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JUAN CARLOS FERNICOLA[1,2,3]
CAROLA CASTIÑEIRA LATORRE[1,2,4]

1. Sección Paleontología de Vertebrados, Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia'. Av. Ángel Gallardo 470, 1405 Ciudad Autónoma de Buenos Aires, Argentina.
2. Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET). Godoy Cruz 2290, C1425FQB Ciudad Autónoma de Buenos Aires, Argentina.
3. Laboratorio de Anatomía y Biología Evolutiva de Vertebrados (LABEV-UNLu), Departamento de Ciencias Básicas, Universidad Nacional de Luján (UNLu). Ruta Nacional 5 y Av. Constitución, 6700 Luján, Buenos Aires, Argentina.
4. División Mineralogía, Petrología y Sedimentología del Museo de La Plata - Facultad de Ciencias Naturales y Museo (FCNyM), Universidad Nacional de La Plata (UNLP). Paseo del Bosque S/N, 1900 La Plata, Buenos Aires, Argentina.

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Asociación Paleontológica Argentina
Maipú 645 1° piso, C1006ACG, Buenos Aires
República Argentina
Tel/Fax (54-11) 4326-7563
Web: www.apaleontologica.org.ar

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DÁMASO ANTONIO LARRAÑAGA AND THE VERTEBRATE PALEONTOLOGY IN THE RÍO DE LA PLATA IN THE EARLY 19TH CENTURY

JUAN CARLOS FERNICOLA[1,2,3] AND CAROLA CASTIÑEIRA LATORRE[1,2,4]

[1]Sección Paleontología de Vertebrados, Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia'. Av. Ángel Gallardo 470, 1405 Ciudad Autónoma de Buenos Aires, Argentina. *jctano@yahoo.com*; *carolacl2004@gmail.com*

[2]Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET). Godoy Cruz 2290, C1425FQB Ciudad Autónoma de Buenos Aires, Argentina.

[3]Laboratorio de Anatomía y Biología Evolutiva de Vertebrados (LABEV-UNLu), Departamento de Ciencias Básicas, Universidad Nacional de Luján (UNLu). Ruta Nacional 5 y Av. Constitución, 6700 Luján, Buenos Aires, Argentina.

[4]División Mineralogía, Petrología y Sedimentología del Museo de La Plata - Facultad de Ciencias Naturales y Museo (FCNyM), Universidad Nacional de La Plata (UNLP). Paseo del Bosque S/N, 1900 La Plata, Buenos Aires, Argentina.

JCF: https://orcid.org/0000-0003-2318-9275; **CCL:** https://orcid.org/0000-0003-1039-2397

Abstract. Dámaso Antonio Larrañaga was born in 1771 in Montevideo, a city that, by those years, integrated the territories of the Virreinato del Perú, and died in 1848 in the same city, current capital city of República Oriental del Uruguay. Until his death, the natural sciences played a fundamental role in his daily activities and were marked by his religious vocation and his participation in the complex struggle for the independence of South America and Uruguay. As a man of science, he studied botanical, geological, paleontological, zoological, linguistic, and ethnolinguistic topics, under different perspectives related to taxonomy, classification, anatomy, stratigraphy, herbalism, and native lexicography, among others. Parts of his work, manuscripts and drawings, were extensively published during the second decade of the 20th century. A small note of his authorship was included in the second edition of the work entitled *Recherches sur les ossemens fossiles de quadrupeds* by Georges Cuvier, published in 1823. Its content had a strong impact on the international scientific community because he included *Megatherium* as a subgenus of the armadillo *Dasypus*, postulating that this large mammal had an external armor. In this contribution, we analyze the work of Larrañaga and recreate the scientific context in which *Megatherium* was inscribed as an armored mammal. As a result, we intend to associate this inference in the diverse postulates concerning the classification of mammals, which, at that time, were based on dental structures, as well as the influence exerted by the interaction between prominent naturalists of the 19th century.

Key words. History. Armored *Megatherium*. Luján. Auguste de Saint-Hilaire. George Cuvier.

Resumen. DÁMASO ANTONIO LARRAÑAGA Y LA PALEONTOLOGÍA DE VERTEBRADOS EN EL RÍO DE LA PLATA A PRINCIPIOS DEL SIGLO XIX. Dámaso Antonio Larrañaga nació en 1771 en Montevideo, ciudad que en aquellos tiempos integraba los territorios del Virreinato del Perú, y falleció en 1848 en la misma ciudad, capital de la República Oriental del Uruguay. Hasta su deceso, las ciencias naturales ocuparon un rol fundamental en sus actividades cotidianas signadas por su vocación religiosa y su participación en la compleja lucha por la independencia de América del Sur y del Uruguay. Como hombre de ciencias, estudió temas botánicos, geológicos, paleontológicos, zoológicos, lingüísticos y etnolingüísticos, bajo distintas perspectivas relacionadas a la taxonomía, clasificación, anatomía, estratigrafía, herboristería, lexicografía nativa, entre otras. Parte de su obra, manuscritos y dibujos, fue publicada en extenso durante la segunda década del siglo XX. Una pequeña nota de su autoría fue incluida en la segunda edición de la obra *Recherches sur les ossemens fossiles de quadrupèdes* de Georges Cuvier publicada en 1823. Su contenido, tuvo un fuerte impacto en la comunidad científica internacional porque él incluyó al *Megatherium* como un subgénero del armadillo Dasypus y postuló que el gran mamífero presentaba una cobertura ósea externa. En este trabajo nosotros analizamos la obra de Larrañaga y recreamos el contexto científico en el que se inscribe al *Megatherium* como un mamífero acorazado. Apelamos entonces a asociar esta inferencia en los postulados para la clasificación de los mamíferos que, en aquellos tiempos, se basaban en las estructuras dentarias, así como también la influencia ejercida por la interacción entre destacados naturalistas del siglo XIX.

Palabras clave. Historia. *Megatherium* acorazado. Luján. Auguste de Saint-Hilaire. George Cuvier.

THE YEAR 2023 marks the 200th anniversary of the publication, in its second edition, of the famous work published by George Cuvier (1769–1832) *Recherches sur les ossemens fossiles de quadrupèdes*, including a brief scientific communication written by the Montevidean priest Dámaso A. Larrañaga (1771–1848) (Larrañaga, 1823a) (Figs. 1, 2). It was based on a letter that Larrañaga sent to the French naturalist Auguste de Saint-Hilaire (1779–1853) in 1822

and presented at the Société Philomatique in Paris (Larrañaga, 1823b).

The content selected for publication in Cuvier's work revealed an interesting paleontological novelty offered in the following terms (Larrañaga, 1823a): "*…Je ne vous écris point sur mon* dasypus *(*mégatherium *Cuv.), parce que je me propose d'en faire l'objet d'un mémoire, qui, je l'espère, ne sera pas indigne de l'intperêt des savants Européens qui s'occupent des fossiles. Je vous dirai seulement que j'ai obtenu un fémur qui a été trouvé dans le Rio del Sauce, branche du Saulis-Grande. Il pèse environ sept livres et est court; il peut avoir six à huit pouces de large. Il ressemble en tous points à un fémur de Tatou. Je vous enverrai un de ses écailles. La queue qui, comme vous l'avez vu, est et très-courte et très-grosse, elle a également des écussons, mais ils ne sont point en forme d'anneaux ou de verticilles…*" (…I am not writing to you on my *dasypus* (*megatherium* Cuv.), because I intend to make it the subject of a memoir, which, I hope, will not be unworthy of the interest of the European sages who deal with fossils. I will only tell you that I obtained a femur which was found in Rio del Sauce, branch of Saulis-Grande. It is short, weighs about seven pounds, and is between six and eight inches wide. It resembles in everything the femur of a Tatou. I am going to send you one of his scales. The tail, as you have been able to see, is very short and very thick, and it also has shields, but they are not in the form of rings or whorls).

Figure 1. View of Montevideo drawn in 1832 during Darwin's voyage on the Beagle. On the left you can see the Cathedral and on the right the Cerro de Montevideo. Modified from King (1839).

Figure 2. Engraving of Dámaso Antonio Larrañaga (1771–1848). Modified from Lipski & Michon (1885), published on the cover of the Uruguayan newspaper *El Indiscreto*.

Briefly, the *Megatherium* that Larrañaga mentioned in his note corresponds to a colossal mammal collected in the city of Luján in 1787, sent to the Real Gabinete de Historia Natural de Madrid in 1788 and formally described by Cuvier (1976) as *Megatherium americanum* (Fig. 3) (Orche & Amaré, 2019a).

At that time, the support given by Cuvier (1823) to the content of Larrañaga´s note was the key to successfully

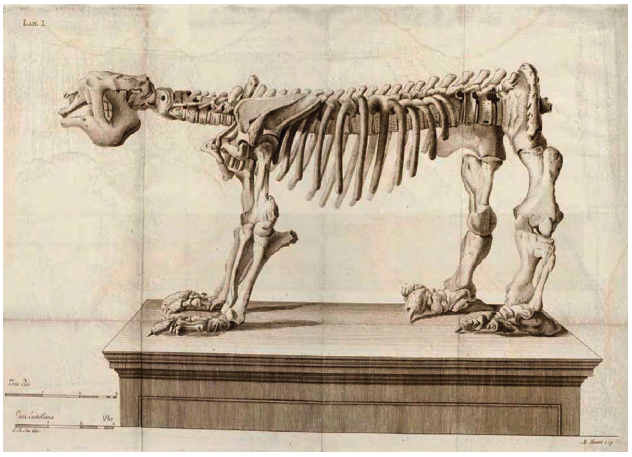

Figure 3. Reconstruction of ***Megatherium americanum*** drawn by Juan Bautista Bru based on the specimen housed at the Real Gabinete de Historia Natural of Madrid. Modified from Garriga (1796).

install the concept of 'armored *Megatherium*' in the scientific community (Fernicola *et al.*, 2009). Then, the German naturalist Christian Weiss (1780–1856) assigned a few osteoderms of the dorsal carapace and a fragment of caudal tube to *Megatherium*; these were recovered in Uruguay by the Prussian naturalist Friedrich Sellow (1789–1831) (Weiss, 1830). In 1835, William Clift (1775–1849) assigned part of a collection of fossil bones to *Megatherium* that were sent to England from Buenos Aires Province by Woodbine Parish (1796–1882), who was commissioned as Consul General at Buenos Aires on 1823 and served as *Chargé d'affaires* (charged with business) of Argentina from 1825 to 1832. Among the specimens, Clift (1835) described and figured an incomplete skeleton, isolated bone elements, and armor fragments (Fig. 4), collected in different places in Buenos Aires.

It was William Buckland (1784–1856), an English paleontologist, geologist, and theologian, who became Dean of Westminster in 1845, the one who in 1837 figured for the first time, in a double plate, the entire skeleton, parts of another skeleton, and two isolated osteoderms assigned to *Megatherium* (Fig. 5).

Fernicola *et al.* (2009) highlighted how the concept of 'armored *Megatherium*' allowed Charles Darwin, on his trip to South America, to recognize the presence of this animal from isolated osteoderms.

The information concerning the colossal mammal from Luján was used in different life reconstructions that were published in magazines of that time. According to Orche and Amaré (2019b), the first known graphic representation of the armored *Megatherium* was published by the magazine El Panorama in 1838. Orche and Amaré (2019b) recognized that this representation with slight modifications was used by Boitard (1861, p. 226, 239) and Huxley (1875, p. 351) (Fig. 6), while in Spain it was included in the Semanario pintoresco (Anonymous, 1841, p. 185–186) and in El Panorama (Anonymous, 1838, p. 357–358).

In 1835, some naturalists showed doubts assigning an exoskeleton to *Megatherium*. Among them, the German engraver and naturalist, Eduard d'Alton (1772–1840), when describing fragments of the endo and exoskeleton collected in Uruguay, remarked the similarity that these elements shared with armadillos (d'Alton, 1835). Another

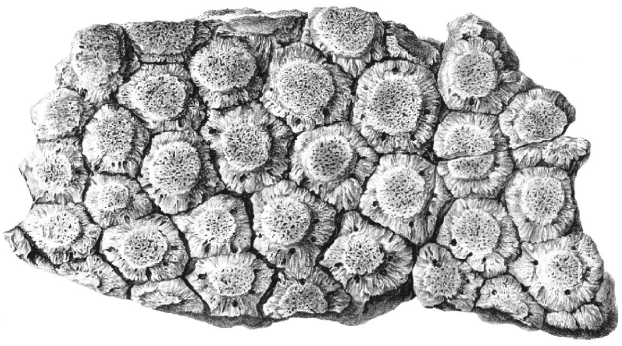

Figure 4. Fragment of dorsal carapace assigned to ***Megatherium*** by Christian Weiss (1780–1856). Modified from Weiss (1830).

author was the French zoologist and paleontologist Charles Léopold Laudrillard (1783–1853), who was in charge of the second edition of Cuvier's work. Laurillard (in Cuvier, 1836, p. 368) questioned the existence of the armored *Megatherium* in a footnote of volume VIII as follows: "*Il serait fort possible que le* Mégathérium *fût en effet recouvert de cuirasses écailleuses; cependant il ne faudrait pas se hâter de lui attribuer les grands fragmens qu'on en a trouvés, car les plâtres envoyés de Londres démontrent qu'un tatou de taille gigantesque existe, avec le Mégatherium, dans les plaines de Buenos-Ayres. Ces morceaux caractéristiques consistent dans un calcanéum, un astragale et un scaphoïde qui ne s'éloignent de ceux des tatous vivans que par la grandeur et par des différences purement spécifiques*" (It would be quite possible that the *Megatherium* was really covered with armor with scales; however, we should not hasten to attribute to him the large fragments that have been found, because the casts sent from London show that there is an armadillo of gigantic size, with the *Megatherium*, on the plains of Buenos Aires. These characteristic pieces consist of a calcaneus, an astragalus and a scaphoid which only differ from those of living armadillos in size and in exclusive specific differences).

It was the English biologist, comparative anatomist, and paleontologist Richard Owen (1804–1892), who definitely banished the idea that the armored *Megatherium* ever existed. His comparative anatomical study and detailed analysis of the geographic record of each of the pieces assigned to *Megatherium*, allowed Owen (1839) to establish that those bone elements anatomically assignable to *Megatherium* had not been recovered in association with osteoderms. In those cases, where the association between

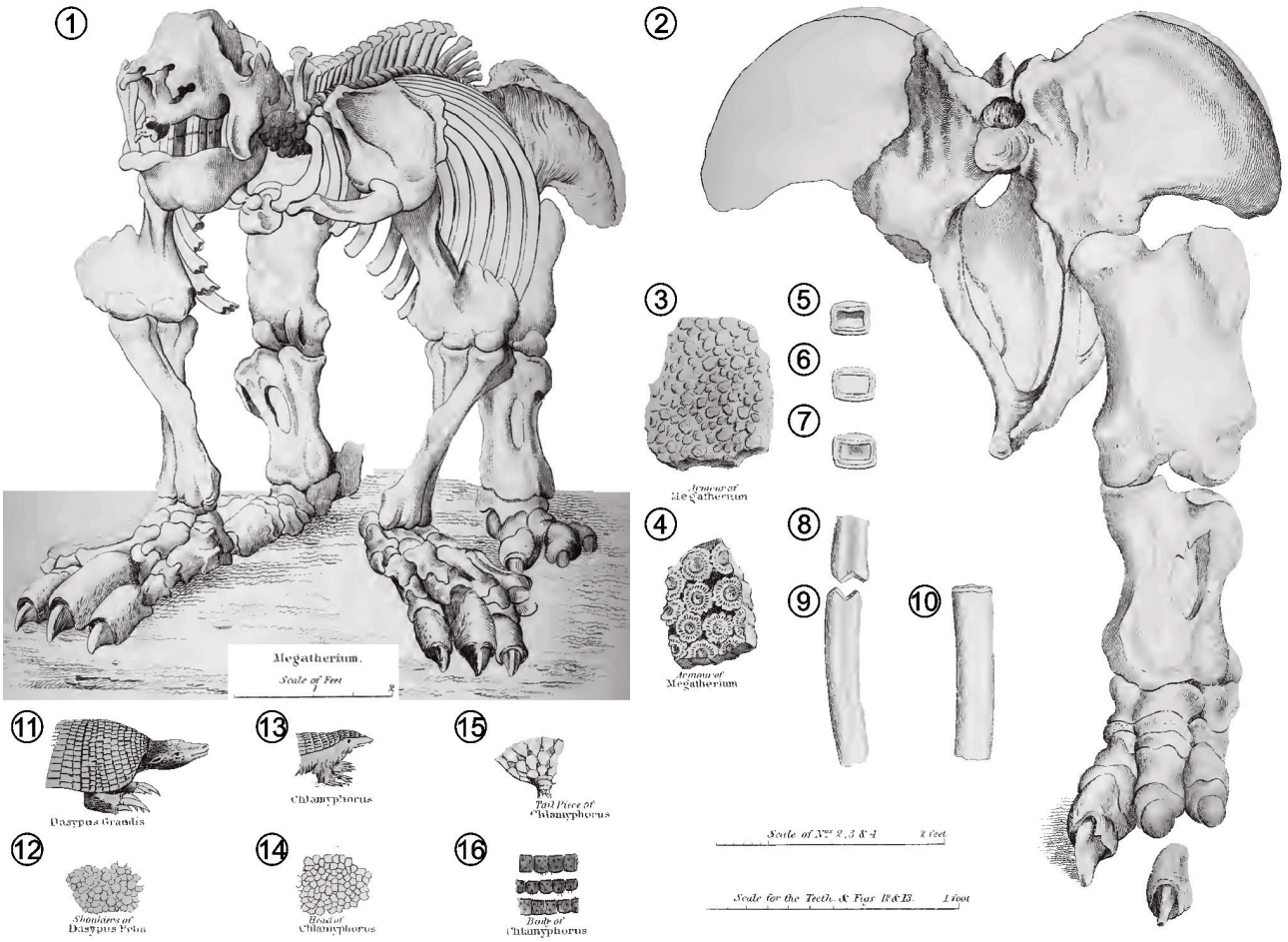

Figure 5. Double plate of Buckland (1837, p. 144, pl. 5). According to Buckland (1837, p. 19), the illustrations are as follows: "**1,** Skeleton of ***Megatherium***, copied from Pander & D'Alton's figure of the nearly perfect skeleton of this animal, in the Museum at Madrid. **2,** Bones of the pelvis of ***Megatherium***, discovered by Woodbine Parish, Esq. near Buenos Ayres, and now placed in the Museum of the Royal College of Surgeons, London. The bones of the left hind leg, and several of those of the foot, are restored nearly to their natural place (Original). **3, 4,** Armour, supposed to be that of ***Megatherium***. **5–10,** Teeth of ***Megatherium***. **11–16,** Armour of ***Dasypus*** and ***Chlamyphorus***. Modified from Buckland (1837).

endoskeleton and exoskeleton was reliable, they did not present similarities with the endoskeleton of *Megatherium*. In short, Owen (1839) demonstrated that megatheres were not armored and that the remains belonged instead to the group of mammals he called 'glyptodonts', a group closely related to armadillos. Regarding Larrañaga´s communication in Cuvier (1823), Owen (1839, p. 81) mentioned: "*...*The notion that the fossils here mentioned belonged to the *Megatherium* rests solely on the circumstance of the worthy Cure having inserted the word *Megatherium* as the synonym of his gigantic *Dasypus...*".

In Argentina, during the second half of the 19th century, the armored *Megatherium* of Larrañaga and Cuvier was incorporated by Burmeister (1864) as part of the historical background that he provided for the paleontology of vertebrates in the Río de La Plata. Ameghino (1889, p. 669) advanced on the causes that would have led to raise the possibility of an armored *Megatherium*, recognizing that the remains of *Megatherium americanum* "*...fueron enviados á Madrid, conjuntamente con algunos fragmentos de coraza de Glyptodon recojidos en el mismo yacimiento...*" (...were sent to Madrid, together with some fragments of *Glyptodon* armor collected in the same deposit...) and that it was this fact that had led Cuvier to "*...creer que el* Megatherium *había estado protegido por una coraza ósea como los armadillos*" (...believe that the *Megatherium* had been protected by a bony shell-

like armadillos) and, consequently, endorsed Larrañaga's idea.

Bosca y Casanova (1903), in his report on the state of the *Megatherium* collected in Luján during the 18th century, noted that "*…hay ejemplares en el Museo de Madrid, procedentes del mismo envío de la ribera del Lujan; piezas de coraza, sobre las que se fundó el género Glyptodon, al que precisamente pertenecen las aludidas partes conservadas en dicho Museo*" (…there are pieces in the Museo de Madrid, coming from the same shipment that came from the banks of Lujan; pieces of armor, on which the genus Glyptodon was founded, to which the aforementioned parts preserved in the Museum precisely belong).

Furlong (1948) and Méndez Alzola (1950) shared the hypothesis of a mixture of specimens from different taxa. The latter author proposed that while Larrañaga served as the Director of the Biblioteca de Buenos Aires between 1814 and 1815, he could have had access to the archives that reported the extraction of the *Megatherium* in Luján and that he found evidence in them to assign the fragments of carapace to *Megatherium*. Méndez Alzola (1950, p. 64) cited a note sent by Priest Fray Manuel Torres to the Viceroy on June 27th, 1787, in which it is read "*He encontrado la media cadera á mi ver, capaz de sujetarse al dibujo. Igualmente la cascara, no ha padecido daño considerable…*" (I have found the half hip in my view, capable of holding onto the drawing. Similarly, the shell has not suffered considerable damage…).

With the exception of those who knew or shared correspondence with Larrañaga and Ameghino, who partially accessed the scientific manuscripts through the historian José Andrés Lamas (1817–1891), no other naturalist could have had access to their writings and correspondences because most of them, including those referring to the *Megatherium*, were published between 1922 and 1930. Only Furlong (1948) and Méndez Alzola (1950) accessed these manuscripts, but as the previous authors, they supported the mixture of pieces that corresponded to different taxa as the fundamental element in the origin of the concept of the 'armored *Megatherium*'.

In this work, we focus on the analysis of Larrañaga's manuscripts and personal correspondence in order to judge whether the mixture of specimens was the cornerstone on which the idea of the armored *Megatherium* rests, a hypothesis preliminarily questioned by Fernicola (2018) and Fernicola & Castiñeira Latorre (2021, 2022). It should be noted that different passages of his studies open a window through which we can reconstruct his way of analyzing and classifying nature, while his personal correspondence with renowned naturalists from the Old World allow us to reconstruct some aspects of his interpretations of nature, classification of mammals, and contextualize his postulate. Thus, the objective of this study is to analyze what were the arguments that led Larrañaga to postulate that the *Megatherium* was an armadillo and what were the reasons why it was accepted by an important group of naturalists of that time.

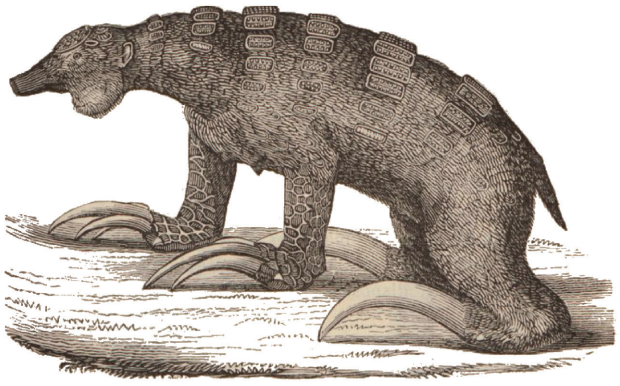

Figure 6. Representation in life of the armored ***Megatherium***. Modified from Huxley (1875).

MATERIALS AND METHODS

This study is based on primary sources from the Archivo General de la Nación (Argentina, AGN), Archivo Histórico (Uruguay, AGN AH), Archivo Museo Histórico Nacional (Uruguay, AMHN), and Archivos del Instituto Ravignani (https://ravignanidigital.com.ar/libros/larraniaga/lar_0000.html)

The taxonomic nomenclature used in this work is the one cited in the original works, manuscripts, and personal correspondence.

LARRAÑAGA AND THE NATURAL SCIENCES IN THE RÍO DE LA PLATA AT THE BEGINNING OF THE 19TH CENTURY

Among the many documents that connect us with the life history of Don Dámaso A. Larrañaga, we highlight one

of the first mentions that reveal his vocation towards natural sciences. The document corresponds to a draft written in Montevideo, in April 1804, and whose final destination would have been to become a letter sent to Barcelona, where the following request is exposed: "*…me proporcionen comunicación con algún sabio naturalista, que me dirija, y con quien pueda consultar las innumerables dudas que se me ofrecen sobre los tres reinos de la naturaleza; pues de todos ellos tengo colecciones y principios y quisiera perfeccionarlos*" (…give me communication with a wise naturalist, who can address me, and with whom I can consult the innumerable doubts that are offered to me about the three kingdoms of nature; because, I have collections and principles concerning all of them and I would like to improve them) (Larrañaga, 1922, p. 256).

Shortly after, it was not Larrañaga who requested academic assistance, but quite the opposite. In a letter dated June 22nd, 1808 and addressed to Don José Joaquín de Araujo (1726–1835), an official of the Real Hacienda del Virreinato and an amateur of natural history (Castellanos, 1948), he explained "*…la receta para conservación de los pájaros extractándola de un autor francés… …En primer lugar se debe tener mucho cuidado en el modo de matarlos… … El fusil es el arma más cómoda y la más propia… …Mr. Manduyo es de parecer que el arco es una de las mejores armas… … dejo en segundo lugar, que los pájaros se pueden conservar de dos modos o enteros o por medio de la piel solamente. El espíritu de vino y también el de la caña son licores que pueden servir para conservar pájaros enteros… …Les he extraído las entrañas, y he llenado su capacidad de unos polvos hechos de alumbre, cal, sal y pimienta; lo mismo hacía con los ojos extrayéndolos, y aun los sesos por esta parte o por dentro del pico por el que introducía alguna porción de dichos polvos… …Después de esto colgaba el ave por los pies, y la tenía así dos o tres días según el tamaño, y cuando la creía bien penetrada la acomodaba en aquella postura, que yo quería que tuviese, o que me parecía más natural; y de este modo la dejaba endurecerse. Este es un método muy fácil; pero siempre las aves se encogen y se desfiguran algún tanto…*" (…the recipe for the conservation of birds, extracting it from a French author… …First of all, great care must be taken in the way of killing them… …The rifle is the most convenient and most appropriate weapon… …Mr. Manduyo is of the opinion that the bow is one of the best weapons…… I leave in second place, that the birds can be preserved in two ways, complete or through the skin only. The spirit of wine and also that of cane are liquors that can be used to preserve complete birds… …I have extracted their entrails, and I have filled their capacity with some powders made of alum, lime, salt and pepper; I did the same with the eyes, extracting them, and even the brains in this part or inside the beak through which I introduced some portion of said powders… …After this I hung the bird by its feet, and kept it like this for two or three days depending on the size, and when I thought it was well penetrated I would accommodate it in that position, which I wanted it to have, or which seemed more natural to me; and in this way I let it harden. This is a very easy method; but the birds always shrink and disfigure themselves somewhat…). Larrañaga ends his extensive letter with the following advice: "*…Prevengo que no se arranque la lengua, que es un carácter muy importante en el sistema de Linneo…*" (…I prevent you from tearing your tongue out, which is a very important character in Linnaeus's system…), and mentioned that "*…Esto es, amigo más bien mi práctica que la inspiración de dicho autor de quien me he separado en varias cosas. La práctica enseña mucho más que toda instrucción…*" (…This is, my friend, rather my practice than inspiration of such author from whom I have grown apart in various ways. Practice teaches so much more than all instruction…) (Falcao Espalter, 1921, p. 309–312).

In the same year, and in response to a query from Father Bartolomé Doroteo de Muñoz (second half of the 18th century–1831) regarding the study of botany, Larrañaga sent him on July 6th, 1808 (Falcao Espalter, 1921, p. 313–325) a detailed explanation regarding how to use Linnaeus' classification of 1758: "*…Yo alabo, amigo, y deseo que Ud. se dedique con seriedad a la Botánica. No es necesario para ello de talento alguno particular, pues el mío es bastante común. Sólo se requiere, según la expresión de Buffon, para las ciencias naturales, una paciencia más que estoica; y mucho más para el Reino interminable de la Botánica. La constancia es la que siempre ha hecho los sabios, no los talentos, y el de Ud., no sólo no es de los vulgares, sino que también está acompañado de una pasión decidida por estas ciencias, que no es de los menores requisitos. Yo, pues, confieso a Ud., por el grande amor que les profesa, que trate de hacerlo con formalidad, para*

aumentar la gloria de nuestro clero, y la felicidad de estas provincias. Yo solo poco puedo hacer, porque es adagio común entre los botánicos que: unus homo nullus homo*... ... Pero si Ud. tratase de hacerlo con formalidad, como me lo dice en su carta, debe principiar por el conocimiento de las 24 clases, cuya inteligencia es muy fácil siempre que se tenga cuidado con la distinción de los sexos de las flores, pues por esto llamó Linneo a su sistema sexual, que es el que Ud. debe seguir por ser hasta hora no sólo el más completo, sino también el más fácil, a pesar de lo que algunos nos quieren ponderar el nuevo Sistema Natural de Cuvier, que para mí tiene muchos más defectos y me parece menos exacto*" (...I praise you, friend, and I want you to dedicate yourself seriously to Botany. It is not necessary for it any particular talent, because mine is quite common. All that is required, according to Buffon's expression, for the natural sciences is more than stoic patience; and much more for the endless Kingdom of Botany. Constancy is what wise men have always done, not talents, and yours is not only not one of the vulgar ones, but it is also accompanied by a decided passion for these sciences, which is not one of the least requisites. I, then, confess to you, for the great love you profess for them, that you try to do it formally, to increase the glory of our clergy, and the happiness of these provinces. I alone can do little, because it is a common adage among botanists that: *unus homo nullus homo*... ... But if you try to do it formally, as you tell me in your letter, you must begin by knowing the 24 classes, whose intelligence is very easy as long as care is taken with the distinction between the sexes of the flowers, for this is why Linnaeus called their sexual system, which is the one you must follow because up to now it is not only the most complete, but also the easier, despite that some want to praise the new Cuvier's Natural System, which for me has many more defects and seems to me less exact).

Among the many indications that Larrañaga gave to Priest Muñoz, the following are included: "...*Sea, pues, su primer cuidado buscar la flor en la planta, si la tuviere visible; porque si no se encontrare, como sucede en las calagualas, en los hongos, en los musgos y en las algas o yerbas de la piedra, pertenecerá a la última clase o a la criptógama. Pero a excepción de esta, todas las otras 23 clases tienen sus flores visibles. Encontrada la flor se debe investigar su sexo: si es masculina, femenina o hermafrodita. Esto lo puede Vd. saber muy fácilmente, porque ya sabe distinguir los estambres de los pistilos: estos coronan el fruto tierno, y aquellos lo rodean. Las flores que tengan solamente estambres, son masculinas; las que tengan solamente pistilos son femeninas; y las que tengan unos y otros son hermafroditas...*" (...Let it be, then, your first care to look for the flower on the plant, if it is visible; because if it is not found, as it happens in the calagualas, in the fungi, in the mosses and in the algae or herbs of the stone, it will belong to the last class or to the cryptogam. But except for this one, all the other 23 classes have their flowers visible. Once the flower is found, its sex must be investigated: if it is male, female or hermaphrodite. You can know this very easily, because he already knows how to distinguish the stamens from the pistils: these crown the young fruit, and those surround it. The flowers that have only stamens are masculine; those with only pistils are female; and those that have both are hermaphrodites...) (Falcao Espalter, 1921, p. 313–325).

Larrañaga continued with an exhaustive explanation of each of Linnaeus's classes and culminated with "*Yo creí amigo escribir una carta y he escrito una Disertación. Alguno quizás encontrará cierta novedad, y método en ella, pero el único que yo encuentro es la abundancia de ejemplos en todas las clases, y de plantas conocidas por todos nosotros: este es el defecto, que para mí siempre tuvieron todas las obras botánicas que he visto, y que era muy natural que así fuese, porque los nombres vulgares son tan variables, o aún más que los terrenos en que se crían las plantas. ¡Cuántas horas de estudio, y cuantos quebraderos de cabeza hubiera ahorrado si hubiera sabido estos ejemplitos! Estudie Vd. bien esas plantas, reconozca bien todas sus estambres, y reuniendo con ellas todas que se le parezcan, las tiene ya Vd. con solo esto a todas perfectamente clasificadas...*" (I thought my friend that I was writing a letter and I have written a Dissertation. Perhaps someone will find a certain novelty and method in it, but the only thing that I find is the abundance of examples in all classes, and of plants known to all of us: this is the defect, which for me has always been the case with all the botanical works that I have seen, and that it was very natural for it to be so, because common names are as variable, or even more so, than the land on which the plants are raised. How many hours of study, and how many headaches I would have saved if I had known these examples! Study these plants

well, recognize all their stamens well, and gathering with them all that are similar, you already have them, with just this, all of them perfectly classified...) (Falcao Espalter, 1921, p. 313–325).

In the speech that Larrañaga gave in 1816 on the inauguration of the Biblioteca Pública de Montevideo, he established the need to "*Estudiad el gran libro de la Naturaleza, de esa madre fecunda y siempre nueva. Vuestros descubrimientos harán honor á vuestra patria y aumentarán los renglones de su tráfico y cultivo. Linneo, el hijo más querido, el hijo más fiel, á quien ha revelado todos sus arcanos; Buffon, el Plinio francés, su elocuente panegirista Castel, su compendiador Tournefort, Jussieu, Ruiz y Pavón, Cavanilles, Ortega, Azara, y otros célebres expositores de la Naturaleza que adornan estos estantes, son los mejores maestros que pueden dirigirnos en tan importantes investigaciones; vuestro país abunda en producciones nuevas; y en este corto recinto, en medio de las más serias ocupaciones de mi ministerio, he clasificado y descrito sistemáticamente más de mil especies desconocidas en sus tres reinos*" (Study the great book of Nature, of that fecund and ever new mother. Your discoveries will honor your country and increase the lines of its traffic and cultivation. Linnaeus, the most beloved son, the most faithful son, to whom he has revealed all his secrets; Buffon, the French Pliny, his eloquent panegyrist Castel, his abridger Tournefort, Jussieu, Ruiz y Pavón, Cavanilles, Ortega, Azara, and other famous expositors of Nature who adorn these shelves, are the best teachers who can guide us in such important investigations; your country abounds in new productions; and in this short enclosure, in the midst of the most serious occupations of my ministry, I have systematically classified and described more than a thousand unknown species in its three kingdoms) (Larrañaga, 1951, p. 14).

In the transcribed passages of the letters that we quoted above, we can glimpse how Larrañaga prepared himself to study nature, and in the selected passages of his inaugural speech at the Biblioteca Pública de Montevideo, we can consider how such preparation came to fruition. It is hard to establish whether more than a thousand new species were actually incorporated into science by Larrañaga, but in his *Diario de Historia Natural*, written between 1808 and 1824 (Larrañaga, 2015, 2017), approximately that number of taxa were recognized as either new or previously known.

Throughout his studies, the number of species reported in 1816 changed, in part, due to access to new bibliography, as can be seen in his letter sent to Bonpland in February 1818 (Larrañaga, 1924, p. 284) or in his work entitled *Geología del Río de La Plata* (Larrañaga, 1894, 1924), which is assumed to have been written in 1819 (Lamas, 1879). In the latter work, Larrañaga (1924, p. 7–8) recognized that "...*En los primeros años de mi estudio, me dexé llevar de aquella manía del siglo, o mejor dicho de aquella inocente distracción de estudios más serios, acopiando los testáceos más hermosos que nuestro país producía o que de fuera podía conseguir... ...Habiéndolas clasificado y encontrándolas casi todas nuevas en el sistema de Linneo procuré a exemplo de nuestro primer padre, darles aquellos nombres que me parecieron más conformes al estado de esta ciencia. Pero al mismo tiempo el sabio Maton leía en 1809 una memoria a la Sociedad Linneana de Londres en que describía unas conchas del Río de La Plata, siguiendo el mismo sistema de su titular, y advertí que había hecho el mismo juicio que yo en su extrañeza y novedad, dándoles también nuevos nombres. El se ha anticipado en su publicación y tiene un derecho a que se conserven éstos y no los míos, quando no choquen con los progresos que han hecho las ciencias. Yo, pues, los denominaré en esta Memoria, según lo hace el sabio en la suya...*" (...In the first years of my study, I let myself be carried away by that mania of the century, or rather that innocent distraction from more serious studies, collecting the most beautiful testaceans that our country produced or that could be obtained from abroad... ....Having classified them and finding them almost all new in Linnaeus's system, I tried, following the example of our first father, to give them those names that seemed to me to be more consistent with the state of this science. But at the same time, in 1809, the wise Maton was reading a memoir to the Linnean Society of London in which he described some shells from the Río de La Plata, following the same system as the owner, and I noticed that he had made the same judgment as me in his strangeness and novelty, also giving them new names. He has anticipated their publication and has a right to preserve these and not mine, when they do not clash with the progress that science has made. I, then, will name them in this Memory, as the wise man does

in his…). After these considerations, Larrañaga (1924, p. 8) founded a new taxon in the following terms: "*En esta familia establecida por Cuvier solo deben colocarse aquellas bivalvas que a más de otros caracteres tengan sus extremos más o menos entreabiertos; y según confesión del Sr. Matón* valvae sunt ochisissima*. A más de ésto la valva inferior está como partida en su charnela y en su fondo se halla la cavidad o foveola del ligamento. Creo, pues, que debe hacerse un nuevo género.* Matonia antigua*…*" (In this family established by Cuvier, only those bivalves should be placed that, in addition to other characters, have their ends more or less open; and according to the confession of Mr. Matón *valvae sunt ochisissima*. In addition to this, the inferior valve is as if split in its hinge and at its bottom is the cavity or foveola of the ligament. I therefore believe that a new genre should be made. *Matonia antigua*…).

This work clearly reflects how meticulous Larrañaga was as a naturalist. He recognized that many of his taxa did not have priority and, therefore, did not mention them in his study, but he named *Matonia antigua*, whose specimens had been considered by him as *Mya labiata* and *Tellina marina*, as can be seen in his notes on the shells of the Río de La Plata in his *Diario de Historia Natural* of August 1815 (Larrañaga, 1922, p. 40). It should be noted that if the taxon had been published by Larrañaga in 1819, *Matonia antigua* would have to be considered a junior synonym of *Erodona mactroides* (Daudin en Bosc, 1801) (Méndez Alzola, 1950, p. 88; Martínez, 1998). Something similar happened with a new genus of rodent that he described in the note published by the Société Philomatique in Paris, in which the armored *Megatherium* was reported for the first time (Larrañaga, 1823a). The description of the rodent was made in the following terms: "…*Le Quyia d'Azzara doit être séparé de* l'Hydromys *et faire un genre nouveau, à cause de ses 4 maxillaires demi-composées et compliquées de chaque côté des deux mandibules. C'est mon genre* Potamys*, voisin du* Castor*…*" (…The Quyia d'Azzara must be separated from the *Hydromys* and make a new genus, by the presence of 4 semi-compound and complicated maxillae on each side of the two mandibles. It's my genus *Potamys*, neighbor of *Castor*….) (Larrañaga, 1823a, p. 83). The dental characteristics mentioned by Larrañaga (1823a) led him to create a new genus, but as happened with *Matonia*, a new taxon had already been named from specimens collected in Chile as *Mus coypus* by Molina (1782), that later Kerr (1792) recognized as the type species of the genus *Myocastor*.

THE *MEGATHERIUM* AND THE CONSTRUCTION OF ITS PROPOSAL

Larrañaga (1823a) commented that he would write a memoir of the *Megatherium*. Whether it was written or not we do not know, but, to date, no manuscript on this topic has been found among his documents.

The first mention that we find of *Megatherium* corresponds to a note included in his *Diario de Historia Natural* dated July 1814 and, more precisely, to a translation of the *Megatherium* description published in the 12th volume of the Encyclopaedia Britannica of 1810. In this brief description, which lacks any figures and/or diagrams, it is mentioned that "…Some years ago, there was discovered below the surface of the earth in South America, an entire fossil skeleton of an animal at present unknown; but which M. Cuvier found to resemble the present genus [*Bradypus*] more than any other. From its vast size, Cuvier gave it the name of *Megatherium*, and he has given the following description of it in the Annales de Museum National, accompanied with a figure: This skeleton is twelve feet (French) long, by fix feet in height… … The thigh bones are excessively thick, and the leg bones still more so in proportion; the entire sole of the foot bore on the ground in walking; the shoulder blade is much broader than long… … To judge by the form of the last phalanges, there must have been very large pointed claws, enclosed at their origin in a long sheath. There appears to have been only three of these claws on the fore feet, and a single one on the hind; the other toes seem to have been deprived of them, and, perhaps, entirely concealed beneath the skin… … The head is the greatest singularity of this skeleton; the occiput is elongated and flattened, but is pretty convex above the eyes; the two jaws form a considerable projection, but without teeth, there being only four on each fide above and below, all grinders, with a flat crown, and grooved across…" (Larrañaga, 1922, p. 4–5).

Other studies consulted by Larrañaga (1922, p. 68) such as the *Tableau élémentaire de l'histoire naturelle des animaux* by Cuvier (1798, p. 145–146), has similar information: "…*le*

squelette d'un quadrupède, dont l´espèce a peut-être péri, et qui a beaucoup de rapport avec les paresseux par la forme de sa tête et les proportions de ses membres, mais qui est long de donze pieds, et n'a que des molaires, sans incisives ni canines. On l'a nommé Megatherium" (...the skeleton of a quadruped, whose species may have perished, and which bears much relation to sloths in the shape of its head and the proportions of its limbs, but which is twelve feet long, and has only molars, without incisors or canines. It was named *Megatherium*).

The absence of drawings of *Megatherium* in the aforementioned works was replaced by a drawing of this mammal (Fig. 7) that is still kept in his archives. According to Méndez Alzola (1950), this drawing is a copy of one drawn at the end of the 18th century by Lieutenant Francisco Javier Pizarro, commissioned by the Marqués de Loreto, Viceroy of the Río de la Plata (Mones, 2002). It should be noted that a watercolor illustration housed at the División Paleontología de Vertebrados of the Museo de La Plata is preserved with the following dedication: "*Al Sr. Dn. Damaso Antonio Larrañaga ofrece este diseño del raro esqueleto desenterrado de las barrancas del Río Luján el año 1785 y enviado por el Exmo Sr. Virrey Marques de Loreto al Real Gabinete de Historia Natural de Madrid. su affmo. amigo Bartolomé Muñoz*" (To Mr. Dn. Dámaso Antonio Larrañaga offers this design of the rare skeleton unearthed from the cliff of the Río Luján in 1785 and sent by His Excellency viceroy Marqués de Loreto al Real Gabinete de Historia Natural de Madrid. his affmo. friend Bartolomé Muñoz) (Ramirez Rozzi and Podgorny, 2001) (Fig. 8). So, it is possible that Larrañaga's drawing was based on Muñoz's watercolor and not on Pizarro's original illustration. The extensive description of *Megatherium* included in the Encyclopaedia Britannica of 1810 and its drawing preserved in its archives can be considered two of the most important sources of information that Larrañaga had when classifying the colossal mammal from Luján.

In support of this hypothesis, it is important to note that in the same folder in which his 1819 geological notes were preserved, a peculiar paragraph about the Luján giant is conserved: "*...Pero en parte alguna se ha encontrado nada más gigantesco ni extraordinario como el* Megatherium *de Cuvier, que se encontró en el Rio de Luxan, que ya ha perecido y solo tiene representante a nuestros Tatus, matacos, mulitas y quirquinchos. Aquel profundo maestro y fundador de la Anatomía comparativa me permitirá que me separe de su*

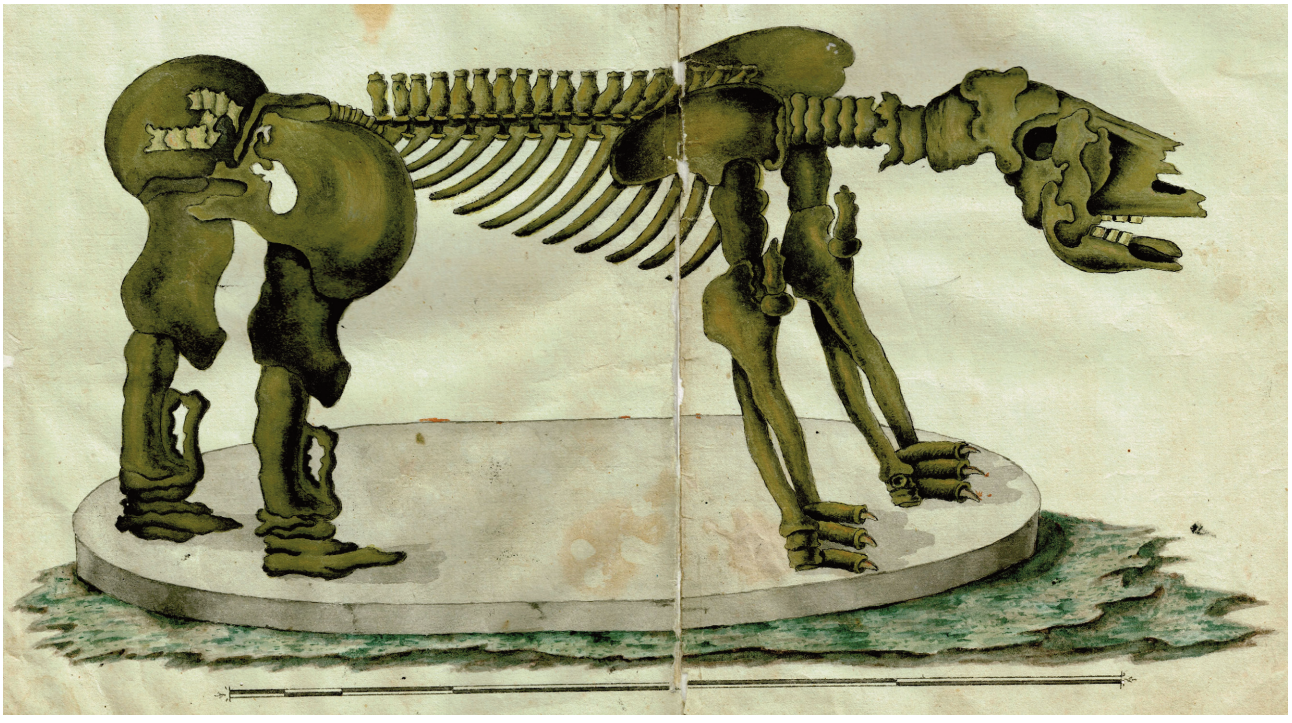

Figure 7. Reconstruction of the ***Megatherium*** skeleton preserved in the Larrañaga archives. **UY 11100 AGN AH Ex AMHN**.

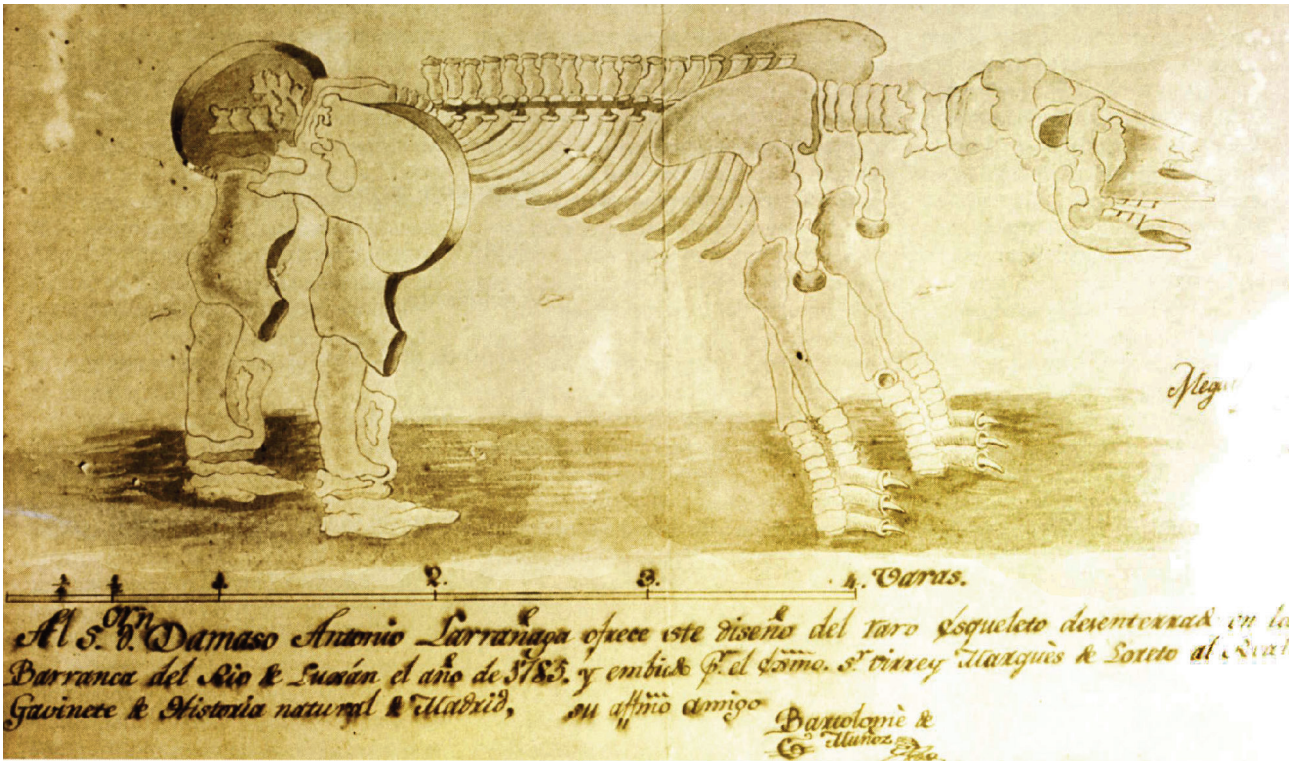

Figure 8. Reconstruction of the ***Megatherium*** skeleton dedicated to Priest Larrañaga by Priest Muñoz. Modified from Ramirez Rozzi & Podgorny (2001).

opinión en esta parte. La boca con solo molares, sus huesos cortos y muy anchos, su testa ósea tan grande como un horno de panadería; su cola cubierta de grandes escudas que conservamos, indican de un modo indudable que no puede ser sino un subgénero de nuestros Tatus; y nos permitirá que en este sentido lo denominemos en adelante Megaterium Cuvierii..." (...But nothing more gigantic or extraordinary has been found as the Cuvier's *Megatherium*, which was found in the Río de Luxan, which has already perished and only has a representative of our Tatus, matacos, mulitas and quirquinchos. That wise teacher and founder of Comparative Anatomy will allow me to differ from his opinion in this part. The mouth with only molars, its short and very wide bones, its bony head as big as a bakery oven; its tail covered with large bone plates that we preserve, undoubtedly indicate that it can only be a subgenus of our Tatus; and will allow us to name it *Megatherium Cuvierii* from now on...) (Larrañaga, 1924, p. 23).

Beyond the anatomical characteristics recognized by Larrañaga, the name *Megatherium cuvierii* shows that when writing the note, he was unaware that Cuvier in 1796 had named the large mammal from Luján as *Megatherium americanum*. In support of this idea, the specific name of Cuvier has not been found in any of the preserved manuscripts of the Presbyter. In summary, it is possible that the only relevant information that Larrañaga had regarding the anatomy and morphology of the *Megatherium* was what he transcribed from the Encyclopaedia Britannica of 1810 and the figure of *Megatherium*.

It is from this anatomical and morphological information published that Larrañaga proposed the classification of *Megatherium*. The 12th volume of this encyclopaedia, besides including the previously transcribed anatomical description of *Megatherium*, contains Cuvier's classification of mammals in the following terms: "According to Cuvier's arrangement, the Mammalia are divided into three general orders: 1. Those having claws or nails; 2. Those having hoofs; and, 3. Those having feet like fins: a division very similar to that of Mr Pennant. The first of these orders is subdivided into those mammalia that have three sorts of teeth, and those that want at least one kind of teeth". This division includes: I, Bimanum; II, Quadrumana; III, Sarcophaga; IV, Rodentia,

and at "V. EDENTATA, or those mammalia which have neither cutting nor canine teeth. This family comprises three genera, *viz.* MYRMECOPHAGA, or Ant-Eaters, comprehending the subgenera of myrmecophaga, echidna or porcupine ant-eater, and manis or sealy lizard; ORYCTEROPUS, or Cape Ant-Eaters; and DASYPUS, or Armadillos" and "VI. TARDIGRADA, or such as are deficient only in cutting teeth. Of this family there is only one genus, viz. BRADYPUS, or Sloths, under which Cuvier arranges as a subgenus, the unknown animal which he calls *Megatherium*." (Anonymous, 1810, p. 451).

As can be seen in Larrañaga's schemes on the classification of mammals entitled "*Clasificacion de los Mamilares del Rio de la Plata, particularmente de su Banda Oriental segun el Sistema de Cuvier, con sus caracteres acomodados al Pais*" (Fig. 9), and "*Clasificacion de los mamilares de este Pais segun el Sistema de Cuvier*" (Fig. 10), Larrañaga did not recognize Cuvier's *Megatherium* as a sloth. In these schemes, Cuvier's *Megatherium*, characterized as a colossal animal, is included within the Family Edentata and assigned to the genus *Dasypus*, based on the hierarchical use of the following anatomical sequence: 1. Those having claws or nails, and 2. Those Mammalia which have neither cutting nor canine teeth (see Figs. 9, 10). It is possible to argue that Larrañaga recognized *Megatherium* as a subgenus of *Dasypus* for two reasons. On the one hand, the generic name at that time included all known armadillo species; on the other hand, he maintained the hierarchical level proposed in the Encyclopaedia Britannica, in which *Megatherium* was considered a subgenus of *Bradypus*.

It should be noted that Larrañaga's scheme entitled *Clasificación de los mamilares de este País según el Sistema de Cuvier* includes within the Tardigrada a second species of megathere named *Megatherium cataphractus*. Although we do not have more information regarding this species and as already highlighted by Méndez Alzola (1950, p. 84), it is possible to argue that the generic assignment can be considered preliminary since Larrañaga (1924, p. 7–8) knew the nomenclature rules used at that time and, therefore, would not have used the same generic name for two species located in families so close to each other. However, this assignment is interesting given that the presence of an external bone cover, inferred from the specific name, did not prevent Larrañaga from including an armored animal among sloths, showing that the armor was not a main characteristic for him.

This lower hierarchy of characters related to the external covering of animals is observed in the classification included in the Encyclopaedia Britannica. In fact, the absence of teeth led to the inclusion of the pangolin *Manis* and the echidna *Echidna* in the Edentata as subgenera of *Myrmecophaga,* whose external coverings differed remarkably from each other: coarse hair and spines in *Echidna*, hair in *Myrmecophaga*, and overlapping plate-like scales in *Manis*.

THE *MEGATHERIUM* AND ITS INTERNATIONAL LINKS

The inclusion of Larrañaga's note in Cuvier's work gave strong support to its content. Cuvier (1823, p. 191) presentation strongly supported Larrañaga's hypothesis of the armored *Megatherium*: "*...Al´instant ou l´on achève l´impression de cette section, M. Auguste de Saint-Hilaire, savant botaniste, qui vient de farrea u Brésil le voyage le plus intéressant, et d´y rassembler les collections les plus riches, me communique l´extrait suivant de la lettre d´un savant Brasilien, qui annonce que le* Mégatherium *auroit poussé son analogie avec les tatous jusqu´a être comme eux revétu de cuirasses écailleuses. Nous devons attendre avec impatience le mémoire important que cette lettre nous promet...*" (...When finishing with the printing of this section, Mr. Auguste de Saint-Hilaire, a wise botanist, who has just made a most interesting trip to Brazil and collected rich collections there, communicated to me the note of a Brazilian scholar that follows, announcing that the *Megatherium* would have taken its analogy with the tatou until it was, like them, covered in a shell with scales. We will have to wait impatiently for the important memory that this letter promises. The recognition of Larrañaga as a wise man, the same term applied to Saint-Hilaire, presents him to the international community as a select colleague).

It is possible to reconstruct the origin of this recognition from his personal correspondence with different naturalists from the Old World. The first epistolary exchange was with the famous French naturalist, settled in the Río de La Plata, Aimé Bonpland (1773–1858), who traveled with Alexander von Humboldt around Latin America from 1799 to 1804. In his letter sent to Larrañaga from Buenos Aires on February

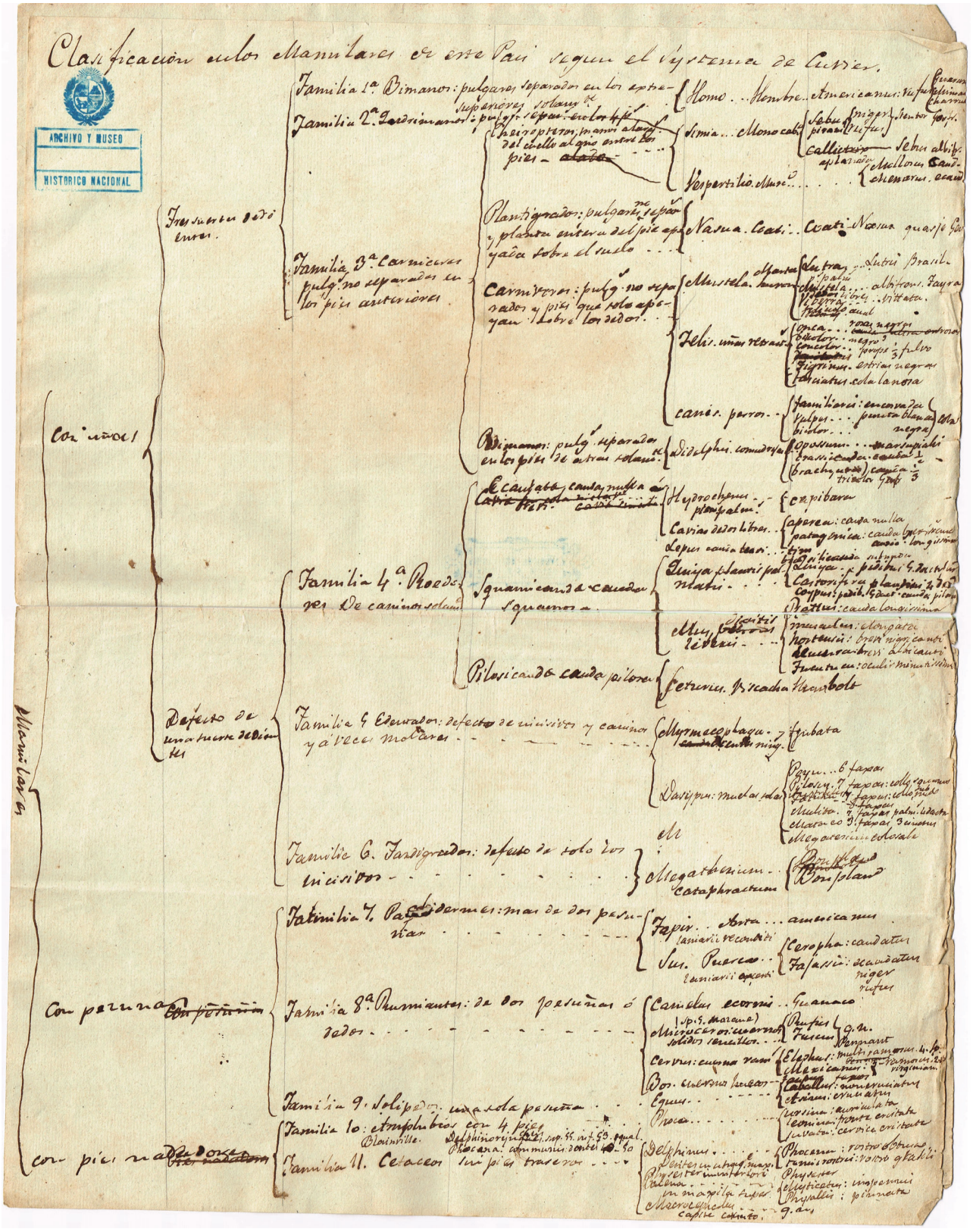

Figure 9. *Clasificación de los Mamilares del Río de la Plata, particularmente de su Banda Oriental según el Sistema de Cuvier, con sus caracteres acomodados al País* (Classification of the mammals of the Río de la Plata, particularly its eastern band according to the Cuvier system, with their characters adapted to the country), preserved in the Larrañaga archives. **UY 11100 AGN AH Ex AMHN**.

Figure 10. *Clasificación de los mamilares de este País según el Sistema de Cuvier* (Classification of the Mammals of this country according to the Cuvier system), preserved in the Larrañaga archives. **UY 11100 AGN AH Ex AMHN**.

13th, 1818, Bonpland introduced himself as follows: "*Il y a déja plusieurs années que j'ai l'honneur de vous connottre de réputation et chaqué jour le désir de vous connoitre personellement s'augmente. Ce n'est que depuis quelques - jours que j'ai appris positivement votre retour á Monte-Video et si je n'étais retenu ici par des occupations que je ne puis quitter je serais moi - même le porteur de ma lettre. Je remetrai done mon voyage á Monte-Video á une époque plus éloignée si vos affaires ne vous apellent pas ici, malgré le désir extréme que j'ai de m'entretenir avec vous et de jetter un coup d'ceil dans vos belles collections de plantes, d'insects, de minéraux, etc. Je suis particuliérement instruit de tous vos travaux útiles et de votre noble ardeur pour les sciencies par Monsieur Segurola et par Don Bartholo Muñoz*" (I have had the honor of knowing you by your reputation for several years, and every day my desire to meet you personally increases. It was only a

few days ago that I positively learned of your return to Montevideo and if I were not held here by occupations that I cannot leave, I would myself be the bearer of my letter. So, I will postpone my trip to Montevideo for a more distant time if your business does not bring you here. Despite the immense desire I have to talk with you and take a look at your beautiful collections of plants, insects, minerals, etc. I am particularly well informed of all your useful works and your noble desire for science by Mr. Segurola and Don Bartholo Muñoz) (Larrañaga, 1924, p. 257).

In response to the previous letter, Larrañaga (1924, p. 284) wrote to him, from Montevideo on February 26th 1818, inviting him to maintain continuous epistolary contact and giving him a brief detail of the structure of his scientific works: "*Es cierto que aunque retirado en estos últimos pueblos de la América del Sur en que apenas llegaba algún libro de la Hist.ª N.l y en donde casi ningún naturalista habia fixado una vista científica, tuve el atrevimiento de emprender el vasto proyecto de describir cientificamen.te los tres reynos de la Naturaleza de este Pais, siguiendo el Sistema Naturae de Linneo, edición de Gmelin. Entregado a mi mismo y solo con este gran Maestro y algún otro expositor, he llegado a reunir muchos e interesantes materiales en quienes por entonces encontraba más novedad que ahora, q.e con la abundancia de Libros he conseguido catálogos mas completos, y que me han obligado a reducir el numero de mis nuevos géneros y especies, principalm.te de plantas*". (It is true that although retired in these last towns of South America, where hardly a book of Natural History arrived and where almost no naturalist had fixed a scientific glance, I had the audacity to undertake the vast project of scientifically describing the three kingdoms of Nature of this Country, following Linnaeus' Naturae System, Gmelin's edition. Devoted to myself and alone with this great Master and some other expositor, I have come to gather many interesting materials in which I found more novelty then than now, that with the abundance of Books I have obtained more complete catalogues, which have forced me to reduce the number of my new genera and species, mainly of plants).

Other letters followed, but one from May 25th, 1818, sent to Bonpland by Larrañaga (1924, p. 267–268) stated: "*...estado del reyno animal que abrazan 62 mamíferos, 142 aves, 33 anfibios y 65 peces clasificados según la edición 13 del Systema Naturae de la resplandeciente Estrella polar del Norte... ...No obstante, como es preciso seguir la moda y conformarse a las luces que nos suministra el siglo 19 remito a Ud. Los mamilares clasificados por el nuevo método y también con algunas innovaciones mías, ya que nos es permitido a todos metodizar. Los caracteres que presento son originales y acomodados solamente al País...*" (...state of the animal kingdom that includes 62 mammals, 142 birds, 33 amphibians and 65 fish classified according to the 13th edition of the Systema Naturae of the resplendent Pole Star of the North... ...However, as it is necessary to follow fashion and conform to the lights that the 19th century gives us, I refer you the mammals classified by the new method and also with some innovations of my own, since we are all allowed to methodize. The characters that I present are original and accommodated only to the Country...).

Bonpland's response was encouraging "... *Je suis dans la plus grande admiration de tous vous travaux; ils sont immenses; ils surpassent, j´ose le dire, toute idée exagérée qu´on pouvait en avoir concu, il est incroyable que, seul dans ce pays, livré à l´étude d´Histoire naturelle, sans guide, sans livres vous eussiez pu réunir tant d´objets différents et les classer comme vouz l´avez fait...*" (...I deeply admired of all your works, they are immense. They exceed, I dare say, any exaggerated idea that could have been conceived; It is incredible that you alone, in the country, dedicated to the study of Natural History, without a guide, without books, have been able to gather so many different objects and classify them as you have done) (Larrañaga, 1924, p. 270). Next, the first reference to the *Megatherium* appears in the following terms: "*...Mr Abadie m´a dit, si je l ái bien compris, que vous aviez des os du grand squelette trouvé à Luxan et que j´ai vu dans le Museum de Madrid. Si veritablement vouz avez de ces os je serais bien d´avis que vous les conservassiez pour le pays. Vous pourriez en faire un dessin reduit et l´envoyer en Europe et on serair très reconnaissant de ce cadeau. Cuvier est le seul homme auquel cela convient et peu-être serait-il plus convenable d´adresser les dessins au Ministre de l´Intérieur pour le Museum d´Historie naturelle, ou directement au Museum et dans l´un et l´autre cas écrire à Cuvier... ...Revenons á vos savants et trés intéressants tableaux! Chaqué fois que je les régarde, ce qui m'arrive souvent, mon admiration s'augmente et je crois que vous feriez une chose utile á votre*

gloire scientifique de les faire publier en Europe..." (... Mr. Abadie told me, if I understood correctly, that you had bones from the great skeleton found in Luxan and that I saw in the Madrid Museum. If you really had those bones, I would be of the opinion that you should keep them for the country. You could make a reduced drawing and send it to Europe and they would be very grateful for that gift. Cuvier is the only man to whom that is convenient and perhaps it is best to address the drawings to the Minister of the Interior, to the Museum of Natural History, or directly to the Museum and write to Cuvier in either case. Forgive, I beg you, my suggestions in this regard, and have the conviction that I am doing it in yours and in your country's interest...) (Larrañaga, 1924, p. 271).

Bonpland's response showed how important Larrañaga's studies were for him, and he offered advice on how to publish them in Europe: "*...Revenons á vos savants et trés intéressants tableaux! Chaque fois que je les régarde, ce qui m'arrive souvent, mon admiration s'augmente et je crois que vous feriez une chose utile á votre gloire scientifique de les faire publier en Europe. Si vous étes de cet avis et que vous désiriez que je vous indique la marche que je crois la plus convenable, je le ferai avec autant d'empressement que de plaisir.*" (...Let's go back to your very erudite and interesting schemes! Every time I look at them, and this often happens to me, my admiration increases and I think that you would do a useful thing for your scientific glory by having them published in Europe. If you were of that opinion and would like me to indicate the course that seems most convenient to follow, I would do so with great pleasure and solicitude) (Larrañaga, 1924, p. 271). At the moment, it is not possible for us to establish whether Larrañaga's work was preserved in any institution, although it is very likely that Larrañaga may have included part of the information that is preserved on vertebrates among his manuscripts in either table or text format.

This link with the naturalists from the Old World was reinforced with the recurring visits of the French botanist Auguste de Saint-Hilaire to his house in Montevideo during 1820. In the letter that he sent from Brazil on January 15th, 1821, Auguste de Saint-Hilaire wrote to Larrañaga the following: "*Je ne veux pas tarder plus longtemps à vous exprimer combien j'ai été sensible aux honnetetés que j'ai regues de vous pendant mon séjour á Montévidéo. Depuis Rio de Janeiro je n'avais trouvé personne avec qui je pusse m'ontretenir de mes études favorites et je me rappellerai longtemps avec regret les soirées agréables que vous m'avez fait passer...*" (...I do not want to delay any longer expressing to you how much I was sensitive to the honesty that I received from you during my stay in Montevideo. Since Rio de Janeiro, I have not found anyone with whom I could talk about my favorite studies and I will long miss the pleasant evenings that you gave me) (Larrañaga, 1924, p. 277). The letter continues with the following terms: "*...Les deux nottes que vouz avez eu la bonté de me communiquer seront remises à la Societé Philomatique. Cette Societé qui compte parmi ses membres les savants les plus distingués de l´Institut, est de toutes les societés libres qui existent en Europe, celle peut-être qui a le plus contribué aux progres que les sciences ont faite depuis vingt années... ... Sachant combien elle peut gagner en acquérant un correspondant aussi instruit que vous, j´ais pris la liberté de vous proposer comme tel, et je ne doute pas qu´elle ne s´empresse à vous admettre dans so sein. J´espère, Monsieur, que vous voudrez bien m´excuser de ne pas vous avoir consulté auparavant...*" (...The two notes that you have kindly sent me will be sent to the *Societé Philomatique*. This society, which counts among its members the most distinguished sages of the institute, is of all the free societies that exist in Europe the one that perhaps has contributed the most to the progress of science in the last twenty years... ...knowing how much it can gain acquiring a correspondent as educated as you, I have taken the liberty of proposing it as such and I do not doubt that she will hasten to admit it to her bosom. I hope, sir, that you will excuse me for not having consulted it before. I did not think about it while I was in Montevideo, and currently the distance does not allow us to maintain an active and continuous correspondence...) (Larrañaga, 1924, p. 277–278). Unlike Bonpland, Saint-Hilaire began to establish himself as the link between the wise man of Montevideo and the institutions and naturalists of the Old World. In addition, not only the exchange of ideas is verified, but Saint-Hilaire accessed the collection of objects that Larrañaga housed at his private museum (Saint-Hilaire, 1887, p. 183–184) for which Larrañaga's observations could be confronted with the objects that generated them.

In 1821, Larrañaga met the naturalist Louis Claude de Freycinet in Montevideo and a short time later, on March 29th, 1822, the latter wrote him an extensive letter from Paris in which he mentioned: "*...J´imagine, Monsieur, que vous continuez toujours à vous livrer à vos doctes occupations; les savans français seraient bien aise de pouvoir jouir des fruits de vos recherches; j´espère que vous voudrez bien les leur communiquer quelquefois. Mr. Cuvier, auquel j´ai parlé de vos décuvertes en histoire naturelle, serait fort satisfait des communications que vous voudriez bien lui faire; et la Société de Geographie à laquelle j´ai parlé de vous comme d´un savant qui pouvait utilement favoriser ses vues pour l´avancement de la belle science qui fait l´objet de son institution, désire vous avoir au nombre de ses correspondants. Vous recevres bientôt je pense une lettre spéciale à ce sujet et j´ose espérer que vous voudrez bien satisfaire à nos voeux... ...Je me flatte, Monsieur, que vous voudrez bien m´honorer de terms de vos lettres; s´il vous est possible de me comuniquer les observations météorologiques que vous avez faites et devez faire pendant 1821, 1822 et 1823 je serais bien aise de les avoir et que vous me permittiez de les citer dans mes ouvrages...*" (...I imagine, sir, that you always continue to devote yourself to your scholarly occupations; how happy the French scholars would be to be able to take advantage of the fruits of your investigations. I hope that you will kindly communicate with them sometime. Monsieur Cuvier, to whom I spoke of your discoveries in natural history, would be very pleased to receive any communications that you would make to him, and the Geographical Society to which I spoke of you as a scholar who could usefully further their aims for the advancement of the beautiful science that forms the object of the institution, it wishes to have it in the number of its correspondents. You will soon receive, I believe, a special letter on this subject, and I venture to hope that you will kindly accede to our wishes... ...I venture to hope that you will wish to honor me from time to time with your cards; If it is possible for you to communicate to me the meteorological observations that you made and will make during the years 1821, 1822 and 1823, I would be very happy to have them and that you would allow me to cite them in my works) (Larrañaga, 1924, p. 288).

Once again, Cuvier's name appears on the scene, but in a more categorical way since Louis Claude de Freycinet personally communicated Larrañaga's discoveries and analysis to Cuvier. In this way, the credibility generated in the studies of the native of Montevideo gained credibility in the Old World.

In this sense, on September 19th, 1822, Auguste de Saint-Hilaire wrote again to Larrañaga from Paris and, as Freycinet, indicated the following: "*...J´ai communique á notre savant Cuvier ce que vous me faites l'honneur de me mander relativement au Tatou fossil. Comme il se propose de donner bientôt une 2éme édition de son ouvrage, il désire vivement que vous publieez quelques chose sur cet objet intéressant, et me charge de vous en prier en son nom. Dans le cas ou cela ne vous convienddroit pas vous pourriez m´envoyer une simple note dont il profiteroit, en vous citant, comme cela doit être... ...Les nottes que vous m´aviez remises pour la Société Philomatique ne son point parvenues en France...*" (I have communicated to our sage Cuvier that you did me the honor of telling me regarding the fossil *tatú*. As he intends to publish a second edition of his work soon, he wants you very much to publish something about this interesting object and he asks me to do so on his behalf. In the event that this does not suit you, you could send me a simple note that he would use, quoting you as it should be done... ...The notes that you had sent me for the Société Philomatique did not arrive in France, and the same thing happened with a Memorandum that I had attached) (Larrañaga, 1924, p. 292).

DISCUSSION

The different passages of the chosen quotes not only highlight Larrañaga's work, but also show how different naturalists who came to the Río de La Plata ended up in one way or another recommending his studies. In particular, those referring *Megatherium* to George Cuvier, an international authority on natural sciences. It is possible to consider that Larrañaga's systematicity and eloquence, manifested in the different instances of interaction with other naturalists, led to a small part of his ideas on the classification of vertebrates being incorporated into one of the most important paleontological works of the 19th century.

At the moment, we cannot establish whether or not osteoderms assignable to *Glyptodon* or another glyptodon were collected with the *Megatherium* from Luján. The data cited here and historically contextualized allows us to

propose that its assignment to *Dasypus* is the result of Larrañaga's adherence to the methodological parameters established by the natural sciences at his time. To reduce his postulate to the consequences of a mixture of pieces would be to underestimate Don Dámaso's contribution to paleontological sciences.

The taxonomic decision made by Larrañaga regarding *Megatherium* is, in our opinion, the result of his analysis based on the information available for him and on the exchange of ideas and knowledge with other prestigious naturalists of that time. In this way, his work, referring to fossil vertebrates, takes on even greater prominence. Indeed, his study, based on the same characteristics proposed and used by Cuvier in his classification, led him to contradict Cuvier himself, this being manifested on different occasions, such as in the geological note transcribed above or in the letter sent to Bonpland in 1818. Larrañaga's dissent cannot be considered an unsubstantiated opinion. It arose from a detailed study of the objects and characters that reigned in the classification methods at that time.

The use of anatomical characteristics and their consequences in the classification of living beings was not a strange activity for Larrañaga as a naturalist or person of consultation. Among the recommendations that he sent to Father Muñoz (*vide supra*) to classify plants according to the Linnaeus's system, the presbyter remarked to Father Muñoz that he had to be very precise when recognizing the characters that these schemes included and supported. These recommendations also take place in the answers to the queries that different figures of that time made him and highlight the evidence regarding Larrañaga's concern for the systematics in observational and classificatory studies, and even, in the improvement of practices related to the generation and preservation of reference collections of living beings. These approaches that demarcate his attachment to the methods of the natural sciences of the early 19th century are what solidified his insertion in the fields of these sciences at a local and international levels. Larrañaga interacted both by letter and personally with the prestigious French naturalists Freycinet and Saint-Hilaire, and it is with them that he developed and shared his conclusions regarding *Megatherium*. Thus, we allow ourselves to reconstruct that in Montevideo at the beginning of the 19th century, Don Dámaso Antonio Larrañaga shared extensive talks, exposed his doubts, uncertainties, certainties, and resorted on more than one opportunity to exemplify his position and musings before French naturalists as a colleague, whose discrepancies should be respected just as Cuvier did when including his studies in his work.

CONCLUSION

More than 200 years have passed since Larrañaga decided to dedicate part of his time to the study of natural sciences. The analysis of his work allows us to establish that he was a naturalist whose method was consistent with those applied by other naturalists at that time. His studies related to the anatomy, taxonomy, and classification of living beings, with particular emphasis on living and fossil mammals, allow us to recognize Don Dámaso Antonio Larrañaga as the first great naturalist born and trained in the Río de La Plata, whose work, although mostly unpublished, marks the beginning of the vertebrate paleontology in the Río de La Plata from the transcendence of its systematic conclusions regarding the armored *Megatherium* included in the note published in Cuvier's work of 1823.

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