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**ON THE PUBLICATION AND PAGINATION OF AMEGHINO'S (1894)  
TAXONOMY OF SANTACRUCIAN MAMMALS**

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Header: DE IULIIS *et al.*: AMEGHINO'S TAXONOMY OF SANTACRUCIAN  
MAMMALS

**Key words:** Ameghino. Taxonomy. 1894. Santa Cruz Formation. Patagonia.

**Palabras clave:** Ameghino. Taxonomía. 1894. Formación Santa Cruz. Patagonia.

DURING the course of our research on the paleobiology and systematics of mammalian remains of the Santa Cruz Formation of Argentine Patagonia, we became aware of differences in the early literature dealing with Santacrucian (late Early Miocene) mammals. Although literature errors are not uncommon, they are often only an inconvenience. However, in this case it involves an article in which numerous taxa were erected, so that particular attention must be paid to the circumstances of its publication. The article in question is Florentino Ameghino's (1894a, b) *Énumération synoptique des espèces de mammifères fossiles des formations éocènes de Patagonie* (henceforth, *Énumération*). This article was published formally in 1893 in the *Boletín de la Academia Nacional de Ciencias en Córdoba* (henceforth, *Boletín*) and also in 1894, with identical title and text but different pagination, as an offprint (henceforth, offprint).

The difference in publication year has never affected *Énumération*'s citation as 1894, regardless of version, by Ameghino and other researchers, so far as we are able to ascertain. On the other hand the use of these versions has been inconsistent. Some authors have cited only the offprint or *Boletín* version, both versions, and one or the other version in different publications. For example, Ameghino (e.g., 1894c, 1895) referred to the offprint. Trouessart (1897) cited the offprint version, but Trouessart (1898) cited the *Boletín* version. Scott (1903, 1904, 1905) and Sinclair (1906, 1909) refer to both versions, but used the pagination of the offprint. Roger (1896), Roth (1899), and Palmer (1904) used the pagination of the offprint, while Simpson (1945), Mones (1986), McKenna & Bell (1997), and De Iuliis *et al.* (2014) used the pagination of the *Boletín*.

For these reasons the existence of two versions with differing paginations and date, albeit with identical text, clearly has implications in the recognition of formal

taxonomic names; and so the question arises as to which of the two versions should be formally recognized for such purposes.

At first glance, one might entertain the idea that both versions be allowed to stand for formal taxonomic purposes, as both have been used in the literature and have been assumed to have been published simultaneously in 1894. However, use of more than a single source runs counter to taxonomic practices and would, in our opinion, be confusing. At the very least, it would require explanation of the situation in any publications dealing with the formal taxonomy of the taxa erected in *Énumération*, which would both unnecessarily lengthen and detract from the main theme of such publications. This is the situation in which we currently find ourselves and is the reason for addressing the issue here. Establishing priority of one over the other would eliminate this dual publication problem. A second concern with recognizing both publications is that it is not at all clear that they were published simultaneously. However, it can be demonstrated that the date of publication of the *Boletín* version as indicated in this journal is incorrect, whereas the published date of the offprint is correct (see below).

The situation with regard to publication year is somewhat complex, for as far as we are able to ascertain none of the mentioned authors who cite *Énumération* as 1894 mentioned this temporal discrepancy. Establishing the date of publication of *Énumération* must rely on independent information because the date of 1893, which appears on the title page of this article in the *Boletín* cannot be correct. If we rely on the published literature, which always cites this article as 1894, then we would be led to believe that the year, 1893, that appears on the *Boletín* version was either a typographical error or an intentional misrepresentation; although it cannot be determined which of these possibilities may have occurred, the latter possibility is not

as far-fetched as it may seem and would certainly not be the sole example of inconsistencies in the Argentine paleontological literature. Indeed, Ameghino (1894c) reproached Francisco Moreno, the director of the Museo de La Plata, for printing 1893 (rather than 1894) on the front page of Richard Lydekker's volume on ungulates (see below). In terms of the published literature, Ameghino (1894c) did note that the offprint was distributed (rather than published) during the first days of March, 1894. Thus, we cannot rule out an 1893 publication year for the *Boletín* version (this does not affect the offprint, which was dated 1894).

The *Boletín* version appears in *Tomo 13*, which indicates it contains research from 1892 and 1893. The other *Entregas* (or Parts) of *Tomo 13* also have a title page date. The articles bear internal dates on the last page, with the exception of Ameghino's *Énumération*. However, these dates are not consistent: for most of the articles the internal date, presumably indicating the article's date of completion, is earlier than the title page date, but that in Arribáizaga (1893) is more recent than the indicated publication date on the title page. The last section of *Tomo 13* includes *Entregas 3* and *4*, as indicated on the title page with date December, 1893, but it contains only a single paper, Ameghino's *Énumération*. The latter's year of publication as 1894 is almost undoubtedly correct, but this is corroborated independently of the published literature by Ameghino's scientific correspondence. The correspondence also hints that the offprint's publication may have preceded that of the journal, which may explain why Ameghino and other researchers first used the offprint's pagination rather than that of the *Boletín* (but see below).

The first piece of evidence for establishing *Énumération*'s year of publication is a letter, dated October 31, 1893, sent by Florentino Ameghino to Oscar Doering, who acted as a liaison for publications in the *Boletín*. This letter establishes that an

article had not been published by early November, 1893. It is clear that Ameghino is referring to *Énumération* because of the subject matter (a general revision of the Santacrucian fossil fauna) and his estimate of pages (about 160). The actual published length, 196 pages, is the only effort by Ameghino during this period that approaches this length and is dedicated to Santacrucian mammals. As well, he indicated that he would require some 150 offprints.

Correspondence between the Ameghino brothers, Carlos and Florentino, sheds further light on this matter. In a letter dated December 26, 1893, Florentino informed Carlos that the article on Santacrucian fossils was still not finished – he had completed the manuscript only a few days prior to the date of the letter, essentially only a week before 1894.

Florentino's letter of February 19, 1894, further informed Carlos that *Énumération* had still not been published. He complained of its slow progress, but recognized that this was partly due to the fact that the article was in French (again, this shows that he is writing about *Énumération*, which is the only article written in this language exclusively on Santacrucian fossils and of the appropriate length by Florentino during 1893 – 1894). Florentino was able to report that the last few sheets of the article were being printed.

Carlos wrote to Florentino, in a letter dated March 13, 1894, that “He recibido también un ejemplar [sent to him by their brother Juan, as indicated in a letter by Florentino to Carlos dated May 14, 1894] sobre los fósiles de Santa Cruz.” Thus, *Énumération* had finally been published, clearly in 1894. This assertion is made objective by the information contained in the letters between Florentino and Carlos; if we were instead to rely on the published information itself (i.e., the *Boletín*), it becomes difficult to see how we could accept any date other than 1893. In this

context, is clear that *Énumération* was published in 1894, but was included in Volume 13 of the *Boletín*, which is dated as 1893. Volume 13 should thus be recognized as including articles published in 1892, 1893, and 1894.

Within this framework, there remains the question of which of the two versions was published first. This cannot be determined objectively, but it remains true that the only certainly dated version (given that the date of December, 1893 for the *Boletín* version cannot be correct) is the offprint, which as noted, bears February, 1894, on its cover page. We can assume that at least this version was published by this date based on Carlos' letter (though the possibility still remains that the *Boletín* version was also published by this time, even simultaneously or slightly before the offprint, although currently there is no evidence to support this). As for the *Boletín* version, the date of publication may be approximated as between February and July, 1894, the latter based on the date of the first article in *Tomo 14* of the *Boletín* (by Doering, 1894; the date on the title page is July, *Tomo XIV Entrega 1<sup>a</sup>* and the internal date, on the last page of the article, is July 8, 1894).

As we propose recognition of only a single source of *Énumération* for formal taxonomic purposes, there are two choices: accept the *Boletín* version, which was published with an incorrect date; or accept the offprint version, which was published with a correct date. Given the certain date of the one and the incorrect date of the other, we propose that the offprint's pagination be recognized as the formal pagination for nomenclatural purposes.

Although we recognize the offprint based on its accurate publication date, there is additional reason to prefer it: there is suggestion, subtle though it may be, that its publication may have preceded that of the *Boletín* version. This may explain why some of the more prominent paleontologists of the late 1800s and early 1900s that

were most actively involved with Santacrucian fossil mammals used the offprint version. One might also suggest that the offprint version may have been used by Ameghino and others simply for practical reasons: it was the version Ameghino had as his personal copy and that he sent to his scientific colleagues, whereas the *Boletín* was sent to libraries and institutions. However, we suggest otherwise and offer the following as evidence for an earlier publication of the offprint.

Ameghino's (1894c: 202) first citation of *Énumération* clearly demonstrates a preference for the offprint (as do his subsequent papers that dealt with taxonomic matters): "Le tirage à part de mon travail *Énumération synoptique des espèces de mammifères fossiles des formations éocènes de Patagonie*, a été imprimé au mois de Février de cette année et distribué dans les premiers jours du mois de Mars. Comme le travail de M. Lydekker porte sur la couverture la date de 1893, on pourrait peut-être me prendre pour un plagiaire; je tiens donc à répéter que la date de cette dernière publication est fausse; l'impression n'en a été terminée qu'au mois de Mars de cette année, et la distribution en a été faite dans le mois d'Avril."

Ameghino used the offprint (le tirage à part) in attempting to establish taxonomic priority for Hegetotheridae over Pachyrucidae, arguing that the offprint had been printed in February and distributed in early March, 1894. The question that immediately comes to mind is: why would Ameghino not have used the *Boletín* version – arguably the more formal publication – instead of the offprint, if both had been published simultaneously (in February, 1894) and therefore available for formal taxonomic purposes? The timing is critical, for Ameghino accepted that Lydekker's paper had been printed in March, 1894. If the *Boletín* version had also been published in March (Ameghino would certainly have been aware of its publication date), then Ameghino would have had every reason to prefer the offprint, which had been printed



in February. It becomes difficult, given this situation, to uphold the idea that the offprint and *Boletín* versions were published simultaneously, and we are left with the likelihood that the offprint was published earlier. It is thus unlikely that Ameghino (1894c) used the offprint merely for practical reasons. One might also wonder why Ameghino did not use the *Boletín* version with a date of 1893, which is the printed date on the *Boletín* version. The reason is that Ameghino was clearly aware (as has been demonstrated here and as implied by Ameghino in ignoring any mention of the *Boletín* version) that the date of the *Boletín* version is incorrect; and as he criticized the incorrect date of Lydekker's paper, he could not very well have put himself in the position of falling into a similar trap. We suggest that this strengthens the argument for recognizing the offprint version over the *Boletín* version for taxonomic purposes, as did the original author himself.

Roth (1899) provides further insight. In discussing the issue of the priority of Hegetotheriidae or Pachyrucidae, Roth (1899) confirmed that Ameghino's (1894a) offprint had been distributed in March, 1894. Ameghino (1894c) noted that it had been distributed in the first few days of March, which Roth (1899) did not contradict. If there were issue with Ameghino's (1894c) claim, we would expect that Roth (1899: 173) would have pointed this out, given that this author explicitly noted that Lydekker's work had been distributed in the "mes de Marzo de 1894 (no en Abril como pretende Ameghino)." Although the taxa noted here are not of concern in the current report, Roth's (1899) work both reinforces that the offprint version of *Énumération* was printed in February, 1894 (for he cites it as such and as was likely given its distribution in the first few days of March, 1894) and that during the 19th century, just following the publication of the *Boletín* and offprint versions of *Énumération*, it was the offprint version that was cited in attempting to resolve issues

of priority. We suggest that by 1899 Roth could easily and preferentially have referred to the *Boletín* version (again, arguably the more formal publication) were he confident that they had been published simultaneously.

Although all the scenarios presented in the preceding paragraphs are plausible, the only objectively demonstrable circumstance is that the offprint bears a correct publication year, whereas the *Boletín* version bears an incorrect publication year. We suggest this is sufficient evidence for our recommendation that the former be recognized as the formal source for nomenclatural purposes (as did Ameghino, 1894c and Roth, 1899), while maintaining that the offprint was published earlier than the *Boletín* version of *Énumération*.

## CONCLUSIONS

1.-*Énumération* was published in 1894, but included in Volume 13 of the *Boletín*, which is dated as 1893. Volume 13 should thus be recognized as including articles published in 1892, 1893, and 1894.

2.-In accordance with the evidence presented and analyzed here we recommend that the offprint, dated February 1894 and distributed in the first days of March, be used for nomenclatural purposes. The offprint is available online at <http://www.biodiversitylibrary.org/bibliography/77348#/summary> and several hard copies still exist (e.g., the library system of the Museo Argentino Ciencias Naturales “Bernardino Rivadavia,” Museo Nacional de Historia Natural Montevideo, and Museum of Comparative Zoology; A. Mones, pers. comm., 2015).

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**Appendix 1: Taxa erected in *Énumération* (Ameghino (1894a)).**

**Appendix 1: Nomenclatural actions and taxa erected in *Énumération* (Ameghino, 1894).**

*Homunculus imago* Ameghino, 1894: 10

*Pitheculus* Ameghino, 1894: 10

*Pitheculus australis* Ameghino, 1894: 10

*Protypotherium lineare* Ameghino, 1894: 13

*Patriarchus icochiloides* Ameghino, 1894: 14

*Icochilus senilis* Ameghino, 1894: 15

*Icochilus lamellosus* Ameghino, 1894: 15

*Icochilus trilineatus* Ameghino, 1894: 16

*Icochilus anomalus* Ameghino, 1894: 16

*Icochilus truncus* Ameghino, 1894: 16

*Icochilus crassiramis* Ameghino, 1894: 16

*Icochilus multidentatus* Ameghino, 1894: 17

*Icochilus curtus* Ameghino, 1894: 17

*Icochilus hegetotheroides* Ameghino, 1894: 17

*Interatherium brevifrons* Ameghino, 1894: 18

*Interatherium anguliferum* Ameghino, 1894: 18

*Interatherium interruptum* Ameghino, 1894: 18

*Interatherium dentatum* Ameghino, 1894: 18

*Hegetotheridae* Ameghino, 1894: 19

*Hegetotherium minun* Ameghino, 1894: 19

*Selatherium* Ameghino, 1894: 19

*Selatherium pachymorphum* Ameghino, 1894: 20

*Selatherium remissum* Ameghino, 1894: 20

*Nesodon cavifrons* Ameghino, 1894: 23

*Nesodon brachycephalus* Ameghino, 1894: 24

*Proterotherium perpolitum* Ameghino, 1894: 36

*Proterotherium pyramidatum* Ameghino, 1894: 37

*Proterotherium nitens* Ameghino, 1894: 37

*Proterotherium principale* Ameghino, 1894: 37

*Proterotherium divortium* Ameghino, 1894: 38

*Proterotherium brachygnathum* Ameghino, 1894: 38

*Proterotherium intermedium* Ameghino, 1894: 38

*Proterotherium mixtum* Ameghino, 1894: 39

*Tetramerorhinus* Ameghino, 1894: 39

*Tetramerorhinus fortis* Ameghino, 1894: 40

*Tetramerorhinus lucarius* Ameghino, 1894: 40

*Licaphrium granatum* Ameghino, 1894: 41

*Licaphrium proclivum* Ameghino, 1894: 42

*Licaphrium debile* Ameghino, 1894: 42

*Licaphrium tenuae* Ameghino, 1894: 43

*Tichodon* Ameghino, 1894: 43

*Tichodon quadrilobus* Ameghino, 1894: 43

*Heptaconus* Ameghino, 1894: 44

*Heptaconus acer* Ameghino, 1894: 44

*Thoatherium rhabdodon* Ameghino, 1894: 45

*Diadiaphorus robustus* Ameghino, 1894: 47

*Homalodontotherium excursum* Ameghino, 1894: 64

*Homalodontotherium crassum* Ameghino, 1894: 64

*Acaremys tricarinatus* Ameghino, 1894: 68  
*Sciamys robustus* Ameghino, 1894: 68  
*Sciamys tenuissimus* Ameghino, 1894: 68  
*Neoreomys variegatus* Ameghino, 1894: 68  
*Scleromys osbornianus* Ameghino, 1894: 69  
*Adelphomys eximius* Ameghino, 1894: 69  
*Stichomys arenarus* Ameghino, 1894: 70  
*Stichomys regius* Ameghino, 1894: 70  
*Spaniomys biplicatus* Ameghino, 1894: 70  
*Perimys impactus* Ameghino, 1894: 72  
*Perimys aemulus* Ameghino, 1894: 72  
*Perimys pacificus* Ameghino, 1894: 72  
*Perimys reflexus* Ameghino, 1894: 72  
*Perimys diminutus* Ameghino, 1894: 73  
*Prolagostomus amplus* Ameghino, 1894: 73  
*Dicardia proxima* Ameghino, 1894: 74  
*Abderites altiramis* Ameghino, 1894: 84  
*Metriodromus* Ameghino, 1894:86  
*Metriodromus arenarus* Ameghino, 1894: 87  
*Metriodromus spectans* Ameghino, 1894: 87  
*Callomenus robustus* Ameghino, 1894: 88  
*Callomenus ligatus* Ameghino, 1894: 88  
*Epanorthus simplex* Ameghino, 1894: 91  
*Metaepanorthus* Ameghino, 1894: 92  
*Metaepanorthus complicatus* Ameghino, 1894: 92



*Paraepanorthus* Ameghino, 1894: 93  
*Prepanorthus* Ameghino, 1894:95  
*Prepanorthus lanius* Ameghino, 1894: 95  
*Phonocdromus* Ameghino, 1894: 99  
*Phonocdromus patagonicus* Ameghino, 1894: 100  
*Phonocdromus gracilis* Ameghino, 1894: 100  
*Parhalmarhiphus* Ameghino, 1894: 100  
*Stilotherium grande* Ameghino, 1894: 102  
*Cladoclinus* Ameghino, 1894: 102  
*Cladoclinus copei* Ameghino, 1894: 103  
*Borhyaena zitteli* Ameghino, 1894: 119  
*Borhyaena sanguinaria* Ameghino, 1894: 120  
*Borhyaena excavata* Ameghino, 1894: 121  
*Prothylacynus brachyrhynchus* Ameghino, 1894: 124  
*Napodonictis* Ameghino, 1894: 124  
*Napodonictis thylacynoides* Ameghino, 1894: 125  
*Anatherium (?) oxyrhynchus* Ameghino, 1894: 128  
*Cladosictis lateralis* Ameghino, 1894: 132  
*Amphiproviverra minuta* Ameghino, 1894: 134  
*Amphiproviverra crassa* Ameghino, 1894: 135  
*Sipalocyon curtus* Ameghino, 1894: 138  
*Sipalocyon mixtus* Ameghino, 1894: 138  
*Sipalocyon altiramis* Ameghino, 1894: 139  
*Sipalocyon longus* Ameghino, 1894: 139  
*Ictioborus destructor* Ameghino, 1894: 140

*Hapalops macrognathus* Ameghino, 1894:145  
*Hapalops brachycephalus* Ameghino, 1894: 146  
*Parhapalops pygmaeus* Ameghino, 1894: 146  
*Amarorhynchus* Ameghino, 1894: 147  
*Amarorhynchus latus* Ameghino, 1894: 147  
*Pseudhapalops altiramis* Ameghino, 1894: 150  
*Pseudhapalops grandis* Ameghino, 1894: 151  
*Eucholoeops curtus* Ameghino, 1894: 154  
*Xyophorus crassissimus* Ameghino, 1894: 156  
*Mecorhinus* Ameghino, 1894: 156  
*Mecorhinus primus* Ameghino, 1894:157  
*Uranokyrtes* Ameghino, 1894: 159  
*Uranokyrtes bombifrons* Ameghino, 1894: 160  
*Adiastemus* Ameghino, 1894: 161  
*Adiastemus compressidens* Ameghino, 1894:161  
*Prepothierium moyani* Ameghino, 1894:162  
*Analcimorphus giganteus* Ameghino, 1894: 165  
*Ammotherium aculeatum* Ameghino, 1894: 168  
*Ammotherium declivum* Ameghino, 1894: 168  
*Prodasyptus* Ameghino, 1894: 172  
*Eodasyptus* Ameghino, 1894: 173  
*Peltephilus giganteus* Ameghino, 1894: 179  
*Diaphorocetus* Ameghino, 1894: 181  
*Diochotichus* Ameghino, 1894: 182  
*Adiastaltus procerus* Ameghino, 1894: 186

*Plagiocoelus* Ameghino, 1894: 186

*Plagiocoelus obliquus* Ameghino, 1894: 187