talonid occurring in *Suncus pannonicus* (Kormos) and *S. zelceus* n. sp. suggests the separation of these two species from the living *S. etruscus* (Savi) (Miller, 1912). The latter

T a b l e 9
Suncus zelceus n.sp. — dimensions of mandibles (in mm)

Mandibles →	1	2	3	4	5	6
Specimen Nos. →	502	402	2x	559	2y	602
Total length of mandible	6.6	6.7	6.6	—	—	—
Cardinal length of mandible	5.0	5.1	5.0	—	—	—
Length of:						
I-M ₃	4.3	4.4	4.2	—	—	—
C-M ₃	3.1	3.3 <i>a</i> *	3.1	3.1	—	—
P ₄ -M ₃	2.9	3.1 <i>a</i>	2.8	2.9	2.9	3.0
M ₁ -M ₃	2.5	2.6 <i>a</i>	2.5	2.4	2.4	2.5
M ₁ -M ₂	1.7	1.9	1.8	1.8	1.8	2.0
M ₂ -M ₃	1.4	1.5 <i>a</i>	1.5	1.5	1.6	1.4
M ₃	0.8	0.6 <i>a</i>	0.7	0.5	0.6	0.5
Height of mandible below M ₂	0.6	0.6	0.6	0.5	0.6	0.6
Thickness of mandible below M ₂						
M ₂	0.5	0.4	0.5	0.5	0.4	0.4
Height of coronoid process	2.3	2.4	2.5	2.3	2.6	2.3
Height of condyloid process	1.8	1.7	1.8	—	2.0	1.6
Distance between the articular facets of condyloid process	1.1	1.1	1.2	—	1.2	1.2
Individual age of specimen	y o u n g		old	y o u n g		

a — measured along the alveoles.

is distinguished by notably larger dimensions. The two fossil species differ not only in size, but also in the shape of the coronoid process, pterygoid fossa, structure of lower incisor and of molars. In *S. zelceus*, the pterygoid fossa is not large, at the top delimited by a fairly conspicuous sill, the incisor is short, with two indistinct lobes, while the molars are relatively somewhat longer than those in *S. pannonicus* (Kormos).

*Palaeozoological Laboratory
of the Polish Academy of Sciences
Warszawa, September 1958*

REFERENCES

- ALLEN, M. G. 1938. The Mammals of China and Mongolia. — *Nat. Hist. Centr. Asia*, **11**, 1, 1-620, New York.
- BOBRINSKIJ, N. A., KUZNECOV, B. A. & KUZJAKIN, A. P. 1944. Opređelitel mlekopitajuščich SSSR. Gos. Izdat. Sov. Nauka, 1-58, Moskva.
- BOHLIN, B. 1942. The fossil Mammals from the Tertiary Deposit of Taben-buluk, Western Kansu. I: Insectivora and Lagomorpha. — *Palaeont. Sinica*, N. ser. C, **8a**, 14-28, Nanking.
- BOROWSKI, S. & DEHNEL, A. 1952. Materiały do biologii Soricidae. — *Ann. Univ. M. C.-S.*, **7**, 6, 305-448, Lublin.

- BRUNNER, G. 1934. Eine präglaziale Fauna aus dem Windloch bei Sackdilling (Oberpfaltz). — *N. Jb. Min. etc.*, B, 71, 303-328, Stuttgart.
- 1950. Das Gaisloch bei Münzighof (Mfr.) mit Faunen aus dem Altdiluvium und aus jüngeren Epochen. — *Ibidem*, B, 91, 1-34.
- CZYŻEWSKA, T. 1958. Dwa zęby nosorożca *Dicerorhinus* z brekcji kostnej z Węzów koło Działoszyna (Two teeth of *Dicerorhinus* from the bone breccia at Węże near Działoszyn (Poland)). — *Acta Palaeont. Pol.*, 3, 1, 49-53, Warszawa.
- DEHNEL, A. 1949. Badania nad rodzajem *Sorex* L. (Studies on the genus *Sorex* L.). — *Ann. Univ. M. C. S.*, 4, 2 (C), 17-102, Lublin.
- 1950. Badania nad rodzajem *Neomys* Kaup (Studies on the genus *Neomys* Kaup). — *Ibidem*, 5, 1 (C), 1-63.
- DEPÉRET, CH. 1887. Recherches sur la succession des faunes de Vertébrés Miocènes de la Vallée du Rhône. — *Arch. Mus. Hist. Nat.*, 4, 46-313, Lyon.
- DOBSON, G. E. A. 1882-90. A Monograph of the Insectivora systematic and anatomical, vol. 3, London.
- 1890. A synopsis of the genera of the family Soricidae. — *Proc. Zool. Soc.*, 4, 49-51, London.
- EFREMOV, J. A. 1950. Tafonomija i geologičeskaja letopis'. — *Tr. Palaeont. Inst.*, 24, 1, 1-172, Moskva.
- ELLERMAN, J. R., MORRISSON-SCOTT, T. S. C. 1951. Checklist of Palaearctic and Indian Mammals, 1753 to 1946. — *Brit. Mus. Nat. Hist.*, 1-810, London.
- FREUDENBERG, W. 1914. Die Säugetiere des älteren Quartärs von Mitteleuropa mit besonderer Berücksichtigung der Fauna von Hundsheim und Deutschaltenburg in Niederösterreich. — *Geol. Palaeont. Abh.*, N. F., 12, 4/5, 1-219, Wien.
- FRIANT, M. 1949. Les Musaraignes (Soricidae) quaternaires et actuelles de l'Europe occidentale. — *Ann. Soc. Géol. Nord.*, 67, 222-269, Lille.
- GAILLARD, C. 1899. Mammifères miocènes nouveaux ou peu connus de la Grive-Saint-Alban (Isère). — *Arch. Mus. Hist. Nat.*, 7, 2, 11-79, Lyon.
- GRASSE, P. P. 1955. Traité de Zoologie. Mammifères. 17, 2, 1574-1712, Paris.
- HEIM DE BALSAC, H. 1940. Un Soricidé nouveau du Pléistocène; considérations paléobiogéographiques. — *C. R. Acad. Sci.*, 211, 808-810, Paris.
- HELLER, F. 1930a. Eine Forest-Bed-Fauna aus der Sackdillinger Höhle (Oberpfaltz). — *N. Jb. Min. etc.*, Beil.-Bd., 63, A, 247-298, München.
- 1930b. Jüngstpliozäne Knochenfunde in der Moggaster Höhle (Fränk. Schweiz). — *Cbl. Min. etc.*, Abb. 4, B, 154-159, Stuttgart.
- 1933. Ein Nachtrag zur Forest-Bed-Fauna aus der Sackdillinger Höhle (Oberpfaltz). — *Ibidem*, 1, B, 60-68.
- 1936a. Eine oberpliozäne Wirbeltierfauna aus Rheinhessen. — *N. Jb. Min. etc.*, Beil.-Bd., 76, B, 99-160, München.
- 1936b. Eine Forest-Bed-Fauna aus der Schwäbischen Alb. — *Sitzber. Heidelb. Akad. Wiss.*, Math.-naturw. Kl., 2, 1-29, Heidelberg.
- 1939. Kleinsäugerreste aus den altdiluvialen Sanden von Mauern. — *Ibidem*, 8, 1-18.
- 1954. Neue Fundstellen altdiluvialer Desmanareste in Südwestdeutschland. — *N. Jb. Geol. Palaeont.*, 10, 465-478, Stuttgart.
- HIBBARD, C. W. 1950. Mammals of the Rexroad Formation from Fox Canyon, Kansas. — *Contr. Mus. Paleont. Univ.*, 8, 6, 113-192, Michigan.
- 1953. The Insectivores of the Rexroad fauna, Upper Pliocene of Kansas. — *J. Paleont.*, 27, 1, 21-32, Menasha.
- 1955. The Jinglebob Interglacial (Sangamon?) fauna from Kansas and its climatic significance. — *Contr. Mus. Paleont. Univ.*, 12, 10, 179-228, Michigan.

- HIBBARD, C. W. 1957. Notes on Late Cenozoic Shrews. — *Trans. Kansas Acad. Sci.*, **60**, 4, 327-336, Lawrence.
- 1958. Summary of North American Pleistocene Mammalian local faunas. — *Pap. Mich. Acad. Sci. Art. Lett.*, **43**, 3-32, Michigan.
- HINTON, M. A. C. 1911. The British Fossil Shrews. — *Geol. Mag.*, N. ser., **7**, 12, 530-539, London.
- JACKSON, H. H. T. 1928. A taxonomic review of the American Longtailed Shrews (Genera *Sorex* and *Microsorex*). — *North Amer. Fauna*, **51**, 1-238, Washington.
- KORMOS, T. 1911. *Canis (Cerdocyon) Petényii* n. sp. und andere interessante Funde aus dem Komitat Baranya. — *Mitt. Jb. Ungar. Geol. Reichsanst.*, **19**, 165-196, Budapest.
- 1913a. Trois nouvelles espèces fossiles des desmans en Hongrie. — *Ann. Mus. Nat. Hungar.*, **11**, 125-146, Budapest.
- 1913b. *Amblycoptus oligodon*, eine Spitzmaus aus den ungarischen Pliozän. — *Ibidem*, **24**, 370-391.
- 1930a. Diagnosen neuer Säugetiere aus dem oberpliozänen Fauna des Somlyóberges bei Püspökfürdő. — *Ibidem*, **27**, 237-246.
- 1930b. Beiträge zur Präglazialfauna des Somlyóberges bei Püspökfürdő. — *Allat. Közl.*, **27**, 40-62, Budapest.
- 1930c. *Desmana thermalis* n. sp., eine neue präglaziale Bisamspitzmaus aus Ungarn. — *Ann. Mus. Nat. Hungar.*, **27**, 1-19, Budapest.
- 1931. Über eine neuentdeckte Forest-Bed-Fauna in Dalmatien. — *Palaeobiologica*, **4**, 113-136, Wien.
- 1934. Neue Insektenfresser, Fledermäuse und Nager aus dem Oberpliozän der Villányer Gegend. — *Földt. Közl.*, **64**, 296-321, Budapest.
- 1935. Die perlzähnlige Spitzmaus (*Sorex margaritodon* Korm.) und das Anpassungsproblem. — *Allat. Közl.*, **32**, 1/2, 61-79, Budapest.
- 1937a. Zur Frage der Abstammung und Herkunft der quartären Säugetierfauna Europas. — *Festschr. Embr. Strand*, **3**, 287-328, Riga.
- 1937b. Revision der Kleinsäuger von Hundsheim. — *Földt. Közl.*, **67**, 23-171, Budapest.
- 1938. Zur näheren Kenntnis der oberpliozänen Bisamspitzmäuse Südungarns. — *Festschr. Embr. Strand*, **4**, 163-180, Riga.
- KOWALSKI, K. 1951. Jaskinie Polski, I. P. Muz. Archeol., 1-466, Warszawa.
- 1956. Insectivores, bats and rodents from the early Pleistocene bone breccia of Podlesice near Kroczyce, Poland (Owadożerne, nietoperze i gryzonie wczesnoplejstoczeńskiej brekcji kostnej z Podlesic koło Kroczyce). — *Acta Palaeont. Pol.*, **1**, 4, 331-394, Warszawa.
- 1958. An early Pleistocene fauna of small mammals from the Kadzielnia Hill in Kielce, Poland (Wczesnoplejstoczeńska fauna drobnych ssaków z Kadzielni w Kielcach). — *Ibidem*, **3**, 1, 1-47.
- KRETZOI, M. 1937/38. Die Raubtiere von Gombaszög nebst Übersicht der Gesamtfauna. — *Ann. Mus. Nat. Hungar.*, **31**, 88-157, Budapest.
- 1941a. Die unterpleistozäne Säugetierfauna von Betfia bei Nagyvarád. — *Földt. Közl.*, **71**, 308-335, Budapest.
- 1941b. Weitere Beiträge zur Kenntnis der Fauna von Gombaszög. — *Ann. Mus. Nat. Hist. Hungar.*, **34**, 105-139, Budapest.
- 1943. Bemerkungen über Petényia. — *Földt. Közl.*, **73**, 607-608, Budapest.
- 1956a. Die altpleistozänen Wirbeltierfaunen des Villányer Gebirges. — *Geol. Hungar.*, S. *Palaeont.*, **27**, 1-264, Budapest.

- KRETZOI, M. 1956b. Quaternary geology and the vertebrate fauna. — *Acta Geol. Hungar.*, 2, 1-2, 67-77, Budapest.
- KUBIK, J. 1951. Analysis of the Puławy population of *Sorex araneus* L. — *Ann. Univ. M. C.-S.*, 5, 11, 335-372, Lublin.
- MIGULIN, O. O. 1933. Zwiri URSR. Akad. Nauk URSR., Inst. Zool. Biol. 1-422, Kijiv.
- MILLER, C. S. 1912. Catalogue of the Mammals of Western Europe. Brit. Mus., 1-1019, London.
- 1927. Revised determinations of some Tertiary Mammals. — *Palaeont. Sinica*, 5, 2, 1-20, Peking.
- MLYNARSKI, M. 1953. Żółw błotny *Emys orbicularis* (L.) z pliocenu Polski (Pond tortoise *Emys orbicularis* (L.) from the Pliocene of Poland). — *Acta Geol. Pol.*, 3, 1, 545-572, Consp. 168-170, Warszawa.
- 1955. Żółwie z pliocenu Polski (Tortoise from the Pliocene of Poland). — *Ibidem*, 5, 2, 161-214, Consp. 46-62.
- 1956 a. Lizards from the Pliocene of Poland (Jaszczurki z pliocenu Polski). — *Acta Palaeont. Pol.*, 1, 2, 135-152, Warszawa.
- 1956b. On a new species of Emydid-tortoise from the Pliocene of Poland (Nowy gatunek żółwia z pliocenu Polski). — *Ibidem*, 1, 2, 153-164.
- OGNEV, S. J. 1928. Zveri vostočnoj Evropy i severnoj Azii, I, 1-631, Moskva.
- 1929-30. Geografičeskoe rasprostranenie nasekomojadnych v svjazi s ich paleontologiej. — *Izv. Assoc. Nauč.*, Inst. fiz. mat. Mosk. Gos. Univ., 2, 1, 107-134, Moskva.
- 1934. Materialien zur Systematik, Morphologie und Zoogeographie der Paläarktischen Spitzmäuse. — *Zool. Anz.*, 105, 3/4, 77-85, Leipzig.
- 1951. Očerki ekologii mlekopitajuščich. — *Mosk. Obsč. Ispyt. Prir.*, 26, 11, 1-252, Moskva.
- PASA, A. 1948. I mammiferi di alcune antiche brecce Veronesi. — *Mem. Mus. Civ. Stor. Nat.*, 1, 1-111, Verona.
- 1950. I depositi Quaternari del Ponte di Veja. II: La fauna. — *Ibidem*, 2, 241-308.
- PEI, C. W. 1931. Mammalian remains from locality 5 at Choukoutien. — *Palaeont. Sinica*, C, 7, 7-8, Peking.
- 1936. On the Mammalian remains from locality 3 at Choukoutien. — *Ibidem*, C, 7, 5, 1-108.
- 1940. The Upper Cave fauna of Choukoutien. — *Ibidem*, C, 10, 125, 9-11.
- PETÉNYI, S. J. 1864. Hátragyott Munkai. — *Magyar Tudományos Akad.*, 1, 1-130, Pest.
- PIDOPLIČKO, I. G. 1955. Novyje dannye o faune pozvonočnyh antropogennyh otloženiij Tarnopolskoj Oblasti. — *Dokl. Akad. Nauk SSSR*, 100, 989-991, Moskva.
- 1956. Materiali do vivčenia minulich faun URSR. — *Akad. Nauk URSR*, 2, 132-133, Kijiv.
- PIVETEAU, J. 1958. *Traité de Paléontologie*. 6, 2, 822-908, Paris.
- POPLEWSKI, R. 1948. *Anatomia ssaków*. 2, 1-690, Warszawa.
- SAMSONOWICZ, J. 1934. Zjawiska krasowe i trzeciorzędowa brekcja w Wężach pod Działoszynem (Sur les phénomènes karstiques de Węże près de Działoszyn sur la Warta). — *Zab. Przyn. Nieoż. Ziem R. P. (Monum. Nat. Inanimée Rép. Pol.)*, 3, 147-158, Warszawa.
- SCHAEFFER, H. 1935. Studien an mitteleuropäischen Kleinsäugetern mit besonderer Berücksichtigung der Rassenbildung. — *Arch. Naturg.*, N. F., 4, 535-590, Leipzig.

- SCHREUDER, A. 1940. A revision of fossil water-moles (Desmaninae). — *Arch. néerl. Zool.*, **4**, 201-333, Leiden.
- 1943. Fossil moles and other Mammals (Desmana, Talpa, Equus etc.) out of well-borings in the Netherlands. — *Verh. Geol. Mijnb. Gen. Nederl. Kolon.*, Ser. geol., **13**, 399-434, s'Gravenhage.
- SIMPSON, G. G. 1945. The principles of classification and classification of Mammals. — *Bull. Amer. Mus. Nat. Hist.*, **85**, 1-350, New York.
- STACH, J. 1951. *Arctomeles pliocaenicus*, nowy rodzaj i gatunek z podrodziny bor-sukowatych (*Arctomeles pliocaenicus* n. gen. & sp. from Węże). — *Acta Geol. Pol.*, **2**, 1/2, 129-157, Consp. 55-63, Warszawa.
- 1952. *Ursus wenzensis*, nowy gatunek małego niedźwiedzia plioceńskiego (*Ursus wenzensis*, a new species of a small Pliocene bear). — *Ibidem*, **3**, 1, 103-136, Consp. 21-24.
- 1954. *Nyctereutes* (Canidae) w pliocenie Polski (*Nyctereutes* (Canidae) in the Pliocene of Poland). — *Ibidem*, **4**, 2, 191-206, Consp. 39-41.
- 1957. *Agriotherium intermedium* n. sp. from the Pliocene bone breccia of Węże (*Agriotherium intermedium* n. sp. z plioceńskiej brekcji kostnej, wydobytej w miejscowości Węże w Polsce). — *Acta Palaeont. Pol.*, **2**, 1, 1-17, Warszawa.
- STEHLIN, H. G. 1940. Zur Stammesgeschichte der Soriciden. — *Eclogae Geol. Helv.*, **33**, 298-306, Basel.
- TATARINOV, K. A. 1958. Znachidki zemlerojki blariny na Ukraini. — *Dopov. Akad. Nauk URSR*, **1**, 81-84, Lviv.
- TEILHARD DE CHARDIN, P. 1940. The fossils from locality 18 near Peking. — *Palaeont. Sinica*, **9**, 124, 4-5, Peking.
- TEILHARD DE CHARDIN, P. & PEI, C. W. 1941. The fossil Mammals from locality 13 of Choukoutien. — *Ibidem*, **11**, 126, 5-8.
- TROUËSSART, E. L. 1893-99. *Catalogus mammalium tam viventium quam fossilium. Quinquennale supplementum*. N. ed., **15**, 1/2, 1-929, Berolini.
- VEREŠČAGIN, N. K. & GROMOV, J. M. 1950. Sbor ostatkov vyššich pozvonočnych četvertičnogo perioda. — *Izd. Akad. Nauk SSSR*, **20**, 1-37, Moskva.
- VIRET, J. 1938. Etude sur quelques Erinacéidés fossiles, spécialement sur le genre *Palerinaceus*. — *Trav. Lab. Géol. Univ. Lyon*, Mém. **28**, 34, 1-32, Lyon.
- WEBER, M. 1928. Die Säugetiere. 1/2, 1-898, Jena.
- YOUNG, C. C. 1934. On the Insectivora, Chiroptera, Rodentia and Primates other than *Sinanthropus* from locality 1 at Choukoutien. — *Palaeont. Sinica*, **C**, **8**, 3, 1-160, Peking.
- ZDANSKY, O. 1928. Die Säugetiere der Quartärfauna von Choukoutien. — *Ibidem*, **C**, **5**, 4, 1-146.
-

OWADOŻERNE Z PLIOCEŃSKIEJ BREKCJI KOSTNEJ Z WĘŻÓW

Streszczenie

WSTĘP

Opracowane z Wężów owadożerne są dalszym przyczynkiem do znajomości kręgowców tego znaleziska, opisanych przez J. Stacha (1951, 1952, 1954, 1957), M. Młynarskiego (1953, 1955, 1956) i T. Czyżewską (1958). Owadożerne reprezentowane są dotychczas przez 18 gatunków, należących do rodzin: Erinaceidae Bonap., Talpidae Murray i Soricidae Gray, oraz do 11 rodzajów: *Erinaceus* L., *Talpa* L., *Desmana* Güld., *Galemys*(?) Kaup, *Sorex* L., *Blarinoidea* n. gen., *Neomys* Kaup, *Beremendia* Kormos, *Petenya* Kormos, *Crocidura* Wagler i *Suncus* Ehrenb. Poza znanymi już gatunkami z plio-plejstocenu opisano tu 4 nowe: *Erinaceus samsonowiczi* n. sp., *Blarinoidea mariae* n. sp., *Neomys soriculoides* n. sp. i *Suncus zelceus* n. sp. Opisy i tabele ich pomiarów znajdują się w tekście angielskim; poniżej podajemy tylko krótkie diagnozy. Są to gatunki plioceńskie, występujące z reguły w dolnych i środkowych partiach brekcji.

Nowy rodzaj *Blarinoidea*, bardzo zbliżony do amerykańskiej *Blarina* Gray, jest w Wężach zapewne reliktem mioceniowym i pochodzi z dolnego pliocenu. Jego stosunek do *Blarina* Gray wyjaśniono na podstawie szczegółowej analizy morfologii czaszek i zuchw. Przypuszczenia o wspólnym ich pochodzeniu są jeszcze hipotetyczne z powodu braku dostatecznej dokumentacji paleontologicznej z terenu Azji. Możliwość migracji tych form mogła przy tym zachodzić tylko we wczesnym pliocenie, lub — co jest prawdopodobniejsze — jeszcze w miocenie. Hipotetyczne są również wnioski co do pokrewieństwa i podobnej możliwości migracji gatunków *Beremendia fissidens* (Petenyi) i *Paracryptotis rex* Hibbard, mimo że znane jest ogniwo pośrednie łączące je, a mianowicie *Beremendia sinensis* (Zdansky).

W pracy niniejszej uzupełniono wnioski poprzednich badaczy o pochodzeniu brekcji i jej wieku; potwierdzono też przypuszczenia Stacha i Młynarskiego co do dwójakiego charakteru fauny. Fauna owadożernej pozwala na ustalenie warunków klimatycznych, panujących w okresie tworzenia się brekcji kostnej z Wężów; część jej bowiem żyła i żyje obecnie w strefie stepowo-pustynnej o klimacie gorącym i suchym. pozostałe zaś reprezentują grupę form wyraźnie palearktycznych, bytujących w strefie klimatu wilgotnego, ciepłego, zbliżonego do dzisiejszego.

Poddano także rewizji mianownictwo zębów jednoguzkowych górnej szczęki u Soricidae, zastosowano uproszczony podział na klasy wieku i podano możliwość połączenia dwu podrodzin Soricinae i Crocidurinae w jedną, wyższą jednostkę systematyczną.

DIAGNOZY NOWYCH JEDNOSTEK SYSTEMATYCZNYCH

Erinaceus samsonowiczi n. sp.

(pl. II, fig. 1 a-c & 2)

Diagnoza. — I_1 szeroki u podstawy, z ostrą krawędzią tnącą. C duży, labialnie przesunięty. P_4 parakonid wysoki, zaostżony, pionowy; protokonid ostry, zagięty ku tyłowi; metakonid niski, tępy. Przednia krawędź parakonidu P_4 słabo zaostżona. Parakonid M_3 zredukowany do małego sęczka. Labialna strona ramus ascendens (w fossa masseterica) z wyraźnym, lecz niewysokim grzebieniem. Kąt między ramionami żuchwy prawie prosty. Foramen mentale między P_4 a M_1 znacznie niższy, aniżeli u współczesnego jeża. Powierzchnia stawowa processus condyloideus szeroka, prawie prostopadła do ramus ascendens, o rozszerzonej lingwalnie elipsie. Processus angularis szeroki u nasady.

Uwagi. — *Erinaceus samsonowiczi* różni się od wszystkich znanych dotychczas, wymarłych i dzisiejszych gatunków: rozmiarami, dużym kłem labialnie odchylnym, wysokim i pionowym parakonidem P_4 , zredukowanym M_3 z reguły do jednego sęczka, niewysokim grzebieniem w fossa masseterica, elipsoidalną powierzchnią stawową processus condyloideus i znacznie niżej położonym foramen mentale. Pewne podobieństwo budowy żuchwy obserwuje się u mioceńskiego gatunku *Erinaceus sansaniensis* Depéret.

Rodzaj *Blarinoides* n. gen.*Blarinoides mariae* n. sp.

(pl. II, fig. 4 a-b; pl. III, fig. 6 a-c; text-fig. 4: 2 a-f)

Diagnoza. — Rodzaj monotypowy, z jednym gatunkiem. Wzór zębowy

$$\frac{3 \ 1 \ 3 \ 3}{1 \ 1 \ 1 \ 3} = 32.$$

I z trzema płatami, przedni płat słabszy niż następne. C mały, spłaszczony. P_4 duży, słabo dwuszczytowy, z mocno ku tyłowi wyciągniętym cingulum (pod protokonid M_1). M_1 duży, z rozszerzonym pod protokonidem cingulum, trzykrotnie większy od M_3 . Wszystkie trzonowe pięcioguzkowe. Endokonid M_3 mały, lecz widoczny. Processus coronoideus łopatowaty, z wyraźnym schodkiem; powierzchnia wyrostka gładka, z lekkim zwężeniem. Crista masseterica z wyraźnym kolcem, łukowata; dolny jej koniec skierowany ku górnej powierzchni stawowej processus condyloideus. Górna powierzchnia stawowa wyrostka kondylarnego wąska, w stosunku do dolnej pod kątem 45° lub mniej. Listwa międzystawowa szeroka, słabo lingwalnie wcięta. Dolna powierzchnia stawowa wyrostka kondylarnego szeroka, końcem lingwalnym zagięta ku dołowi, pośrodku wcięta. Kąt między podstawą ramus ascendens a ramus horizontalis rozwarty. Foramen mentale między korzeniami M_1 a widoczną przed nim spłaszczoną area. Processus angularis szeroki u nasady, krótki, przytępiony, z małym zgrubieniem od strony wewnętrznej. Incisura sigmoidea superior głęboka, wcięta

prawie pod kątem prostym. Incisura sigmoidea inferior nie występuje. Fossa pterygoidea mała, kwadratowata, z małym prożkiem.

Rostrum czaszki wydłużone, nie ścięte. Między I¹ a P⁴ kości szczęk mocno wgłębione. Foramen lacrimale nad tylnym korzeniem M¹. Foramen infraorbitale nad P⁴. Foramina palatini anteriora między I²⁻², z małą, wąską i podłużną szczelinką. Foramina palatini posteriora tuż przed przednimi korzeniami M¹⁻¹. I² mniejszy lub rzadziej równy I³; oba zęby z tyłolingwalnymi piętками. C i P¹ dwukrotnie mniejsze od siecznych, podobne w budowie. P² malutki, okrągławy, bez tyłolingwalnej piętki i podsunięty pod P¹ (niewidoczny z boku). P⁴ trapezowaty od góry, ze zredukowaną częścią protokonusa. Tylne krawędzie M¹ i M² słabo wcięte. M³ trójguzkowy, ze zredukowanym talonem. Foramen nasale prawie jednakowej szerokości na całej wysokości.

Uwagi. — Rodzaj ten podobny jest do *Blarina* Gray budową siecznego z trzema płatami, ogólnym układem zębów trzonowych, łopatomatym processus coronoideus z labialnym kolcem, ogólnym zarysem powierzchni stawowych processus condyloideus, spłaszczoną areą przed foramen mentale, ilością i budową jednoguzkowych górnej szczęki, położeniem foramen lacrimale i infraorbitale, położeniem otworów podniebiennych i budową trzonowych górnej szczęki. Różni się on jednak znacznie większym P₄, z mocnym, wyciągniętym ku tyłowi cingulum, małym i spłaszczonym kłem żuchwy, pięcioguzkowym M₃, silnymi cingulami trzonowców, schodkiem na processus coronoideus, odmienną jednak budową powierzchni stawowych processus condyloideus i szeregiem innych cech, pozwalających na wyodrębnienie w Wężach nowego rodzaju i gatunku.

Neomys soriculoides n. sp.

(pl. III, fig. 4 a-c; text-fig. 5 C, D)

Diagnoza. — I krótki, tępy na końcu, z dwoma płatami i cingulum u podstawy. C mały, ciasno przylegający do I i P₁, jednoguzkowy. P₄ dwuguzkowy, z wygiętym ku tyłowi cingulum, M₃ dwukrotnie mniejszy od M₁, czteroguzkowy. Processus coronoideus niski, smukły, z małym schodkiem. Crista masseterica półksiężycowata, bez kolca. Górna powierzchnia stawowa processus condyloideus wąska, ukośna, lingwalnie przedłużona; dolna zaś szeroka, labialnie zwężona, lingwalnie szeroka i wygięta ku dołowi. Listwa międzystawowa prawie dwukrotnie węższa niż dolna powierzchnia stawowa, labialnie prosta, lingwalnie głęboko wcięta. Incisura sigmoidea superior i inferior głębokie. Processus angularis smukły, krótki, ostry. Fossa pterygoidea mała, owalna, z poprzecznym prożkiem. Foramen mentale pod przednim korzeniem M₁. Kąt między ramionami żuchwy rozwarty. Górna partia processus coronoideus lekko pochylona ku przodowi.

Rostrum czaszki ścięte. Foramen lacrimale między korzeniami M¹ i M². Foramen infraorbitale duże, owalne, nad M¹. Przedni płat I¹ prawie dwukrotnie wyższy od talonu. I² i I³ nieco mniejsze od talonu I¹. prawie równej wielkości. P¹ mały, pod-

sunięty pod P^1 . widoczny z boku. Zęby jednoguzkowe z tylnymi piętakami. Trzonowe wyraźnie z tyłu wcięte. M^3 mały, dwuguzkowy.

Uwagi. — Gatunek ten różni się od pozostałych plio-plejstocenijskich form tego rodzaju: obecnością dwóch płatów na I, wygiętym ku tyłowi cingulum P_4 , czteroguzkowym M_3 , smuklejszym processus coronoideus z małym schodkiem, szerszą listwą międzystawową, małą fossa pterygoidea, mocniej podsuniętym P^1 pod P^4 . Od rodzaju *Soriculus* Blyth różni się budową siecznego żuchwy, czteroguzkowym M_3 , dużym foramen infraorbitale i położeniem P^1 . Podobieństwo występuje tylko w rozmiarach i ogólnym kształcie budowy całej żuchwy.

Suncus zelceus n. sp.

(pl. III, fig. 2 a-b; pl. IV, fig. 1 a-c)

Diagnoza. — Żuchwa drobna, delikatna. I krótki, ze słabymi dwoma płatami. C mały, jednoguzkowy. P_4 wysoki, jednoguzkowy. Oba zęby jednakowej długości, ściśnięte, bez luk. M_3 z małym, silnie zredukowanym talonidem, z reguły trójguzkowy. Cingulum trzonowców lekko wydęte pod protokonidami. Processus coronoideus u podstawy szeroki, szybko zwężający się ku górze, z małym schodkiem. Processus condyloideus niski; górna powierzchnia stawowa krótka, słabo ukośna, dolna silnie lingwalnie wydłużona; obie powierzchnie równoległe. Listwa międzystawowa wąska, równa długości górnej powierzchni stawowej processus condyloideus. Processus angularis krótki, szpilkowaty. Fossa pterygoidea trójkątna, głęboka, ze słabym poprzecznym prożkiem. Foramen mentale między korzeniami P_4 a M_1 . Kąt między ramionami żuchwy lekko rozwarty. Incisura sigmoidea superior i inferior głęboko wcięte.

Uwagi. — *Suncus zelceus* n. sp. różni się od gatunków *S. etruscus* (Savi) i *S. pannonicus* (Kormos): mniejszymi rozmiarami, krótkim siecznym z dwoma płatami, ściśniętymi, bez luk C i P_4 , silnie zredukowanym talonidem M_3 (do trzech guzków), wydęciami cingulum pod protokonidami trzonowców, słabym schodkiem na processus coronoideus, silniej lingwalnie wysuniętą dolną powierzchnią stawową processus condyloideus i jej ułożeniem w stosunku do górnej.

OBJAŚNIENIA DO ILUSTRACJI

Fig. 1 (p. 121)

Podłużny przekrój leja krasowego z brekcją kostną (według J. Samsonowicza, 1934): 1 gleba barwy szarej, 2 rumosz wietrzelinowy, 3 czerwona brekcja z rudą bobową, 4 & 5 „szara“ brekcja, między warstwami brekcji „szarej“ — soczewki brekcji czerwonej, 6 wapień skorupowy barwy różowo-kremowej, 7 glina ceglasta z brekcją kostną i rudą bobową, 8 kalcyt, 9 nacieki wapienia skorupowego i kalcytu, 10 wapień jurajski.

Fig. 2 (p. 127)

Schematyczne rysunki przedstawiające stosowane pomiary: *A* długość żuchwy, *a* całkowita, *b* zasadnicza; *B* wysokość wyrostków stawowych, *a* processus coronoideus, *b* proc. condyloideus, *c* długość proc. angularis.

Fig. 3 (p. 128)

a Budowa processus condyloideus (articularis): *fc. c. sup.* facies condyli superior, *fc. c. inf.* facies condyli inferior, *l. intart.* lamina interarticularis.

b Budowa wyrostków stawowych i tylnej partii żuchwy: *inc. s. sup.* incisura sigmoidea superior, *inc. s. inf.* incisura sigmoidea inferior, *f. ptg.* fossa pterygoidea, *for. mand.* foramen mandibulae, *lim.* limula.

Fig. 4 (p. 146)

1 *Beremendia fissidens* (Petényi): *a* okaz No. 710, fragment rostralny czaszki, z boku, *b* z dołu, *c* zarys otworu nosowego; *d* lewa żuchwa, od wewnątrz (okaz No. 80), *e* dolny szereg zębów bez I, *f* processus condyloideus z tyłu.

2 *Blarinoides mariae* n. sp.: *a* okaz No. 800, fragment rostralny czaszki, z boku, *b* z dołu, *c* prawa połowa górnej szczęki z szeregiem zębów I¹—M² i zaznaczoną szóstą alweolą (P³), *d* zarys otworu nosowego, *e* dolny szereg zębów bez I, *end* endokonid, *f* processus condyloideus z tyłu.

Uwaga: Wyrostki kondylarne i dolne szeregi zębów dwukrotnie powiększone w stosunku do pozostałych ilustracji.

Fig. 5 (p. 149)

A & B Petenyia hungarica Kormos (okaz No. 1009): *A* fragment rostralny czaszki, z dołu, *B* z boku, *C & D Neomys soriculoides* n. sp., holotyp (okaz No. 1109): *C* rostralny fragment czaszki, z dołu, *D* z boku.

Pl. I

Nadtrawiony kwasem octowym blok brekcji kostnej; połowa wielkości naturalnej.

Pl. II

Fig. 1. *Erinaceus samsonowiczi* n. sp., paratyp (okaz No. 1052), prawa żuchwa: *a* od wewnątrz, *b* od zewnątrz, *c* powierzchnia stawowa processus condyloideus.

Fig. 2. *Erinaceus samsonowiczi* n. sp., holotyp (okaz No. 1051), lewa żuchwa od zewnątrz.

Fig. 3. *Desmana nehringi* Kormos, czaszka (okaz No. 1201), *a* z boku, *b* od góry; żuchwa lewa (okaz No. 1204), *c* od zewnątrz, *d* otwór nosowy.

Fig. 4. *Blarinoides mariae* n. gen., n. sp., genoholotyp (okaz No. 803), czaszka, *a* z dołu, *b* górny szereg zębów z I¹—P¹ (schemat).

Fig. 5. *Blarina brevicauda* (Say), czaszka z dołu, współczesna.

Pl. III

Fig. 1. *Suncus pannonicus* (Kormos), prawa żuchwa (okaz No.183), *a* od zewnątrz, *b* processus condyloideus.

Fig. 2. *Suncus zelceus* n. sp., paratyp (okaz No.402), prawa żuchwa, *a* od zewnątrz, *b* processus condyloideus.

Fig. 3. *Petenya hungarica* Kormos, lewa żuchwa (okaz No.48), *a* od wewnątrz; prawa żuchwa (okaz No.9), *b* od zewnątrz; *c* processus condyloideus.

Fig. 4. *Neomys soriculoides* n. sp., holotyp, prawa żuchwa (okaz No. 700), *a* od wewnątrz; holotyp, lewa żuchwa (okaz No.160), *b* od zewnątrz, *c* processus condyloideus.

Fig. 5. *Blarina brevicauda* (Say), prawa żuchwa od zewnątrz, współczesna.

Fig. 6. *Blarinoides mariae* n.sp., paratyp (okaz No. 342), *a* prawa żuchwa od zewnątrz; holotyp (okaz No.178), *b* lewa żuchwa od zewnątrz, *c* od wewnątrz.

Fig. 7. *Beremendia fissidens* (Petényi), lewa żuchwa (okaz No.80), od zewnątrz.

Pl. I-III. Fotografie retuszowane

Pl. IV

Fig. 1. *Suncus zelceus* n. sp., holotyp (okaz No.502), prawa żuchwa, *a* od wewnątrz, *b* od zewnątrz, *c* processus condyloideus.

Fig. 2. *Suncus pannonicus* (Kormos), prawa żuchwa (okaz No.183), *a* od zewnątrz, *b* processus condyloideus.

Fig. 3. *Sorex* cf. *minutus* Linnaeus, lewa żuchwa (okaz No.207), *a* od zewnątrz, *b* processus condyloideus.

Fig. 4. *Crocidura* sp., przednia część lewej żuchwy (okaz No.334), *a* od zewnątrz, *b* od wewnątrz; tylna część lewej żuchwy (okaz No.341), *c* od zewnątrz, *d* od wewnątrz, *e* processus condyloideus.

Fig. 5. *Sorex runtonensis* Hinton, prawa żuchwa (okaz No.1), *a* od zewnątrz, *b* od wewnątrz, *c* processus condyloideus.

Fig. 6. *Sorex* sp. (*S. savini* Hinton?), lewa żuchwa (okaz No.1100), *a* od wewnątrz, *b* od zewnątrz, *c* processus condyloideus.

Fig. 7. *Sorex* sp. (*S. dehnelti* Kowalski?), prawa żuchwa (okaz No.1101), *a* od wewnątrz, *b* od zewnątrz, *c* dolny szereg zębów żuchwy, z góry, bez I.

Fig. 8. *Sorex araneus* Linnaeus, prawa żuchwa (okaz No.500), *a* od wewnątrz, *b* od zewnątrz.

Fig. 9. *Talpa fossilis* Petényi, *a* fragment lewej żuchwy (okaz No.951), od zewnątrz; *b* przednia część lewej żuchwy (okaz No.954) z I₁₋₃ i C, od zewnątrz.

Fig. 10. *Talpa minor* Freudenberg (okaz No.518), prawy fragment żuchwy, od zewnątrz.

Fig. 11. *Erinaceus* sp. (okaz No. 1060), lewy fragment żuchwy bez zębów, od zewnątrz.

Uwaga: Powiększenie wyrostków kondylarnych u Soricidae dwukrotnie większe, aniżeli ilustracje żuchw.

НАСЕКОМОЯДНЫЕ ИЗ ПЛИОЦЕНОВОЙ КОСТНОЙ БРЕКЧИИ В МЕСТНОСТИ ВЕНЖЕ

Резюме

ВВЕДЕНИЕ

Описанные в работе насекомоядные найдены в карстовой воронке, заполненной двумя видами брекчии: „красной” — с обильной примесью остаточных глин и бобовой руды (*terra rossa*) и „серой” — сильно кальцитизированной.

В брекчии находится большое количество костей мелких и крупных позвоночных, главным образом млекопитающих. Остатки пресмыкающихся, амфибий и птиц — немногочисленные.

Кости разбросаны и сильно потресканы, темнубурого и черного цвета. Полости черепов и трубчатых костей заполнены кальцитом.

Материал отпрепарирован раствором уксусной кислоты. В зависимости от сохранности костей применялась концентрация в 5, 10 или 15%. Во избежание вредного действия кислоты, частично отпрепарированные кости смазывано жидким парафином. Выделенные кости пропитывано раствором шеллака.

Характер цемента и чередование слоев указывают на то, что костная брекчия возникла во время нескольких продолжительных климатических циклов. „Красная” брекчия соответствует повидимому периодам жаркого и сухого климата (зоны пустынь и степей), а „серая” — условиям более холодного и влажного климата, свойственного современным зонам южной палеарктики.

Накопленные костные остатки можно подразделить на четыре группы: одни из них — это кости животных постоянно или временно населявших бывшую пещеру, вторые — принадлежат немногочисленным млекопитающим и пресмыкающимся, случайно попавшим в эродированную уже пещеру, другие являются остатками притащенными хищными млекопитающими и птицами, а остальные принадлежат разным животным, которые погибли в близости и принесены в пещеру и ущелья в периоды ливней.

Возраст брекчии из местности Венже определен на основании изученных до сих пор хищных и насекомоядных. Верхние слои брекчии (известняковый щебень) причислено к верхнему плиоцену и нижнему плейстоцену, а может быть и к первому межледниковому периоду, нижние — отнесены к верхнему миоцену и нижнему плиоцену.

В составе фауны насекомоядных, кроме новых видов (см. описание и таблицы измерений в английском тексте), находятся: *Erinaceus* sp. (близкий *E. lechei* Kormos), *Galemys* (?) sp. (возможно что это *Mygalina hungarica* (Kormos)), *Desmana nehringi* Kormos, *Talpa minor* Freudenberg, *Talpa fossilis* Petényi, *Talpa* sp. (по всей вероятности *T. europea* L. (*fossilis*)), *Sorex runtonensis* Hinton, *Sorex araneus*

Linnaeus, *Sorex* cf. *minutus* Linnaeus (не исключено *S. minutissima* Heim de Balsac), *Sorex* sp. (остатки принадлежащие по всей вероятности к двум видам: *S. savini* Hinton и *S. dehnelti* Kowalski), *Beremendia fissidens* Petényi (многочисленный), *Petényia hungarica* Kormos, *Crocidura* sp. (повидимому новый вид, немногочисленный) и *Suncus pannonicus* (Kormos).

В фауне хищных и насекомоядных можно выделить две группы. Первая состоит из форм южной фауны зоны пустынь и степей, вторая — из палеарктических видов обитающих во влажных и теплых районах разного ландшафта, похожего на современный.

Новый род *Blarinoides*, морфологически, а повидимому и генетически, близок американскому *Blarina* Gray, является по всей вероятности миоценовым реликтом и очевидно вымер еще в первой половине плиоцена вследствие похолодания климата.

В работе обсуждено взаимное соотношение между видами *Beremendia fissidens* (Petényi), „*Blarina ucrainica*” Pidopličko и *Paracryptotis rex* Hibbard, вместе с их местом в систематике, географическим и стратиграфическим распространением и происхождением.

Общая часть работы содержит замечания о некоторых измерениях, исполнении иллюстрации, введении новых морфологических терминов, применении упрощенного разделения образцов на классы разного возраста, степени окраски зубов, ее таксономическом значении и о номенклатуре однобугорчатых зубов верхней челюсти у *Soricidae*.

В описании даны подробные сведения о новых видах и дополнение данных касающихся изменчивости и морфологических различий известных уже видов.

ДИАГНОЗЫ НОВЫХ ВИДОВ

Erinaceus samsonowiczi n. sp.

(пл. II, фиг. 1 а-с & 2)

Диагноз.— I_1 широкий у основания, с острым режущим краем. С — большой, несколько передвинут в лабиальном направлении. P_4 с высоким, острым, вертикальным параконидом; протоконид острый, изогнутый назад; метаконид низкий, тупой. Передний край параконида P_4 слабо заостренный. Параконид на M_3 редуцированный, в виде небольшого сучка. Лабиальная сторона восходящей ветви (в fossa masseterica) с отчетливым и невысоким гребнем. Угол между ветвями челюсти почти прямой. Foramen mentale между P_4 и M_1 , значительно более низкий чем у современного ежа. Суставная поверхность на processus condyloideus широкая, почти перпендикулярная к восходящей ветви, с расширенным лингвальным эллипсом. Processus angularis широкий у основания.

Род *Blarinoides* n. gen.

Генологотип *Blarinoides mariae* n. sp.

(пл. II, фиг. 4 a-b; пл. III, фиг. 6 a-c; текст-фиг. 4: 2 a-f)

Диагноз.— Зубная формула $\frac{3 \ 1 \ 3 \ 3}{1 \ 1 \ 1 \ 3} = 32$. I — с тремя лопастями. Передняя

лопасть сильнее задних. С — маленький, плоский. P₁ большой, слабо двухбугорчатый, с сильно вытянутым назад (под протоконид M₁) cingulum. M₁ большой с расширенным и вздутым вниз под протоконид cingulum. M₃ три раза меньший чем M₁, пятибугорчатый (энтоконид видимый). Processus coronoideus лопатовидный, с отчетливой ступенькой. Суставная поверхность processus coronoideus гладкая, без сужения. Crista masseterica с отчетливым шипом, дугообразная, нижним концом обращенная к верхней суставной поверхности на processus condyloideus. Верхняя суставная поверхность узкая, расположена под углом 45° по отношению к нижней челюсти. Межсуставная пластинка широкая, со слабой лингвальной вырезкой. Нижняя суставная поверхность на processus condyloideus широкая, с согнутым вниз лингвальным концом с вырезкой посредине. Угол между основаниями восходящей и горизонтальной ветви тупой. Foramen mentale между корнями M₁ и плоской площадкой спереди его.

Ростр черепа удлинённый, нескосенный. Между M¹ и P¹ кости челюстей сильно углубленные. Foramen lacrimale над задним корнем M¹. Foramen infraorbitale над P⁴. Foramina palatini anteriora между I²⁻²; между ними находится небольшая, продолговатая щель. Foramina palatini posteriora тут же перед передними корнями M¹⁻¹. I² меньший, реже равный I³; оба — с заднелингвальными пятками. С и P¹ вдвое меньше чем резцы, похожи по строению. P² маленький, округленный, лишен заднелингвальной пятки, всунутый под P⁴, не видимый сбоку. P⁴ сверху трапецевидный. Задние края M¹ и M² со слабой вырезкой. M³ трехбугорчатый, с редуцированным талоном. Носовое отверстие почти одинаковой ширины на всех уровнях.

Род до сих пор монотиповый.

Neomys soriculoides n.sp.

(пл. III, фиг. 4 a-c; текст-фиг. 5 C, D)

Диагноз.— I — короткий, с тупым концом, с двумя лопастями и cingulum у основания. С — небольшой, тесно прилегающий к I и P₁, однобугорчатый. P₄ двухбугорчатый, с изогнутым назад cingulum. M₃ вдвое меньший чем M₁, четырехбугорчатый. Processus coronoideus низкий, тонкий, с небольшой ступенькой. Crista masseterica имеет форму полумесяца, лишена шипа. Верхняя суставная поверхность на processus condyloideus узкая, диагональная, удлиненная лингвально; нижняя — широкая уже лабиально, более широкая лингвально изогнута вниз. Межсуставная пластинка почти вдвое уже нижней суставной по-

верхности, прямая лабиально, лингвально с глубокой вырезкой. *Incisura sigmoidea superior* и *inferior* глубоко врезаны. *Processus angularis* тонкий, короткий, острый. *Fossa pterygoidea* небольшая, овальная, с небольшим поперечным порогом. *Foramen mentale* под передним корнем M_1 . Угол между ветвями нижней челюсти тупой. Верхняя часть *processus coronoideus* наклонена немного вперед.

Ростр черепа скошенный. *Foramen nasrimale* между корнями M^1 и M^2 . *Foramen infraorbitale* большое, овальное, над M^1 . Передняя лопасть I^1 почти вдвое высшая чем талон. I^2 и I^3 меньшие чем талон I^1 . I^3 более низкий чем I^2 . P^1 небольшой, подвинут под P^4 , видимый сбоку. Однобугорчатые с пятками *sad-di singulum*. Протоконус P^4 направлен несколько назад. Коренные зубы с отчетливой вырезкой сзади. M^3 небольшой, двухбугорчатый.

Suncus zelceus n. sp.

(пл. III, фиг. 2 a-b; пл. IV, фиг. 1 a-c)

Диагноз.— Нижние челюсти мелкие, тонкие. I — короткий, с двумя слабыми лопастями. C — небольшой, однобугорчатый. P_4 высокий, однобугорчатый. Оба зубы одинаковой длины, тесно прижаты друг к другу. M_3 с небольшим, сильно редуцированным талонидом, трехбугорчатый. *Singulum* коренных зубов с небольшим вздутием под протоконидами. *Processus coronoideus* широкий у основания, скоро суживающийся кверху, со слабой ступенькой. *Processus condyloideus* низкий. Верхняя суставная поверхность короткая, несколько диагональная; нижняя сильно удлиненная лингвально; обе поверхности параллельны друг к другу. Межсуставная пластинка узкая, с длиной равной верхней суставной поверхности *processus condyloideus*. *Processus angularis* короткий, игловидный. *Fossa pterygoidea* трехугольная, глубокая, со слабым поперечным порогом. *Foramen mentale* между корнями P_4 и M_1 . Угол между ветвями нижней челюсти несколько тупой. *Incisura sigmoidea superior* и *inferior* очень отчетливы, глубокие.

EXPLANATIONS OF PLATES

Pl. I

A block of bone breccia etched with acetic acid; one half the natural size.

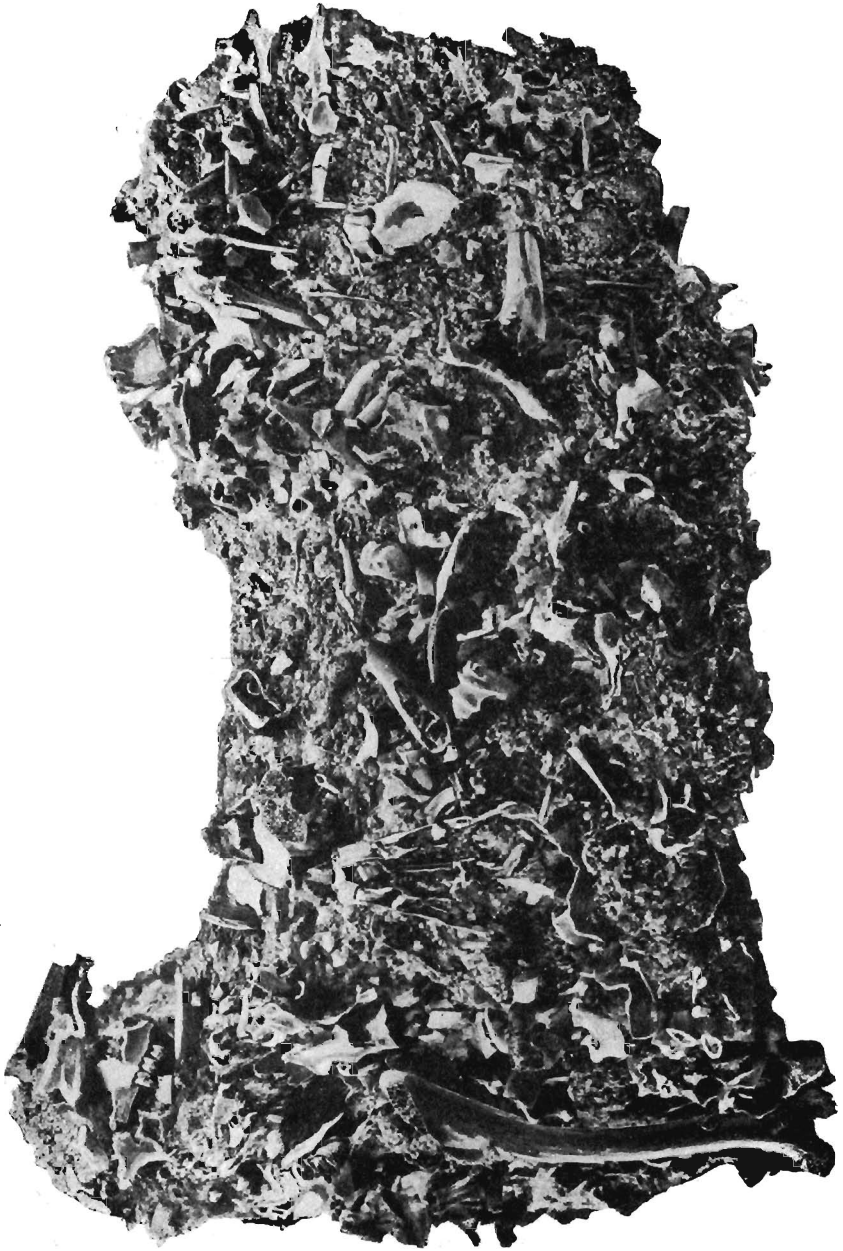
Pl. II

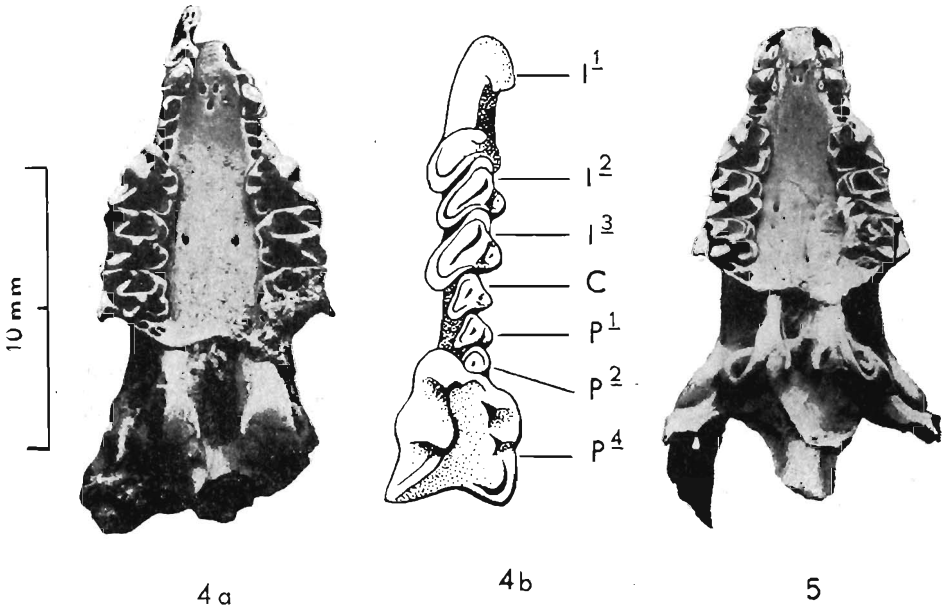
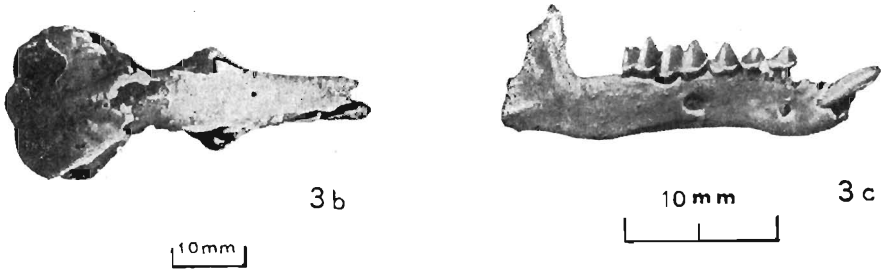
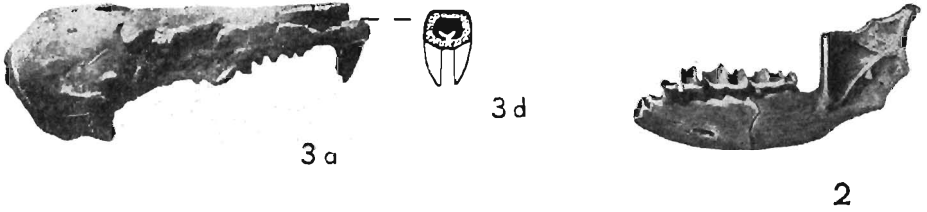
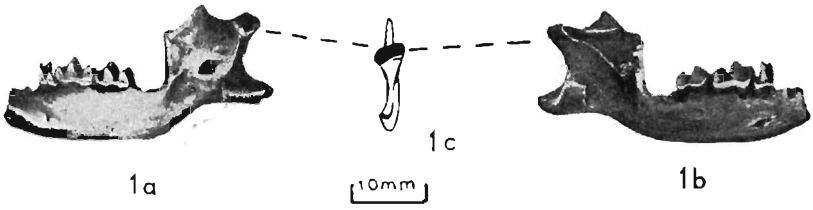
- Fig. 1. *Erinaceus samsonowiczi* n. sp., paratype (spec. No. 1052), right mandible: *a* inner view, *b* outer view, *c* articular facet of condyloid process.
- Fig. 2. *Erinaceus samsonowiczi* n. sp., holotype (spec. No. 1051), outer view of left mandible.
- Fig. 3. *Desmana nehringi* Kormos, skull (spec. No. 1201), *a* side view, *b* top view; right mandible (spec. No. 1204), *c* outer view, *d* nasal foramen.
- Fig. 4. *Blarinoides mariae* n. gen., n. sp., genoholotype (spec. No. 803): *a* ventral view of skull, *b* upper tooth-row with I¹—P⁴ (scheme).
- Fig. 5. *Blarina brevicauda* (Say), bottom view of skull, recent.

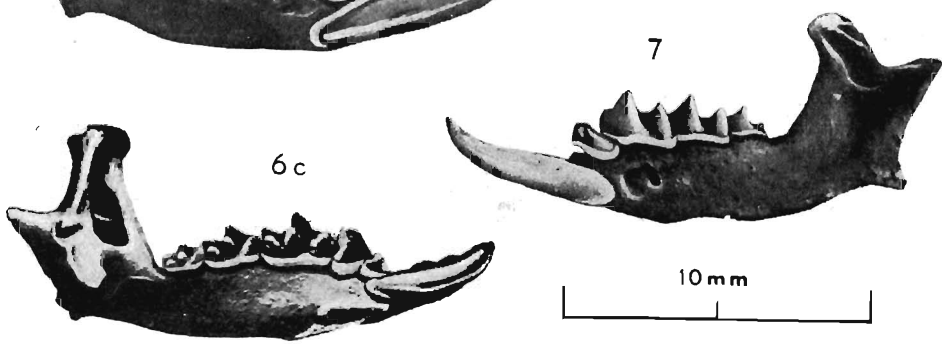
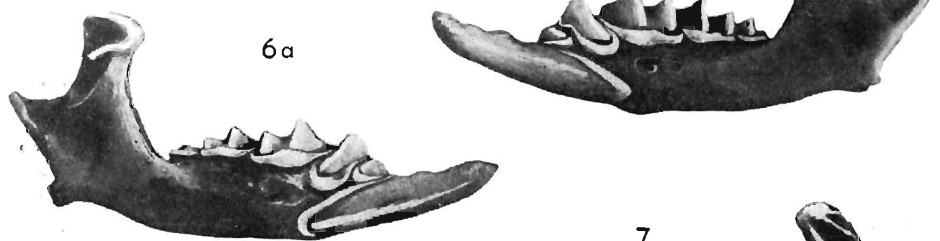
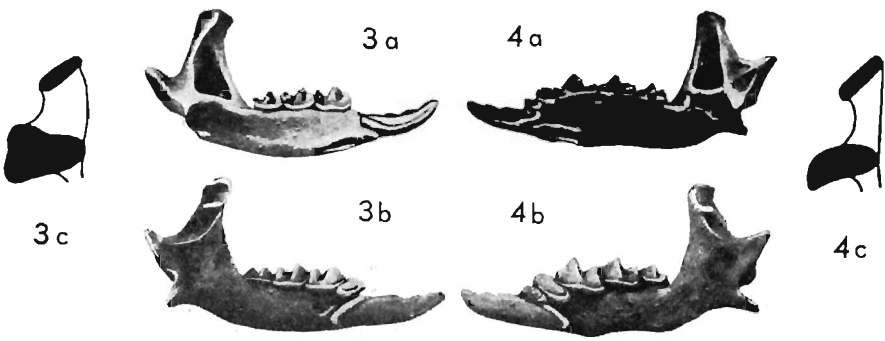
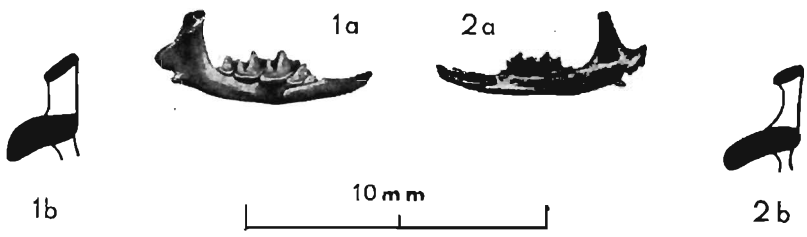
Pl. III

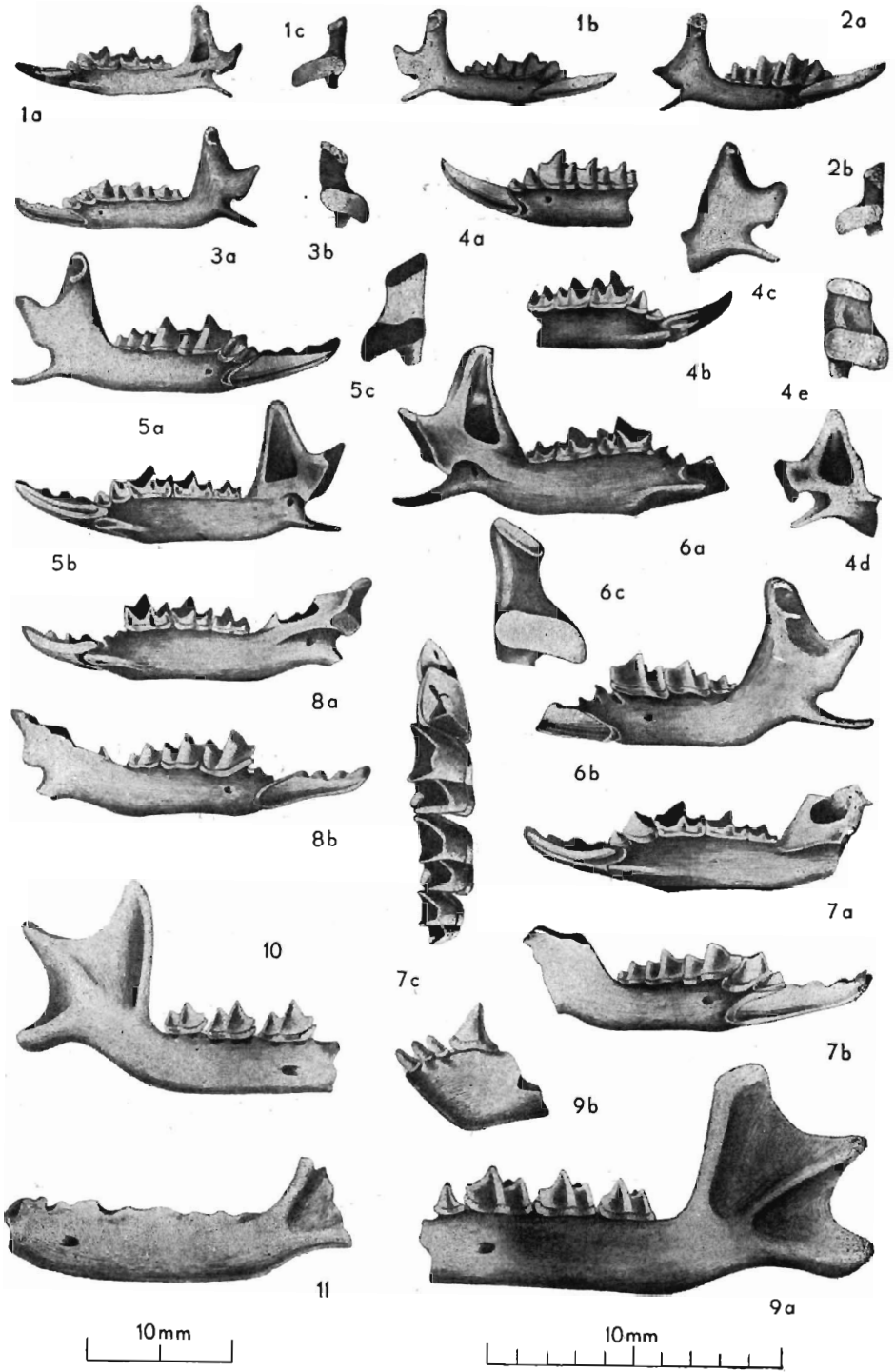
- Fig. 1. *Suncus pannonicus* (Kormos), right mandible (spec. No. 183), *a* outer view, *b* condyloid process.
- Fig. 2. *Suncus zelceus* n. sp., paratype (spec. No. 402), right mandible, *a* inner view, *b* condyloid process.
- Fig. 3. *Petenymia hungarica* Kormos, left mandible (spec. No. 48), *a* inner view; right mandible (spec. No. 9), *b* outer view, *c* condyloid process.
- Fig. 4. *Neomys soriculoides* n. sp., holotype, right mandible (spec. No. 700), *a* inner view; holotype, left mandible (spec. No. 160), *b* outer view, *c* condyloid process.
- Fig. 5. *Blarina brevicauda* (Say), outer view of right mandible, recent.
- Fig. 6. *Blarinoides mariae* n. sp., paratype (spec. No. 342), *a* outer view of right mandible; holotype (spec. No. 178), *b*, *c* outer and inner views of left mandible.
- Fig. 7. *Beremendia fissidens* (Petényi), left mandible (spec. No. 80), outer view.

Pl. I-III. Photographs are retouched.









Pl. IV

- Fig. 1. *Suncus zelceus* n.sp., holotype (spec. No. 502), right mandible, *a* inner view, *b* outer view, *c* condyloid process.
- Fig. 2. *Suncus pannonicus* (Kormos), right mandible (spec. No. 183), *a* outer view, *b* condyloid process.
- Fig. 8. *Sorex* cf. *minutus* Linnaeus, left mandible (spec. No. 207), *a* outer view, *b* condyloid process.
- Fig. 4. *Crocidura* sp., anterior part of left mandible (spec. No. 334), *a* outer view, *b* inner view; posterior part of left mandible (spec. No. 341), *c* outer view, *d* inner view, *e* condyloid process.
- Fig. 5. *Sorex runtonensis* Hinton, right mandible (spec. No. 1), *a* outer view, *b* inner view, *c* condyloid process.
- Fig. 6. *Sorex* sp. (*S. savini* Hinton?), left mandible (spec. No. 1100), *a* inner view, *b* outer view, *c* condyloid process.
- Fig. 7. *Sorex* sp. (*S. dehneli* Kowalski?), right mandible (spec. No. 1011), *a* inner view, *b* outer view, *c* top view of lower tooth-row of mandible without I.
- Fig. 8. *Sorex araneus* Linnaeus, right mandible (spec. No. 500), *a* inner view, *b* outer view.
- Fig. 9. *Talpa fossilis* Petényi, *a* fragment of left mandible (spec. No. 951), outer view; *b* anterior part of left mandible (spec. No. 954) with I₁₋₃ and C, outer view.
- Fig. 10. *Talpa minor* Freudenberg (spec. No. 518), outer view of right mandible fragment.
- Fig. 11. *Erinaceus* sp. (spec. No. 1060), outer view of left mandible fragment without teeth.

Remark: Condyloid processes in Soricidae enlarged twice as much as the mandibles illustrations.
