Trogontherium cuvieri Fischer, 1814 is the valid name for the Eurasian giant beaver

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NOMENCLATURAL NOTE

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Abstract. The purpose of this Nomenclatural Note is to demonstrate that 1) the objective junior synonym *Trogontherium cuvieri* Fischer, 1814 should have precedence over *Castor trogontherium* Cuvier, 1809, and 2) the binomen should be attributed to Fischer (1814) instead of the widely cited Fischer (1809). When, in 1809, Johann Gotthelf Fischer described the fossil skull of a beaver found near the Sea of Azov (Russia), he erected for it the genus name *Trogontherium* without proposing a species name. The skull later became the holotype of what is now commonly cited as *Trogontherium cuvieri* Fischer, 1809, even though this binomen had not been formally proposed that year. Later that year, Georges Cuvier used the name *Castor trogontherium* to refer to the same specimen. We found an apparently previously-overlooked 1814 publication by Fischer in which

the binomen *Trogontherium cuvieri* was used for the first time. Although an objective junior synonym of *Castor trogontherium* Cuvier, 1809, that senior synonym has not been used as a valid name since 1884 and, in compliance with the Code, we suggest reversing precedence and conclude that the correct name for the European giant beaver is *Trogontherium cuvieri* Fischer, 1814.

Keywords. Nomenclature; taxonomy; Castoridae; Fischer; *Trogontherium cuvieri*.

In 1809, Johann Gotthelf Fischer described the fossil skull of a beaver found near the coast of the Sea of Azov near Taganrog, Russia. The exact age of the skull is unknown, but it most likely dates to the Early Pleistocene (Tesakov et al., 2007). This specimen later (Fischer, 1814) became the holotype of the species commonly cited as *Trogontherium cuvieri* Fischer, 1809, but much has remained unknown about this name. Fischer (1809a) first published the genus name *Trogontherium* in an article addressed to Count Alexander Sergeyevich Stroganov, with reference to the Taganrog skull. Although styled as a 'letter', this was a printed article published by the University of Moscow and therefore constitutes an available work for the purpose of nomenclature (ICZN, 1999, Art. 8). It was quite common in those days for a scientific publication to be dedicated to some dignitary, or even apparently addressed to them. This was sufficient to formally establish the genus name, even though no species name was attached (ICZN, 1999, Art. 11.4.1). Fischer pointed out that the skull belonged to a new species of rodent: "Tous les naturalistes seront convaincus avec moi, que Votre Excellence a rendu un grand service à la science en desirant une description détaillée d'un objet qui ajoute à nos connoisances une nouvelle espèce de rongeur, qui en impose par sa grandeur et n'a point de semblable parmi les rongeurs vivans." [All naturalists will be convinced with me that Your Excellency has rendered a great service to science by desiring a detailed description of an object which adds to our knowledge a new species of rodent, which impresses by its size and has no parallel among living rodents.] (Fischer, 1809a, p. 2). In the same year, Fischer (1809b) repeated the name in *Mémoires de la Société impériale des Naturalistes de Moscou*, again without a named species.

Later in 1809, Georges Cuvier argued that giving only a generic name did not comply with nomenclatural rules. Nor was he convinced that the skull described by Fischer belonged to a new species. Therefore, he introduced the name *Castor trogontherium* Cuvier, 1809, suggesting that it could be used until it was certain that *Trogontherium* described by Fischer belonged to a new species (Cuvier, 1809). The name *Castor trogontherium* is thus the first binomen assigned to the species and therefore has priority, and the name cannot be excluded based on its 'provisional' use by Cuvier alone (ICZN, 1999, Art. 11.5.1). However, in Volume 5 of his *Recherches sur les ossemens fossiles*, Cuvier (1823) mentioned the name *Trogontherium cuvieri* for the first time, in the title of the chapter on beavers: "…et notamment de la grande espèce nommée *Trogontherium Cuvieri*, par M. de Fischer" […and in particular of the large species named *Trogontherium Cuvieri*, by M. de Fischer] (Cuvier, 1823: p. 59), ignoring his own 1809 binomen. It had until now been unknown when and how the name *Trogontherium cuvieri* was first conceived by Fischer. The English paleontologist Edwin Tulley Newton did intensive research into the origin of the name, but concluded that "after a prolonged search I have been unable

to find that Fischer ever used the specific name *Trogontherium cuvieri*, although Cuvier attributes the name to him" (Newton, 1891, p. 51). In 1892, Newton suspected that the name *Trogontherium cuvieri* was established through an exchange of letters between Fischer and Cuvier: "The earliest name given to this rodent was *Trogontherium cuvieri*; it does not appear, however, in M. Fischer's first description of the skull, but seems to have been used by him in a letter to Cuvier, who gave it in the heading of his article in the 'Ossemens Fossiles,' but did not adopt it for the fossil" (Newton, 1892, p. 174). Indeed, in the text of that chapter, Cuvier (1823, p. 60) retained the name *Castor trogontherium* while repeating that it was provisional until its specific identify could be demonstrated.

Recently, de Bruijn & de Bruijn (2023) discovered the use of the binomen *Trogontherium cuvieri* in an 1814 publication by Fischer: the three-volume *Zoognosia tabulis synopticis illustrata: in usum praelectionum Academiae Imperialis Medico-Chirugicae Mosquensis*. The third part of this monograph was published in 1814 with the title *Quadrupedum reliquorum, cetorum et monotrymatum descriptionem continens* (Fischer, 1814). There, Fischer mentioned, on page 584, that the genus *Trogontherium* can be divided into two species: *Trogontherium cuvieri* and *Trogontherium werneri*. For the species *Trogontherium cuvieri*, Fischer referred to the skull described by him in his 1809 article addressed to Alexander Sergeyevich Stroganov and to Cuvier's 1809 publication depicting two figures of the skull (Fischer, 1814). By citing Cuvier (1809) in identifying to what specimen the name referred, Fischer (1814) provided a valid 'indication' of the taxon (ICZN, 1999, Art. 12.2.1). This makes the name *Trogontherium cuvieri* available and an objective junior synonym of *Castor trogontherium* Cuvier, 1809.

Following Cuvier's (1809) work, the name *Castor trogontherium* was used for the Eurasian giant beaver by several authors including Schlotheim (1820, p. 23), Desmarest (1822, p. 279), Pictet (1857, pl. 6), Dawkins and Sandford (1866, p. xxxvi) and Gaudry (1872, p. 491). Others used *Trogontherium cuvieri*, including Meyer (1832, p. 57), De Quatrefages (1840, p. 2) and Tennant (1847, p. 10). Usage of *Trogontherium cuvieri* was, ironically, boosted by Cuvier's (1823) *Recherches sur les Ossemens fossiles*, in which the name is used in the heading of the paragraph dealing with the type skull (see above). Others, while recognizing it as a single species, cited both names without stating a preference (e.g., Wagner, 1832, p. 761) or mentioned *C. trogontherium* only to declare its obsolescence (e.g., Owen, 1846, p. 188). The latest usage of which we are aware of *C. trogontherium* as a valid name is in a figure caption in Meunier (1884, p. 84). A list of 25 example papers published in the past 50 years and using *T. cuvieri* as valid for the species in question is appended, in accordance with Art. 23.9.1.2 of the Code (ICZN, 1999). Given that the senior synonym *Castor trogontherium* Cuvier, 1809 is not known to have been used as valid after 1899 and that *Trogontherium cuvieri* Fischer, 1814 has been in exclusive use since that date, precedence can be reversed following Art. 23.9.1, giving *Trogontherium cuvieri* priority. As for the date of publication, although, e.g., Owen (1846, p. 184) gave Fischer's (1809b) paper as the source, there can be no mistake that the name was first proposed in 1814, not 1809.

Within his 1814 monograph, Fischer (p. 584) mentioned a letter he had written to Cuvier, apparently proposing the name *Trogontherium*, adding that he did not know whether the letter had been delivered or the name published. The archivists of the Bibliothèques du Muséum national d'Histoire naturelle in Paris have, at our request, searched for letters from Fischer to Cuvier. Among three letters that have surfaced, there is one from 1809 ('Moscou, le 25 mars, 6 avril' [dates referring to the Russian and

French calendars, respectively]) in which Fischer reports the discovery of *Trogontherium* to Cuvier and informs him that he has sent the engraving shown in his 1809 article (Fischer, 1809a) addressed to Count Stroganov. This is almost certainly the letter referred to by Cuvier in his 1809 paper in the *Annales*, and later in the 1823 edition of *Ossemens fossiles*. It corroborates Newton's (1892) suggestion of correspondence between the two on the matter of the skull (see above), but not his supposition that this included the specific name *cuvieri*. Cuvier's (1823) citation of *T. cuvieri* is likely to have been based on Fischer's (1814) monograph.

The name *Trogontherium cuvieri* was hence first published by Fischer in 1814; it was introduced in accordance with the current Code; and the binomen has since received wide usage by numerous authors (although incorrectly citing the year as 1809). We therefore conclude that the correct name for this taxon is *Trogontherium cuvieri* Fischer, 1814.

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Appendix

List of 25 example papers since 1974 using *Trogontherium cuvieri* as a valid name.

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