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János Tulogdy's first study attempt about an Eocene sea cow tooth from Transylvania

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Abstract. János Tulogdy (1891–1979) was a geography university teacher of Hungarian descent, specialized in the fields of geographic and speleological studies. His works have enriched the geographic knowledge of Transylvania, yet he suffered from an injury on his leg because of a wound caused in World War I. Despite this, Tulogdy tirelessly traveled across Transylvania's mountainous regions and cave systems. The knowledge accumulated throughout his life, he transcribed into several scientific books and close to 300 scientific articles. The manuscript of one such article is presented in this work and

compared to the final, published variant, showcasing various pieces of information that are either published or unpublished. The topic of his article concerns an Eocene sea cow tooth, a rare fossil in Transylvania.

Keywords: vertebrate paleontology, Transylvania, Sirenia, Eocene, Romania.

Introduction

In the Eocene deposits of Transylvania, among the marine mammals, the most common fossils are those of the Sirenians, those of other groups being extremely rare and often problematic from the taxonomic point of view. One such example is that of the caudal vertebrae of (?) Basilosauridae collected in the second half of the 19th century around the street of the Orthodox Church in Cluj-Napoca (Koch 1899; initially two vertebrae, of which only one is currently in the Paleontology-Stratigraphy Museum of "Babeș-Bolyai" University, abbreviated PSMBBU 15985). The geological age of the fossils and their bearing rocks are still questionable, and, due to the situation in the field (the entire area is currently covered by buildings), it cannot be verified (Codrea 2006).

In the Transylvanian Paleogene sedimentary basin, the majority of Eocene (Lutetian and Priabonian) sea cow fossils refer to postcranial bones. Cranial bones or teeth are very rarely found in these rocks. Sea cow fossils have been reported and described from the areas south of the basin at Turnu Roșu (formerly Porcești, by Mikael Ackner; Anonymous 1850, Koch 1894), but mainly from the northwestern area of the basin (e.g. Koch 1894, 1900, Fuchs 1970, 1971, Șuraru & Codrea 1988, Veress & Codrea 2023). Sirenian teeth, although extremely rare, have nevertheless been encountered. Thus, Elek Pávay (1871), together with Count Kálmán Eszterházi, collected between Gilău and Căpușu-Mare a tooth which they identified as '*Choeropotamus*', but which Sickenberg (1934) considered to be from the sea cow '*Halitherium* (*Ceirotherium*) *subapeninum*'.

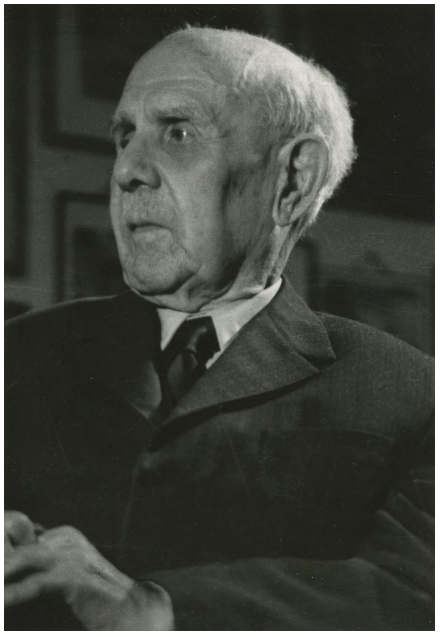

Figure 1. Photo of János Tulogdy.
Source: https://archivum.helikon.ro/fotok/tulogdy-janos/

A relatively early report of a sea cow cheektooth comes from a fervent researcher of the surroundings of Cluj-Napoca, János Tulogdy (1944). Although he was a geographer and speleologist and therefore less concerned with paleontology (https://hu.wikipedia.org/wiki/Tulogdy_J%C3%A1nos ; accessed February 12, 2014; Fig. 1), this teacher and researcher from Cluj has focused his attention in this article on an isolated molar found in the Cluj Limestone Formation ('Upper Coarse Limestone'; late Eocene, Priabonian), in the quarry at Cheile Baciului, near Cluj-Napoca (Fig. 2), by a student of the Reformed High School of Cluj, named István Barabás. The molar in question (considered by the author to be a m_3 '*of the left mandible*'), found together with other postcranial bones of a sea cow, was considered by Tulogdy (1944) to belong to '*Eotherium or Prototherium'.* The exact location of the discovery is also specified as *'...opposite the "Angels' Fountain" in the old, abandoned quarry located on the northern slope, in the limestone level below the* Vulsella dubia *bank* '.

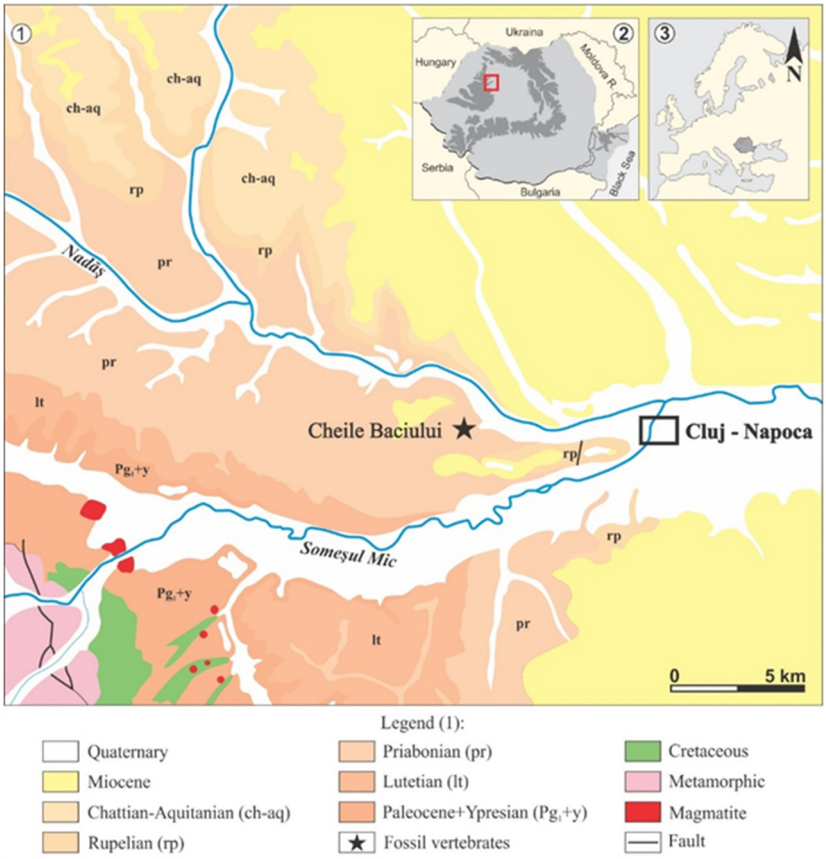

Figure 2. Geological map of Cheile Baciului area.

János Tulogdy's study of the Sirenian sea cow

Tulogdy, who was not a professional paleontologist dedicated to this science, but a very skillful discoverer of fossils and an enthusiast (for example, he spotted the Lower Oligocene–Rupelian concentration levels with small anthracotheres on the Cetățuie Hill in Cluj-Napoca in 1919, but when the determination of these fossil vertebrates was under discussion, he sent teeth, mandibles and upper jaws bearing diagnostic characters for determination to the Hungarian Geological Institute in Budapest, abbreviated MAFI - personal observation, VAC). In MAFI, there are also manuscript documents sent by Tulogdy

to the famous vertebrate paleontologist Miklós Kretzoi (Fig. 3), which were kindly made available to one of us (VAC) for study by Dr. László Kordos, a former member of the institute's management.

Figure 3. Photo of Miklós Kretzoi (1907-2005; from Codrea & Gáll 2005).

So, faced with a challenge related to the determination of the cheek tooth in question, Tulogdy contacted Kretzoi by mail with the following text (Fig. 4):

"*My dear friend Miklós,*

I wished to personally return Sickenberg's book to you, however, I cannot go to Pesta for the time being. Which is why I sent it to you through a former student of mine from the Faculty of Arts.

*I presented the "*Halitherium*" tooth at the Transylvanian Museum Society. The author asked me to write the report into the Museum Notebook. I tried. I attached it, with the request to please read through it, and study what needs to be*

studied. I would be very grateful to you if you would do this and send my paper back to me as quickly as possible.

I wanted to go myself to learn from you, but pain prevents me from doing so.

I would like to inform you that a student of mine showed me a wonderful Mastodon (Dibunodon) arvernensis *tooth, which was found by his grandfather in the Levantine gravel near Bățanii Mari. Unfortunately, he doesn't want to separate himself from it.*

I thank you with anticipated recognition for your kindness.

I greet you, with respectful love as your friend,

Tulogdy János,
Cluj, Reformed College, 1944.02.23."

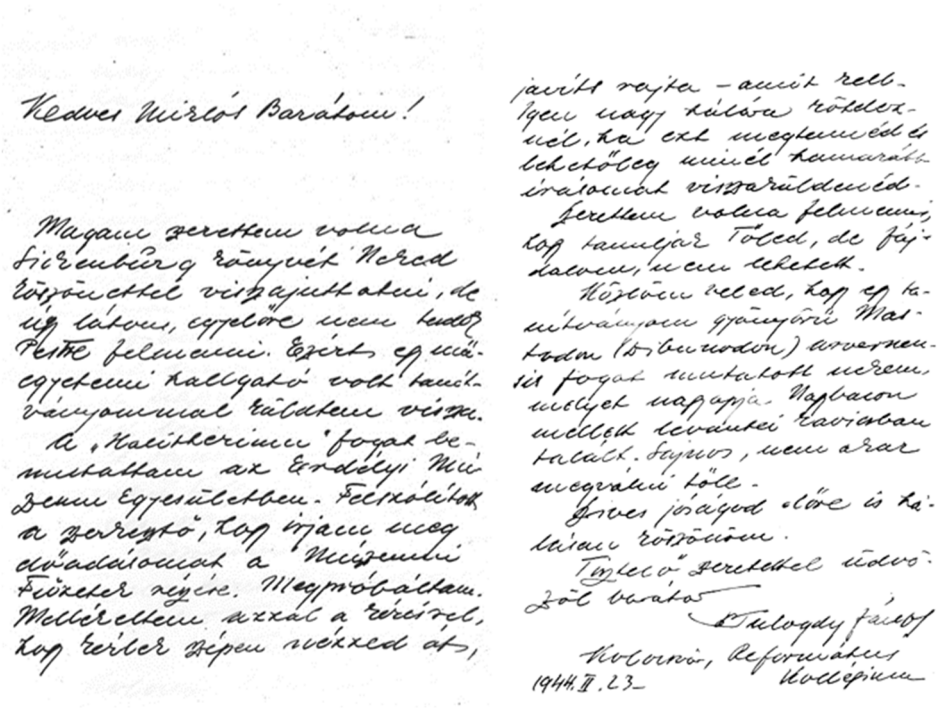

Figure 4. Photocopy of the letter addressed in 1944 by Tulogdy to Kretzoi.

A number of issues emerge from the text: there were previous friendly relations between the two scientists, Kretzoi providing Tulogdy with Sickenberg's monograph, which the latter returned through an intermediary; the short letter also contains an appeal for support in determining the sea cow tooth, with a view to publishing a note in a Transylvanian journal; at that time Tulogdy had communicated the tooth to the Transylvanian Museum Society as '*Halitherium*'; he regretted that he could not travel personally to Budapest to learn the determination technique of the sea cow fossil because of the sequelae of a wound he had sustained in the First World War; finally, he reported the presence of a tooth of the bunodont mastodon *Anancus arvernensis* from Bățanii Mari (a locality in the Baraolt sedimentary sub-basin in the Bârsei sedimentary basin, filled in dominance by Pliocene-Pleistocene lacustrine and terrestrial sedimentary rocks; Codrea et al. 2018) in SE Transylvania, an area devoted to Pliocene vertebrate faunas, especially mastodons (Kovács 1981, Rădulescu & Samson 1985, 2001, Toth et al. 2010).

Tulogdy asked Kretzoi to check his draft text. An analysis of this text (Fig. 5), compared with the published one reveals several aspects that deserve to be highlighted, as the work published by Tulogdy in 1944 is rather less known to paleontologists in our country and elsewhere. Consequently, we will present the compared texts: the one in the letter vs. the published one.

The title originally intended by the author was different from the one published later. Tulogdy had thought of a systematic specification ('*Halicorida (Eotherium, Prototherium?) tooth...*') but abandoned it, probably because of the imprecision that persisted on the systematic classification of the fossil that was the subject of the study in question. Consequently, the definitive title has remained as indicated in the references section of this article.

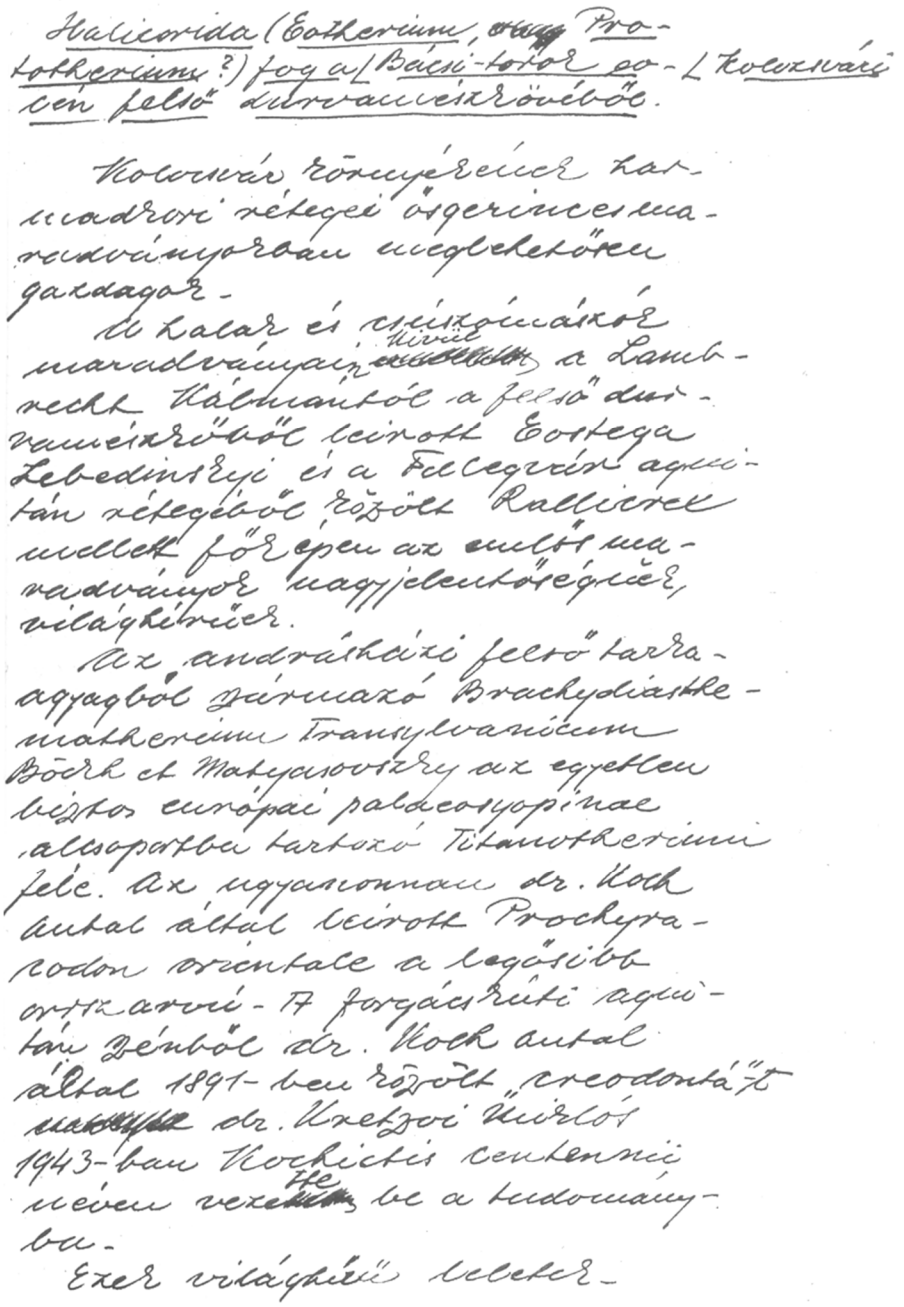

Figure 5. Photocopy of the first page of Tulogdy's manuscript.

In a short introduction, he recalls the fossil birds described so far from Cluj-Napoca: *Eostega lebedinskyi* from the Cluj Limestone Formation (Priabonian) of the former Cluj-Mănaștur quarry (Lambrecht 1929, 1933, Jurcsák & Kessler 1973, Mlíkovský 2007, Codrea & Venczel 2020, Venczel & Codrea 2022), respectively *Rallicrex kolozsvarensis* (Lambrecht 1929, 1933, Jurcsák & Kessler 1973, Olson 1977, Mlíkovský 2002). It is worth mentioning that he considered the coal-bearing strata with small anthracotheres (which belong to *Elomeryx* sp.) on the Cetățuie Hill of Cluj-Napoca belonging to the Dâncu Formation (Rupelian; MP23 or MP24, Fărcaș & Codrea, 2004), as lowermost Miocene (Aquitanian).

In this context there are mentioned: the discoveries of large mammals from the Nadăș Valley Formation (Priabonian) at Rădaia (*Brachydiastematherium transylvanicum* and *Prohyracodon orientale*; Codrea 2000 and related references), now completed with taxa reported from the same formation at Morlaca, west of Huedin, where fossil vertebrate remains were firstly reported by Mateescu (1926) and later by Mészáros et al. (2001) and Tissier et al. (2018); and the 'creodont' reported by Koch (1891a, b, 1894, 1900) from the Oligocene (Rupelian) coals of the Dâncu Formation and described as a new taxon by Kretzoi (1943) as *Kochictis centenii* (Kretzoi, 1943), now reconsidered as a Pantolestidae representative (McKenna & Bell 1997, Russell 1988). In addition, the printed article also mentions Koch's discovery (1911) of a Lower Oligocene rhinocerotid from the Popeștilor Valley (Cluj-Napoca), from the Mera Formation (Rupelian; Codrea & Șuraru 1989, Fărcaș & Codrea 2004). Initially determined as '*Proaceratherium minus*' by the discoverer, it has undergone several systematic reclassifications: Abel (1910) considered it '*P. filholi*', Kretzoi (1940) '*Paracenopus kochi*', Brunet (1979) '*Epiaceratherium*? *kochi*', Russell et al. (1982) '*Allacerops kochi'*, Codrea (2000, and related references) '*Ronzotherium*' *kochi*, Uhlig, 1999, Becker (2009) '*Epiaceratherium',* and more recently it was reconsidered as *Ronzotherium filholi* (Tissier et al. 2021).

The author's attention then turns to the marine mammals of the sea cow group, with the relatively high frequency of postcranial bones from the Cluj Limestone (Priabonian) at Cheile Baciului, or from the large nummulites

(*Nummulites perforates*, Lutetian) levels at Iara. In this section, old reports of the remains of these marine mammals from the southern Paleogene basin of Transylvania, from deposits that are laying on the northern branch of the metamorphic rocks of the Făgăraș Mountains at Turnu Roșu (formerly Porcești, Sibiu County), are specified, which are the work of Mikael Ackner and Herman von Meyer, who reported them as '*Halianassa*' (Anonymous 1850).

In 1866, in the bed of the Someșul Mic (Little Someș) River at Cluj, works were underway to build a dam to channel part of the river water towards the so-called Canal of the Mill (initially designed in the Middle Ages for sanitation purposes, it was later equipped with several mills, which did not process exclusively cereals, but also served small local crafts and industries: tobacco industry, finishing of weapons and agriculture tools, paper manufacture, etc.; https://actualdecluj.ro/canalul-morii-cluj/). At that point, in the riverbed, exposed surfaces of the Cluj Limestone occurred, from which fossil vertebrates could be collected. Pávay (1871) collected such fossils which he attributed to the crocodile '*Toliapicus*'. Shortly afterwards, Koch (1894, 1900), showed that the remains were of the sea cow *Halitherium* sp. The author quite correctly mentions that the preferred environments of these mammals were '*coastal areas of warm seas*'. Compared to the manuscript letter, in the printed text he has restricted the presentation of recent systematic groups and their ecological preferences, keeping strictly to the general wording to which we have referred. In the letter, he elaborates:

'*To understand the frequency of sirenian remains, we mention that modern living sirenians – the only herbivorous marine mammals – live in the shallow beaches, bays and river estuaries of the hot climate zones.*

*To their first family (Trichechidae) belongs the manatee (*Trichechus manatus*), which lives in the coasts, rivers and the estuarian sections of West Africa and South America.*

The second family (Dugongidae). The dugong lives in the coastal areas of the Indian Ocean.

The third family (Hydrodamalidae) is extinct.'

Such an ecological preference, to which he referred in the published article, and certain reports make sea cows extremely important markers in reconstructing the water vs. land distributions of the Paleogene of Transylvania or, in other words, for reconstructing the paleogeography of those times.

The description of the tooth (considered by Tulogdy a left m_3) in the published text, although succinct, is broader than that in the letter. No specific professional terminology was used for the morphological components of the crown, but the dimensions were specified: length 2.6 cm, maximum width 1.6 cm. The illustration of the tooth (Fig. 6) is interesting: the image of the drawing in the published text is in latero-occlusal view, while the drawing sent to Kretzoi (without scale) is occlusal. The morphology of the molar clearly indicates that we are dealing with a right (*non sin.*!) m_3 of an adult animal, although still young.

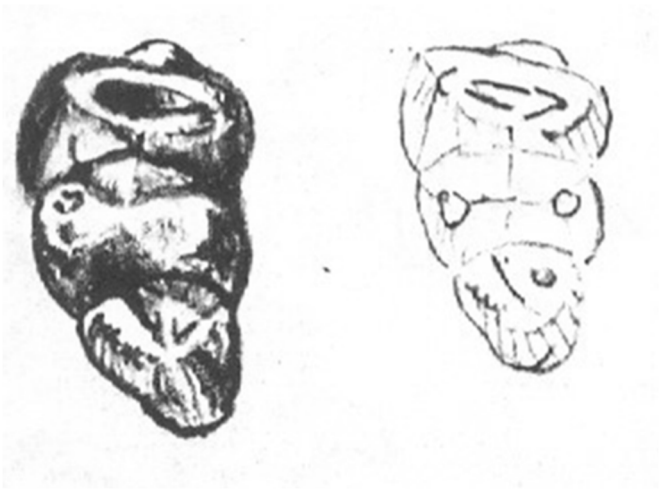

Figure 6. Drawing of the sea cow molar in the manuscript: occlusal view (not at scale).

Both texts mention Sickenberg's view of the possible existence of a distinct sirenian taxon, both in Iara (considered as a large sized form: '*According to Sickenberg, the size of the ribs - quadratic section - at Iara would infer that the Transylvanian sirenian species exceeds in size all other known species*') and Cheile Baciului ('*Sickenberg believes that the remains found at Cheile Baciului belong to*

the same species and states that it is probable that these remains come from a species of sirenians that cannot be found anywhere outside Transylvania'). The same ideas are also emphasized in the text of the article, where he states that the remains from Cheile Baciului belong '*to a type known only from Transylvania*'.

In the printed text, Tulogdy points out that the fossils that have been collected from Cluj-Napoca are of Eocene age, and consequently excludes the possibility of them belonging to the genus *Halitherium* and considered that they could belong to a species that could be classified either in the genus *Eotherium* or *Prototherium*. At the same time, he points out that for a judicious determination more complete bones and teeth are needed than those that are available at the University of Cluj.

The manuscript ends with thanks to Miklos Kretzoi for his support: '*I owe sincere gratitude to Dr. Miklós Kretzoi, keeper of the paleontological repository of the National Museum, who by lending and guiding Sickenberg's work corrected my thesis and helped me in my work*'. These thanks no longer appear in the published text, we do not know for what reason, but it is possible that Kretzoi himself asked for them.

One last important point: the student who found the Sirenian fossils at Cheile Baciului handed them over to the paleontology museum of the University of Cluj. From there, they vanished in unknown circumstances, being either lost or stolen in the decades that followed, like many other fossils in that museum.

Conclusions

The tooth reported and briefly described by Tulogdy is important in the context of the rarity of sirenian teeth in Transylvania. The occlusal image accompanying the manuscript is important, as it provides more consistent details on the morphology of the dental crown compared with the printed version. Decades after the discovery of this fossil, the systematics of the Transylvanian sirenians remains as unclear as ever, mainly due to the absence of fossils sufficiently well preserved to allow for complete observations.

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