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Clemente Onelli's sketch map and his first-hand, retrospective account of an early fossil-hunting expedition along the Río Santa Cruz, southern Patagonia, 1888–1889

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ABSTRACT: A 1922 letter from Clemente Onelli to North American paleontologist Elmer S. Riggs, found at Chicago's Field Museum, is one of only a few known first-hand accounts of the former's participation on a fossil hunting expedition along the Río Santa Cruz, southern Patagonia, 1888–1889. Onelli and his companions, who were sent to Patagonia by Francisco P. Moreno, director of the Museo de La Plata, were among the first to collect fossil mammals at this important locality. Moreno had first discovered fossil mammals there in 1876–1877. He then sent Carlos Ameghino, who worked as an assistant preparator of palaeontology at the museum, to revisit his discoveries in January 1887. Ameghino later lost his position at the museum over a dispute between his brother, paleontologist Florentino Ameghino, and the director, in March 1889. Onelli, who had only been associated with the Museo de La Plata for a few short months, was asked by Moreno to accompany a new expedition outfitted in 1888–1889. In December 1922, Riggs travelled to South America to make a representative collection of the fossil mammals of Argentina and Bolivia. Learning of his arrival in Buenos Aires, Onelli wrote him a letter, in Spanish, providing detailed information about fossil localities along the Río Santa Cruz. This letter, translated here, along with the accompanying sketch map, provides previously unknown details about Onelli's itinerary and his observations.

KEY WORDS : Museo de La Plata – Francisco P. Moreno – Carlos Ameghino – Santa Cruz Formation – Elmer S. Riggs – plesiosaurs.

INTRODUCTION

Clemente Onelli (1864–1924) (Figure 1) was born into a noble family in Rome, Italy. In his youth he lived a comfortable life surrounded by books. He attended select schools including the University of Rome, where he studied natural sciences and languages. According to his biographer, Jules Verne's fiction and Charles Darwin's *Beagle* narrative filled him with a desire to visit exotic foreign lands. In 1888, he emigrated from Italy to Argentina in order to realize his dream of exploring Patagonia (Del Pino 1976: 9–11).

Shortly after his arrival, Onelli joined the staff of the Museo de La Plata as a traveller-naturalist in August 1888. The museum had been founded in 1884 in La Plata, the capital of Buenos Aires province. The new museum's director, Francisco P. Moreno (1852–1919), emphasized the importance of building collections. Moreno's "quasi-military collecting

Figure 1. Clemente Onelli (courtesy of Archivo General de la Nación, Argentina).

campaigns" in the 1870s scoured Patagonia and other remote areas in an obsessive quest for objects of Argentinian patrimony, including artifacts made by the indigenous people and their skeletal remains, and fossils. Beginning in the late 1880s, Moreno hired numerous traveller-naturalists, like Onelli, to make collections throughout Argentina (Sheets-Pyenson 1988: 88–89). Moreno's vision for the museum was to foster a sense of Argentinian unity and nationalism by creating a public exhibition of the country's greatness. Vertebrate fossils were part of this splendour: "Los gliptodontes sin saberlo fueron parte del esplendor argentino" (Podgorny 1995: 95).

In 1876 and 1877, Moreno had explored Patagonia and collected fossil mammals along the valley of the Río Santa Cruz. In 1887, Moreno, as the director of the Museo de La Plata, sent Carlos Ameghino (1865–1936), then an assistant preparator of palaeontology at the museum, to follow up on these earlier discoveries. Later that same year, Florentino Ameghino, then vice-director of the museum, published on the fossils collected by his brother Carlos (Ameghino 1887). Irreconcilable differences with Moreno drove the Ameghino brothers to leave their positions at the museum, first Florentino in January 1888, then Carlos in March 1889 (Fernicola 2011a, 2011b).

An unfortunate consequence of the conflict between Moreno and the Ameghinos was a fierce competition to explore and collect fossils in Patagonia (Podgorny and Lopes 2008: 228). The Sección Exploraciones Nacionales of the Museo de La Plata organized several expeditions to collect fossils from Moreno's and Carlos Ameghino's localities along the Río Santa Cruz (Riccardi 2008; Farro 2009), with the intention of seeing to it that no museum

would have a superior collection of ancient fossils from Patagonia: "tratar de que ningún museo supere al de La Plata, en cuanto a documentos sobre las antiguas faunas australes" (Moreno 1890: 59). Meanwhile, Carlos Ameghino made one final expedition for Moreno to Chubut in 1888–1889. Moreno, however, suspected Carlos of funnelling specimens to his brother Florentino, and he directed other naturalists to observe Carlos's movements in the field (Podgorny 2002). After leaving the Museo de La Plata, Carlos resumed collecting fossils in Patagonia for Florentino's benefit, while the latter continued to publish their results (Simpson 1984). By omitting maps and geological sections in his publications, Florentino Ameghino effectively hid his sources for fossils from rivals like Moreno, who reciprocated this practice. Thus, precise data about fossil localities remained privileged and carefully guarded information. This situation later created difficulties for other field palaeontologists who attempted to replicate Ameghino's observations (see, for example, Hatcher 1903: 483–484; Simpson 1967). While this strategy helped Argentinian scientists to establish priority of publication, it also undermined their credibility with foreign scientists (Podgorny 2005: 254–255).

Late in 1888, Moreno organized an expedition consisting of two Italian naturalists, Santiago Pozzi (1849–1929) and Clemente Onelli (1864–1924), and two assistants, Juan Ivovich and Francisco Larumbe, to collect fossil mammals in Patagonia (Figure 2). According to a summary report written by Moreno, the expedition departed on 31 October 1888, and arrived in the Chilean port of Punta Arenas, on the Straits of Magellan, in the early part of November. They examined a coal deposit there, collected some samples, and then continued on horseback to Río Gallegos. After collecting some fossil mammals and rocks, they departed for Santa Cruz, arriving on 28 November. Immediately, they began their exploration of the river. The expedition returned to La Plata on 2 August 1889, bringing 94 boxes of fossils and antiquities, ancient and modern indigenous human remains, and a large assortment of extant mammals, reptiles, fish and insects. (The expedition had previously shipped 20 boxes of specimens to the museum.) Among the fossils there were some large, nearly complete skulls and other bones representing an extinct suborder of endemic ungulate mammals called Toxodontia. There were also some "extraordinary" fossils of giant birds. Unfortunately, due to lack of sufficient time and difficulties with transportation, the expedition was unable to explore all of the places that they had been assigned. Nevertheless, the collection they amassed "forms the largest flow of Patagonian palaeontological remains discovered to date and its value greatly exceeds the amount spent to obtain it" (Moreno 1890: 59). Their collection included many specimens new to science, including some of "very great importance." Moreno planned to prepare the fossils as rapidly as possible, illustrate them, and make moulds and casts for exchange with other scientists and other institutions. The ultimate research objective was to obtain a museum collection sufficient to reconstruct the "lost relationships" of the southern fauna with that of the northern hemisphere (Moreno 1890: 59).

Moreno published two brief reports of the expedition (Moreno 1889, 1890). Onelli and Pozzi both kept a journal during the expedition, as instructed (see Pozzi 2014). Likewise, Pozzi made a series of photographs and pencil sketches of the areas they explored. These formed a major part of the official record of the expedition and were intended to be published shortly after its return. Apparently, this was never done, possibly because Moreno preferred to keep specific fossil locality information from the Ameghinos. In any case, many of the original documents and photographs from the expedition are now considered lost. Fortunately, Onelli also described his experiences on the expedition in a letter written more

Figure 2. Argentina, showing localities mentioned in the text.

than three decades later, which now comprises one of the few complete, first-hand accounts known of this important expedition. A translation of this letter is provided here.

Following the expedition, Onelli remained with the Museo de La Plata for a time as traveller-naturalist (until July 1890). He later served as Moreno's personal secretary. In 1892, he married María Celina Panthou, the daughter of French radicals living in exile in Buenos Aires. Moreno later appointed him to an important role on Argentina's Boundary Commission, which was charged with resolving the long-disputed border with Chile. He explored the Andes, and wrote a book about his experiences, *Trepando los Andes* (1904). At the end of 1904, he was appointed Director of the Jardín Zoologico de la Ciudad de Buenos Aires by the President of Argentina, Julio Roca. Under his directorship, the zoo thrived. Onelli remained at the zoo for the rest of his career, indeed, for the rest of his life. He lived at the zoo with his wife for nearly two decades, and died on 20 October 1924 (Del Pino 1976).

THE LETTER

Elmer S. Riggs (1869–1963) arrived in Buenos Aires on 3 December 1922. An associate curator of palaeontology at the Field Museum of Natural History in Chicago, Riggs had come to South America with the goal of making a representative collection of all the known fossil mammal localities of Argentina and Bolivia. On the morning of 7 December, Riggs and his party made ready to travel to La Plata to visit the museum and see its renowned exhibits of vertebrate fossils. A reporter unexpectedly arrived at their hotel at 8.50am, asking for an audience. A second reporter, from *La Nación*, who had been invited for an interview, arrived at 9.15am. Riggs gave the second reporter, who spoke and understood English very well, a lengthy interview, which was published in *La Nación* two days later. The first reporter lingered a bit longer and conducted a brief interview with the help of an interpreter. He then raced off to find a photographer. Riggs, however, had a train to catch, and he and his party hired a cab to take them to the railroad station. A breathless photographer caught up with them there and snapped a picture of the Field Museum party waiting on the platform. Returning to Buenos Aires at 6.00pm, Riggs found a photograph of his party and an account of their visit in the evening edition of *La Acción* (see Anonymous 1922a, 1922b).[1]

Onelli must have seen the article. The following day he wrote a long and somewhat rambling letter, in Spanish, to Riggs detailing his own experiences collecting fossil vertebrates in Patagonia. The letter is typed on four sheets and signed with a fine-nibbed pen. There are numerous corrections and emendations apparently written with the same instrument. The letter was found at the Field Museum Library in a folder labelled "Data on Fossil-Bearing Localities – 1922–1927," in a file drawer containing the professional correspondence of Elmer Riggs. A sketch map (Figure 3), folded many times, accompanied the letter.

Memorandum for Professor ELMER S. RIGGS, Chief of the Paleontological Department of the Field Museum in Chicago, who is going to Patagonia

In the year 1889 I made a trip as naturalist searching for fossils along the banks of the Santa Cruz River. I was very young; I had only general knowledge about paleontology: I was told that the terrains that I went to explore pertained to the Tertiary. It had been only a few months since I had arrived in South America: before the trip I had been two months in the Museo de La Plata, understanding very little Spanish and therefore having very vague information of the fossils I went to search for. I can say that my mission was rather material,[2] and others would take advantage of the pieces of paleontology that I was going to bring and with these pieces arrange the geological horizons of the region. My harvest of fossils was studied separately by Richard Lyddeker, Francisco Moreno, Alcides Mercerat and Florentino Ameghino.[3]

On the trip, I used a small sketch taken from the survey made by officers of HMS *Beagle*, when they traced a good part of the river accompanied by Charles Darwin.[4] The upper course of the Santa Cruz and part of Lake Argentino, the river's source, had been traced with a compass by the naturalist Moreno and an officer of the Argentine navy, Valentin Fielberg.[5]

I disembarked in Punta Arenas (Straits of Magellan) directing myself to the north and as my exploration should focus only on the bare cliffs of the Santa Cruz River, when crossing the Gallegos River[6] on an Indian trail, I observed superficially and rapidly[7] the bare layers, finding only fragments of *Pachyrukhos* and *Hoplophorus*.[8]

I arrived at the port of Santa Cruz, which in that year still had no more than 60 inhabitants, and remained two days at the mouth of the river at Entrance Mount,[9] where I observed that all the sediments exposed until some 250 feet above the level of the river, had a great abundance of two species of giant oysters, one was *Ostrea patagonica*.

Upstream the river to a point that then was still known by its Tehuelche name "Chikerok-Aiken", at an elevation of 15 to 20 feet above the level of the river, I recovered fossil oysters very worn as though they had felt the action of waves on the shore of a sea; soon I arrived at the point of the river Darwin called Swamp Bend which is a true Eldorado for palaeontologists, a cemetery of fossils like that of Nebraska in North America.[10]

[f. 2] In Swamp Bend the lower and older stratum was a thick sandstone, the next higher layer was of a finer grain and had an oyster different from the patagonica. Then there was a thin layer of crystalized gypsum followed by a grey layer, fossil-poor, but where I found the femur of a very large bird. Next a layer of some 15 feet in thickness which I think I remember that was volcanic ash. Higher the yellow and grey clay layers constituted the veritable paleontological necropolis of this site, where there are abundant remains of toxodontids, *Hoplophorus* and marsupials. Following this layer was another of sandstone, yellow in the lower part but which transitions to grey in the upper part and in which I couldn't find any fossils: however, as pebbles that appeared to have fallen from that sandstone, I had collected at a lower level fragments of astrapotheres.

Later I visited the great bend of the river at Stepout Reach. At this point the sandstone layers are thicker than the clayey layers: the fossils were very abundant, and while in Swamp Bend it appeared to me to resemble the horizon of the *Astrapotherium* it was more modern, in Stepout Reach I found a skull in a lower sandstone some 30 feet above the level of the river. In a conglomerate with iron oxides I found the lower jaw and four molars from the skull of an undescribed gigantic animal; I don't remember who studied it later nor what scientific name it obtained.

After Stepout Reach comes the region of basalts: the road is rugged. I arrived at a point called Yatenk-uaken, where the layers are covered with their own detritus, eroded by the rain: I found in eight days of exploration only the skull of a toxodon whose teeth had fossilized like turquoise.[11]

Here the sandstones had many puddingstones of very hard conglomerates and the sedimentary layers were not horizontal but formed pronounced angles with the horizon.

From this point the lower valley of the river widens greatly, and in this low area, in a clayey sediment, I went back to find *Ostrea patagonica*. I believe this valley is the one Darwin called Mystery Plain.[12] The sediments of the cliffs away from the river are folded and metamorphosed.

From there I moved to Punta Walichu on Lake Argentino which is a breakwater of compact sand, over the lake, without fossils, as I did not find either in the small yellow and bare hills that one can see far away. All this part of the [f. 3] terrain presents the characteristics of moraines of ancient glaciers.

At Punta Walichu in that year of 1889 I checked a cave where I found remains of a native human race older than the present Tehuelche.[13]

Behind Mount Buenos Aires one can enjoy the most imposing spectacle of Lake Argentino, the magnificent glacier[14] that falls in the water which marks the northern limit of Mount Avellaneda.

On this trip the most abundant collection of fossils I made on the south side of the Santa Cruz River. I descended to Pavon Island very near the estuary and crossed to the north bank.

I went to reconnoitre the point of the small mesa that has become isolated a bit by erosion and that was then called "Cerro Caracol" (Snail Hill) because of the enormous quantity of *Turritella* shells of which many have lost their calcareous cover and are preserved as an interior mould made of siliceous stone. There are other molluscs and crabs and other crustaceans well preserved.

On the north side of the Santa Cruz River, the basalts begin much more to the east than on the south side. I remember that here I thought Darwin had been wrong when he said that the epoch of the volcanoes in Patagonia appeared in the dawn[15] of the Tertiary: here (I don't remember with precision the point) I was able to realize that the layers of basalt are overlapping and rest over the Tertiary sediments. Besides, I observed that the conglomerates, breccias and puddingstones of the sedimentary strata consist of porphyries, granites and quartzes and never pebbles of basalt. I have found basalt pebbles on the surface of the soil and in the immediate glacial epoch.

As the "3 de Febrero" hills are low down abruptly by the river we had to go around them marching over the high pampa until I could return to the shore where the sedimentary layers were exposed. But while on the south bank these layers are filled with fossils, here on the north, in the same geological horizons I could not find any fossilized bone, except a very rare time. From this I argued that on the south side the wind, in this geological sea, brought to a certain point the bodies which came to form a bank where the remains were deposited.

On the north bank I observed that the glacial period had advanced to the east more than on the south side.

At Yaten-kuaken, on the north shore, in a geological cut nearly 90 feet I found Dasipodos.[16] Halfway between Tres Cerros and Car-aiken I found a tarsus nearly a metre [f. 4] long of a bird of prey.[17]

From Car-aiken to the Leona River I found no fossils and the sedimentary rocks were like metamorphics.

On Lake San Martin, at a point called "Bahia de la Lancha", on another trip I have found ammonites of almost a yard in diameter, and on the other side of the local watershed and from where one can see Mount Hatcher I found a stream with shale and layers of coal or lignite.

When Mr. Riggs moves further north, to Chubut and to Negro River and Neuquén, I will try to remember the points where in rapid marches and other objectives which did not allow me to stop, I have seen traces of fossils.[18]

Clemente Onelli
Buenos Aires December 8 1922

Note – On the sketch I have marked with a red pencil the points where I found fossils and with a blue[19] pencil the point where Sr. Juan Ivovich, a rancher and my travel companion in 1889, now lives.[20] He would be a valiant collaborator for you, because before he became so sedentary he was a great traveller.[21]

MEETING ONELLI

Having read the letter with much interest (and with the help of his interpreter), Riggs arranged to meet with Onelli, probably at the zoo. There, presumably, they discussed the expedition's fossil-hunting ambitions. But Onelli also shared a fantastic story with his North American guest. In January 1922, he related, he had received a letter from Martin Sheffield, a native Texan and adventurer then living in Patagonia. Sheffield claimed that he had seen a bizarre animal swimming in a lake near Esquel, a small Patagonian town in the foothills of the Andes: "I saw in the middle of the lake an animal with a huge neck like that of a swan, and the movement in the water made me suppose the beast to have a body like that of a crocodile," he wrote. Sheffield's account, coupled with other, similar reports, brought plesiosaurs to the zoo director's mind. Intrigued by the possibility of finding an animal alleged to be extinct in the wilds of Patagonia, Onelli organized an expedition to capture the beast alive and bring it back to the zoo in Buenos Aires. Armed with elephant guns and dynamite, the expedition set out from Buenos Aires on 23 March 1922, only nine months before Riggs arrived in Argentina. The expedition reached the lake, but finding no sign of the plesiosaur, they turned back empty-handed with the onset of the austral winter (see Matters 1922: 21).

An Associated Press story later circulated widely in North American newspapers linking Riggs to the hunt for Patagonian plesiosaurs. According to an article in the *Chicago post*, for example, Riggs listened "with interest" to Onelli's account of the unsuccessful search for the mysterious monster. But he would not be tempted away from his fossil expedition. According to the reporter, though, he toyed with the idea: " 'If I meet that Plesiosaurus,' said Prof. Riggs to Prof. Onelli, 'I'll put a lariat around his neck and lead him direct to the Buenos Aires zoo' " (Anonymous 1922c). The palaeontologist William Diller Matthew, a friend and colleague of Riggs who was following the progress of the expedition with interest, read a similar article in a New York newspaper. "I noted in the newspaper despatches an interview with Dr. Riggs," Matthew wrote in a letter to Riggs's field companion George F. Sternberg, "in which he promised to lead the live plesiosaurus home by the tail, evidently refusing to take that story as seriously as the reporter wanted him to."[22]

Onelli evidently took the rumours of living plesiosaurs very seriously, but Riggs did not.[23] Riggs had every intention, however, of following-up on the fossil mammal locality information provided in Onelli's letter, which he accepted as reliable. The Field Museum party left Buenos Aires by steamer on 22 December, heading for the southern port of Río Gallegos. Riggs intended to commence his search for fossils in the Early Miocene Santa Cruz beds across the river from town, gradually working his way north along the coast as the weather turned colder. His original plan called for the party to be camped along

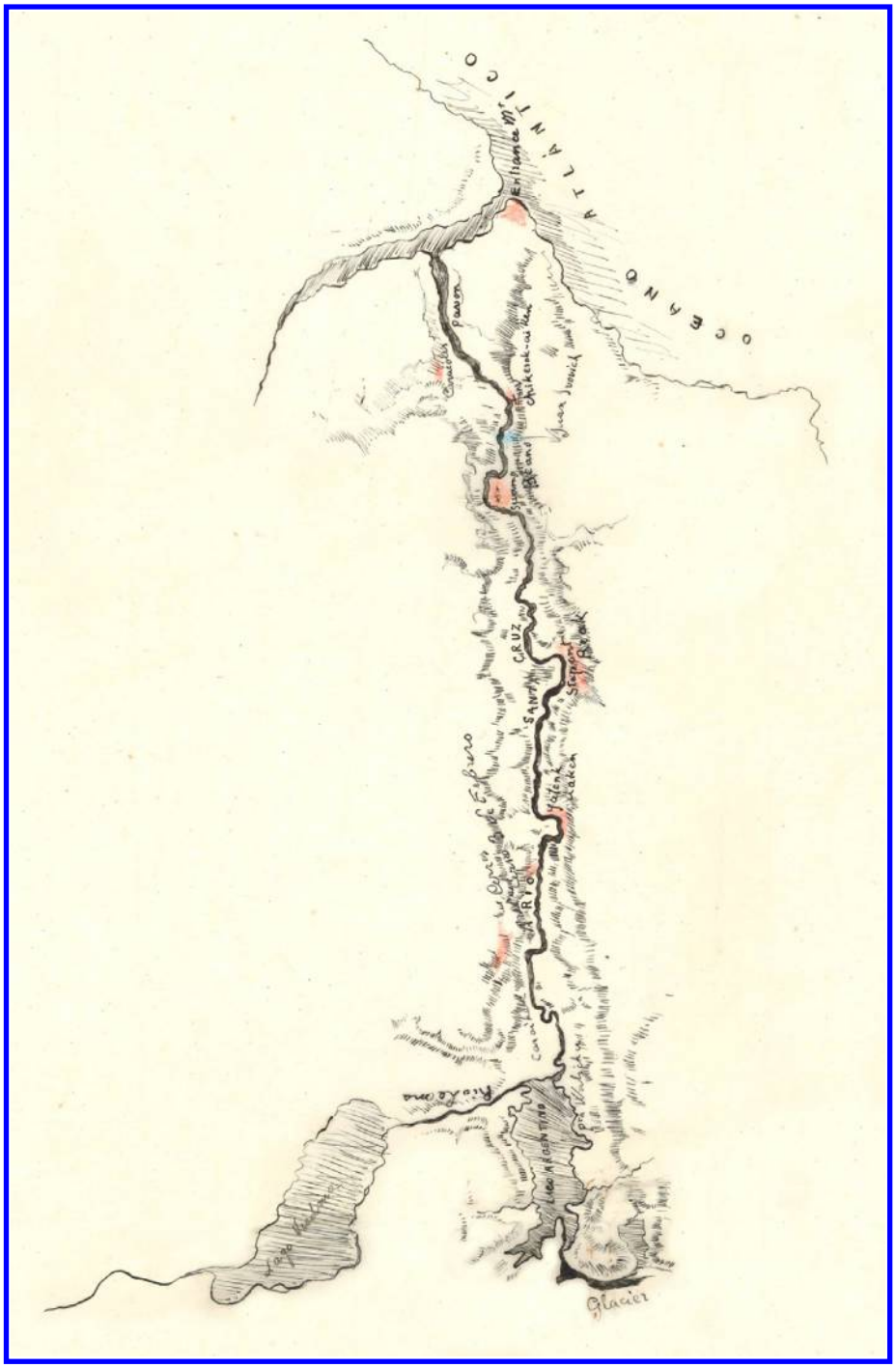

Figure 3. This sketch map, drawn in black ink and blue and red coloured pencil on tracing paper, accompanied Onelli's letter. Localities named by Onelli include Stepout Reach as "Stepont Reak" and Swamp Bend as "Suamp Beand". (Reproduced by courtesy of The Field Museum, Chicago).

the Río Santa Cruz by the beginning of April 1923, with the explicit intention of working those localities described and mapped by Onelli. "He was a member of certain earlier expeditions to these localities," Riggs justified in a letter to Curator Oliver C. Farrington, his museum superior.[24] As it happened, Riggs and his party found an abundance of excellent specimens in the vicinity of the Ríos Gallegos and Coyle. They remained in that area until late May, when the weather was already cold enough to justify bypassing the Río Santa Cruz localities in favour of working farther northward. Moreover, the plan for the following field season called for working in the older fossil horizons of central Patagonia. Indeed, after Riggs and his party left the town of Santa Cruz on 28 May 1923, they never again ventured so far south.[25]

CONCLUSION

Onelli's letter conveyed a wealth of potentially useful fossil locality information that Riggs never had the opportunity to exploit, despite the best of intentions. The fact that Riggs planned to visit Onelli's localities, and then saved the letter after the opportunity to do so was long past, suggests that he deemed the information reliable and worthy of keeping on long-term record. Indeed, Onelli's letter is filled with detailed information that remains useful to modern palaeontologists who are interested in re-tracing historic fossil localities worked by the likes of Moreno and Ameghino (see, for example, Fernicola *et al*. 2014). It is also valuable for its own sake, and because it constitutes one of the only known first-hand accounts of the early fossil-hunting expedition on which Onelli was a young participant.

ACKNOWLEDGEMENTS

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NOTES

[1] A book-length history of the Captain Marshall Field Paleontological Expedition to Argentina and Bolivia is currently in preparation by the first author.

[2] Here, Onelli means to say that his mission was practical and not intellectual. He was sent to make a collection, not to draw conclusions.

[3] Lydekker (1849–1915) was an English naturalist and geologist who, in 1893–1894, studied fossil vertebrates in the Museo de La Plata and wrote a pioneering description of Patagonian dinosaurs. Moreno, as already noted, was the museum's first director and an important early explorer of Patagonia (Fasano 2006). Onelli was his friend and secretary. Mercerat was a Swiss geologist whom Moreno hired as palaeontologist from 1889–1892. By some accounts, he was not a very good palaeontologist (see Simpson 1984: 132, 136). Ameghino (1854–1911) was the most important Argentine palaeontologist of the nineteenth and early twentieth centuries. He worked briefly under Moreno at the Museo de La Plata and was replaced by Mercerat (see Simpson 1948: 19–26; 1984: chapter 5).

[4] From 18 April to 8 May 1834, while the *Beagle* was laid ashore at the mouth of the Río Santa Cruz for repairs, Captain Robert FitzRoy (1805–1865) led a small party of officers and men on an unsuccessful expedition to find the

source of the river. Darwin, who was particularly interested in the geology of the Santa Cruz area, accompanied the expedition (see Darwin 1839: chapter 10; FitzRoy 1837; 1839: chapter 16).

[5] Feilburg (1852–1913) was a sailor and explorer who served in the Argentine navy. In 1873, he and four companions explored the Río Santa Cruz, looking for its source. After a long and difficult trek, they arrived at a large lake that they mistook for Lago Viedma. They left a message in a bottle at the base of a make-shift mast made with a paddle and an Argentine flag. Moreno found the message in February 1877 at a place he called Feilburg Cape. The lake, Moreno realized, was unknown. He named it Lago Argentino (see Fasano 2006: 64–83).

[6] Royal Navy Commander Bartholomew James Sulivan, a former *Beagle* shipmate of Darwin's, discovered and collected fossil mammals along the Río Gallegos in 1845. Sulivan's collection was the first ever made from what would later be designated the Santa Cruz beds (early-middle Miocene), which is one of the most prolific fossil mammal horizons in South America (Brinkman 2003). Thus, even in the late 1880s, the Río Gallegos area was already a reasonably well-known fossil locality.

[7] Onelli's instructions were to search the Río Santa Cruz and not the Río Gallegos. Because his mission was "material," he was not at liberty to make his own scientific decisions. This explains his haste and his superficial search for fossils at the Río Gallegos.

[8] *Pachyrukhos* is an extinct, rabbit-like notoungulate found in the Santa Cruz formation of southern Patagonia. *Hoplophorus*, however, is an extinct genus of glyptodont found only in the Pleistocene deposits of Brazil. Probably Onelli found scutes of *Propalaeohoplophorus*, or another glyptodont common in the Santa Cruz Formation.

[9] Mount Entrance, named by officers of HMS *Adventure* and HMS *Beagle*, marked the mouth of the Río Santa Cruz.

[10] Onelli refers to the well-known White River badlands fossil locality (early Oligocene) of South Dakota, Nebraska and Wyoming. Possibly, Onelli knew that Riggs had significant experience working in the White River.

[11] Bone turquoise, or odontolite, is a turquoise mimic that derives its blue color predominantly from trace amounts of manganese. It is an unusual natural substance most often found in the teeth of mastodons and other large fossil mammals.

[12] Mystery Plain was a term used by FitzRoy for the place where the *Beagle* expedition stopped and turned back due to short supplies and a weary company. The name, probably an allusion to the unsolved mystery of the source of the Río Santa Cruz, appears on a map and in the caption of a plate published by FitzRoy (1837: map; 1839: map opposite p. 338, and plate opposite p. 352).

[13] Punta Walichu is today a well-known archaeological site on the shore of Lago Argentino, consisting of a series of caves with elaborate paintings. Moreno discovered these caves in 1877 (Fasano 2006: 77–78).

[14] Probably Onelli refers to the now famous Perito Moreno glacier.

[15] Onelli used the word "aurora" here.

[16] Dasypodidae is the only extant family of the order Cingulata, which includes the extinct families Glyptodontidae and Pampatheriidae. Probably Onelli found the fossil remains of an armadillo-like animal.

[17] Onelli found the tarsometatarsus or another long limb bone of a large, flightless phorusrhacid, or terror bird. The first terror bird, *Phorusrhacos longissimus*, was described by Florentino Ameghino in 1887 on the basis of a large toothless jaw fragment. Ameghino initially interpreted it as a mammal. In 1889, Moreno described several new taxa of enormous birds based on fossils collected at Monte Hermoso. Thus, Onelli's discovery of giant bird fossils was made in the context of the Ameghino–Moreno struggle for priority of publication (see Buffetaut 2013: 126–127).

[18] The Argentine newspaper, *El Diario*, sent Onelli to write reports about railroad construction between Bahia Blanca and Neuquen ca. 1904. Onelli spent some of his time there collecting specimens.

[19] The original reads "bleu", in French.

[20] The Ivovich family still owns Estancia Santa Lucia, on the south side of the river, but it is located west of what Onelli calls "Swamp Beand" on his sketch map. Either Onelli mis-located the estancia or the Ivovich family moved to another estancia after 1922. A descendant, Ariel Ivovich, is currently an important member of the government of Santa Cruz province. Several traveller-naturalists from the Museo de La Plata bought properties in Patagonia and started their own private businesses. Mercerat, for example, bought land near the Río Coyle.

[21] Letter, C. Onelli to E. S. Riggs, 8 December 1922: original manuscript in a folder labelled "Data on Fossil-Bearing Localities – 1922–1927", Elmer Riggs Papers, Field Museum Library. Originally written in Spanish, the letter was transcribed and translated by the present authors.

[22] W. D. Matthew to G. F. Sternberg, 26 December 1922: original manuscript in General Correspondence, Sternberg, G., Folder 1, Department of Vertebrate Paleontology Archives, American Museum of Natural History, Washington DC.

[23] In fairness, Onelli later wrote he had expected the expedition to find a mysterious mammal, possibly a giant ground sloth, which he called *Cryptoterium domesticum*. Onelli explained that playing along with public opinion about the possibility of finding a plesiosaur was crucial to the expedition's success. To quash these popular expectations "would . . . kill the enthusiasm of those that were minded to pay the expenses of the expedition (Onelli 1923: 190)."

[24] See E. S. Riggs to O. C. Farrington, 9 March 1923: Elmer Riggs Papers, Field Museum Library, Chicago.

[25] For details regarding Riggs's itinerary in Patagonia, see E. S. Riggs, "Private Journal . . . Field Museum Paleontological Expedition to Argentina, 1922–1925": original manuscript in Geology Department Archives, Field Museum, Chicago.

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