

2016, Volumen 1, Número Especial: 316-333

“La Historia de la Geología en el Bicentenario de la Argentina”

On the objectives and results of the Handel T. Martin paleontological expedition (1903-04) to the Santa Cruz Formation in southern Patagonia

S.F. Vizcaíno¹, P.D. Brinkman² and Richard F. Kay³

¹ CONICET, División Paleontología Vertebrados, Facultad de Ciencias Naturales y Museo, Calle 60 y 122, 1900 La Plata, Argentina, vizcaino@fcnym.unlp.edu.ar

² North Carolina Museum of Natural Sciences, 11 W. Jones Street, Raleigh, NC 27601, USA,
paul.brinkman@naturalsciences.org

³ Evolutionary Anthropology and Division of Earth and Ocean Sciences, Duke University, Box 90383, Durham, NC 27708, USA, richard.kay@duke.edu



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ABSTRACT. Between January and June 1904, Handel T. Martin (1862-1931), of the University of Kansas (KU), collected fossil vertebrates from the Early Miocene Santa Cruz Formation along the Río Gallegos and the Atlantic Coast of Patagonia, as his own private initiative. In his account of the expedition, Martin stated that when he and his companion, arrived in Buenos Aires, they visited Florentino Ameghino at the Museo Nacional. Martin's album of photographs shows that he also visited the Museo de La Plata and Ameghino's home in La Plata. Before heading to Patagonia, Martin assembled his equipment in Bahía Blanca, where his brother had settled. It is not clear if Martin collected a total of 235 or 395 specimens. Clearly, his main goal was to collect fossils to sell, as many specimens were later sold to different institutions in the United States and Europe by Martin himself and through Robert Ferris Damon, a well-known fossil and mineral trader of the time. To date, we have identified only about 170 specimens in formal collections. A large part of the collection – at least 130 of the choicest specimens – remained at KU, which constitutes one of the largest collections of Santacrucian vertebrates outside Argentina (in addition to the ones in the Yale Peabody Museum in New Haven, the Field Museum in Chicago, and the American Museum in New York). Although the collection at KU is largely neglected by paleontologists and has seldom been studied, it contains a good representation of the Santacrucian fauna, with many fine specimens.

Keywords: *Patagonia, fossils, old Miocene collections, museums*

RESUMEN. Sobre los objetivos y resultados de la expedición paleontológica de Handel T. Martin (1903-04) a la Formación Santa Cruz en Patagonia austral. Entre enero y junio de 1904, Handel T. Martin (1862-1931), de la Universidad de Kansas (KU), colectó vertebrados fósiles de la Formación Santa Cruz (Mioceno temprano) a lo largo del Río Gallegos y la costa atlántica de Patagonia, como una iniciativa privada de Martin. En reporte de la expedición, Martin afirmó que cuando él y su compañero llegaron a Buenos Aires, visitaron a Florentino Ameghino en el (entonces) Museo Nacional. Su álbum de fotografías muestra que también visitó el Museo de La Plata y la casa de Ameghino en La Plata. Antes de dirigirse a la Patagonia, Martin organizó su equipo en Bahía Blanca, donde su hermano se había establecido. No hay certeza de si Martin recogió un total de 235 o 395 ejemplares. Claramente, su principal objetivo fue recoger fósiles para comercializar. Muchos

especímenes fueron vendidos a instituciones en los Estados Unidos y Europa por Martin y Robert Ferris Damon, un comerciante de fósiles y minerales. Se han identificado cerca de 170 especímenes en colecciones formales. Gran parte de la colección - unos 130 de los mejores ejemplares - se mantuvo en KU, constituyendo una de las mayores colecciones de vertebrados santacruceses fuera de Argentina (además de las del Museo Peabody de Yale en New Haven, el Museo Field de Chicago y el Museo Americano de Nueva York). Aunque la colección en KU es en gran medida ignorada por los paleontólogos y poco estudiada, contiene una buena representación de la fauna santacruceses, con muchos ejemplares de calidad.

Palabras clave: *Patagonia, fósiles, colecciones antiguas, museos*

Introduction

Between January and June 1904, Handel T. Martin (1862-1931, Fig. 1) undertook a paleontological expedition to collect fossil vertebrates from the outcrops of the Early Miocene Santa Cruz Formation along the Río Gallegos and the Atlantic Coast, near the southernmost tip of continental Patagonia (Fig. 2). The formation contains fossil vertebrates that form the core of the Santacrucean South American Land Mammal Age (Vizcaíno *et al.*, 2012a, b). According to his unpublished autobiography, as well as his published report on the expedition (Martin, 1904), this was Martin's private initiative⁽¹⁾. To accomplish this expedition, he secured a one-year leave of absence as a preparator and collector of fossil vertebrates for the University of Kansas in Lawrence, Kansas (Ostrander *et al.*, 1986), where he had first arrived in the 1890s as an assistant to Professor Samuel Wendell Williston (1852-1918).



Figure 1. Handel T. Martin (1862-1931) in Argentina, wearing his field attire, with a book and a skull (probably a puma).



Figure 2. Martin's route in Argentina (1903-1904). Redrawn from the map of railroads of Argentina in 1906 by Captain Enrique Méndez.

The expedition produced a large number of specimens (253 vertebrate fossil specimens from the Santa Cruz Formation appear in a copy of the field catalog found at the Field Museum). Despite ongoing controversies between the two main scientific teams that had worked previously on the geology and paleontology of the formation, Florentino and Carlos Ameghino (1854-1911; 1865-1936) in Argentina and John B. Hatcher (1861-1904) and William B. Scott (1858-1947) from Princeton University (USA), Martin's collections received scant attention and remained virtually unknown to most paleontologists for several decades. The only formal, albeit brief and preliminary, report of the expedition was read before the Kansas Academy of Sciences on 31 December 1904 (Martin, 1904)⁽²⁾. Martin (1904, p. 104) stated that the specimens then placed in the university's museum "*when cleaned, will be described and figured in the University Quarterly.*" However, a fuller report was never published. Decades later, paleontologist Larry G. Marshall (1975) called attention to this important Santacrucean collection kept in the University of Kansas Natural History Museum (UKNH, hereafter). Also, the expedition has been mentioned briefly in other historical accounts of the paleontology of the Santa Cruz Formation and its fauna (e.g. Marshall, 1976; Vizcaíno *et al.*, 2012a,

2013). Tellingly, George G. Simpson's (1984) book-length history of fossil mammal collecting in Patagonia, does not mention Martin at all.

It was not only the scientific results of Martin's expedition that remained obscure. Unlike the clearly stated objectives of Hatcher and Scott, which were to test Ameghino's ideas about the great age of the formation and phylogenetic affinities of its species *vis à vis* North American and Eurasian mammals (see Vizcaíno *et al.*, 2013), Martin's motives remain somewhat cryptic. His only published statement was that "*After carefully reading over the narrative of the above trips [Hatcher's Princeton Patagonian Expeditions], I determined to make a trip to this Mecca of fossils*" (Martin, 1904, p. 101). The aim of this contribution is to reconstruct Martin's expedition, to speculate on Martin's motives and to evaluate the current importance of his Patagonian collection.

Handel T. Martin biography and background

Handel T. Martin was born near Nottingham, England in 1862. He had little formal education. In his youth, he became acquainted with fossils through his father – William Martin, a brick layer – who had made arrangements with quarry men at the lime kilns at nearby Cropwell to save any "*Old Bones*" they found. These were mostly the bones of ichthyosaurs and other Jurassic animals. Leaving home at age thirteen, he lived in Dorsetshire, England and Wales, where his interest in fossils and other objects of natural history was encouraged by like-minded friends⁽³⁾.

Martin immigrated to the United States in 1886 and settled on a homestead in western Kansas, "*in the very midst of the richest Cretaceous fossil field*" then known. That same year, while exploring the chalk beds exposed along the banks of the Solomon River, he found his first American fossil, part of a large bony fish then commonly called *Portheus* but now known as *Xiphactinus*. The following spring, on his own land, he found a "*practically perfect*" skull of a huge marine reptile called *Tylosaurus*. This specimen he forwarded to Othniel Charles Marsh, at Yale College, who was then serving as official vertebrate paleontologist of the US Geological Survey and honorary curator of the Department of Vertebrate Paleontology at the United States National Museum. Arguably the most prominent paleontologist in America, Marsh was then embroiled in a bitter contest with his arch rival, Edward Drinker Cope, to acquire and publish descriptions of any new fossils (see Brinkman, 2016). Thus, an unsolicited specimen sent by a new collector in an important fossil locality was welcome news. In return, Marsh sent Martin copies of several of his papers on animals of the Kansas Cretaceous, a textbook on geology, a set of printed instructions on how best to collect fossils, and a small pick. Martin then became a regular supplier of fossils. For these, Marsh sent small sums of money, often too small and almost always very tardy. Martin's correspondence with Marsh is filled with pitiful pleas for payment. "*[S]end me a little to keep the ball rolling,*" he wrote in 1889⁽⁴⁾. "*I should be awfully glad if you could send me a few Dollars to be going on with, as I am getting short and have not been working at anything for some time,*" he wrote in 1890⁽⁵⁾.

Martin was a novice collector, and Marsh, it seems, was not entirely satisfied with his technique. The Yale professor offered this advice: "*[M]ake every effort to keep [bones] entire [...]. A good way is to paste cloth over it, or put plaster of Paris around it. It is worth much more if kept together than if the parts are dug out potato fashion and mixed with other [...] bones. [...] You are in a very good region for fossils, and ought to get something important, worth all you have sent, and much more. Use greater care in collecting and keep all the bones together you can [emphasis original].*"⁽⁶⁾

The geological survey provided Marsh with an appropriation for fieldwork, so he put Martin on the USGS payroll on a trial basis in 1890. Unfortunately for Martin, this arrangement lasted only one field season⁽⁷⁾. After 1890, he began collecting fossils on a freelance basis, selling specimens to various museums in the US, including the Smithsonian Institution and the American Museum of

Natural History, and to other museums in Europe. Marsh and Yale College continued to acquire some specimens from Martin into the mid-1890s (Hawley, 2009).

In 1893, Martin met Samuel Wendell Williston, a professor of paleontology at the University of Kansas and a former employee of Marsh⁽⁸⁾. The following spring, using a modest appropriation for fieldwork provided by the Kansas state legislature, Williston hired Martin to collect with his field and lab assistant, Thomas R. Overton, in the Niobrara Chalk beds of the Smoky Hill River of western Kansas. On this trip, Martin discovered a magnificently preserved fossil bird specimen – with fine scale and feather impressions – near Hill City on the Solomon River (see Williston, 1896; Martin, 1994). Martin joined Overton again in the summer of 1895, when they excavated the 12 Mile Creek Paleoindian site for the University of Kansas. Unfortunately, funding for fieldwork was very erratic at the University of Kansas. Indeed, when Martin returned to the 12 Mile Creek site for a second field season in 1896, he was working as a freelancer again. Consequently, he later sold the fossil bison skeleton and spearhead he recovered there to Williston (see Hawley, 2009).

Williston thought highly of Martin as a collector: *“If you have occasion to purchase Kansas Cretaceous material, I can cordially recommend Mr. H. T. Martin to you,”* he wrote to a colleague. *“[Martin] collected for Marsh eight years and as usual was treated pusillanimously. I hope to employ him in the coming year [...]. He is careful and conscientious, and understands the real art of collecting.”*⁽⁹⁾

In the mid-1890s, Martin began corresponding with Henry Fairfield Osborn, founder and first curator of the Department of Vertebrate Paleontology at the American Museum of Natural History. A protégé of Cope's, Osborn loathed Marsh – his fervent wish was to supplant his Yale rival by establishing a bigger and better program for vertebrate paleontology in New York. By 1895, Osborn's program was acquiring fossils aggressively and pioneering new, cutting-edge preparation and exhibition techniques (Brinkman, 2010a). Martin hoped to benefit from the special training that Osborn's program could provide: *“I anticipated with eagerness the opportunity I should then have of getting practical knowledge of the latest methods of cleaning and preparing the specimens for mounting. I would also learn something of the mounting, itself, for the specific understanding with Professor Osborn was that I was to assist Mr. Herman[n], the head preparator in the work of mounting.”* Osborn, for his part, hoped to benefit from Martin's information about Marsh's fossil localities in western Kansas.

In his autobiography, Martin wrote that he began working at the American Museum in the spring of 1895. But this is likely a mistake for 1896. Two unpublished annual reports for the museum's Department of Vertebrate Paleontology list Martin as an assistant in 1896 and 1897⁽¹⁰⁾. Likewise, a letter from Osborn to Williston confirms that Martin was present in New York and doing satisfactory work by 30 January 1896. *“Your man, Martin, is here and appears to understand his work very well,”* Osborn wrote⁽¹¹⁾. In the spring and summer of 1897, Martin teamed up with William Diller Matthew, a young paleontologist at the American Museum, to explore the Niobrara chalk beds of Kansas for vertebrate fossils. This was familiar territory for Martin. Indeed, Martin's ranch at the mouth of Beaver Creek served as the expedition's headquarters. Again, in 1898, Martin joined an American Museum expedition for fossil mammals in the Miocene and Oligocene beds of Kansas, Wyoming and Colorado⁽¹²⁾. Yet Martin was never a full-time, permanent employee of the department. And his status as an occasional freelancer meant that he could not be trusted with sensitive fossil locality information – at least not by some. Osborn, for example, called Martin's loyalty into question in a letter in 1898: *“I trust you will consider that this is purely American Museum work, and that we do not expect yourself or any member of the party to work independently in the same beds until we get through with them.”*⁽¹³⁾ Jacob Wortman, Osborn's field foreman, didn't trust Martin at all. In a letter to Osborn he warned: *“I am afraid of Martin[....] If [...] Martin once set eyes on what we have in sight [we] would become competitors[....] [He] will not know our localities if I can help it.”*⁽¹⁴⁾

In 1899, Martin returned to Lawrence, Kansas and joined the staff of the university as a fossil preparator (Martin, 1994). (Overton had left Williston's employ in 1896 to "go to preaching" [Shor, 1971, p. 145]). Martin worked for three years under Williston, until the latter was hired by the University of Chicago in 1902. He then worked under Clarence E. McClung (who had replaced Williston as curator of vertebrate paleontology), apparently as a field collector and preparator (Shor, 1971). It was not until 1907 – three years after his return from Argentina – that Martin was appointed to the position of assistant curator of vertebrate paleontology. He remained in this position for the rest of his life (Hawley, 2009).

"Discouraged at the outlook for paleontology at the University of Kansas" following Williston's departure, and dissatisfied – perhaps – with his position at the university, Martin obtained a leave of absence in 1903 to undertake an expedition to Patagonia, where Williston "had long hoped to send him." ⁽¹⁵⁾ Martin claimed that he had determined to make a trip to Patagonia after "carefully reading over the narrative" of John Bell Hatcher's Princeton Patagonian Expedition (Martin, 1904, p. 101). Hatcher had found "almost embarrassing riches" (Hatcher, 1903, p. 37) in the fossil beds of southern Patagonia – Martin expected to duplicate his colleague's success. He also hoped to succeed where Hatcher had failed, by "possibly finding the lower eocene beds." ⁽¹⁶⁾ Another early impetus, however, came from a conversation he had with William Diller Matthew about Barnum Brown's expedition ⁽¹⁷⁾. Matthew must have given Martin the impression that there was a much work yet to be done in Patagonia. Martin then wrote to Osborn in March, 1903, to propose a joint expedition: "I cannot see but what there is a great possibility for some good careful collecting to be done there, and should like to get a chance of a trip into the localities visited by Brown and Hatcher [...]. [I]f Brown would go down as well, I think we can get along together as well as anyone, and get as much good material as is possible." ⁽¹⁸⁾ Osborn was unable to commit to a joint expedition. He did, however, tell Martin that he would be "very glad indeed to try to make such purchases as we can afford, and as do not duplicate our own collections, on your return." ⁽¹⁹⁾ Thus did Martin enlist his first potential client.

H.T. Martin in Buenos Aires, La Plata, and Bahía Blanca

Martin and Mr. Samuel Adams, a recent University of Kansas graduate (1903), who went along to collect zoological material, left the United States from New York in September 1903 on the steamer *Afghan Prince*. According to Martin (1904; see also Marshall, 1975), they reached Buenos Aires on 20 September, where they visited the "National Museum" (Museo Nacional) at the "Manzana de las Luces" (currently surrounded by the streets Bolívar, Moreno, Alsina and the Avenida Julio A. Roca), and met its director, the famous Argentine paleontologist Florentino Ameghino, prior to traveling overland via the Southern Railroad (the British company Ferrocarril del Sud) to Bahía Blanca.

A transcription in volume XXII of the *Scientific Works and Correspondence of Florentino Ameghino (Obras Completas y Correspondencia Científica de Florentino Ameghino; Torcelli, 1936, letter 1952)* reveals that Martin carried a brief letter of recommendation from Williston (by then at the Department of Paleontology at the University of Chicago), dated 1 September 1903. In the letter, Williston claimed that Martin was especially interested in collecting fossils in Mesozoic deposits ⁽²⁰⁾. Martin recorded that they were "courteously treated" by Ameghino. In a letter dated 25 October (Torcelli, 1936, letter 1494) to his brother Carlos, who was then in Punta Alta, near Bahía Blanca, Florentino wrote: "Los Norteamericanos ya vinieron y estuvieron a verme hace unos días. El señor Martin, que es el paleontólogo, creo que tiene un hermano en Bahía Blanca, si no me equivoco, propietario de un hotel. Esto explicaría el por qué toman como base de sus exploraciones a Bahía Blanca. Creo que ya debe haber salido para esa; de modo que no pierdas tiempo y trata de sacarle toda la delantera posible" (The Americans arrived and came to see me a few days ago. Mr. Martin,

who is a paleontologist I think has a brother in Bahia Blanca, if I'm not mistaken, [the brother is] a hotel owner ⁽²¹⁾. This would explain why they take Bahia Blanca as a base for their explorations. I think they must have already departed; so do not waste time and try to get ahead as much as possible). This suggests that Florentino Ameghino knew in advance that Martin was going to visit him and that he was worried that Martin planned to look for fossils in Punta Alta – less than thirty kilometers east and south of Bahia Blanca – where Darwin had discovered and collected fossil mammals in 1832 and again in 1833 (see Brinkman, 2010b).



Figure 3. Martin's photo album kept at the Division of Vertebrate Paleontology of the Kansas University Natural History Museum: **A.** Cover. **B.** Articulated skull, mandible and cervical vertebrae of a Santacrucian fossil mammal housed in the Museo de La Plata, probably collected by the early museum expeditions (see Vizcaíno *et al.*, 2013; Brinkman and Vizcaíno, 2014). **C.** Articulated skull and mandible and cephalic shield of the bizarre Santacrucian armadillo *Peltephilus* collected by Carlos Ameghino, probably after his separation from the Museo de La Plata, which Martin must have seen at Ameghino's home in La Plata; the specimen is currently part of the Ameghino collection in the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" of Buenos Aires. **D.** panoramic view of the front and left wing of the Museo de La Plata in 1903; on the right side in front, note the monument made of a fossil log and a bust of the French explorer Jules Crevaux (1847-1882) on top (De Santis, 1977). **E.** View of the rear of the Museo de La Plata and surrounding gardens; in the lower floor an elegant colonnade served as entrance for carriages. Regrettably, this part of the Museum and the gardens do not flaunt this glamor today. **F.** Ameghino's house and bookstore at the corner of 11th and 60th streets in La Plata. **G.** Presumably, the patio at Ameghino's home.

We do not know how long Martin visited with Ameghino, but certainly it must have taken several days or even weeks (see below). During his visit, he put together a collection of 580 photographic prints into an album (Fig. 3A), which must have been bought in Argentina. The album contains an interesting collection of photographs of prepared fossil vertebrate specimens (Fig. 3B-C), most of which were not at the Museo Nacional in Buenos Aires then, but must have been in Ameghino's private fossil collection in nearby La Plata. These include some specimens that originally belonged to the Museo de La Plata, but now are at the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN, formerly the Museo Nacional). In any event, the specimens in question remained in the Ameghino family home until the death of Carlos Ameghino (in 1936). Martin must have examined this large collection in La Plata, taken the photographs and assembled the album over a period of several days or weeks. Incidentally, there are also two photographs of the exterior of the Museo de La Plata (Fig. 3D-E), some of Ameghino's cabinet, house and bookstore on the corner of 11th and 60th streets in La Plata (Fig. 3F-G), including one (presumably) of the patio at Ameghino's house⁽²²⁾.

In Bahía Blanca, Martin visited his older brother Albert Euerby Martin (1855-1944), a fact that is confirmed by Albert's descendants in Argentina. According to the Martin family, Albert left his schoolmaster position in Welshpool (Montgomeryshire, UK), in 1888, and set off for Argentina, leaving behind his wife and daughters until he became established. Less than three months after his arrival in Argentina, he opened his first school of English, in the town of Cañada de Gómez, in the Province of Santa Fe. In March 1889, his wife and their four daughters joined him. Two years later the family moved to Barracas, Buenos Aires, to open another English school. In 1894, they moved to Quilmes where they opened yet another English school. Finally, they settled in Bahía Blanca where Albert opened the English Academy in 1898. In 1905 he was invited to head the English Department of the Bahía Blanca National High School of Commerce, an office he held until his retirement in 1936⁽²³⁾. The opportunity to make a lengthy visit with his estranged brother, and his brother's family, must have been an important personal motivation for Martin's expedition. Indeed, he brought his own small family with him to Argentina, leaving them in Bahía Blanca when he continued south to collect fossils. Martin (1904, p. 101) regretted having had to spend two months in Bahía Blanca waiting for his camping outfit to arrive. But by January 2nd 1904, Martin, Adams and a locally acquired camp hand and interpreter – perhaps one of his brother's students – were aboard the steamer *Chubut*, bound for Río Gallegos⁽²⁴⁾.

Account of the expedition

No journal is known from the expedition. Some information is available in the brief report that Martin read before the Kansas Academy of Sciences (Martin, 1904; Marshall, 1975). Additional information can be gleaned from the field notebooks and from a small collection of surviving correspondence.

As mentioned previously, Martin, Adams and their interpreter left Bahía Blanca just after the new year of 1904. Their ship called at San Blas, Puerto Madryn (where they collected a fossil penguin in the Puerto Madryn Formation), Cabo Raso (Martin called it "Caboroso"), Santa Elena, Camarones, Comodoro Rivadavia, Cabo Blanco, Puerto Deseado, Puerto San Julián and Puerto Santa Cruz (Fig. 2), where they secured collections of any material available. They arrived at Río Gallegos on 23 January and there spent "*a few uncomfortable days...getting our camping outfit together, and breaking our four South American horses to the use of the farm wagon that we shipped from New York*" (Martin, 1904, p. 102). They followed Hatcher's trail, crossing the river at "*Weir Aike*" (Güer Aike) and setting up their first camp at Mr. H. S. Felton's Estancia (today Killik Aike Norte; Fig. 4).

Martin carried a letter of introduction from Hatcher, and was “*very hospitably received*” (Martin, 1904, p. 102). They spent two months collecting a great number of fossils – mostly small mammals – from the cliffs at Felton’s Estancia and both up- and downstream, and at the base of the cliff and the bed of the river during low tide.

In March they moved eastwards to Mr. John Rudd’s Estancia at what Martin called – again, following Hatcher – Cape Fairweather (Estancia Cabo Buen Tiempo) and two days later they established a new camp on the Atlantic coast two miles north of the Cape. Besides some very brief geological observations, most of Martin’s narrative consists of vivid descriptions of the peculiar collecting conditions on the platforms exposed at low tide, as it was done before by Carlos Ameghino (Torcelli, 1935, letter 652) and John B. Hatcher (Hatcher, 1903, p. 72). Although no mention is made of other localities in Martin’s published narrative, his catalog suggests that they collected some fossils considerably farther north. Certain specimens are listed as coming from “*Mount Tiger*” [Monte Tigre] – about twenty-five kilometers north of Cabo Buen Tiempo – and some from even farther north. The severe winter conditions forced them to abandon the field before planned. By June the fossils had been shipped to New York *via* Punta Arenas.

Figure 4. Martin’s camp at Felton’s estancia by the Gallegos River. The picture has been colored and exhibited in the Kansas University Natural History Museum, with the caption “Martin declared his KU affiliation with an excerpt from the newly minted Rock Chalk chant boldly painted on the side of tent.” The foremost figure appears to be Martin; in the background it is possible to see part of a wagon. In the estancia (today Killik Aike Norte) there are remains of two American-made buckboard wagons. One probably was used by John B. Hatcher and Barnum Brown in 1898-1899, the other may have been Martin’s.



Martin’s report ends with the claim that his specimens had been placed in the University of Kansas Museum and promises a publication in the *University Quarterly*. Two pictures, one of the camp at Felton’s Estancia and the other of the cliffs 20 miles north of Cabo Buen Tiempo, and a brief list of taxa recorded complete the report.

Objectives and results of the expedition

As already stated, Martin did not declare clear scientific objectives for his expedition to Patagonia in his report of 1904. We conclude that Martin’s professional motive was two-fold. First, he hoped to collect sufficient fossil material to sell in order to defray his expenses and provide a reasonable wage. Second, he hoped to widen his experience and place himself in a more competitive position for a better and higher paying job at the University of Kansas or at any one of the new museums or university departments that were then opening in the United States.

Two sources of information in the archives of the Vertebrate Paleontology Department at UKNH indicate that one of his main objectives was to sell fossils. One is the “Field Book 401” (Fig. 5) in which the great majority of the specimens were assigned a price; the other is his autobiography, which states that the expedition was carried on defraying all expenses by himself and that “*part of the*

collection I sold to the British Museum, London, England, and to the other museums in Europe, parts to several museum in this country (USA), and a good representative collection was bought by KU and now is in our own museum.”⁽²⁵⁾ Because Martin fronted the money to fund the expedition, it would have been reasonable at least to recoup his expenses. Santacrucian fossils were much sought after by most scientific institutions interested in paleontology and biological evolution in the last part of the XIXth and the beginnings of the XXth centuries when there were still questions about Ameghino’s hypothesis that some North American mammalian orders may have had their origins in South America. At the time there was a considerable market in which fossils from the Santa Cruz were sold or used as exchange currency among paleontologists and institutions (Vizcaíno *et al.*, 2013; Vizcaíno & Bargo, 2013).

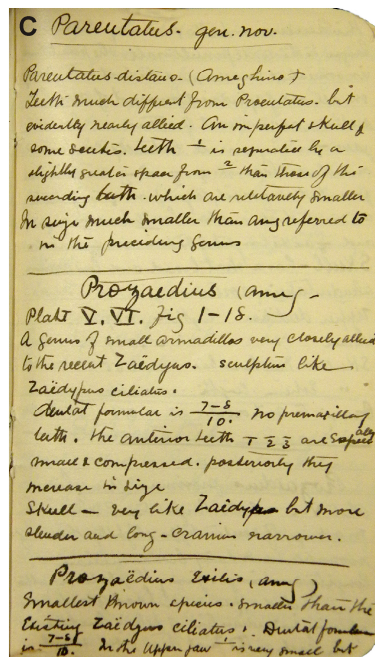
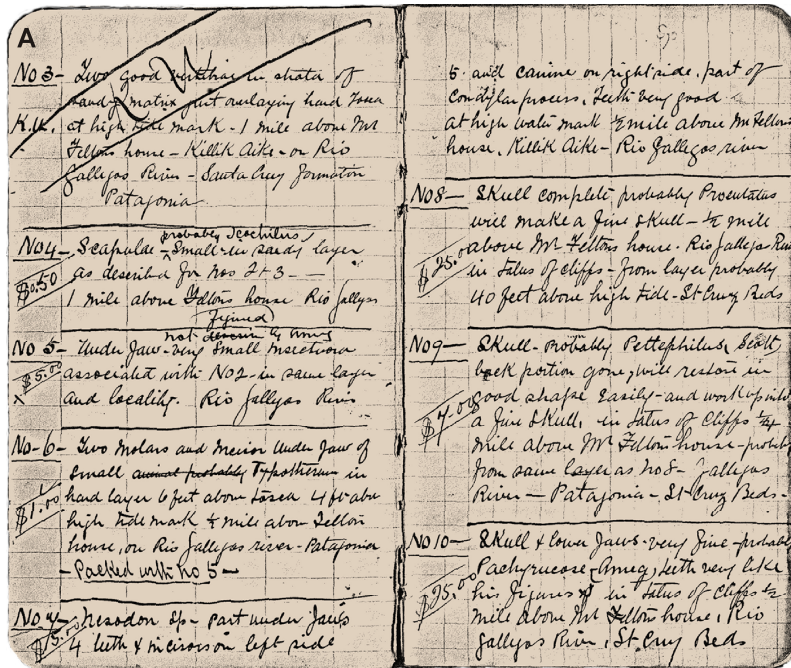


Figure 5. A. Representative pages of the “Field Book 401” labeled “H.T. Martin Patagonian Collection,” which seems to be a clean copy of his field catalog. The great majority of specimens are assigned a price. Others are marked K.U. Apparently the latter were selected to remain in the Kansas University Natural History Museum while the others were to be sold. B. Cover of the notebook “Pocket Notes” labeled “Mammals & Invertebrates,” which contains notes about Ameghino’s localities and descriptions of Santacrucian mammals taken from the literature.

There is no certain information about how many specimens were originally collected, but it must have been as many as 400 specimens. Information in “Field Book 401” suggests that Martin’s

estimation of the value of his collection was close to US \$3,550 (the 2016 equivalent of more than US \$90,000).

A number of institutions and individuals made a claim to parts of Martin's collections. Despite numerous accounts suggesting that the collections were made entirely for the benefit of the University of Kansas, a letter of introduction written by Richard Rathbun, assistant secretary of the Smithsonian Institution, claims that "*a part of [Martin's collection] is to become the property of the United States National Museum.*"⁽²⁶⁾ Likewise, Samuel Wendell Williston claimed that Martin "*promised me that I should have the first opportunity to acquire the results of his expedition in their entirety, and at a reasonable cost. He only desires to be reimbursed for the cost of his trip and receive a reasonable wage for his services.*"⁽²⁷⁾ Williston explained, "*The expedition was widely advertised at the time as from and by the University of Kansas, but it was made wholly upon Mr. Martin's resources.*"⁽²⁸⁾ This latter claim is not entirely accurate, either. It is true that Martin fronted most of the cost of the expedition himself. However, a letter from Martin to Frank Strong, chancellor of the University of Kansas, suggests that Martin was expecting to receive an unknown (but likely modest) appropriation from the university regents in exchange for "*a small collection*" from Patagonia⁽²⁹⁾. Likewise, Martin received generous material aid while in Argentina. His outfit was admitted to Argentina duty-free, for example. Francisco P. Moreno, director of the Museo de La Plata, arranged for free passage on government transports between Bahía Blanca and Río Gallegos for Martin's party. Finally, Manuel Lainez, founding owner of a local newspaper called *El Diario* (Buenos Aires), gave the expedition "*four fine horses*" as a Christmas present⁽³⁰⁾.

According to an article published in the *Kansas City Star* newspaper, Martin gave the University of Kansas "*some thirty of his better specimens ... as he did not wish to see the collection go to another institution.*" This may have been motivated, at least in part, by the payment of a modest appropriation by the university regents (see above). In 1906, the university was able to secure what still remained of his collection – nearly 200 specimens – for about \$1,500, "*which nearly covered the expenses of the expedition*" (see Anonymous, 1906, p. 4).

We don't know how many specimens Martin sold. In the "Field Book 401" there are only 14 specimens marked as to remain in Kansas, but we recorded 130 actually present in the vertebrate paleontology collections at UKNH. It may be that a missing notebook that recorded specimens between 236 and 350 was mostly, or entirely, dedicated to specimens that were selected to stay there.

According to Marshall (1975), besides the collection at UKNH there were four other specimens in the Paleontological Section of the then British Museum (Natural History) of London, labeled as being purchased from H.T. Martin in 1905. We cannot confirm that this was the total number of Martin specimens acquired.

Ostrander et al. (1986) mentioned that a part of Martin's collection is in the Museum of Comparative Zoology at Harvard University. There, we found eight individual specimens and a box with several fragmentary mandibles and maxillae, with information that suggests that they were collected by Martin (Table 1). Two specimens have labels that indicate that they were purchased from R. F. Damon. One (MCZ 7193) reads: "*coll. H.T. Martin; from R.F. Damon, 1906.*" One possibility is that Martin sold the specimens to Robert Ferris Damon (1845-1929), a well-known dealer in fossils and other natural history specimens who was based in London.

There are also fossils collected by Martin in the Field Museum, in Chicago. Field Museum accession number 1285 lists 26 cataloged specimens purchased from Martin. We identified 17 specimens in the fossil mammal collection that show clear indications that they were collected by Martin (Table 1). The Field Museum purchased "*about 25 specimens of fossil mammals from Patagonia, representing fourteen species none of which is possessed in the collection*" (along with approximately 200 specimens of invertebrate fossils from Patagonia and a slab of *Uintacrinus*) from Martin for \$50 early in 1908. "*Five or six of these are good exhibition material, the remainder are of*

value chiefly for study,” according to Curator of Geology Oliver C. Farrington⁽³¹⁾. However, Elmer S. Riggs, the Field Museum paleontologist who was later to lead the hugely successful Captain Marshall Field Paleontological Expedition to Argentina and Bolivia, 1922-1927, had some misgivings about the purchase. Riggs informed Martin “that there were only about six specimens in the lot that ‘appealed to him’ as being worth while, and that I [Martin] was withholding two of these.” That Martin did not appreciate the new museum-paleontology paradigm whereby vertebrate fossils were often valued chiefly for their exhibit qualities (see Brinkman, 2010a, p. 17-20) is clear from Martin’s explanation to Farrington: “When I first began collecting for Prof. Marsh 20 years ago, he gave me to understand that any Palaeontologist would consider any fossil bone of value that had any articulation present, or any specimen that showed a tooth to identify it by. These ideas still stick to me.”⁽³²⁾ Martin and the Field Museum eventually resolved their differences and the sale was finalized in February, although the museum was very slow in settling the bill⁽³³⁾.

Table 1. Specimens found in the Museum of Comparative Zoology and the Field Museum of Natural History that came from the Martin collection. Specimens marked with an asterisk have the following note: “from R.F. Damon 1906”

Catalogue Number	Identification	Material
MCZ 3926	<i>Hegetotherium</i> : Notoungulata	Skull
MCZ 3927	Glyptodont: Xenarthra	Skull
MCZ 4506	<i>Neoreomys</i> : Rodentia	Skull, mandible and postcrania
MCZ 5181 *	<i>Adinotherium</i> : Notoungulata	Skull
MCZ 7193 *	<i>Astrapotherium</i> : Astrapotheria	Mandible
MCZ 8434	Glyptodont: Xenarthra	Scutes
MCZ 8579	Glyptodont: Xenarthra	tail sheet
MCZ 8581	Sloth: Xenarthra	Tibia
MCZ n/n	Rodentia	mandibles
FMNH P12045	<i>Interatherium</i> : Notoungulata	mandible and skull
FMNH P12046	Protypotherium: Notoungulata	skull
FMNH P12047	<i>Protypotherium</i> : Notoungulata	mandible
FMNH P12048	<i>Stichomys</i> : Rodentia	mandible
FMNH P12049	<i>Protherotherium</i> : Litopterna	mandible
FMNH P12050	Hegetothere: Notoungulata	mandible
FMNH P12051	<i>Pachyrukhos</i> : Notoungulata	mandible
FMNH P12053	<i>Adinotherium?</i> : Notoungulata	axis
FMNH P12052	<i>Neoreomys</i> : Rodentia	mandible
FMNH P12054	<i>Perimys</i> : Rodentia	mandible
FMNH P12055	<i>Eocardia</i> : Rodentia	mandible
FMNH P12056	<i>Eocardia</i> : Rodentia	mandible
FMNH P12057	<i>Protypotherium</i> Notoungulata	skull
FMNH P12058	<i>Protypotherium</i> Notoungulata	skull
FMNH P12059	Protypotherium: Notoungulata	skull
FMNH P12060	Protypotherium: Notoungulata	skull
FMNH P12061	<i>Adinotherium</i> : Notoungulata	mandible
FMNH P12062	<i>Peleciodon</i> : Xenarthra	postcrania
FMNH P12063	Glyptodont: Xenarthra	mandible
FMNH P12064	<i>Adinotherium</i> : Notoungulata	maxilla
FMNH P12065	Glyptodont Xenarthra	mandible
FMNH P12066	<i>Adinotherium</i> : Notoungulata	maxillae and mandibles
FMNH P12067	<i>Nesodon</i> : Notoungulata	mandible
FMNH P12068	<i>Peleciodon</i> : Xenarthra	mandible
FMNH P12069	<i>Proeutatus</i> : Xenarthra	mandibles and scutes
FMNH P12284	Glyptodont: Xenarthra	scutes
FMNH P15100	<i>Proeutatus</i> : Xenarthra	poscrania
FMNH P15101	<i>“Palyeidodon”</i> : Notoungulata	maxilla

So far, we have not found definitive evidence of the presence of specimens collected by Martin in other institutions that hold Santacrucian fossils, such as the National Museum of Natural History (Washington, DC), Amherst College (Amherst, Massachusetts) and the Carnegie Museum of Natural History (Pittsburgh, Pennsylvania), in the United States; Museum National d'Histoire Naturelle (Paris) and Université C. Bernard (Lyon), in France; Bayerische Staatssammlung für Paläontologie und Geologie (Munich) and Museum für Naturkunde (Berlin), in Germany; Palaontologisches Institut Und Museum (Zurich), in Switzerland; and the Hungarian Natural History Museum (Budapest), in Hungary (see Vizcaíno *et al.*, 2013; Vizcaíno & Bargo, 2013).

In summary, in formal collections we identified only about 170 of 235 to 395 fossil vertebrate specimens collected by Martin. As mentioned before, this collection remained largely forgotten by paleontologists until the work of Marshall (1975, 1976). According to that author (1975), the only specimen from this collection ever described in a publication was the type of *Protypotherium martini* Lane, 1927 (collection number KUPV 630; see Lane, 1927; Ostrander *et al.* 1986), a typotherium named in honor of Martin. This situation does not seem to have changed.

With some 130 specimens, the collection of fossils from the Santa Cruz Formation of Patagonia at UKNH constitutes one of the largest in the USA together with the ones at Yale Peabody Museum in New Haven, the Field Museum in Chicago (see Vizcaíno *et al.*, 2013) and the American Museum in New York. The first contains almost all the specimens collected by Hatcher for Princeton University between 1896 and 1899 (a few specimens remain at Princeton). The second holds almost all the specimens collected by the Captain Marshall Field Paleontological Expedition to Argentina and Bolivia led by Elmer S. Riggs of the then Field Museum of Natural History in 1923 (some specimens were exchanged to other institutions) and, as related above, several specimens collected by Martin. The third is the result of the joint expedition between the Princeton and the American Museum launched in 1898. The Yale Peabody Museum acquired Princeton's part of these collections in the 1980s.

Albeit seldom visited in many decades the collection at UKNH is reasonably well curated, as noted by Marshall in 1975. It contains a good representation of the Santacrucian fauna, with many fine specimens, including cranial and postcranial elements in association. Certainly this collection could help to increase the sample size for any anatomical study that considers variability. Nevertheless, caution is needed for any studies in which the geographic and stratigraphic provenance within the range of the Santa Cruz Formation is relevant. According to the information recorded in the field books, Martin collected fossils from the cliff and the bed of the Rio Gallegos from some 20 km inland (near Güer Aike) to Cabo Buen Tiempo, and up to 50 km northward from there along the Atlantic coast. His collections would then encompass an important part of the upper and lower parts of the stratigraphic sequence of the Formation, to include the two members supposed to represent different environmental conditions and different in faunal compositions (Tauber 1997), an issue currently under debate (Vizcaíno *et al.* 2012b, and chapters therein). Unfortunately, all the specimens collected by Martin at UKNH or in other collections are labeled: "*Vicinity of Rio Gallegos*" or "*Near Rio Gallegos*," providing a vague or even misleading idea of their stratigraphic provenance. Martin's field notebook, in most cases, states where each specimen was collected. The problem is that the field numbers were not transferred to the specimens before they were disbursed to various museums. Thus, there is no reliable way, in many cases, to determine which field number belongs with what museum specimen.

Conclusions

Handel T. Martin's expedition to Patagonia was personally motivated. He was inspired to go to Patagonia first by a careful reading of his friend John Bell Hatcher's narrative of the Princeton Patagonian Expeditions, and second, by a conversation with William Diller Matthew that apparently left Martin with the impression that there was still much work remaining to be done by North American paleontologists if they were to make a meaningful contribution to the vertebrate paleontology of South America. Martin had become discouraged by the outlook for paleontology at Kansas following Williston's departure for Chicago in 1902. His position as collector and preparator was somewhat tenuous. Martin likely hoped to improve his prospects at Kansas (or elsewhere) by undertaking an ambitious collecting expedition on his own initiative. But, to do so, he was obliged to advance the costs himself. He hoped, however, to recoup these costs and to secure a reasonable wage for the time he spent in Argentina by selling specimens to various museums in Europe and North America. Thus, the marketability of Santacrucian fossils was certainly a factor in deciding on an expedition to Argentina. Finally, Martin was undoubtedly motivated to travel to Argentina by the opportunity to visit with his long-estranged older brother, whom he had not seen in many years, in Bahia Blanca.

Scientific motives were secondary to Martin. First, he planned to make a useful, representative collection of Santacrucian fossil mammals for UKNH – Hatcher's narrative gave the impression that such fossils were abundant and easily collected. Next, he hoped to collect dinosaurs in Chubut Province. Finally, he had vague ambitions to succeed where Hatcher had failed by finding the older fossil mammal horizons underlying the Santa Cruz Formation. In the latter two ambitions, Martin's expedition was unsuccessful – perhaps, in part, because of the time lost while waiting for his outfit to arrive from North America. In the first, however, he was successful. Indeed, the scientific merit of Martin's collection at UKNH – and, to a lesser extent, his collections at other institutions – is rooted in the quality of the specimens.

Acknowledgments

This is a contribution to the projects ANPCyT PICT 0389 and UNLP 11/N750 to SFV. In 2013 this author visited collections in the US thanks to a travel grant from the Universidad Nacional de La Plata (Argentina). Harry Martin kindly received SFV at his home in El Tigre (Argentina) and provided information about Albert Martin. Marlin F. Hawley, an archaeologist at the Wisconsin Historical Society, generously provided access to his own research on H. T. Martin. Isaac Brinkman tracked down a number of obscure sources at the University of Kansas. We are deeply grateful to many curators and collection managers who provided access to critical information about their collections, including: Linda Trueb, Desui Miao and David Burnham, collection managers at the Kansas University Natural History Museum; William F. Simpson, collection manager at the Field Museum (Chicago); Jessica D. Cundiff, Curatorial Associate of the Museum of Comparative Zoology of the Harvard University (Cambridge); Rebecca Schulte, University Archivist of the University of Kansas; Susan K. Bell, resident research associate at the American Museum of Natural History. M. Susana Bargo and Néstor Toledo helped with the figures. Carlos Cingolani provided information about the photograph of the front of the Museo de La Plata.

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Notes

- ¹ There are at least two versions of Martin's autobiography, both unpublished. A typescript entitled "H. T. Martin's Experiences, by himself," can be found in the Department of Vertebrate Paleontology of the University of Kansas Natural History Museum (UKNH). A second typescript entitled "An Autobiography," dated 8 January 1924, is housed in the H. T. Martin Papers, University of Kansas Archives, Spencer Research Library, Lawrence, Kansas (Martin Papers, hereafter).
- ² Martin later published an article entitled "South American archeological notes," in which he briefly described an unusual human skull and some artifacts collected by the expedition (see Martin, 1908).
- ³ Except where otherwise noted, this biographical sketch, including all unattributed quotations, is based on the Martin autobiography (Martin Papers).
- ⁴ Letter, H. T. Martin to O. C. Marsh, 22 July 1889, Othniel Charles Marsh Papers (MS 343), Series I: Correspondence, Yale University Library, New Haven, Connecticut (Marsh Papers – Yale, hereafter).
- ⁵ Letter, H. T. Martin to O. C. Marsh, 7 May 1890, Marsh Papers - Yale.
- ⁶ Letter, O. C. Marsh to H. T. Martin (copy), 27 February 1890, Marsh Papers – Yale.
- ⁷ See Brinkman (2010a: 9-10, 17) for additional context regarding Marsh' precarious federal funding.
- ⁸ According to L. Martin (1994: 141), Williston contacted Martin to warn him that some fossils he had left to be prepared by Charles Sternberg, in Lawrence, needed to be looked after.
- ⁹ Letter, S. W. Williston to H. F. Osborn, 24 January 1895, Department of Vertebrate Paleontology Archives, American Museum of Natural History, New York (DVP Archives, hereafter).
- ¹⁰ Sixth Annual Report from the Department of Vertebrate Paleontology, 1896; and Seventh Annual Report from the Department of Vertebrate Paleontology, 15 December 1897, DVP Archives.
- ¹¹ Letter, H. F. Osborn to S. W. Williston, 30 January 1896, DVP Archives.
- ¹² Seventh Annual Report from the Department of Vertebrate Paleontology, 15 December 1897; and Eighth Annual Report from the Department of Vertebrate Paleontology, 1898, DVP Archives.
- ¹³ Letter, H. F. Osborn to H. T. Martin (copy), 14 April 1898, DVP Archives. See Brinkman (2010a, págs. 44-63) for additional context on Wortman, Osborn and the American Museum's field program.
- ¹⁴ Letter, J. Wortman to H. F. Osborn, 18 June 1898, DVP Archives.
- ¹⁵ Letter, S. W. Williston to W. R. Harper, 3 May 1904, Harper, William Rainey Papers, Special Collections Research Center, University of Chicago Library.
- ¹⁶ Letter, H. T. Martin to H. F. Osborn, 9 March 1903, DVP Archives. Although Hatcher had accumulated a magnificent collection of fossils from what we now call the Santacrucian fauna, he had hoped to find and collect fossils from older horizons discovered and worked profitably – and controversially – by Carlos Ameghino.
- ¹⁷ Barnum Brown, a former student of Williston's at the University of Kansas, had participated in the last of Hatcher's expeditions for Princeton on behalf of Osborn's program at the American Museum. Hatcher left Patagonia for the last time in April, 1899. Brown remained to collect fossils on his own for another ten months (see Dingus and Norell, 2010).

Hatcher's narrative was available by early February 1903, about the same time as Martin's conversation with Matthew, which must have taken place in February or early March.

¹⁸ Martin to Osborn, 9 March 1903, DVP Archives.

¹⁹ Letters, H. F. Osborn to H. T. Martin (copies), 20 March and 7 May 1903, DVP Archives.

²⁰ Martin's main objective was to follow in Hatcher's footsteps by collecting fossil mammals in southern Santa Cruz, but he had also talked about the possibility of collecting in the Mesozoic sediments of Chubut Province. Most likely, Williston – who was himself far more interested in Mesozoic marine reptiles – was simply confused about Martin's goals.

²¹ Martin's brother, Albert Euerby Martin, lived in Bahía Blanca but was actually a schoolteacher (see below).

²² Photograph album with a cover that reads "Album Argentino," Department of Vertebrate Paleontology at UKNH. The album was probably made as a reference for identifying fossils in the field and back in Kansas. Martin's packing list (Martin Papers) includes an "Eastman" film camera, probably a Kodak Brownie Number 2.

²³ See <http://www.beeston-notts.co.uk/martin.htm> (accessed 15 February 2016).

²⁴ This indicates that Martin spent more than one month in Buenos Aires and La Plata. H. T. Martin's family, who accompanied him, included his wife Jennie, and his young son and daughter, Harry and Hazel.

²⁵ "Field Book 401" and "H. T. Martin's Experiences, by himself," UKNH.

²⁶ Letter, R. Rathbun to Friends and Correspondents of the United States National Museum, 10 September 1902, Martin Papers. There are Santacrucian specimens in the Smithsonian Institution that are listed in the catalog as coming from Barnum Brown (mainly) but none from Martin.

²⁷ Letter, S. W. Williston to W. R. Harper, 30 May 1904 (Harper Papers).

²⁸ Williston to Harper, 30 May 1904, Harper Papers.

²⁹ Letter, H. T. Martin to F. Strong, 12 March 1904, Martin Papers.

³⁰ Letter, H. T. Martin to F. Strong, 30 December 1903, Martin Papers.

³¹ See letter, O. C. Farrington to F. J. V. Skiff, 13 January 1908, Accession Record No. 1285, Field Museum Archives (AR1285, hereafter).

³² Letter, H. T. Martin to O. C. Farrington, 26 January 1908 [1098 on the letter], AR1285.

³³ Various correspondence, AR1285.

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Recibido: septiembre 2016

Aceptado: octubre 2016