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Curation and cataloging of the "Old Collections" of fossil vertebrates of the Museo de La Plata (1884–1902): The case of Nesodontinae (Mammalia, Notoungulata, Toxodontidae) from the Santa Cruz Formation

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CURATION AND CATALOGING OF THE "OLD COLLECTIONS" OF FOSSIL VERTEBRATES OF THE MUSEO DE LA PLATA (1884–1902): THE CASE OF NESODONTINAE (MAMMALIA, NOTOUNGULATA, TOXODONTIDAE) FROM THE SANTA CRUZ FORMATION

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Abstract. The process of organizing early collections for the simple sake of storing and retrieving information—for example, assigning identifying numbers to specimens, recording those numbers in a catalog, and, more recently, adding that information to a computerized database—has long been central to museum collections management. In this sense, catalog numbers are vital when specimens are used for research. Particularly the early fossil vertebrate collections ("Old Collections") of the Museo de La Plata, Argentina, incorporated in the last decades of the 19th Century and the beginning of the 20th century (that is, between 1884 and 1902) to this institution are considered foundational. They hold approximately 35,000 specimens that show diverse and varied ways in the curatorial and cataloging procedures carried out throughout time. In this contribution, we selected the notoungulate mammals Nesodontinae (Toxodontidae) from the Santa Cruz Formation (Early–Middle Miocene) housed in the Vertebrate Paleontology collection, as a sample study. The reasons to study this group are: (1) its scientific importance, as it was one of the best studied between 1887 and 1894; (2) it includes some of the first vertebrates incorporated into the Museo de La Plata in 1884; and (3) there are a large number of specimens in the collection. More than 780 specimens were reviewed, with 84 type specimens registered, several previously reported as lost.

Key words. Toxodontia. *Nesodon. Adinotherium.* Santacrucian. Old Collections. Management.

Resumen. CURACIÓN Y CATALOGACIÓN DE LAS "COLECCIONES ANTIGUAS" DE VERTEBRADOS FÓSILES DEL MUSEO DE LA PLATA (1884–1902): EL CASO DE LOS NESODONTINAE (MAMMALIA, NOTOUNGULATA, TOXODONTIDAE) DE LA FORMACIÓN SANTA CRUZ. El proceso de organizar las colecciones antiguas por el simple hecho de almacenar y recuperar información—por ejemplo, identificar y asignar números de catálogo a los especímenes, registrar esos números en catálogos y, más recientemente, incorporar esa información a bases de datos digitales—ha sido durante mucho tiempo tema central de la gestión de las colecciones de un museo. Particularmente las primeras colecciones de vertebrados fósiles ingresadas al Museo de La Plata ("Colecciones Antiguas") que fueron incorporadas en las últimas décadas del siglo XIX y comienzos del siglo XX (esto es, entre 1884 y 1902) son consideradas fundacionales en esa institución. Cuentan con aproximadamente 35.000 especímenes y muestran una gran variedad de procedimientos curatoriales y de catalogación realizados a través del tiempo. En esta contribución, hemos seleccionado como caso de estudio los mamíferos notoungulados Nesodontinae (Toxodontidae) provenientes de la Formación Santa Cruz (Mioceno Temprano–Medio) por las siguientes razones: (1) su importancia científica, ya que este grupo fue uno de los mejor estudiados entre 1887 y 1894; (2) fueron uno de los primeros vertebrados fósiles incorporados al Museo de La Plata en 1884; (3) incluyen un gran número de especímenes dentro de la colección. Se revisaron más de 780 especímenes y se registraron 84 especímenes tipo, varios de ellos previamente reportados como perdidos.

Palabras clave. Toxodontia. *Nesodon, Adinotherium.* Santacrucense. Viejas Colecciones. Gestión.

THE FOSSIL vertebrate collections incorporated into the Museo de La Plata (MLP) between 1884 and 1902 hold approximately 35,000 specimens. These collections include reptiles, birds, and terrestrial and marine mammals from the Argentine Pampean region and Patagonia collected, exchanged, or purchased by Francisco P. Moreno (1852–1919; Fig. 1.1) before the creation of the MLP, and those collected by the first explorations to Patagonia organized by the MLP. They also include significant originals and casts of Pampean mammals purchased from Florentino Ameghino

(1854–1911; Fig. 1.3), and originals provided by the Swiss naturalist Santiago Roth (1850–1924; Fig. 1.9).

The terrestrial fossil mammals from Patagonia are considered the foundation stone of what Rosendo Pascual (1925–2012), Head of the *División Paleontología Vertebrados* (DPV) of the MLP between 1957–2007, informally termed "Old collections" ("*Viejas Colecciones*" *in schedula* in the DPV-Record Book N° 3, p. 92–93) in 1958. Later, the term was used to refer also to other groups (whales, birds, dinosaurs) that are part of the early fossil vertebrate collections from Patagonia and Pampean region housed in the MLP-PV (Museo de la Plata-Paleontología Vertebrados) collection.

Particularly important are the terrestrial mammals (Metatheria, Xenarthra, Notoungulata, Astrapotheria, Litopterna, Rodentia, and Primates) from the Early–Middle Miocene Santa Cruz Formation (SCF). This is one of the most widespread continental formations in South America, cropping out virtually all along the Santa Cruz Province in Argentina (Vizcaíno *et al.*, 2012a, 2022; Fernicola *et al.*, 2019; Cuitiño *et al.*, 2019, 2021), and its fossils represent the best record for interpreting the biological diversity of mammals in the southern part of South America before the Great American Biotic Interchange (see Vizcaíno *et al.*, 2012b). They were crucial for understanding and setting the succession of Cenozoic faunas from Patagonia (Ameghino, 1906) and constituted the basis for the establishment of the Santacrucian South American Land Mammal Age (SALMA) (Pascual *et al.*, 1965; Kay *et al.*, 2021).

The first fossil mammals of the SCF were collected from the exposures along the Río Santa Cruz (RSC) valley by F. P. Moreno during 1876–1877 and by Carlos Ameghino (1865–1936; Fig. 1.2) in 1887. They consisted of a large number of

Figure 1. Relevant scientists that participated as researchers, collectors, and curators of the fossil vertebrate collection from **SCF** at the **MLP**. **1,** Francisco P. Moreno, from Archivo Histórico del Museo de La Plata; **2,** Carlos Ameghino from https://alchetron.com/Carlos-Ameghino; **3,** Florentino Ameghino, from https://www.wikiwand.com/es/ Florentino_Ameghino; **4,** Carlos G. Burmeister, from Berg (1985); **5,** Alcides Mercerat, from Vignati (1935); **6,** Santiago Pozzi, from Laza (2019); **7,** Clemente Onelli, from Archivo Histórico del Museo de La Plata; **8,** Richard Lydekker, from Archivo Histórico del Museo de La Plata; **9,** Santiago Roth, from Archivo Histórico del Museo de La Plata.

specimens (*ca.* 3,500) and became the kernel of the SCF vertebrates in the MLP-PV collection.

Among them, the notoungulates, including the groups Toxodontia (Toxodontidae and Homalodotheriidae) and Typotheria (Interatheriidae and Hegetotheriidae), are very common and include skulls and mandibles excellently preserved, isolated teeth, and postcranial elements. In the last part of the 19th century, one of the better-studied groups of the MLP-PV collection was Nesodontinae (Toxodontidae), holding approximately more than 80 type specimens studied by Moreno (1882), Ameghino (1887a, 1887b; 1889), Mercerat (1891b), Lydekker (1895), and Roth (1899).

Until 1925, the ways in which the "Old Collections" and the specimens were labeled and cataloged varied greatly according the criteria of the persons in charge of the collections, in some cases, following personal rather than institutional styles. Unfortunately, a formal record catalog that allows to easily understan the early customs or codes for cataloging was not always kept.

This contribution intends to clarify the curatorial and cataloging procedures used over time on the Nesodontinae (Notoungulata, Toxodontidae) specimens from the "Old Collections" of the MLP-PV. For our purposes, this group represents a clear example to identify different curatorial transactions and decisions on the specimens and the timing of the different cataloging systems used in the early fossil vertebrate collections of the MLP-PV.

BACKGROUND ON THE NATURE, ORIGIN, AND FIRST STUDIES OF THE TOXODONTIDS FROM THE SCF

The fossiliferous exposures of the RSC were explored during 1876–1877 by Moreno (1879), who collected few, but remarkable, fossil mammals of Santacrucian Age. In 1877, during an expedition to Lago Argentino, F. P. Moreno and Carlos M. Moyano (1854–1910) collected the first nesodontines along the valley of the RSC (Moreno, 1879) (Fig. 2). Moreno (1882, p. 23) mentioned the discovery of *Nesodon imbricatus* remains in the RSC in the same place where the skull of an astrapothere had been unearthed, his "*Mesembriotherium brocae*", *nomen illegitimun*. Actually, this specimen is the holotype of *Astrapotherium patagonicum* Burmeister, 1879 (MLP-PV 12-119, Fig. 3; Mercerat, 1891a). In the same place, he also collected two mandibles and isolated teeth of a toxodontid that he called "*Toxodon patagonenes*", *nomen nudum* (Mercerat, 1891, pp. 417–418, 444), MLP-PV 12-43 (Fig. 4.1) and MLP-PV 68-IV-25-10 (Fig. 4.2), syntypes of *Nesotherium patagonense* Mercerat, 1891.

In 1884, F. P. Moreno, who had become the founder and first director of the MLP, donated to the museum the collection he had made in 1874 and 1876–1877 in the Santa Cruz territory and other purchased collections (Vizcaíno *et al.*, 2013). In July 1886, F. Ameghino (1854–1911; Fig. 1.3) became the "*Secretario Subdirector*" (or Assistant Director) of the MLP. Soon after, his brother C. Ameghino (Fig. 1.2) was

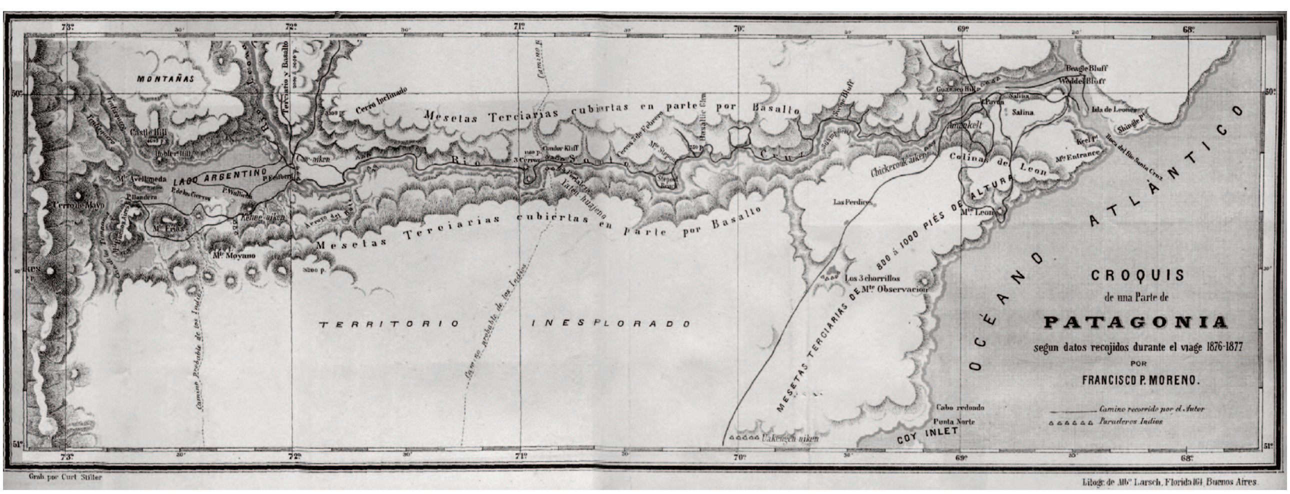

Figure 2. Map of the **RSC** with the itinerary and localities of the expedition of F. P. Moreno, 1876–1877, modified from Moreno (1879). The **RSC** originates in the Lago Argentino and flows through a deeply incised valley, stretching 230 km from west to east across the continent.

Figure 3. ***Astrapotherium patagonicum*** Burmeister, 1879, holotype **MLP-PV 12-119**.

hired as "*Ayudante Preparador de Paleontología*" (Assistant Preparator of Paleontology) and "*Naturalista Viajero*" (Travelling Naturalist) (see Fernicola, 2011a, 2011b; Vizcaíno, 2011; Fernicola *et al.*, 2014). In the same year, the MLP started a field research and a collecting program. In January 1887, F. P. Moreno commissioned C. Ameghino to the Santa Cruz territory to follow up on his earlier discoveries (Farro, 2009; Vizcaíno, 2010; Fernicola, 2011a, 2011b; Vizcaíno *et al.*, 2012a, 2012b, 2013). The maps produced by the British Vice-Admiral Robert Fitz Roy (1805–1865), captain of HMS Beagle during Charles Darwin's famous voyage, extended and improved by the expeditions of F. P. Moreno in1876–1877, served as a guide for C. Ameghino's expedition to the SCF in the RSC, beginning in January 1887 and returning to La Plata in September 1887 (F. Ameghino, 1887a; C. Ameghino, 1890). Data published by F. Ameghino (1887a, 1887b) and C. Ameghino (1890) indicated that the specimens were collected in three localities along the RSC, between 90 and 200 km west of its mouth, and possibly a fourth locality at about 50 km further southwest (see Fernicola *et al.*, 2014 for details on these localities).

Approximately 2,500 fossil vertebrate specimens from the SCF (number estimated from crossing data of the "*Inventario de las existencias del Museo de La Plata-Inventario de la Sección Paleontológica*", DPV internal inventory reports of S. Roth in 1902; Book Catalog of Fossil Vertebrates N° 1 and N° 2 —see below—, and Archival card catalog) were collected in this expedition to the RSC and housed in the MLP-PV. The fossils were described by Ameghino (1887a, 1887b), who named more than 120 new species of extinct mammals. Among them, F. Ameghino erected 16 species of toxodontid nesodontines (Ameghino, 1887a; Tab. 1), but the descriptions of these species were published later (Ameghino, 1887b). Then, F. Ameghino published the data on which he termed the *Formación Santacruceña* or *Piso Santacruceño* (Ameghino, 1889).

In 1888, F. P. Moreno commissioned the Italians Santiago Pozzi (1849–1929; Fig. 1.6) and Clemente Onelli (1864–1924; Fig. 1.7), with the assistants Juan Ivovich and Francisco Larrumbe, to undertake a second expedition to the RSC (Moreno, 1890; Farro, 2008). Approximately 2,900 fossil vertebrate specimens (an estimated number obtained from crossing data of the "*Inventario de las existencias del*

Figure 4. Toxodontids collected by F. P. Moreno in 1876–1877 from **RSC**: **"*Toxodon patagonenes*"** (*nomen nudum*), ***Nesotherium patagonense*** Mercerat, 1891, Syntypes **1, MLP-PV 68-IV-25-10**, right palate with P4–M3 broken and **2, MLP-PV 12-43**, left palate with P4–M3 (probably both belong to the same individual); **3,** F. Ameghino handwriting label (taxonomic identification): **"*Protoxodon patagonensis*"**; **4,** F. Ameghino handwriting label (coded): "I-S-(3)"; **5,** A. Mercerat handwriting label (taxonomic identification): **"*Trematherium patagonensis*"** (*nomen nudum*, note that *Trema* was amended by *Neso* in blue ink). The same three handwriting labels are adhered on both specimens; **6, MLP-PV 12-43** figured by Ameghino (1889, pl. XVII, fig. 6) as ***Protoxodon sulivani*** Owen (***Nesotherium patagonense*** Mercerat, 1891); **7–8, MLP-PV 12-984** ***Nesodon imbricatus***, right mandibular fragment with symphysis and i2, **7,** in labial view, and **8,** in occlusal view. Scale bar= 1 cm.

Museo de La Plata - Inventario de la Sección Paleontológica", DPV internal inventory reports of S. Roth in 1902; Book Catalog of Fossil Vertebrates N° 1 and N° 2, and Archival card catalog) were collected in this expedition and housed in the MLP-PV in 1889. Many of the specimens from the RSC collected by C. Ameghino in 1887 and S. Pozzi in 1888 were later studied by the Swiss geologist Alcides Mercerat (18?? –1934; Fig. 1.5) (Mercerat 1891a, 1891b, 1891c; Moreno & Mercerat, 1891) who replaced F. Ameghino as paleontologist of the MLP in 1889.

Between 1891 and 1894, there were two new expeditions to the Santa Cruz territory. The first one, in 1891, was carried out by the "*Naturalista Viajero del Museo de La Plata*" Carlos Germán Venancio Burmeister (1867–1951)—the eldest son of C. Germán Conrado Burmeister (Fig. 1.4)—together with the MLP employees Emilio Beaufils, J. Ivovich, and Federico Berry. In 1894, F. Berry conducted the second expedition and collected approximately 86 specimens that were housed in the MLP-PV collection in September 1895 (Fig. 5.1–4).

In 1893 and 1894, the English naturalist and geologist Richard Lydekker (1849–1915; Fig. 1.8), visited Argentina invited by F. P. Moreno and spent some months studying the collection of fossil vertebrates of the MLP. His work, including many illustrations, was published in the "Anales del Museo de La Plata" volumes II and III (Lydekker, 1894, 1895). Lydekker gave the first satisfactory account of several of the peculiar extinct vertebrates of South America, *i.e.*, dinosaurs and cetaceans from Patagonia and South American ungulates. His descriptions and figures of the Nesodontinae from the SCF (Lydekker, 1895) are especially valuable. In his study, Lydekker synonymized most of the species erected by Ameghino (1887a) and Mercerat (1891b) (see Appendix), and figured several type specimens studied by Ameghino (1887a), *i.e.*, MLP-PV 12-2 *Acrotherium patagonicum* (plate XV, fig. 2), *Adinotherium magister* (plate XVI, fig. 3), and MLP-PV 12-4 *Adinotherium magister* (plate XVI, fig. 1) (Fig. 6.1–3).

MATERIALS AND METHODS

Cataloging of fossil vertebrates is the process by which all the parts of a specimen are linked to their associated information (identification, anatomical description, locality, stratigraphy, age, collector, date, and any other relevant data) through a catalog number, a single identifying number that should be marked on the fossil when possible. Also, cataloging is the process of creating metadata representing information resources, such as books and inventory ledgers.

In order to review all toxodontid specimens from the SCF of the "Old Collections", we conducted an exhaustive search and revision of the drawers and shelves of the collection storages. Approximately 780 specimens were identified and analyzed, and their associated information was tracked and verified based on two main sources, as follows.

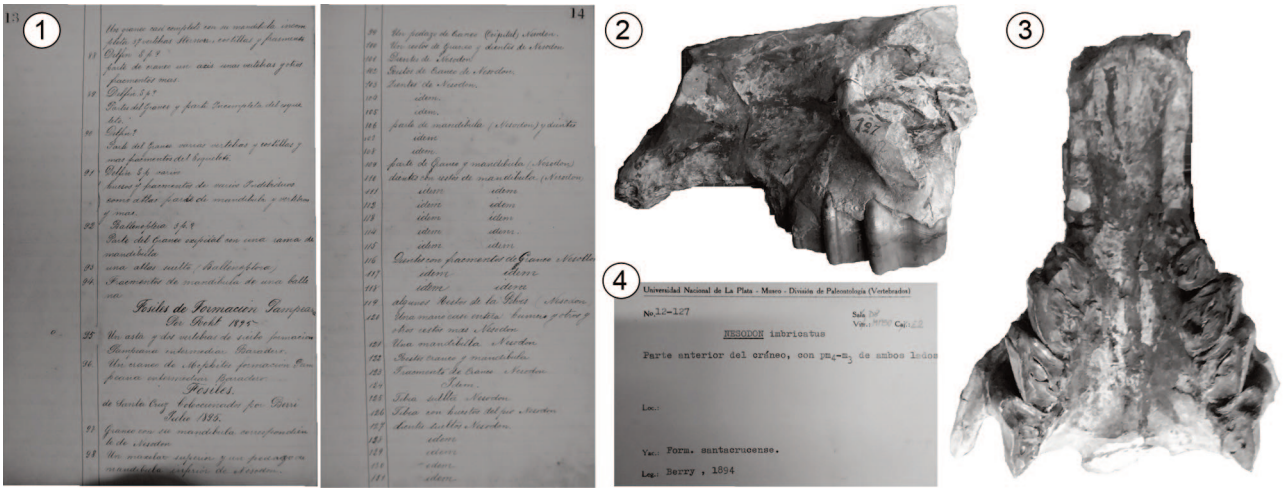

Figure 5. Federico Berry collection from **SCF**, 1894. **1,** Registration of the collection in in the **RBFV N° 1** (p. 13–16), September 1895; **2–4, MLP-PV 12-127**, ***Nesodon imbricatus***, incomplete skull with P4-M3 left and right series; **2,** in lateral view and **3,** in occlusal view (note the number 127); **4,** Catalog card.

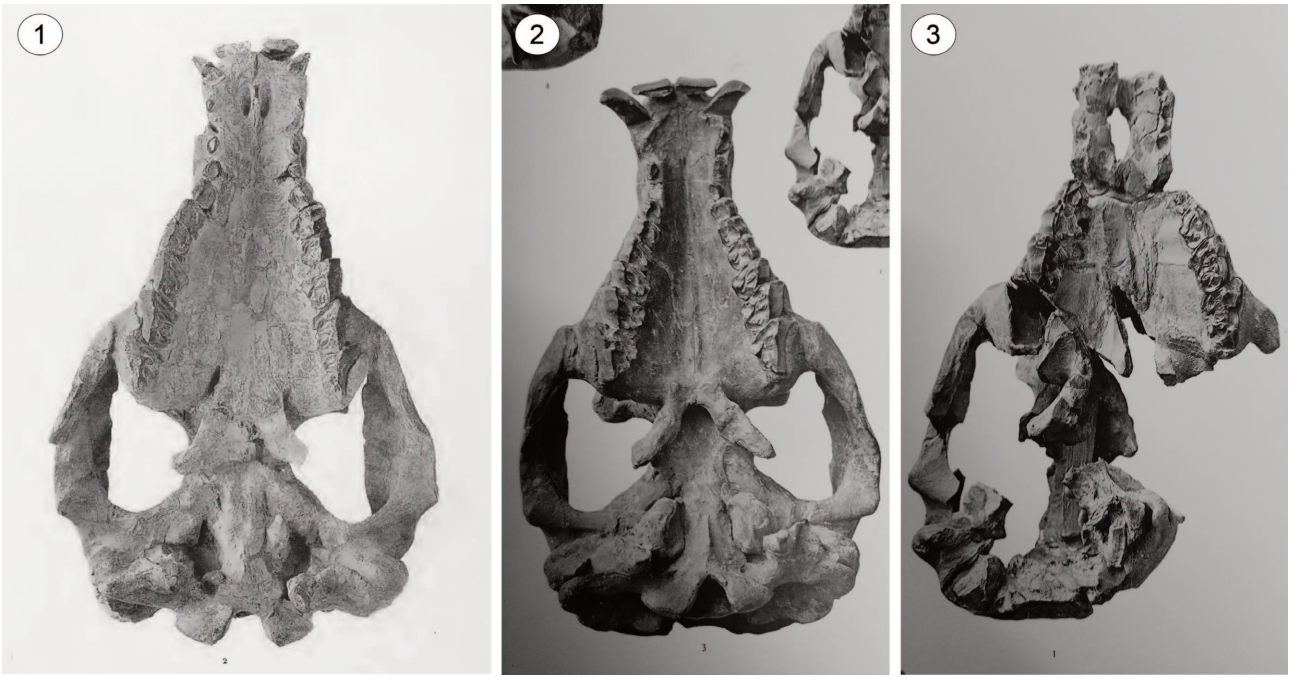

Figure 6. Nesodontines from **RSC** figured by Lydekker (1895). **1,** Syntype **MLP-PV 12-6** ***Adinotherium magister*** Ameghino (plate XVI, fig. 1); **2,** Syntype **MLP-PV 12-2** ***Adinotherium magister*** Ameghino (plate XV, fig. 2); **3,** Syntype **MLP-PV 12-4** ***Adinotherium magister*** Ameghino (plate XVI, fig. 3).

Fossils as a primary source of data (Figs. 7–8)

- Identification of the handwriting labels adhered on the fossil by F. Ameghino in 1886–1887 and by A. Mercerat in 1889–1891 (Figs. 7.1–3, 8.1–2).
- Acronyms written in the fossil with India ink, probably by S. Roth in the period 1895–1896 (see below) (Figs. 7.3–4, 8.1–2).

MLP-PV archival documents (books) (Fig. 9)

- Book Catalog of Fossil Vertebrates N° 1 (BCFV N° 1)—*Libro Catálogo de Vertebrados Fósiles* N° 1, Notungulata [*sic*], Folios 447–474—(1895–1925; Fig. 9.1).
- Book Catalog of Fossil Vertebrates N° 3 (BCFV N° 3)—*Libro Catálogo de Vertebrados Fósiles* N° 3, Notungulata [*sic*], Folios 21–79—(1895–1925).
- Record Book of Fossil Vertebrates N° 1 (RBFV N° 1)—*Libro de Registro de Vertebrados Fósiles* N° 1—(1925–1952).
- Record Book of Fossil Vertebrates N° 2 (RBFV N°2)—*Libro Registro de Vertebrados Fósiles* N° 2— (1911/27–1953/57).
- Record Book of Fossil Vertebrates N° 3 (RBFV N°3)—*Libro de Registro de Vertebrados Fósiles* N° 3—(1955–1969).
- "*Inventario de las existencias del Museo de La Plata-Inventario de la Sección Paleontológica*" by Roth (1902). MLP internal inventory report, unpublished, p. 51–65. (Fig. 9.2)
- DPV Internal report fossil vertebrate listing of the MLP exhibitions, *ca.* 1905 (Fig. 9.3).
- Archival card catalog (implemented during 1955–1956) (Fig. 9.4–7).

Finally, the information was compared and verified with published catalogs or synopsis and relevant bibliography that include: Ameghino (1887a, 1887b, 1889), Mercerat (1891a, 1891b, 1891c), Moreno & Mercerat (1891), Lydekker (1895), and Mones (1986).

EARLY PHASE (1887–1903) OF THE CATALOGING SYSTEM: HANDWRITING LABELS, ACRONYMS, AND SEQUENTIAL NUMBERING

Labels with author's handwriting attached to the specimens from RSC

The MLP-PV "Old Collections" include numerous specimens (among them, holotypes and syntypes) that keep original handwriting labels (Figs. 7–8). These old labels, lightly attached to the specimens, have been frequently

partially peeled away and the ink is fading, making it very difficult to read. Handwriting recognition for deciphering the authorship of labels has been surveyed following Breure (2013). Positive identification of authorship was facilitated by comparing with other documents, such as correspondence and internal reports from DPV collection archives. The diversity and the regular preservation of these labels provide an important historical and scientific value to those collections (Figs. 10–11). The analysis of this information allowed narrowing down the manufacturing date of these labels to the 1886–1887 and 1889–1890 years of the 19th century and F. Ameghino and A. Mercerat were identified as the main authors, respectively.

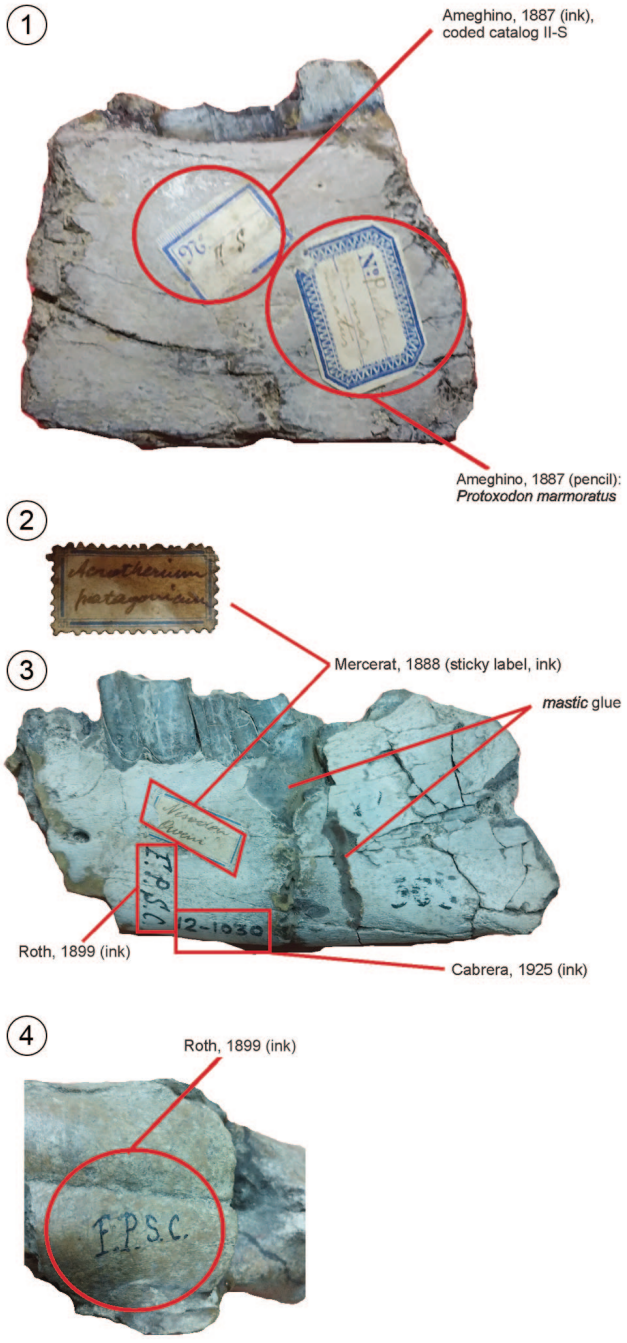

Figure 7. Taxonomic identification and coded labels and acronyms on Nesodontinae specimens from **SCF**. **1,** F. Ameghino's identification and coded catalog sticky labels; **2–3,** A. Mercerat identification labels; **4,** S. Roth acronym "**F.P.S.C**". Note that the specimens were repaired using *mastic* glue (a mixture of gypsum, virgin wax, and vegetal resin).

Florentino Ameghino was the first that used handwriting labels attached on the fossils for cataloging and curating the "Pampean" collection that he sold to the MLP in 1886 (Fig. 10.2) and the SCF collection made by F. P. Moreno (1876–1877) and C. Ameghino (1887) in the cliffs of the RSC (Fig. 10.1–8). For the SCF, he used 27 x 19 mm template size labels, with serrated or smooth edges and round corners (Fig. 10.1, 10.3–8). In each specimen identified so far, we found two labels: one with the taxonomic identification and the other with a probable geographic code (localities) supplied by C. Ameghino. There is no written record of what the code means, but it includes Roman numbers (I to IIII), and the letters S and N, separate by a dash (*e.g.*, II-S; Fig. 10.4, 10.6–7), and in some cases, followed by an Arabic number between brackets (*e.g.*, I-S-(3); Fig. 10.6–7). Based on information from Fernicola *et al.* (2014), we tentatively assume that they correspond to the localities prospected in 1887 by C. Ameghino in the south and north banks of the RSC.

As mentioned above, between 1889 and 1891, A. Mercerat had an important role in the management of the nesodontine collections made by F. P. Moreno, C. Ameghino, and S. Pozzi. Mercerat curated and studied the specimens and drew up extensive catalogs with brief descriptions, but without figures, of Santacrucian terrestrial mammals and birds (Mercerat, 1891a, 1891b, 1891c; Moreno & Mercerat, 1891). Mercerat (1891a) named and described 28 new taxa of Nesodontinae (Toxodontidae) from Santa Cruz (Tab. 1). Most of the specimens restudied are identifiable by labels on the fossils with taxonomic identification data handwritten in India ink (Fig. 11.2–10). Mercerat used square cornered label template size (27 x 15 mm; Fig. 13.1) with serrated or smooth edges. Interestingly, and probably erroneously, A. Mercerat labeled several type specimens of

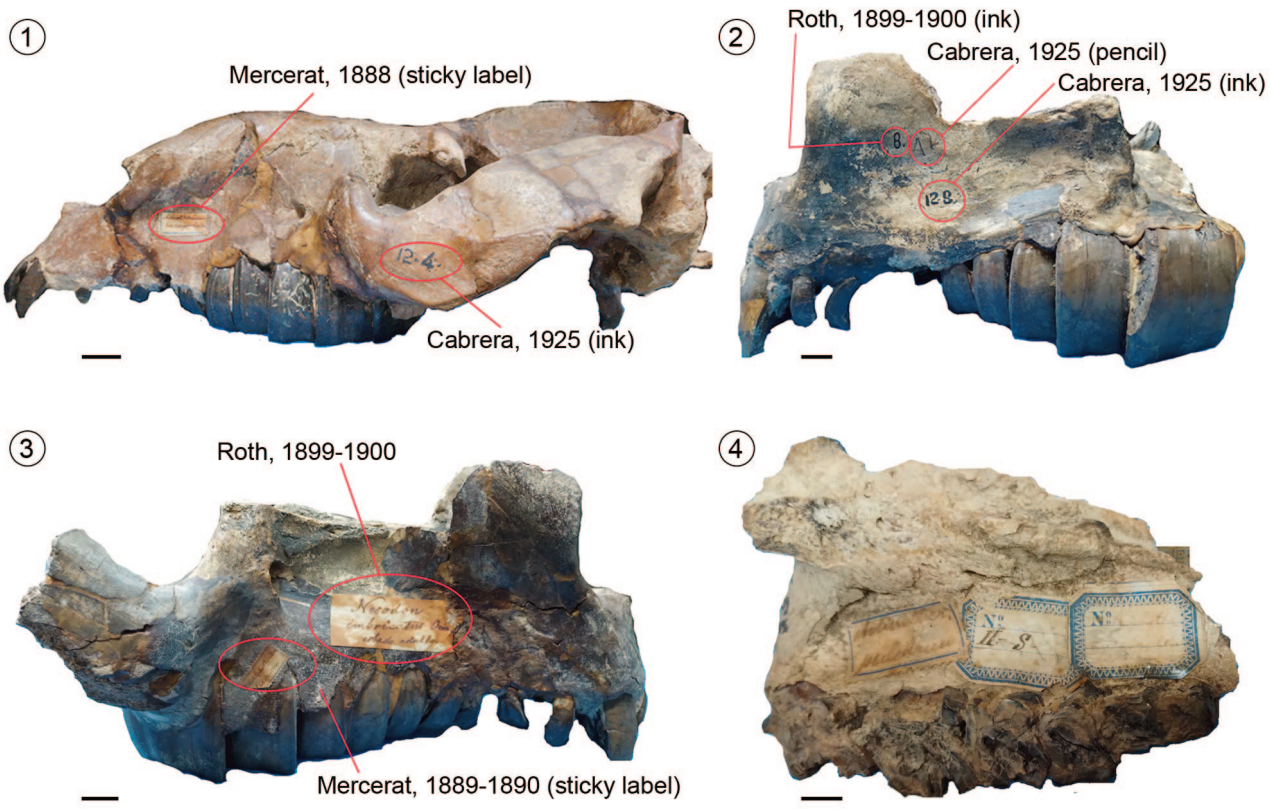

Figure 8. Identification and sticky labels on the fossil. **1,** Left lateral view of **MLP-PV 12-4**, holotype of ***Acrotherium patagonicum*** Mercerat, 1891; **2–3,** Left and right lateral views of **MLP-PV 12-8**, syntype of ***Adelphotherium trivium*** Mercerat, 1891; **4, MLP-PV 55-XII-13-5**, ***Adinotherium splendidum*** Ameghino, left maxilla with P2-M3; A. Mercerat's taxonomic label: ***Adinotherium pulchrum***, F. Ameghino coded original label: II-S-, and A. Mercerat's taxonomic identification original label: ***Adinotherium splendidum***.

Nesodontinae from RSC with the name *Trematherium*; *i.e.*, "*Trematherium kobyi*" (*in schedula*, *nomen nudum*; Fig. 11.2), "*Trematherium rutilum*" (*in schedula*, *nomen nudum*; Fig. 11.3), "*Trematherium patagonensis*" (*in schedula*, *nomen nudum*; Fig. 11.4), "*Trematherium ingens*" (*in schedula*, *nomen nudum*; Fig. 11.5), "*Trematherium argentinum*" (*in schedula*, *nomen nudum*; Fig. 11.6) as type specimens of Nesodontinae from RSC. Unfortunately, *Trematherium* had been first used by Ameghino (1887b) to name a Megalonychidae (Xenarthra, Folivora) from the RSC, whose type species is *Trematherium intermixtum,* MLP-PV 4-45 (Fig. 10.8).

In 1892, A. Mercerat left the MLP, abandoned the study of Santacrucian fossils, and continued with the geologic investigations in Patagonia (Mercerat, 1893, 1895, 1896).

Acronyms and sequential numbering, book catalog

In 1895, F. P. Moreno designated the Swiss S. Roth (1850–1924; Fig. 1.9) as Head of the *Sección Paleontología* to replace A. Mercerat. The museum collections and research were fundamental components of S. Roth's activities in the MLP, including field works, specimen preparation, conservation and cataloging, public education and outreach, and staff management (Sánchez Villagra *et al.*, 2023). While managing the MLP-PV collection, S. Roth undertook an active role in the fossils cataloging. One of his first tasks was to implement a cataloging system (acronyms and numbers) for the fossil samples. In 1896, he used the same system for all the fossils he collected during the trips to Río Negro, Neuquén, and Chubut provinces, recording with initials (acronyms) the geologic/geographic provenance and numbering the samples with tags of different colors. He labeled the fossils with acronyms handwritten in black India ink (Fig. 7.4), *e.g.*, *T.m.C.* ("*Terciario medio Collón Curá*"), *T.i.C.B.* ("*Terciario inferior Cañadón Blanco*"), *C.s.M.* ("*Cretácico superior Muster*"), and the sequential numbering also written onto the fossils (Vera & Reguero, 2023; Sánchez Villagra *et al.*, 2023).

Probably in 1895, S. Roth started labeling all the fossil vertebrates collected in the SCF with the acronym "*F.P.S.C.*" ("*Formación Patagónica Santa Cruz*") (Fig. 7.4).

Mercerat also labeled as "*F.P.S.C.*" some specimens collected by the MLP expedition to Chubut in 1888 by C. Ameghino, E. Botello, and A. Steinfeld, which were erroneously considered Santacrucian in age, considering they come from older (Deseadan?) strata. This collection includes the astrapotheriid *Astrapotherium voghti* Mercerat, 1891 (syntypes MLP-PV 12-105, MLP-PV 12-122, MLP-PV 12-1081, and MLP-PV 12-1089) from an undetermined Carhué locality, *Astrapotherium* sp. (MLP-PV 12-1113) from Puerto Madryn, and *Trachytherus spegazzinianus* (MLP-PV 52-XI-2-1) probably from Choiquenilahue.

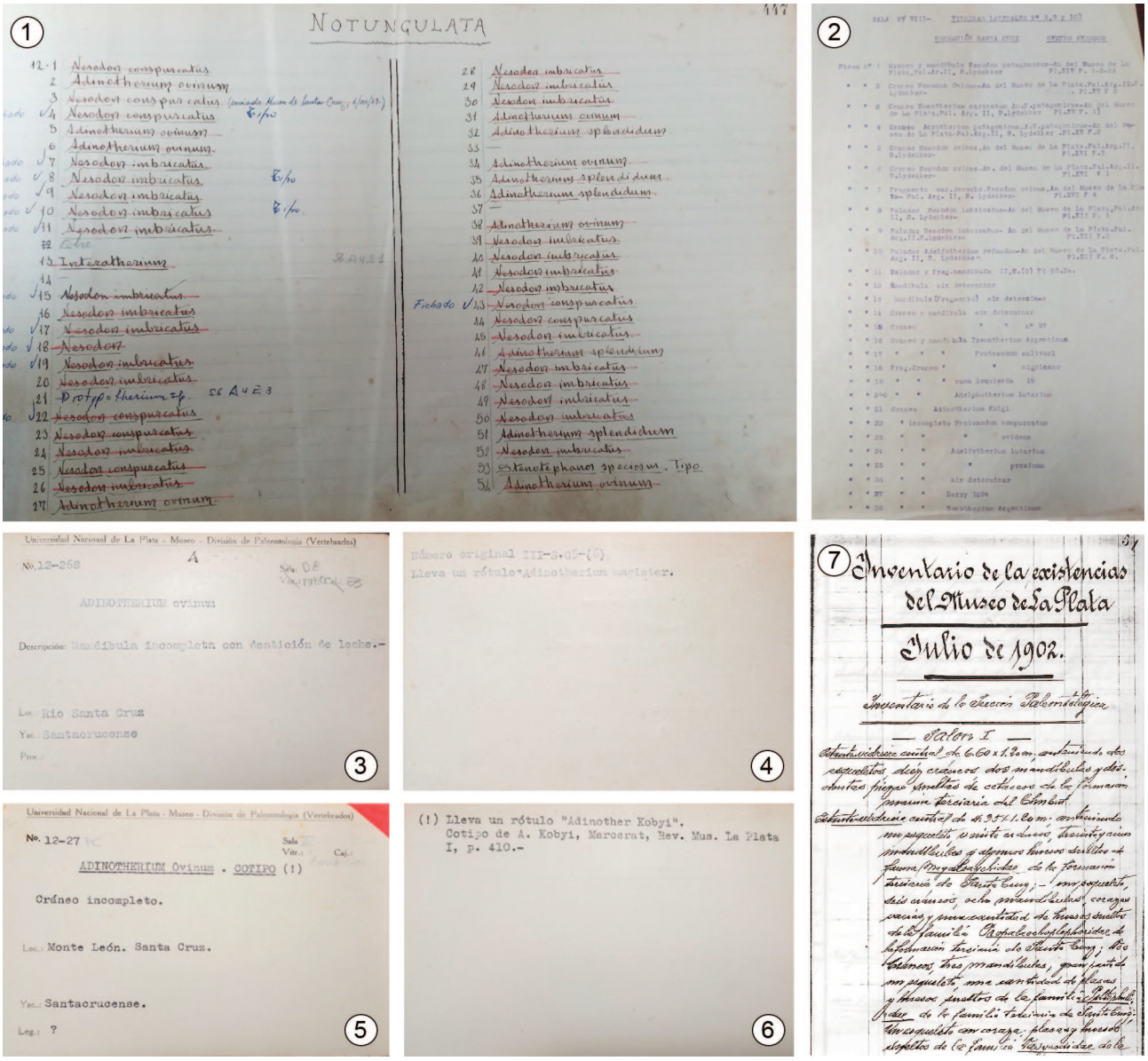

Figure 9. DPV Ledgers and archives: **1,** First page of the **BCVF N° 1**: Notungulata (sic) (p. 447); **2, DPV** Internal Report fossil vertebrate listing of the **MLP** exhibition in 1902: *Sala VIII-Vitrinas laterales* N° 8, 9 y 10-Formación Santa Cruz- género *Nesodon*; **3,** Archival catalog card **MLP-PV 12-268**, *Adinotherium ovinum*, incomplete mandible with milk dentition; **4,** Reverse side of the archival card **MLP-PV 12-268**, "*Número original* III-S.G5-(6). *Lleva un rótulo "Adinotherium magister"*; **5,** Archival catalog type card **MLP-PV 12-27**, *Adinotherium ovinum*, incomplete skull, "Cotype"; **6,** Reverse side of the archival card **MLP-PV 12-27**, "*Lleva un rótulo 'Adinother Kobyi'. Cotipo de A. Kobyi*, Mercerat, Rev. Mus. La Plata, I, p. 410"; **7,** First page of S. Roth report to the **MLP** (July of 1902, *"Inventario de las existencias del Museo de La Plata- Inventario de la Sección Paleontológica", Folios* 51–65).

Approximately between 1895 and 1896, S. Roth implemented the first book catalog of fossil vertebrates (BCFV N° 1) and the first record book of fossil vertebrates (RBFV N° 1) of the MLP-PV collection. In the BCFV N° 1, S. Roth subdivided the entries into 16 systematic groups plus one of casts: Megatheriidae (p. 1), Mylodontidae (p. 51), Megalonychidae (p. 250), Cetacea (p. 381), Perissodactyla (p. 391), *Calcos varios* (p. 399), Proboscidea (p. 411), Artiodactyla (p. 425), Carnivora (p. 433), Marsupialia (p. 441), Notungulata (*sic*), (p. 447), Pyrotheria (p. 475), Insectivora (p. 477), Rodentia (p. 479), Xenartha (Glyptodontidae) (p. 491), Condylarthra (p. 559), and Pisces (p. 563) (Figs. 6.1 and 12) and listed in each group the name of the specimens with the same sequential numbering. In Notungulata (*sic*) of the BCFV N°1 (pp. 447–474) (Fig. 6.1), he also included litopterns and astrapotheres and 1,566 specimens of notoungulates from the SCF. In total, S. Roth listed 322 specimens of nesodontines from the SCF collected by F. P. Moreno (1876–1877), C. Ameghino (1887), S. Pozzi and C. Onelli (1888–1889), and F. Berry (1889). For their identification, S. Roth adopted the names considered valid by Lydekker (1895) and Ameghino (1891, 1894, 1895): *Nesodon* sp., *Nesodon imbricatus, Nesodon conspurcatus, Adinotherium, Adinotherium ovinum, Adinotherium splendidum, Adinotherium nitidum, Rhadinotherium limitatum,* and *Stenotephanus speciosus* (see Appendix).

Figure 10. Different labels with author's handwriting adhered on specimens from the "Old Collection" ("Pampean" and Nesodontinae from **SCF**) of the **MLP**, 1886–1888. **1,** Square cornered label template size (27 x 18 mm) with serrated or with smooth edges; **2,** Two different series of labels originating from F. Ameghino in 1886 ("Pampean") Collection: left ***Lama guanicoe*** (Camelidae) "*192 Amegh, Luján*", right ***Lama guanicoe*** (Camelidae) "*220 Amegh, Luján*"; **3, "*Protoxodon patagonensis*"** on **MLP-PV 12-43**, taxonomic identification original label; **4, "*Protoxodon patagonensis*"** on **MLP-PV 12-43**, coded original label: "I-S-(3)"; **5,** Ameghino taxonomic identification original label: ***Protoxodon obliteratus*** on syntype **MLP-PV 12-940**; **6,** F. Ameghino original label: "III-S-G5-(1)" on syntype **MLP-PV 12-940**; **7,** F. Ameghino coded original label: "I-N-(5)" on **MLP-PV 12-42** ***Adelphotherium trivium***; **8,** F. Ameghino handwriting taxonomic identification label (amended) ***Trematherium intermixtum*** associated to the holotype **MLP-PV 4-45**; **9–12,** Different handwritten labels by S. Roth, 1899–1900.

TABLE 1– Species of Toxodontidae from the SCF erected by Ameghino (1887a, 1887b) and Mercerat (1891b)

Ameghino (1887a, 1887b)	Mercerat (1891b)
Protoxodon patagonensis	*Acrotherium patagonicum*
Protoxodon conspurcatus	*Acrotherium australe*
Protoxodon marmoratus	*Acrotherium intermedium*
Protoxodon obliteratus	*Acrotherium variagatum*
Protoxodon sulivani (Owen)	*Acrotherium mutabile*
Adelphotherium ligatum	*Nesodon bifurcatus* (Ameghino)
Acrotherium rusticum	*Nesodon oweni*
Gronotherium decrepitum	*Nesodon cyclops* (Ameghino)
Adinotherium magister	*Nesodon rutimeyeri*
Adinotherium splendidum	*Nesodon typicus*
Adinotherium proximum	*Nesodon limitatun* (Ameghino)
Adinotherium ferum	*Adinotherium pulchrum*
Adinotherium nitidum	*Adinotherium silvaticum* (Ameghino)
Phobereotherium silvaticum	*Adinotherium antiquum*
Atrypterium bifurcatum	*Adinotherium kobyi*
Scophotherium cyclops	*Nesotherium carinatum*
Rhadinotherium limitatum	*Nesotherium studeri*
	Nesotherium elegans
	Nesotherium rufum
	Nesotherium patagonense (Ameghino)
	Nesotherium turgidum
	Nesotherium rutilum
	Nesotherium argentinum
	Nesotherium nehringi
	Nesotherium burmeisteri
	Protoxodon evidens
	Protoxodon clemens
	Protoxodon trouessarti
	Protoxodon americanus
	Protoxodon decrepitus (Ameghino)
	Protoxodon henseli
	Protoxodon speciosus
	Adelphotherium lutarium
	Adelphotherium trivium

Figure 11. Mercerat handwriting label (taxonomic identifications, *nomina dubia*, *in schedula*), 1889–1892. **1,** Square cornered label template size (27 x 15 mm) with serrated or with smooth edges; **2, "*Trematherium kobyi*"** on **MLP-PV 12-1035** (*nomen nudum*); **3, "*Trematherium rutilum*"** (*nomen nudum*) on **MLP-PV 12-70**; **4, "*Trematherium patagonensis*"** (*nomen nudum*), on **MLP-PV 12-4** (note that *Trema* was amended by *Neso* in blue ink); **5, "*Trematherium ingens*"** (*nomen nudum*) on **MLP-PV 12-57**; **6, "*Trematherium argentinum*"** (*nomen nudum*) on **MLP-PV 12-16**; **7. *Adelphotherium trivium*** on **MLP-PV 12-8**; **8. *"Adelphotherium pumilum"*** on **MLP-PV 12-25**; **9. *Acrotherium patagonicum*** on **MLP-PV 12-44**; **10. *Nesodon oweni*** on **MLP-PV 12-962**.

At the beginning of the 20th century, the MLP organized the first presentation and display of the fossil vertebrate collections, among others. In July 1902, S. Roth provided a summary of the pieces in his "*Inventario de las existencias del Museo de La Plata-Inventario de la Sección Paleontológica*" (*Folios* 51–65). He reported that in the exhibition today identified as *Salas* VII and VIII (Fig. 13), most Nesodontinae specimens (including all the types) from the SCF studied by F. Ameghino and A. Mercerat were on display in wood and

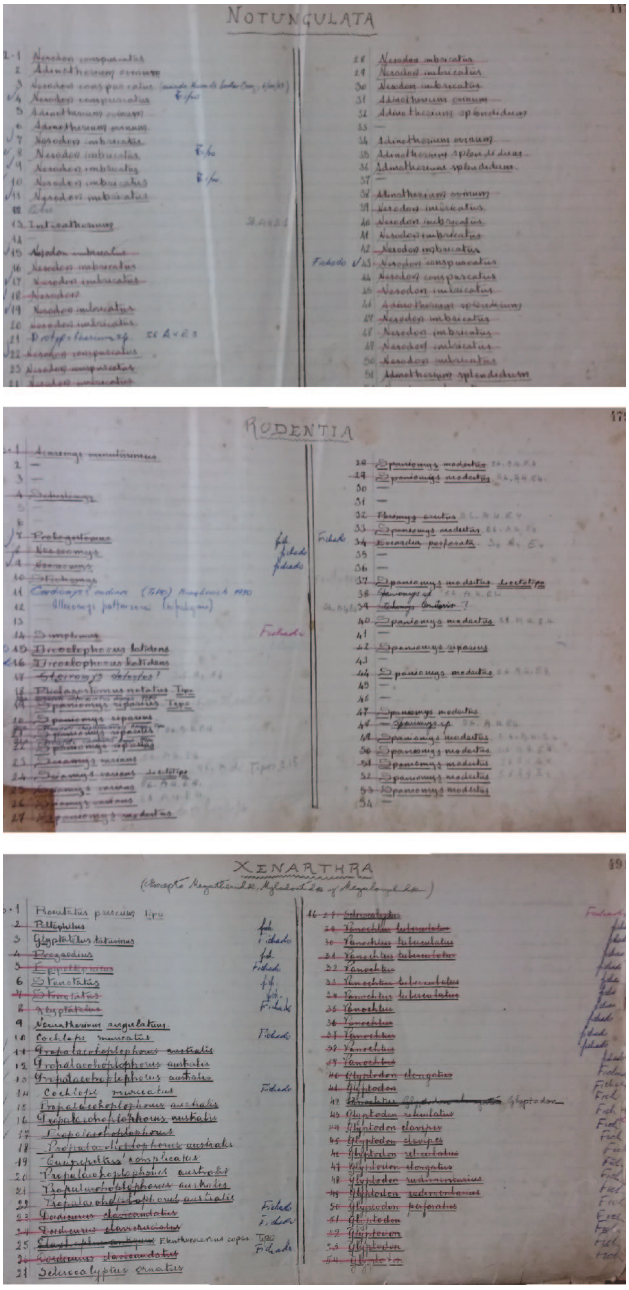

Figure 12. First pages of the **BCVF** N° 1: Notungulata (*sic*) (p. 447), Rodentia (p. 479), and Xenarthra (p. 491).

glass showcases. They included: 45 skulls, 100 maxillae, and 115 mandibles (a total of 260 specimens) of *Nesodon* and *Adinotherium*. Also, in the cabinets at the bottom of the showcases, there were 36 wooden boxes containing approximately 10,000 remains of fossil vertebrates from the "*formación terciaria de Santa Cruz*" (most of them labeled with the acronym "*F.P.S.C.*").

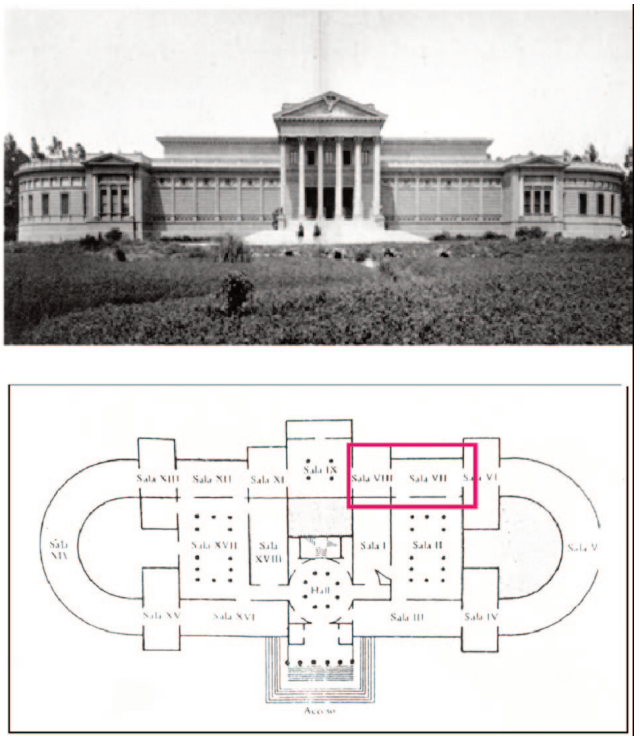

Figure 13. MLP in early 1900s. Old distribution of the exhibition halls ("*Salas*"), from the Archivo Histórico del Museo de La Plata. The red square is positioned on *Salas* VII and VIII (Exhibition of nesodontines from **SCF**).

MODERN PHASE (1925–1968) OF THE CATALOGING SYSTEM: NEW CATALOG NUMBERS AND CATALOG CARDS

After Roth's passing in 1924, the Director of the MLP Luis María Torres (1878–1937) offered the position of *Jefe de Departamento de Paleontología* to the Spanish Angel L. Cabrera (1879–1960; Fig. 14.1). He understood that the specimens of the collection should be referred by their catalog number in scientific publications, which was not a common practice until that time. In September 1925, the cataloging numbering of the MLP-PV collection changed to a new system: indicating year, month (in Roman), day, and sequential number separated by hyphens (*e.g.*, 25-X-2-1). However, for the early collections, A. L. Cabrera kept the sequential numbering system adopted by S. Roth in the BCFV N° 1 and N° 2, but he added a digit for the 16 systematic group entries, followed by a hyphen before the sequential number (Fig. 8.1–2). The digits were defined as follow: **2-** Megatheriidae, **3-** Mylodontidae, **4-** Megalonychidae, **5-** Cetacea, **6-** Perissodactyla, **7-** *Calcos varios*, **8-** Proboscidea, **9-**Artiodactyla, **10-** Carnivora, **11-** Marsupialia, **12-**

Notungulata (*sic*) (including Notoungulata, Astrapotheria, and Litopterna), **13-** Pyrotheria, **14-** Insectivora, **15-** Rodentia, **16-** Xenarthra (Glyptodontidae), **17-** Condylarthra, and **21-** Pisces. With this slight modification of the cataloging in the BCFV N° 1 and N° 2, A. L. Cabrera supported the idea that citing the catalog number ensures that everyone is looking at the same specimen and the same set of associated information.

The remaining specimens from the SCF were cataloged in the mid-1950s, when Héctor A. Orlando was the Head of the *División Paleontología* of the MLP, and R. Pascual (Fig. 14.2), section assistant of *División Paleontología.* In 1955, R. Pascual together with the technician Lorenzo Julio Parodi (1890–1969), started to organize and classify the rest of the "Old Collection" from SCF housed in the MLP-PV and made the first archival card catalog (Fig. 9.4–7). They unpacked and made some curatorial transactions, registration, and cataloging of specimens that had not been yet processed since they arrived to the MLP. In some cases, it was impossible to determine who was the collector, given the sparse information associated with them.

In 1955 and 1968, two important curatorial transactions were done regarding the cataloging of the remaining last specimens from the SCF: in 1955, in the BRFV N° 2 ("*folios*" 92–139) was registered the MLP-PV 55-XII-13, consisting of 480 specimens of xenarthrans and notoungulates (most of them labeled "*F.P.S.C.*") with the collecting locality "Monte León, Santa Cruz". In this collection, there were 165 nesodontine specimens: 124 of *Nesodon* sp. and 41 specimens of *Adinotherium* sp. Among them there were some type specimens labeled by F. Ameghino and A. Mercerat; for example, the syntype of *Adinotherium antiquum* Mercerat, 1891 (MLP-PV 55-XII-13-40, old number 145) collected apparently by S. Pozzi in the 1888–1889 expedition. Some other specimens that did not have any label were also included in this catalog number. It is possible that they were collected in the expedition of C. Burmeister to the SCF in 1891 and that was kept packed, hidden, and away from systematic studies and curatorial actions (cataloging) for many years.

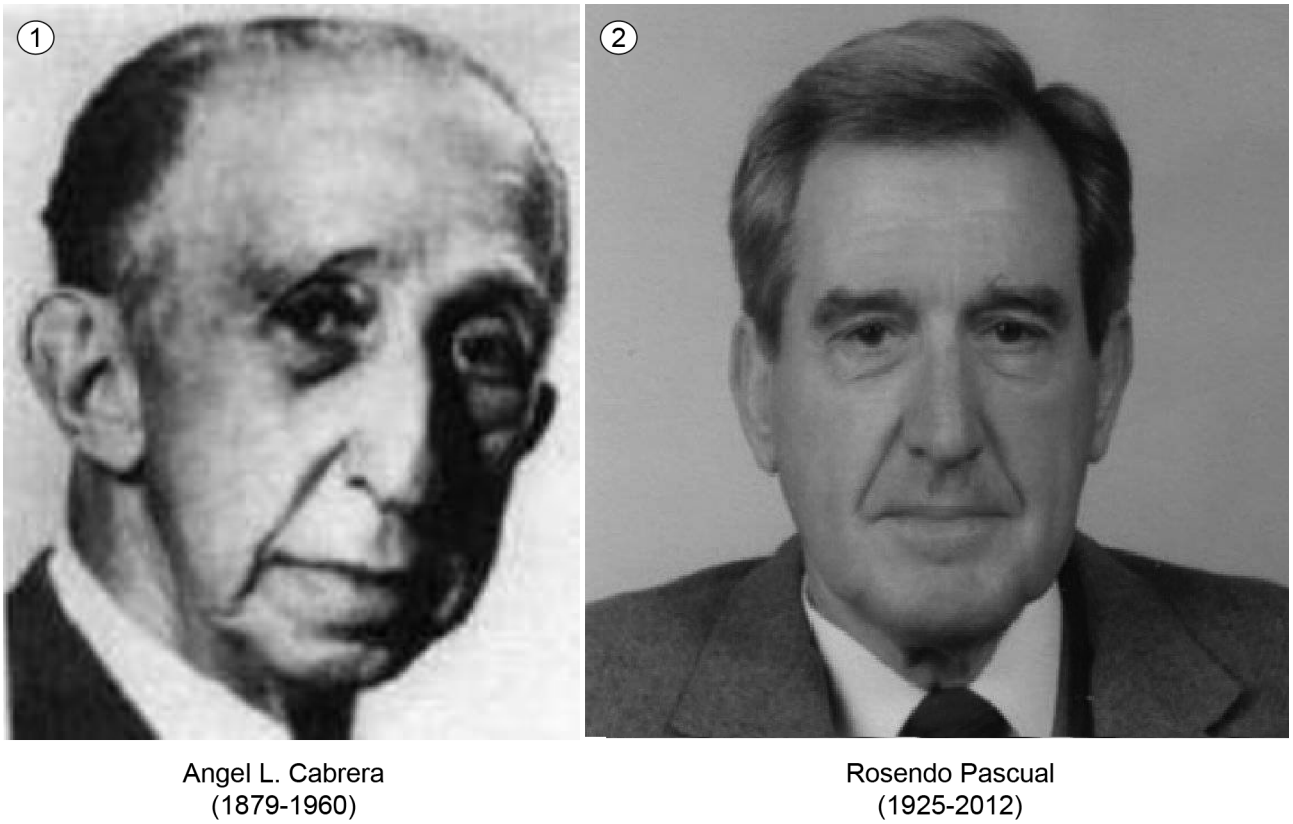

Figure 14. 1. Angel L. Cabrera, from the Archivo Histórico del Museo de La Plata; **2.** Rosendo Pascual, from M. Reguero.

In 1968, a second important curatorial transaction was registered in RBFV N° 3 with the catalog number MLP-PV 68-VI-25 comprising 500 specimens from Santa Cruz (most of them labeled "*F.P.S.C.*"). There were 195 nesodontines cataloged: 148 referred to *Nesodon* sp. and 147 to *Adinotherium* sp. As in the previous transaction of 1955, some type specimens labeled by F. Ameghino and A. Mercerat were registered in this collection. For example, the syntype of *Adinotherium antiquum* Mercerat, 1891, MLP-PV 68-VI-25-11 (old number 150) from Monte León, Santa Cruz, probably collected by S. Pozzi, 1888–1889, and the syntype of *Nesotherium patagonensis*, MLP-PV 68-VI-25-10 from the RSC collected by C. Ameghino (Fig. 4.2). In addition, many specimens of this transaction did not have any label or geographic provenance and probably belong to the C. Burmeister expedition to the FSC in 1891.

As a summary, in Figure 15 we provide the main steps of the early and modern phases of the curatorial and cataloging procedures performed on the Toxodontidae Nesodontinae collection from SCF housed in the MLP-PV collection.

CONCLUSIONS

In this contribution, we reviewed the curatorial and cataloging procedures made between 1884 and 1902 on specimens from the "Old Collections" housed in the MLP-PV collection. For our purpose, we selected the notoungulate mammals Toxodontidae Nesodontinae from the Santa Cruz Formation (Early–Middle Miocene). Our goal was to organize and curate this collection, which was subjected to different curatorial processes when the Vertebrate Paleontology collections of the MLP began to be classified. Our main results can be summarized as follows:

- More than 800 nesodontines cataloged from the "Old Collections" of the SCF were thoroughly reviewed, recording and analyzing their associated information.
- At least two types of handwriting labels were identified. The analysis of the information provided in the labels allowed narrowing down the manufacturing date of these labels to the 1886–1887 and 1889–1890 years of the 19th century and F. Ameghino and A. Mercerat, respectively, were identified as the main authors.
- The diversity and the regular preservation of these labels provide an important historical and scientific value to those collections.
- The archival card catalog of the collection, performed in 1955–1956, contains accurate and very useful processed metadata associated with the early fossil vertebrate collections.
- Eighty-four type specimens were identified and re-cataloged. Some of them had been reported as lost in different publications (Mones, 1986; Hernández Del

	Early phase (1887-1903) of the cataloging system			Modern phase (1925-1968) of the cataloging system			
	Old MLP cataloging system (1887-1891) Labels on the fossils from F. Ameghino and A. Mercerat	Roth MLP cataloging system (1895-1898). Acronym placed on the fossils and sequential numbering.	Roth MLP cataloging system (1901-1903). DPV Catalog Book of Fossil Vertebrates N° 1 and N° 2. First MLP Exhibition.	Cabrera MLP cataloging system (1925). DPV Record Book of Fossil Vertebrates N° 1 ("Notungulata"). New catalog number and cataloging system.	Pascual MLP cataloging system (1925). DPV Record Book of fossil vertebrates N° 3. Archival catalog cards (1955-1956).		
SCF Nesodontinae * (number of specimens)	Sticky labels	F.P.S.C.	F.P.S.C. + number	F.P.S.C + catalog number: MLP 12-	F.P.S.C. + MLP 55-XII-13 Monte León	F.P.S.C. + MLP 68-VI-25	
Nesodon	234	234	234	234	124	148	
Adinotherium	84	84	84	84	41	147	
Rhadinotherium	1	1	1	1			
Stenotephanos	3	3	3	3			
				322	165	295	Total: 782 specimens

* After Roth´s identifications in the DPV Catalog Book of Fossil Vertebrates N° 1

Figure 15. Early (1887–1903) and Modern (1925–1068) phases of the curatorial transactions and cataloging system of the **MLP** "Old Collections".

TABLE 2 – Type specimens of Nesodontinae (Notoungulata, Toxodontidae) of the "*F.P.S.C.*", "Old Collections" of the MLP

Catalog number	Identification	Description	Type	Locality	Age	Collector	Figured
MLP-PV 12-1	*Protoxodon conspurcatus* Ameghino, 1887	Skull and mandible	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	Lydekker (1895, pl. XIV, fig. 1.2, 2a)
MLP-PV 12-2	*Adinotherium magister* Ameghino. 1887	Skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	Lydekker (1895, pl. XV, fig. 3)
MLP-PV 12-3	*Nesotherium carinatum* Mercerat, 1891	Skull and mandible	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	Lydekker (1895, pl. XV, fig. 1)
MLP-PV 12-4	*Acrotherium patagonicum* Mercerat, 1891	Skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	Lydekker (1895, pl. XV, fig. 2)
MLP-PV 12-5	*Adinotherium magister* Ameghino, 1887	Skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-6	*Adinotherium magister* Ameghino, 1887	Skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	Lydekker (1895, pl. XVI, fig. 1)
MLP-PV 12-8	*Adelphotherium trivium* Mercerat, 1891	Palate with premolars and molars	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	Lydekker (1895, pl. XII, fig. 1)
MLP-PV 12-10	*Adelphotherium repandum* Mercerat, 1891	Skull	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-15	*Adelphotherium lutarium* Mercerat, 1891	Skull and mandible	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-16	*Nesotherium argentinum* Mercerat, 1891	Skull and mandible	Syntype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-17	*Protoxodon sulivani* Mercerat, 1891	Skull and mandible	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-19	*Adelphotherium ligatum* Ameghino, 1887	Skull	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-20	*Adelphotherium lutarium* Mercerat, 1891	Incomplete skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-23	*Protoxodon evidens* Mercerat, 1891	Rostrum	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-24	*Adelphotherium lutarium* Mercerat, 1891	Incomplete skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-25	*Adelphotherium pumilum* Mercerat, 1891	Incomplete skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 55-XII-13-247	*Adelphotherium pumilum* Mercerat, 1891	Incomplete skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-26	*Adelphotherium lutarium* Mercerat, 1891	Incomplete skull	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-27	*Adinotherium kobyi* Mercerat, 1891	Incomplete skull	Syntype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-28	*Nesotherium argentinum* Mercerat, 1891	Incomplete skull	Syntype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-29	*Nesotherium turgidum* Mercerat, 1891	Incomplete skull	Holotype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-31	*Adinotherium magister* Ameghino, 1887	Incomplete skull	Syntype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-32	*Adinotherium pulchrum* Mercerat, 1891	Incomplete skull with right p1-m3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 55-XII-13-5	*Adinotherium pulchrum* Mercerat, 1891	Left maxilla with P2-M3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-38	*Phobereotherium sylvaticum* Ameghino, 1887	Incomplete skull	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-40	*Adelphotherium trívium* Mercerat, 1891	Left maxilla with P3-M3	Sintype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-41	*Adelphotherium trívium* Mercerat, 1891	Right maxilla with P4-M3	Sintype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-42	*Acrotherium rusticum* Ameghino, 1887	Left maxilla with P2-M3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	

TABLE 2– Continuation

Catalog number	Identification	Description	Type	Locality	Age	Collector	Figured
MLP-PV 12-43	*Nesotherium patagonensis* Mercerat, 1891	Left palate with P4-M3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	F. P. Moreno, 1876–1877	
MLP-PV 68-IV-25-10	*Nesotherium patagonensis* Mercerat, 1891	Right palate with P4-M3 broken	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	F. P. Moreno, 1876–1877	
MLP-PV 12-44	*Acrotherium patagonicum* Mercerat, 1891	Left maxilla with P2-M3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-46	*Adinotherium splendidum* Ameghino, 1887	Left maxilla with P4-M2	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-50	*Acrotherium rusticum* Ameghino, 1887	Rostrum with right i1-2, c-p2	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-53	*Nesodonopsis speciosus* Roth, 1899	Right maxilla with M1-3	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-55	*Acrotherium mutabile* Ameghino, 1887	Palate with right P4-M2 and left P4-M2	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-58	*Nesotherium rutilum* Mercerat, 1891	Right mandibular fragment with p4-m3	Syntype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-59	*Hyperoxotodon speciosus* Mercerat, 1895	Right maxilla with M1-3	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-62	*Acrotherium variegatum* Mercerat, 1891	Right maxilla with P4-M2	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-64	*Adelphotherium lutarium* Mercerat, 1891	Right maxilla with M1-2	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-65	*Nesodon typicus* Mercerat, 1891	Fragment of maxilla with teeth	Syntype	Monte León, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-68	*Nesodon rutimeyeri* Mercerat, 1891	Mandibular fragment with two molars of juvenile	Syntype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-71	*Acrotherium mutabile* Mercerat, 1891	Left maxilla with P4-M3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-86	*Nesotherium argentinum* Mercerat, 1891	Mandibular fragment with m3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-147	*Adinotherium splendidum* Ameghino, 1887	Fragment of palate with P4-M1-3 right and left series	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-158	*Protoxodon speciosus* Mercerat, 1891	Right mandibular fragment	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-233	*Gronotherium decrepitum* Ameghino, 1887	Right mandibular fragment	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-249	*Rhadinotherium limitatum* Ameghino, 1887	Mandibular fragment with molars	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-250	*Protoxodon marmoratus* Ameghino, 1887	Mandible	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-259	*Adinotherium proximun* Ameghino, 1887	Mandible with molar series complete	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-272	*Nesodon typicus* Mercerat, 1891	Left mandibular fragment with dm 3-4 and m1	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-280	*Adinotherium splendidum* Ameghino, 1887	Left mandibular fragment with molar series	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-286	*Atrypterium bifurcatum* Ameghino, 1887	Right mandibular fragment with molar series	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-836	*Adinotherium ferum* Ameghino, 1887	Mandible incomplete	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-838	*Protoxodon clemens* Mercerat, 1891	Left mandibular fragment with broken teeth	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-847	*Protoxodon clemens* Mercerat, 1891	Right mandibular fragment	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-851	*Protoxodon obliteratus* Ameghino, 1887	Right mandibular fragment with broken molars	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	

TABLE 2– Continuation

Catalog number	Identification	Description	Type	Locality	Age	Collector	Figured
MLP-PV 12-43	*Nesotherium patagonensis* Mercerat, 1891	Left palate with P4-M3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	F. P. Moreno, 1876–1877	
MLP-PV 68-IV-25-10	*Nesotherium patagonensis* Mercerat, 1891	Right palate with P4-M3 broken	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	F. P. Moreno, 1876–1877	
MLP-PV 12-44	*Acrotherium patagonicum* Mercerat, 1891	Left maxilla with P2-M3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-46	*Adinotherium splendidum* Ameghino, 1887	Left maxilla with P4-M2	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-50	*Acrotherium rusticum* Ameghino, 1887	Rostrum with right i1-2, c-p2	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-53	*Nesodonopsis speciosus* Roth, 1899	Right maxilla with M1-3	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-55	*Acrotherium mutabile* Ameghino, 1887	Palate with right P4-M2 and left P4-M2	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-58	*Nesotherium rutilum* Mercerat, 1891	Right mandibular fragment with p4-m3	Syntype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-59	*Hyperoxotodon speciosus* Mercerat, 1895	Right maxilla with M1-3	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-62	*Acrotherium variegatum* Mercerat, 1891	Right maxilla with P4-M2	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-64	*Adelphotherium lutarium* Mercerat, 1891	Right maxilla with M1-2	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-65	*Nesodon typicus* Mercerat, 1891	Fragment of maxilla with teeth	Syntype	Monte León, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-68	*Nesodon rutimeyeri* Mercerat, 1891	Mandibular fragment with two molars of juvenile	Syntype	Monte León, Santa Cruz	Santacrucian	S. Pozzi, 1888–1889	
MLP-PV 12-71	*Acrotherium mutabile* Mercerat, 1891	Left maxilla with P4-M3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-86	*Nesotherium argentinum* Mercerat, 1891	Mandibular fragment with m3	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-147	*Adinotherium splendidum* Ameghino, 1887	Fragment of palate with P4-M1-3 right and left series	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-158	*Protoxodon speciosus* Mercerat, 1891	Right mandibular fragment	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-233	*Gronotherium decrepitum* Ameghino, 1887	Right mandibular fragment	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-249	*Rhadinotherium limitatum* Ameghino, 1887	Mandibular fragment with molars	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-250	*Protoxodon marmoratus* Ameghino, 1887	Mandible	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-259	*Adinotherium proximun* Ameghino, 1887	Mandible with molar series complete	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-272	*Nesodon typicus* Mercerat, 1891	Left mandibular fragment with dm 3-4 and m1	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-280	*Adinotherium splendidum* Ameghino, 1887	Left mandibular fragment with molar series	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-286	*Atrypterium bifurcatum* Ameghino, 1887	Right mandibular fragment with molar series	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-836	*Adinotherium ferum* Ameghino, 1887	Mandible incomplete	Holotype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-838	*Protoxodon clemens* Mercerat, 1891	Left mandibular fragment with broken teeth	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-847	*Protoxodon clemens* Mercerat, 1891	Right mandibular fragment	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	
MLP-PV 12-851	*Protoxodon obliteratus* Ameghino, 1887	Right mandibular fragment with broken molars	Syntype	Río Santa Cruz, Santa Cruz	Santacrucian	C. Ameghino, 1887	

Pino, 2018) (Tab. 2). Three type specimens were still not identified in the MLP-PV collection: *Acrotherium australe* Mercerat, 1891; *Acrotherium intermedium* Mercerat, 1891; and *Adelphotherium rothi* Mercerat, 1891.

- The early fossil vertebrate collections ("Old Collections") of the MLP-PV are not only archives of past-discovered knowledge but also reservoirs of potential future observations, that is, they have great "evidential value."

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APPENDIX – Summary of the Nesodontinae (Notoungulata, Tocodontidae) from the SCF at the Río Santa Cruz identified by Ameghino (1887a, b; 1889) and Mercerat (1890, 1891), and its current nomenclatural status

Ameghino (1887a, 1887b, 1889)	Synonymies and current status	Reference
Nesodon imbricatus Owen, 1847	*Nesodon imbricatus*	Scott (1912)
Nesodon sulivani Owen, 1847	*Nesodon imbricatus*	Ameghino (1891b, 1894); Lydekker (1894); Scott (1912)
Nesodon ovinum Owen, 1853	*Adinotherium ovinum*	Ameghino (1891b, 1894, 1907); Scott (1912)
Protoxodon patagonensis Ameghino, 1887a	*Nesodon imbricatus*	Ameghino (1894); Scott (1912)
Stenotephanos speciosus Ameghino, 1887b	*Hyperoxotodon speciosus*	Mercerat (1895); Madden (1990)
Protoxodon conspurcatus Ameghino, 1887b	*Nesodon conspurcatus*	Ameghino (1894); Scott (1912)
	Nesodon imbricatus	Lydekker (1894)
Protoxodon marmoratus Ameghino, 1887b	*Nesodon imbricatus*	Lydekker (1894); Scott (1912)
Protoxodon obliteratus Ameghino, 1887b	*Nesodon imbricatus*	Lydekker (1894); Scott (1912)

APPENDIX – Continuation

Ameghino (1887a, 1887b, 1889)	Synonymies and current status	Reference
Adelphotherium ligatum Ameghino, 1887b	*Nesodon imbricatus*	Ameghino (1894); Lydekker (1894); Scott (1912)
Acrotherium rusticum Ameghino, 1887b	*Nesodon imbricatus*	Lydekker (1894); Scott (1912)
Gronotherium decrepitum Ameghino, 1887b	*Nesodon imbricatus*	Scott (1912)
Adinotherium magister Ameghino, 1887b	*Adinotherium ovinum*	Scott (1912)
Adinotherium splendidum Ameghino, 1887b	*Adinotherium splendidum*	Scott (1912)
Adinotherium proximum Ameghino, 1887b	*Adinotherium ovinum*	Ameghino (1904); Scott (1912)
Adinotherium ferum Ameghino, 1887b	*Adinotherium ovinum*	Scott (1912)
Adinotherium nitidum Ameghino, 1887b	*Adinotherium nitidum*	Scott (1912)
Phobereotherium silvaticum Ameghino, 1887b	*Adinotherium silvaticum*	Mercerat (1891)
	Nesodon sylvaticum	Lydekker (1893)
	Phobereotherium silvaticum	Scott (1912)
Atrypterium bifurcatum Ameghino, 1887b	*Nesodon imbricatus*	Ameghino (1894)
	Nesodon conspurcatus	Scott (1912)
Scophotherium cyclops Ameghino, 1887b	*Nesodon imbricatus*	Ameghino (1894); Scott (1912)
Rhadinotherium limitatum Ameghino, 1887b	Toxodontia *incertae sedis*	Scott (1912)
Nesodon oweni Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894); Scott (1912)
Nesodon rutimeyeri Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894)
	Nesodon conspurcatus	Scott (1912)
Nesodon typicus Mercerat, 1891	*Nesodon imbricatus*	Scott (1912)
Adinotherium pulchrum Mercerat, 1891	*Adinotherium splendidum*	Ameghino (1894); Scott (1912)
Adinotherium antiquum Mercerat, 1891	*Adinotherium splendidum*	Scott (1912)
Nesotherium carinatum Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894)
	Nesodon conspurcatus	Scott (1912)
Nesotherium studeri Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894); Scott (1912)
Nesotherium elegans Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894)
	Nesodon conspurcatus	Scott (1912)
Nesotherium rufum Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894); Scott (1912)
Nesotherium nehringi Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894); Scott (1912)
Nesotherium argentinum Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894); Lydekker (1894); Scott (1912)
Protoxodon evidens Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894)
	Nesodon conspurcatus	Scott (1912)
Protoxodon americanus Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894); Scott (1912)
Protoxodon clemens Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894); Scott (1912)
Protoxodon henseli Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894); Scott (1912)
Protoxodon speciosus Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1891b, 1894); Scott (1912)
Adelphotherium lutarium Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894); Scott (1912)
Adelphotherium repandum Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894); Lydekker (1894); Scott (1912)
Adelphotherium trivium Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894); Lydekker (1894); Scott (1912)
Adelphotherium rothi Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894); Scott (1912)
Adelphotherium pumilum Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894); Scott (1912)
Acrotherium intermedium Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894); Scott (1912)
Acrotherium mutabile Mercerat, 1891	*Adinotherium ovinum*	Scott (1912)
Acrotherium patagonicum Mercerat, 1891	*Nesodon imbricatus*	Ameghino (1894)
	Nesodon conspurcatus	Scott (1912)
Acrotherium variegatum Mercerat, 1891	*Nesodon imbricatus*	Scott (1912)