PANNONICTIS PLIOCAENICA N. G., N. SP., A NEW GIANT MUSTELID FROM THE LATE PLIOCENE OF HUNGARY

By TH. KORMOS, Ph. D. (Budapest)

(WITH PLATE III.)

ZWEI SCHÄDELHÖHLEN-STEINKERNE VON PANNONICTIS PLIOCAENICA KORMOS

von Dr. TILLY EDINGER (Frankfurt a/M.)

(Mit 3 Textabbildungen.)

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Sämtliche Zeichnungen und Umzeichnungen sind von G. WINTER v. MOELLENDORFF.

I.

Pannonictis pliocaenica n. g., n. sp., a new giant Mustelid from the Late Pliocene of Hungary.

By Th. Kormos, Ph. D. (Budapest).

(With Plate III.)

Opposite to the railway station of Villány (County of Baranya, S. Hungary) rises the Bányahegy (Kalkberg). Here I found, in 1917, a breccia full of remains of Preglacial Vertebrates. Due to the lack of the necessary equipment and outfit I could not exploit the occurrence. The breccia filled out originally a crack in the limestone, and a pillar of it was left in the quarry, which could be approached only by means of ropes and ladder. At the foot of the pillar I collected several bone fragments, and amongst them some canines of a Carnivore. The shape and the dimensions of them reminded me very much of the canines of *Gulo Schlosseri* Kormos from Püspökfürdő (near Nagyvárad). At the time being, I could not examine more closely the remains, and returning home I put the canines aside, with the convinction that I found the Preglacial ancestor of the recent glutton in the mountains of Villány too.

I could visite the locality only five years later. The first result of the systematical exploitation was the fragment of the left mandible of a Carnivore which had the size of a badger. Except the canine and the carnassial (m_1), all the other teeth were missing. However, these two teeth have been sufficient to enable me to recognize that the canine is exactly like those which I found in 1917, and which I thought to belong to *Gulo*. At the same time I could establish that the carnassial has a totally different shape from the carnassial of *Gulo*.

The first lower molar of *Gulo* has only a paraconid, protoconid and talonid, as in the case of the polecat, ermine and the weasel, and is absolutely devoid of the inner lingual tubercle: the metaconid, which is so characteristic of the marten and the otter, etc. The carnassial of the mandibulary fragment from Villány shows a well developed metaconid, and a talonid with a cup-shaped groove, which shows that this Carnivore has no relationship to *Gulo*, in spite of the apparent likeness of its canine. During the course of the last

eight years I visited Villány ten times, and the last year I finished the exploitation of the bone breccia. As a result of my collections I had more than two hundred bones of the above mentioned Carnivore in my possession, amongst them two almost complete skulls and 42 fragments of mandibles.

On basis of the rich material, I can give the most conspicuous features of the skull and the dentition of the giant Mustelid in the following:

Snout short, stout, as regards the shape of its profile: intermediate between the badger and the glutton; nasal cavity narrow and high; nasal sinuated in the region of the third incisive's root; interior edge of orbit rounded, salliant, the maxillary presenting a deep furrow before the lacrimal; infraorbital foramen small (smaller than in the badger, but larger than in the glutton); zygomatic process of maxillary strongly developed, though the zygomatic arch being comparatively slender; forehead broad and scarcely constricted behind the feebly developed postorbital processes; sagittal crest strongly marked; occipital crest — formed by the meeting edges of the parietal and supraoccipital — projecting moulding-like caudad, a deep sinuous groove occurring beneath it and extending to the condyles. Such an extreme development of the occipital moulding is very peculiar to, and highly characteristic of, the Mustelid here discussed. Palatal part of maxillary rather broad; palatum durum — so far as may be stated on the strength of the injured skull — of moderate length (perhaps somewhat shorter than in the case of the badger); squamosum, together with the glenoid process, *Gulo*-like; tympanic bulla large, strongly projecting, mastoid process of considerable bulk; basioccipital and basisphenoid narrow.

Mandible very massive, stout; symphysial region bulky; angular process very short; upper border of coronoid process obliquely flattened caudad; number of mental foramina 1 to 2; teeth standing in a straight, not curved, line.

$$\text{Formula of normal dentition: } \frac{1\ 3\ 1\ 3 \quad 3\ 1\ 3\ 1}{2\ 3\ 1\ 3 \quad 3\ 1\ 3\ 2} = 34.$$

The first premolar, originally present in the dentition formula of the *Mustelidae*, is, thus, generally absent except in those cases, in which it occurs in an atavistic and extremely rudimentary state, as, for instance, on the right side of one of the skulls, and in one of the lower jaw fragments.

The canines, especially the hook-like lower ones, are strongly and deeply furrowed, wrinkled; lower canines provided with a generally well developed collar-like cingulum above the base of the crown; in the upper canines the cingulum, as well as the wrinkled condition of the enamel, are less pronounced, on the very anterior side there is, however, a more or less deep fullering of variable size. These characteristics of the canines are such

that they may be compared to those conditions only, which I have found in the South American *Grison («Galictis»)*.

All of the lower premolars, and the 2nd and 3rd upper ones, are unicusped; upper carnassial very peculiar in shape, its paracone being surrounded by a very strong cingulum which, on the lingual side, forms a triangular, cup-like excavation, and extends caudad beyond the middle line of the tooth, the crown thus assuming, in ventral aspect, the shape of an equilateral triangle. This is a character in which the giant Mustelid of Villány most markedly differs from either the otter and badger, or the glutton, the marten and the polecat. Among recent Mustelids it is only the members of the «*Galictis*» Group *(Thayra, Grison)*, that possess a similar upper carnassial, such case especially obtaining with *Grison*. The latter genus is, at the same time, the unique Mustelid in which I found the upper border of the mandible's coronoid process to be obliquely flattened caudad, similarly to the conditions concerned that are standing out in the Villány fossil Mustelid.

The rhombiform upper first molar (which is the true molar present in the upper jaw), as well as the lower carnassial that presents a well developed metaconid and a broad, cup-like excavated talonid, are also characters in which the Villány fossil proves to be most like the polecat- or marten-sized *Grison*.

Howsoever strange it might appear, it is a matter of fact that specimens with milk dentition were not found. All individuals examined by the writer, proved to be adult — in spite of the considerable difference occurring in their size, such difference being of a more striking kind than is usually met with, in Mustelids, as an expression of sexual dimorphism. It should be noted, furthermore, that the extreme variants in the dentition of this fossil Mustelid are connected with each other by a continuous series of gradations occurring both in shape and size.

The form in question undoubtedly proves to have been of terrestrial habits, exhibiting characters due to a rather heterogenous mode of differentiation, resulting in the union of ancestral peculiarities with modern ones. I propose for this interesting, badger-sized Mustelid, which cannot be identified with any of the known genera and species, the name *Pannonictis pliocaenica*, n. g., n. sp.

Type of both the genus and species: fragmentary skull — crushed and deformed by the mechanical power of superincumbent rocks, but exhibiting the complete maxillar dentition — and right lower jaw lacking the incisives and the m_2. Figured on Pl. III, Figs. 1, 1a, 2 and 3. Nos. Ob/3594, 3596 and 3600, Royal Geological Institute of Hungary.

Find place: Kalkberg at Villány, County of Baranya, S. Hungary.

Geological age: Late Pliocene.
Horizon: Cromerian, corresponding to the Norwich and Weybourne Crag.

Measurements of teeth:

No.	Ob/3594	greatest length and width of crown of							i_3	sup. sin.	:	3·8,	2·7
„	Ob/3594	„	„	„	„	„	„	„	i_2	„ „	:	3·9,	3·0
„	Ob/3594	„	„	„	„	„	„	„	i_1	„ „	:	5·5,	4·5
„	Ob/3594	„	„	„	„	„	„	„	c	„ „	:	9·8,	8·6
„	Ob/3594	„	„	„	„	„	„	„	p_1	sup. dext.	:	2·1,	1·7
„	Ob/3594	„	„	„	„	„	„	„	p_2	sup. sin.	:	5·5,	3·5
„	Ob/3594	„	„	„	„	„	„	„	p_3	„ „	:	7·7,	4·5
„	Ob/3594	„	„	„	„	„	„	„	p_4	„ „	:	13·2,	8·3
„	Ob/3594	„	„	„	„	„	„	„	m_1	„ „	:	6·8,	12·8
„	Ob/3596	„	„	„	„	„	„	„	c	inf. dext.	:	11·0,	7·3
„	Ob/3596	„	„	„	„	„	„	„	p_2	„ „	:	5·5,	3·2
„	Ob/3596	„	„	„	„	„	„	„	p_3	„ „	:	6·7,	4·0
„	Ob/3596	„	„	„	„	„	„	„	p_4	„ „	:	7·7,	4·2
„	Ob/3596	„	„	„	„	„	„	„	m_1	„ „	:	15·3,	6·8
„	Ob/3596	„	„	„	„	„	„	„	m_2	„ „	:	—	—
„	Ob/3600	„	„	„	„	„	„	„	p_3	„ „	:	6·7,	4·3
„	Ob/3600	„	„	„	„	„	„	„	p_4	„ „	:	8·2,	4·3
„	Ob/3600	„	„	„	„	„	„	„	m_1	„ „	:	15·4,	6·3

Pannonictis was also found, by the writer, at Beremend and Csarnóta (County of Baranya, S. Hungary), in the synchronous ossiferous breccia, whilst it is absent in the somewhat younger fauna of the Nagyharsány Hill near Villány. The species is rare in Püspökfürdő, though the Preglacial deposits of this place are approximately of the same age as those of the Villány Kalkberg. It is a most interesting fact that *Pannonictis* is substituted, in Püspökfürdő, by an other Mustelid, of about the size of *Pannonictis*, i. e. *Gulo Schlosseri* KORM., which, in turn, was not found, up to now, in Villány and Beremend, though in Püspökfürdő it is to be met with nearly as often as *Pannonictis* at Villány.

On account of the local conditions obtaining in the Kalkberg find place at Villány, it seems most probable that *Pannonictis* found a convenient dwelling in the Late Pliocene cave that occurred, of yore, on the top of the Kalkberg, and which fell victim to the quarrying business of some decades ago. This cave was filled up with ossiferous breccia — a useless material for industry — to which fact its fortunate preservation is due. This breccia contains thousands of bones of birds, hares, rabbits, hamsters,

voles and other small mammals, a great part of which obviously constitutes the remains of the diet of *Pannonictis*.

* * *

FORSYTH MAJOR described, in 1901, from the Pleistocene (Preglacial?) bone breccia of San Giovanni near Iglesias in Sardinia, the skull of a Mustelid named, by him, *Enhydrictis galictoides*.[1]) The skull, «in the general shape of its upper contour, the only part at first exposed, presented absolute analogy with that of a *Lutra*. Both the facial and the cranial portions are extremely flattened, the latter besides considerably expanded laterally; the frontal region behind the postorbital processes is elongate and contracted, the rostrum short and broad, the orbits elevated, the infraorbital foramen large.

«The ventral region of the skull was at first concealed by strongly adhering stalagmitic matrix; when this was disengaged, remarkable divergences from the *Lutra* became apparent. The posterior portion of the region still recalls *Lutra* by its lateral expansion, flattened *bullae osseae*, and broad basioccipital and basisphenoid. But the broad palatal region between the teeth, and the very elongate bony palate behind the tooth-series, are in striking contrast with all known species of *Lutra*, and approach on the other hand to some genera of the Mustelinae, viz. *Putorius* and *Galictis*.» (Op. cit., p. 625—626.)

It should be noted that the upper carnassial of this lutroid, decidedly aquatic Carnivore resembles, on the strength of MAJOR's description, very much that of the terrestrial *Pannonictis*. On the other hand, MAJOR points at the fact that *Enhydrictis* most approaches, in this respect too, *Galictis*.

The type of *Enhydrictis* was preserved in the British Museum, where, however, it seems to have, somehow, gone astray. No drawings were published by MAJOR. But Miss BATE, to whom I applied in this matter, kindly informs me that some drawings were recently found in the literary property left by MAJOR, this drawings being about to be published in a paper of hers, dealing with Sardinian finds recently acquired. From the Basle Museum I received, for inspection, the fragment of a left lower jaw, labelled as *Enhydrictis*, which was collected by MAJOR at San Giovanni, probably after his having published the description of the skull. This mandible is so very much like those of the small (♀?) specimens of *Pannonictis*

[1]) FORSYTH MAJOR: The Skull of a fossil aquatic Musteline animal from the Pleistocene ossiferous breccia of Sardinia. P. Z. S., London, 2, 1901, p. 625.

that it appears doubtful to me whether it might really be referred to *Enhydrictis*. The sole difference between this jaw and the mandible of *Pannonictis* lies in the first molar's metaconid being situated in one line with the protoconid, the talonid being, therefore, narrower and more elongate than in *Pannonictis*.

It is evident, of course, that *Pannonictis,* the skull of which proves to be, with respect to its characteristics, on the whole, intermediate between that of the badger and the glutton, thus most decidedly pointing toward a terrestrial mode of life, can, by no means, be identified with the aquatic *Enhydrictis* described by MAJOR, which exhibits, with the exception of a few details, troughout lutroid features. Taking such evidence into consideration, it appears especially interesting that there exists a far reaching resemblance between the dentition of *Pannonictis* and *Enhydrictis,* both of them standing nearest to the representatives of the «*Galictis*» group.

ZDANSKY[2]) described, in 1927, from the Upper Miocene *Hipparion* beds of China, a large-sized Mustelid, the systematical position of which he was unable to ascertain, for the lower m_1 was lacking in the jaw. ZDANSKY looks upon this fossil as representing a new species, the generic identification of which proves, at present, impossible. This form, referred to by ZDANSKY under the denomination of «Mustelide gen. indet. sp. n.», shows, despite all differences, a series of characters entering the generic confines of *Pannonictis*. Within the compass of such resemblances, the shape of the upper carnassial is of an outstanding moment, for it is very like that of *Grison,* and almost absolutely identical with that of *Pannonictis*. I do not think it, therefore, impossible that the Mustelid described and figured by ZDANSKY should prove a more ancient representative of the genus *Pannonictis,* bearing, in such early stage of biohistorical development, four premolars, because of the p_1's being still fully developed.

H. v. MEYER described the genus *Trochictis* based upon a find originating from the Miocene deposits of Käpfnach near Zurich, this genus figuring, in literature, as containing a couple of species established by BLAINVILLE, GERVAIS, FILHOL, LARTET and others; the specific and generic identification of the remains concerned, proved, however, to be partly erroneous. So far as I am informed, all these species are based upon more or less fragmentary lower jaws. The same fact is elucent from L. MAYET's monographic «Etude des Mammifères Miocènes des sables de l'Orléanais et des Faluns de la Touraine»[3]) in which the species of the genus are referred to; two new forms are, moreover, here described, viz. «*Trochictis zibethoïdes,*

[2]) ZDANSKY, O.: Weitere Bemerkungen über fossile Carnivoren aus China. Palaeont. Sinica, Ser. C, IV, 4, Peking, 1927, p. 17, Taf. I, Fig. 26, Taf. II, Fig. 1—3.

[3]) Ann. Univ. Lyon, N. Sér., I. Sciences, Médecine, Fasc. 24, Lyon, Paris, 1908.

BLAINVILLE, sp. mut. *Noueli*» from the Burdigalian of Artenay, N of Chevilly, Orléanais, France, and «*Trochictis zibethoïdes,* mut. *Florancei*» from the Burdigalian of Pontlevoy-Thenay, Blésois, France. In both of the latter instances we are in front of lower jaws, one specimen of each species — for I believe that the forms described by MAYET are rather species than «mutations» —, both remains presenting the carnassial undamaged. Both of these carnassials exhibit the metaconid («pointe interne»); the carnassial of the Artenay specimen is robust, whilst that of the Blésois one proves slender. In the latter the p_4 is well preserved, its posterior border being interrupted by a clearly developed metaconid; unfortunately, the crown of the p_4 is broken off in the Artenay specimen, so that, in this case, no inference can be made from this highly important element. It is interesting to remark that the carnassial of the Artenay specimen is very like that of *Pannonictis* in which, however, the metaconid mentioned in the p_4 is absent. In addition to these considerations I have to remark that the perfectly preserved canine of the Blésois specimen bears lateral «fullerings» recalling also in this respect the conditions exemplified by the anterior surface of the upper canine's crown in *Pannonictis.*

As regards the relationship of the genus now discussed, MAYET writes as follows:

«Le *Trochictis zibethoïdes* me paraît avoir été un carnassier très voisin des Loutres. La remarque en a été faite déjà, pour le *T. hydrocyon*, par M. FILHOL. On ne peut guère le confondre pourtemps avec la Loutre actuelle portant trois prémolaires seulement.» (Op. cit., p. 309.)

It should be pointed out, however, that the pertainance of MAYET's specimens to *Trochictis* appears to be very doubtful. In this respect I refer to H. HELBING's recent investigations on the subject[4]), which show that the forms described by MAYET are — in spite of their close resemblance to *Mustela zibethoïdes* BLAINV. from Sansan, which also was regarded by FILHOL[5]) as belonging to *Trochictis* — by no means to be classified with *Trochictis.*

FORSYTH MAJOR's paper previously cited, apparently escaped MAYET's attention, for MAJOR had already thrown, in that publication of his, some light upon the question, and this precisely in connection with a *Trochictis* skull found, by him, in France. MAJOR's statement concerned sounds as follows:

[4]) H. HELBING: Zur Definition des Genus *Trochictis.* Eclogae Geol. Helv., XX, 2, 1927, p. 302.

[5]) H. FILHOL: Études sur les mammifères fossiles de Sansan. Ann. des Sciences Géol., XXI, 1891, p. 105.

«It was therefore natural to search for related forms with *Enhydrictis* amongst the Tertiary Carnivora, with the result that the Middle Miocene *Trochictis* is the only known Tertiary genus in which the upper carnassial is almost identical with those of *Enhydrictis* and *Galictis*.

«The recorded species of *Trochictis* are based on more or less perfect mandibular jaws, and the genus has been classed with the Melinae. An imperfect skull with a mandibular ramus attached, obtained by me in the quarries of La Grive-Saint-Alban, which is now in the British Museum, shows that the upper jaw of this genus has already been described under various names, from Steinheim by O. FRAAS *(Palaeomephitis jaegeri,*[6]) *Lutra dubia*[7]), and from La Grive by DEPÉRET and GAILLARD *(Mustela filholi* DÉP.)[8]). *Trochictis* has on the whole less affinities with the Melinae than with the Mustelinae, and amongst the latter especially with *Galictis* and *Enhydrictis;* to judge from the comparatively small infraorbital foramen and the largely developed bullae osseae, it was not amphibious.» (Op. cit., p. 627.)

Trochictis was, thus, of terrestrial habits, in the same way as *Pannonictis* and ZDANSKY's unidentified giant Mustelid from the Hipparion beds of China.

On such grounds of evidence it proves to be obvious that MAYET's inference based upon the bionomical valuation of the mandible, resulting in the establishment of the existence of some connection between *Trochictis* and *Lutra,* was merely due to the want of sufficient material. Otherwise, the number of premolars cannot be regarded, in the present case, as decisively bearing upon classification. It should be remembered, in this place, that both *Enhydrictis* and *Pannonictis* are provided with three premolars — just as *Lutra* — though *Pannonictis* being terrestrial, like *Trochictis,* whilst *Lutra* and *Enhydrictis* are known as amphibious animals. *Potamotherium Valetoni* GEOFF., on the other hand, which is a typical Miocene otter, is still in possession of the four premolars originally characteristic of the *Mustelidae.*

Regarding the classification of *Trochictis,* HELBING's following inference should be quoted as of conclusive import:

«Die Definition des Genus Trochictis kann sich also vorderhand nur auf Belege der mandibularen Bezahnung stützen, doch ist das odontologische Detail, das wir derselben entnehmen, charakteristisch genug, um der Gruppe ihre generische Selbständigkeit zu sichern.

[6]) Württ. Nat. Jahresh. XVIII, pp. 129, 130, Taf. II, Fig. 18 (1862).

[7]) Ib. XXVI, pp. 164, 165 (1870),

[8]) Arch. Mus. Hist. Nat. Lyon, IV, p. 129, Pl. XIII, Fig. 55 (1887); V, p. 24, Pl. I, Figs. 8, 9 (1892).

Das Genus Trochictis umfasst eine Anzahl unter- und mittelmiozäner Musteliden von verschiedener Grösse, deren mandibularer Reisszahn durch ein Trigonid mit relativ niederem Haupthügel und ein starkes, dem Paraconid nahestehendes Metaconid ausgezeichnet ist. Das kräftige Talonid weist Komplikationen seines Aussen- und Innenrandes auf, wodurch der sonst lutraartige untere M_1 einen an den entsprechenden Zahn von Meles meles anklingenden Habitus erhält. Während im lutrinen M_1 inf. das Hypoconid dominiert, wird seine Bedeutung im unteren Reisszahn von Trochictis dadurch abgeschwächt, dass sich im äusseren Rand des Talonides hinter dem Hypoconid ein zweiter Aussenhügel zu entwickeln beginnt, der voluminöser ist als das homologe Element im lutrinen unteren M_1 und dem Zahn einen mehr melinen Zug verleiht. Dazu kommt der zu einem Wulst aufgeworfene innere Talonrand, der entweder ungegliedert oder wie bei der Species taxodon in eine Reihe niederer Hügelchen aufgelöst sein kann. Die Prämolaren sind einfach gebaut. Der obere Canin steht seinem Homologon im Gebiss des rezenten Meles meles strukturell sehr nahe.

Diese Definition des Genus Trochictis wird auf Grund der noch beizubringenden Belege der Maxillarbezahnung, des Schädels und des Skelettes in mancher Hinsicht zu ergänzen sein.» (Op. cit., p. 306—307.)

A striking resemblance to *Pannonictis* is exhibited by the Mustelid form described from the nodule bed of the Red Crag, near Woodbridge, by NEWTON[9]) as «*Lutra dubia* BLAINVILLE». To judge from the figures published by NEWTON, the likeness is so pronounced that the generic identity of the two forms does not seem to be excluded. At any rate, the question should be subjected to further consideration. NEWTON writes about this fragment as follows:

« . . . a right ramus of a lower jaw of an otter-like animal (fig. 1), which differs from *Lutra vulgaris* in having the carnassial tooth longer from before backwards, and proportionately narrower, while its inner cusp is smaller than in this recent species. The entire alveolar border is preserved, excepting that for the incisors, and measures from the back of the canine to the back of the hindermost molar 40 mm. The depth of jaw below the middle of the carnassial tooth is 17 mm. The carnassial itself is 16 mm. long, 6 mm. wide, and the crown is 5 mm. high. The number of cheek-teeth is apparently the same as in *L. vulgaris* (c. $\overline{1}$, pm. $\overline{3}$, m. $\overline{2}$); but the front premolar seems to have been smaller and placed more obliquely, while the hinder premolar was larger than in *L. vulgaris*. The fangs of the

[9]) E. T. NEWTON: On some New Mammals from the Red and Norwich Crags. Quart. Journ. of the Geol. Soc., XLVI, London, 1890, p. 444, Pl. XVIII, Figs. 1*a*—*c*.

premolars also differ from those of *L. vulgaris* in that each tooth has the hinder fang much larger in proportion to the front one, and this is especially the case in the tooth immediately in front of the carnassial, the piece of fang remaining in the hinder alveolus of this tooth being nearly three times the size of the anterior fang. These differences prevent the Red-Crag specimen from being referred to *Lutra vulgaris.*»

«*Lutra dubia,* BLAINV., from the Miocene of Sansan, bears a very close resemblance to our specimen «. . . .» The greatest differences observable are that the Paris specimen has the ramus deeper below the premolars, the carnassial tooth not quite so narrow at its hinder part, and not so much curved from before backwards. The last molar also seems to be somewhat larger than the tooth could have been which occupied the hinder alveolus of the Red-Crag specimen. These differences, which are to some extent due to wearing and rolling, are not sufficient, as it seems to me, to prevent this British Red-Crag lower jaw being referred to DE BLAINVILLE's *Lutra dubia.*» (Op. cit., p. 444—445.)

It is not without interest to remark that the jaw described and figured by NEWTON has very certainly nothing to do with BLAINVILLE's «*Lutra dubia*» which, in turn, appears to belong to an animal widely differing from *Lutra*.

Quite lately SIMIONESCU[10]) published a paper on the Pliocene Fauna of Mălușteni (Moldavia), in which a large-sized Mustelid is described and figured as «*Lutra rumana* n. sp.». There is little doubt about this species's not being a *Lutra*, though, on the other hand, it cannot be brought into relation with *Pannonictis* either, differing from the latter also by its considerably larger size.

As to the problem of descent, I do not think to be wrong in suggesting that the American group «*Galictis*» and the Neogene Mustelids of Eurasia, viz. *Trochictis, Pannonictis* and *Enhydrictis*, characterized by a *Grison*-like dentition, may be retraced to such common stock of Oligocene Carnivores, the Mio-Pliocene offspring of which still possessed a wide range of geographical distribution, comprising both America and Eurasia. It is not impossible, of course, that the forerunners of the «*Galictis*» group reached America towards the end of the Neogene only, and that their route of extension lead through Asia. Later on the ancient relations of the recent «*Galictis*» group became extinct both in Europe and Asia, and survived in America only. This is perhaps due to the climatic changes which happened in the Pleistocene.

[10]) I. SIMIONESCU: Vertebratele pliocene de la Mălușteni (Covurlui). Acad. Română, Public. Fond. Vasile Adamachi, IX, No. XLIX, București, 1930, p. 91—92, Figs. 10—11, Pl. II, Fig. 17, Pl. IV, Fig. 5.

A late branch of the *Trochictis* stem, the *Pannonictis,* lived, as relic, at the end of the Pliocene in S. Hungary, while another branch, which is represented by *Enhydrictis*, occurred on the territory that comprised Sardinia. Here it adapted itself to the aquatic mode of life which did not interfere with the preservation of the form's ancestral type of dentition, and so it came that, on the whole, *Enhydrictis* proves to have assumed lutroid characters.

II.

Zwei Schädelhöhlen-Steinkerne von Pannonictis pliocaenica KORMOS.

Von Dr. TILLY EDINGER (Frankfurt a./M.)

(Mit 3 Abbildungen.)

Bei dem reichen Material seiner *Pannonictis*, das KORMOS im Oberpliozän von Villány (Südungarn) gesammelt hat, befinden sich auch zwei Steinkerne von Schädelhöhlen. Diese wurden mir von Dr. KORMOS zur Bearbeitung übersandt.

Grobkörnige Terra rossa hatte die beiden — jetzt verschwundenen — Schädelhöhlen grösstenteils, aber nicht ganz allein ausgefüllt. Teilweise hat Kalkspat den Steinkern gebildet. Und wie die umgebende Fundschicht, so hat auch das Material der Steinkerne den Charakter einer Breccie; bei Exemplar I steckt in der rötlichen Grundmasse das Bruchstück eines kleinen Röhrenknochens (Abb. 1, Kn) und ein Stein von 14 mm Breite (die Länge ist nicht feststellbar; Abb. 1, St). Dieser Klotz lässt erkennen, dass die Schädelhöhle schon zerbrochen war, als das Füllsel eindrang.

Es ist also nicht verwunderlich, dass die beiden Schädelhöhlensteinkerne leider recht unvollständig sind. Beide stellen nur Teile der hinteren Hälfte des Vorderhirns dar, Exemplar I zwar mit einem winzigen Stück Kleinhirn, dabei hat aber Verdrückung an jedem Exemplar eine scharfe Kante gepresst, selbst die erhaltenen Teile sind also etwas aus der Form geraten. Wenn wir trotzdem einzelne Furchen und Windungen des Gehirns an den Steinkern-Fragmenten klar ausgeprägt finden, so verdanken wir das der Tatsache, dass sich bei kleinen Raubtieren das Windungsrelief des Gehirns dem Schädel besonders innig einzudrücken pflegt. Solche Oberflächenzüge eines Gehirns sind freilich nur noch von geringem Interesse, seit man ihre individuelle Variabilität kennt und weiss, dass nicht die Furchen es sind, welche die Provinzen im Feinbau der Hirnrinde begrenzen. Form und Grösse des Gehirns der *Pannonictis* lässt aber keines der beiden vorliegenden Steinkern-Bruchstücke erkennen.

Wir sehen also der weiteren Ausbeutung des vielversprechenden Fundorts noch mit Spannung entgegen — zumal vom Gehirn fossiler Musteliden

bisher weiter nichts bekannt ist, als ein Bruchstück der Oberseite des Vorderhirns der oligozänen *Stenoplesictis* (ELLIOT SMITH, 1898) und zwei Gehirne der untermiozänen Otter *Potamotherium* (FILHOL, 1888—1889; diese Beschreibung, nach der ich früher (1929) vergeblich fahndete, wurde mir jetzt durch freundliche Auskunft von Dr. HELBING, Basel, zugänglich); *Pannonictis* ist aber ein Landbewohner. Der ursprünglich von TROSCHEL (1863) für wahrscheinlich *Mustela* gehaltene untermiozäne Steinkern Abb. 3*d* dürfte eher einer Viverride gehören (H. v. MEYER, 1865).

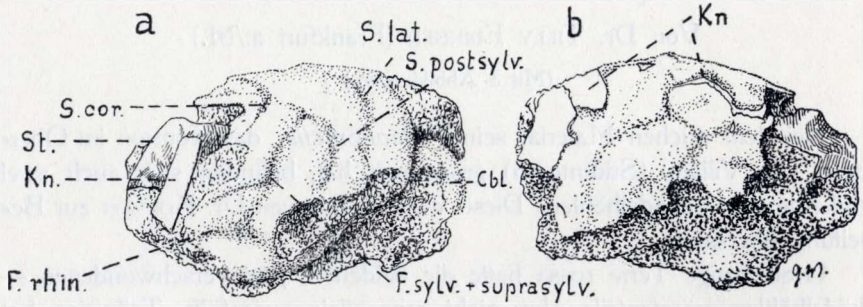

Abb. 1. *Pannonictis pliocaenica* KORMOS, Schädelhöhlen-Steinkern Nr. I. *a)* von links (Cbl: Kleinhirn, Kn: Splitter eines Röhrenknochens, St: Steinklotz); *b)* von rechts (Kn: Knochen des Schädeldachs); 5/6 nat. Gr.; Oberpliozän. Gezeichnet von G. WINTER v. MOELLENDORFF.

Exemplar I (Abb. 1) ist das grössere Stück. Es stellt Teile der hinteren Hirnhälfte dar. Der linke Abschnitt ist besser erhalten als der rechte, doch auch hier ist die Unterseite fast ganz zerstört, der rechten fehlt sie überhaupt. Immerhin lässt sich an den hintersten Partien des linken Teils die grösste Breite für das ganze Gehirn auf etwa 45 mm schätzen, was genau der Breite des *Potamotherium*-Gehirns (Abb. 3*c*) entspricht. Die Verdrückung hat freilich unser Stück so zusammengestaucht, dass nicht nur, etwa auf der Medianen, ein scharfer Kiel entstand, sondern die Füllmasse des Schädels ist auch noch von links nach rechts in der Weise überschoben, dass sie ein Stück des Schädeldachs eingeklemmt hat; Abb. 1*b* sehen wir in einer Paramedianen von unten nach oben Steinkern, Knochen, Steinkern sich folgen. Etwas Knochen haftet auch noch dem Kaudalende des Vorderhirns an. Unten, links hiervon sieht man einen Teil eines der linken Hemisphäre des Kleinhirns entsprechenden Steinkerns (Abb. 1*a*, Cbl). Von eigentlichen Charakteristika des Gehirns ist mithin nichts als die Furchen der circumsylvischen Gegend der linken Hirnseite vorhanden.

Den Schädel der dachsgrossen *Pannonictis* stellt KORMOS (1931) vergleichend zwischen die von *Meles* (Dachs) und *Gulo* (Vielfrass). Wir ver-

gleichen ihr Gehirn also in Abb. 3 mit zwei Exemplaren des Dachsgehirns, das mehrfach beschrieben ist. Die hier wiedergegebenen, von FLATAU & JACOBSOHN (1899) und von ELLIOT SMITH (1902) untersuchten Dachsgehirne zeigen denn auch an der unseren Steinkernen entsprechenden Stelle ungefähr denselben Furchungstyp wie diese, das heisst eine gut ausgeprägte sylvische Spalte, nach hinten-oben ziehend, umgeben von zwei im Bogen um sie herum ziehenden Furchen; der untere Bogen ist vorn und oben der Sulcus suprasylvius, hinten geht er in den Sulcus postsylvius über und der obere Bogen besteht aus dem mit dem Sulcus lateralis verbundenen Sulcus coronalis bei dem FLATAU—JACOBSOHN'schen Exemplar. Die zwei Gehirne

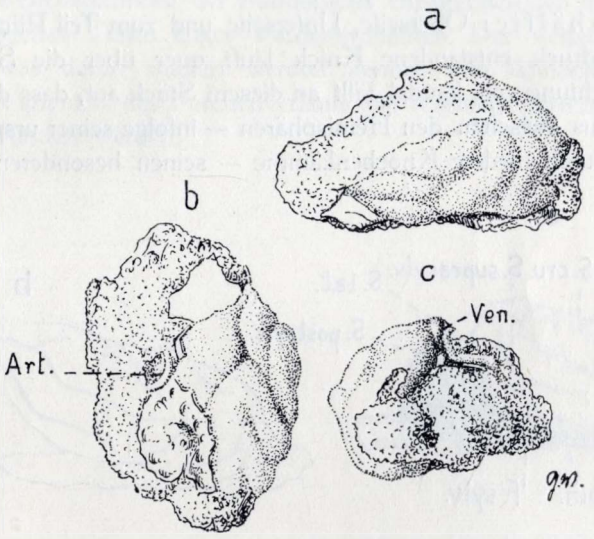

Abb. 2. *Pannonictis pliocaenica* KORMOS, Schädelhöhlen-Steinkern Nr. II. *a)* von links; *b)* von unten (Art.: Arteria carotis cerebralis); *c)* von hinten (Ven.: Sinus sagittalis superior); 5/6 nat. Gr.; Oberpliozän. Gezeichnet von G. WINTER v. MOELLENDORFF.

Abb. 3*a* und *b* zeigen aber gleich, wie variabel die Furchen selbst innerhalb einer Art verlaufen können: bei dem ELLIOT SMITH'schen Dachshirn ist der Sulcus coronalis nicht mit dem S. lateralis verbunden und während bei dem FLATAU—JACOBSOHN'schen *Meles* die sylvische Furche keine Nebenäste hat, läuft bei dem anderen Exemplar der obere Teil der suprasylvischen Furche in die sylvische Grube hinein.

Am Gehirn der *Pannonictis* waren sylvia und suprasylvia einander gleichfalls so genähert, dass wir sie am Steinkern streckenweise ineinandergelaufen, d. h. als gemeinsame Grube im Stein finden. Dies entspricht der heutzutage bei *Meles* beobachteten Tendenz des vorderen Asts der sylvischen

Windung «of being tucked away in its upper part below the surface of the brain» (BEDDARD, 1895, p. 141). Die innere Bogenfurche ist vorn tatsächlich der sylvischen so genähert, dass die dazwischen liegende Windung von der Gehirnoberfläche verschwunden ist. Vom oberen Ende der inneren Bogenfurche zieht eine seichte Rinne zum Sulcus coronalis. Hingegen hat dieser Sulcus coronalis — im Gegensatz zu dem des FLATAU—JACOBSOHN'schen *Meles*, *Stenoplesictis* und *Potamotherium*, aber in Übereinstimmung mit dem ELLIOT SMITH'schen *Meles*, *Gulo* und *Lutra* — keinen Anschluss an die kaudale Hälfte des äusseren Bogens, den am Steinkern ebenfalls deutlichen Sulcus lateralis.

Exemplar II (Abb. 2) ist nur der hinterste Teil der linken Vorderhirnhälfte: Oberseite, Unterseite und zum Teil Rückseite. Der durch Gebirgsdruck entstandene Knick läuft quer über die Seitenfläche. Bei der Betrachtung von kaudal fällt an diesem Stück auf, dass der mediane venöse Blutsinus zwischen den Hemisphären — infolge seiner ursprünglichen Umrahmung durch niedere Knochenkämme — seinen besonderen Kalkspat-

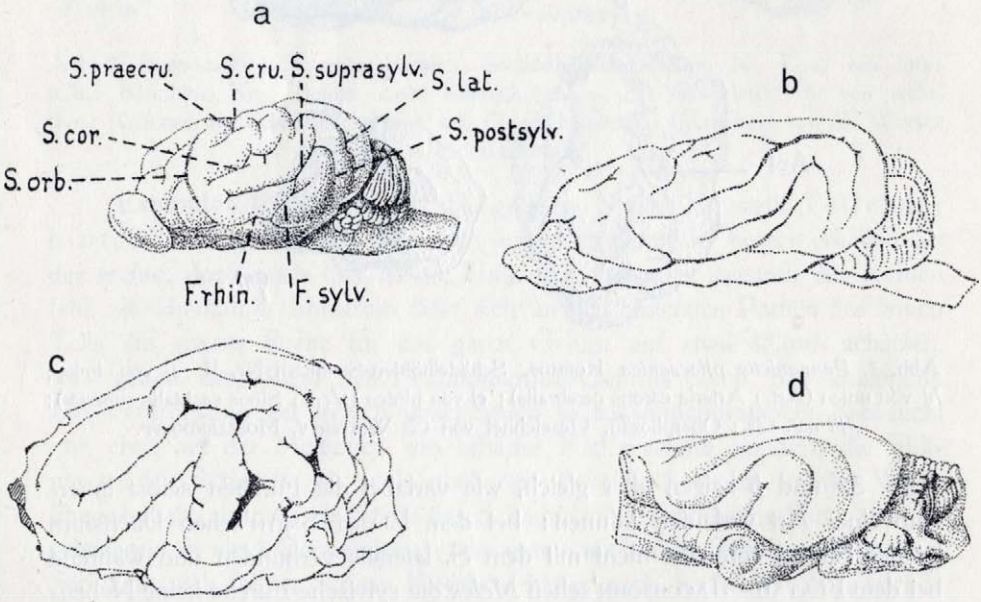

Abb. 3. Gehirne fossiler und rezenter Verwandter der *Pannonictis* zur Ergänzung der in Abb. 1 und 2 wiedergegebenen Bruchstücke und zum Vergleich. a) *Meles meles* L., ein Gehirn von links nach ELLIOT SMITH (1902); 5/9 nat. Gr.; rezent. b) *Meles meles* L., ein Gehirn von links nach FLATAU—JACOBSOHN; 5/6 nat. Gr.; rezent. c) *Potamotherium valetoni* GEOFFR., FILHOL's Abbildung der rechten Gehirnseite spiegelbildlich dargestellt; 5/6 nat. Gr.; Untermiozän. d) Viverride, H. v. MEYER's Abbildung der rechten Gehirnseite spiegelbildlich dargestellt; 5/6 nat. Gr.; Untermiozän. Umgezeichnet von G. WINTER v. MOELLENDORFF.

steinkern zu haben scheint (Abb. 2*c*, Ven). Die Unterseite des Stücks zeigt links den Steinkern des Kanals der rechten Arteria carotis cerebralis als glatten Halbkreis am Rande eines von Kalkspatwaben erfüllten Knochenrests (Abb. 2*b*, Art.). Auch an diesem *Pannonictis*-Gehirn können wir gerade die Furchen der sylvischen Gegend studieren und auch hier ist ihr Verlauf dem *Meles* Abb. 3*a* mehr entsprechend als dem *Meles* Abb. 3*b*: der Sulcus praesylvius kommuniziert mit dem sylvischen. Unsere Kenntnis der Variabilität solcher Verhältnisse (Abb. 3) hindert uns aber, daraus irgendwelche Schlüsse zu ziehen.

Beide Steinkernreste der *Pannonictis* entsprechen den um die sylvische Grube gelegenen Teilen linker Vorderhirnhälften. Der Verlauf der Furchen ist alles, was daran studiert werden konnte. Ihm Ähnliches kann auch unter den Varianten des Furchenverlaufs bei rezenten Verwandten der *Pannonictis* gefunden werden.

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EXPLANATION OF PLATE.

Pannonictis pliocaenica n. gen., n. sp. — Kalkberg, Villány, County of Baranya, S. Hungary. Leg. TH. KORMOS, Ph. D.

Fig. 1. Lateral view of skull. Type specimen. (Roy. Geol. Inst. of Hungary, No Ob/3594.)

Fig. 1*a*. Ventral view of same. The m^1 of the right side is, in its medial portion, partly concealed under the left palatal bone, which fact is due to the deformation of the fossil.

Fig. 2. Right mandible, lateral view. Type specimen. (Roy. Geol. Inst. of Hungary, No Ob/3596.)

Fig. 3. Medial view of a fragment of a right mandible. The figure shows well the carnassial's strongly developed metaconid.

All figures natural size. Photo by Miss TH. DE DÖMŐK.

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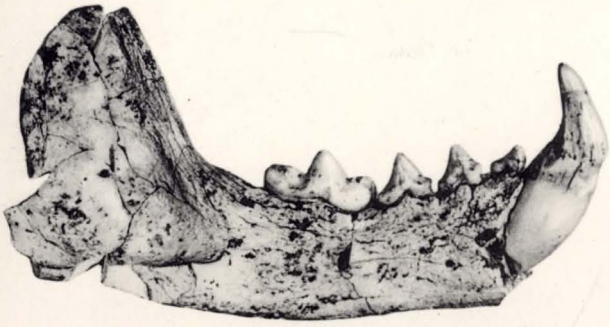

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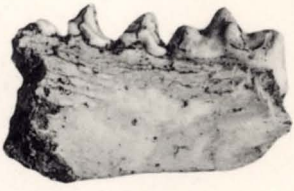

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1 a

PHOT. T. v. DÖMÖK. KORMOS: Pannonictis n. g., n. sp.