RESEARCH REPORT

Human Origins in the New World? Florentino Ameghino and the Emergence of Prehistoric Archaeology in the Americas (1875–1912)

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This paper analyzes the early development of prehistoric archaeology as a scientific discipline in Argentina (1880–1910), focusing on one of its most important topics: Quaternary (Paleolithic) and Tertiary man. Around 1900, the question of proving the great antiquity of humans in South America turned into a proposal that Argentina was the cradle of the human race, where Paleolithic man became a more recent specimen than its remote ancestors in the Pampas and Patagonia. The appearance and disappearance of Argentinean forerunners of humans—widely discussed on the international scene—were deeply connected with the eventual consolidation of prehistoric archaeology and paleoanthropology as scientific disciplines.

Keywords Florentino Ameghino, South America, history of science, early man

1. Introduction

As a scientific discipline, prehistoric archaeology emerged linked to the problem of the "antiquity of man," that is, the occurrence of human artifacts and bones in geological strata, containing evidence of life conditions different from those of modern times. By the 1860s, the coexistence of humans and extinct animals in the Pleistocene was becoming generally accepted by many scientists in Europe (Cohen and Hublin 1989; Grayson 1983; Meltzer 1983; Van Riper 1993). While in the Old World, "Paleolithic" was accepted as equivalent to "Quaternary Man," in the Americas, this was controversial. There, it was argued, the Paleolithic existed until early modern times, so that the long geological scale of Europe was irrelevant and that those humans should simply be called "Pre-Columbian men" (Podgorny 2009).

The great antiquity of humans was accepted independently from the idea of human evolution (Laurent 1989, 1993). For those who accepted the place of humankind in the animal kingdom and its dependence on the laws of evolution, prehistoric archaeology became related to the search for human ancestors on different continents. Some thought that the ancestral forms could be found in European Tertiary strata (Richard 1991); others identified the cradle of humanity in the East Indies or on the Asian mainland. For example, Borneo, Java, and Sumatra—home of orangutans and gibbons—provided potential sources of evidence for the evolution of anthropoid apes (Sherratt 2002).[1] Early in the twentieth century, the Italo-Argentinean paleontologist Florentino Ameghino (1854?–1911) proposed that the cradle of humanity had been instead found in the Pampas of southern South America. Ameghino's date of birth became a contested issue in the 1910s, when some catholic groups tried to prove that he was born in Moneglia, Italy in 1853 rather than in Luján in 1854. This was linked to the attempts of the Socialist Party to make his birthplace in Luján a secular pilgrimage center to compete with the Basilica of Our Lady of Luján (see Podgorny 1997).

Ameghino's paleontological research in the Pampas and Patagonia was the result of a sort of small family business. While one of his brothers spent long periods in the field, the other took care of the family's bookshops in Buenos Aires. Léontine, his French wife, helped him with his writings. The business also had the support of some members of the local Genovese community, various German scientists living in South America, and a few Argentine naturalists. Along with them, the Ameghinos elaborated their ideas about the Tertiary geological formations in South America and about the origin and dispersion of mammals. Due to their fame as paleontologists, they gained national and international visibility, to such an extent that by the 1880s, they had created different networks to provide data and objects.

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Engineers, topographers, military personnel, politicians, and even the national president sent letters, bones, and drawings to their house, preferring this destination to the collections in State museums, namely, the Museum of the city of La Plata, established in 1884, and the National Museum in Buenos Aires, established in 1823. Having been appointed director of the latter in 1902, Florentino died in 1911, leaving behind an impressive list of publications; several open scientific debates; a museum, which was literally in danger of collapse; and his private paleontological collections, library, and archive (Podgorny 2005, 2015).

Using Ameghino's work on the antiquity of man and human origins, this paper aims to analyze the constitution of prehistoric archaeology as a scientific discipline. The first part explores the early debates about the antiquity of man in Argentina and attempts to prove that humans had lived among the colossal fossil mammals of South America. In the following sections, the paper argues that the emergence and disappearance of Argentinean Tertiary forerunners of man are deeply connected with the consolidation of prehistoric archaeology and paleoanthropology as scientific disciplines. The subject of this paper addresses a number of concerns of interest in contemporary history of science. These range from questions of discipline formation of the new science of paleoanthropology; questions of what constitutes an appropriate training to conduct this kind of research; as well as questions regarding instruments, modes of observations, and the reliability of evidence. As discussed in the following pages, the history of prehistoric archaeology and paleoanthropology was shaped by the tensions between the national versus the international nature of archaeological research, tensions where the politics of language as expressed in classificatory systems, publications, debates, and correspondence was a crucial actor.

2. The "Man of the Great Armadillo"

In the nineteenth century, the origin of Americas' inhabitants became one of the central issues at the International Congresses of Americanists, established in France in 1867. At the first meeting in Nancy, the autochthonism of American civilizations was extensively reviewed; while at the second meeting (Luxemburg, 1877), the antiquity of man in the New World was defined as the crucial problem of American anthropology and ethnography. Tertiary man was discussed at Brussels in 1879. In Luxemburg, it was accepted that whereas *prehistoric man* in Europe was equivalent to *ante-diluvian man*, to be searched for among fossil bones, "in America it should rather be called *Pre-Columbian man* (*hombre ante colombiano*), because our history starts with the discovery of the New World." (Comas 1974; Quesada 1879: 144).[2]

In Buenos Aires, literary and scientific circles soon analyzed the problem of the "antiquity of man." Reviews on the European findings and debates were published constantly in the press. A year after publication, Charles Lyell's *The Antiquity of Man* was reviewed as the work that collected all of the documents proving the contemporaneity of humans and fossil fauna (Burmeister 1864: 18). Early in the 1870s, the Italians Giovanni Ramorino and Pellegrino Strobel moved to Argentina to teach natural history at Buenos Aires University. Engaged in the promotions of the "international movement of prehistory," as it was called by Gabriel de Mortillet, they reported on local prehistoric news to Europe and encouraged local naturalists to search for prehistoric artifacts. Ramorino patronized, among others, a young countryman from Moneglia, a school teacher named Florentino Ameghino, who late in the 1870s reported on the association of fossil mammals with objects of human manufacture (Podgorny 2000, 2009). Geology did not help Ameghino to prove such a statement: in the Pampas, "the nature and uniformity of its sediments do not allow for the study of its deeper levels" (Zeballos and Reid 1876: 315). Vestiges of the local antiquity of humans were therefore not fully reliable. At the meetings of local scientific societies, collectors debated over the association of fossil fauna, geological strata, and archaeological relics (Lopes and Podgorny 2000; Podgorny and Lopes 2008). In addition, since the late 1850s, traders in fossil mammal bones from the Pampas were aware of the demand existing in Europe on remains from "prehistoric man." In a context where the search for prehistoric objects was seen as a mere attempt to create a new commodity for the market in natural history objects, Ameghino was treated by Hermann Burmeister, the German director of the Museum of Buenos Aires, as just one of the many fossil providers in search of scientific and social recognition (Podgorny 2009, 2015).

Other young men from Buenos Aires as well became devoted to the study of the antiquity of man in South America. Among them were the law and engineering student Estanislao Zeballos (1854–1923), and Francisco P. Moreno (1852–1919), director of Buenos Aires Anthropological Museum, established in 1878 (and closed soon thereafter). Whereas Ameghino adopted the methods of geological archaeology, trying to link objects with fossils and strata, Zeballos proposed a Holocene age for the South American Paleolithic, stressing the uncertainty of local stratigraphy. For him, the remains found in deeper layers could not be authenticated "in terms of their real location in the strata" (Zeballos 1879: 40, 47). For Ameghino, on the one hand, the South American Paleolithic was as old as in Europe and

could be related to the prehistoric sequence of technological industries proposed by de Mortillet and his followers (Podgorny 2009). Moreno and Zeballos, on the other hand, proposed a sequence of mere local meaning. The three of them had their own private collections of fossils and prehistoric tools, in which they invested much money and time, so for all of them, the Paleolithic in the Pampas was a matter of fact.

In 1878, Ameghino presented his archaeological and paleontological collections at the Paris Anthropological Exhibition, impressing French scientists to such extent that the collections were described as a "prehistoric museum in itself" (Exposition 1879: 172). Prehistoric archaeology, as Kaeser (2002) has underlined, was established as an international enterprise, with fora such as the International Congress of Prehistoric Anthropology and Archaeology—established in 1863—and meetings associated with world exhibitions. The emergence of prehistoric archaeology faced the challenge of creating transnational chronological and classificatory frameworks, equivalent to those provided by geology. Integrating local sequences into a general schema of worldwide meaning implied working on the basis of correlation and a common classificatory language (Coye 1997; Van Riper 1993). "The French from South America"—as Ameghino wanted to be considered—were creating evidence that allowed for the spread of prehistory to South American territories, another location from which to extract evidence for the great antiquity of man. Thus, French scientists were open to welcoming South American Paleolithic man as further proof of humans' long history on the Earth, on the basis of the collections transported to Paris and the expertise Ameghino showed in the debate on the geologic antiquity of the site of Chelles. In fact, Florentino stayed in Paris until 1881, studying paleontological collections stored in the Muséum National d'Histoire Naturelle and participating in multiple geological and archaeological venues and discussions (Podgorny 2009).

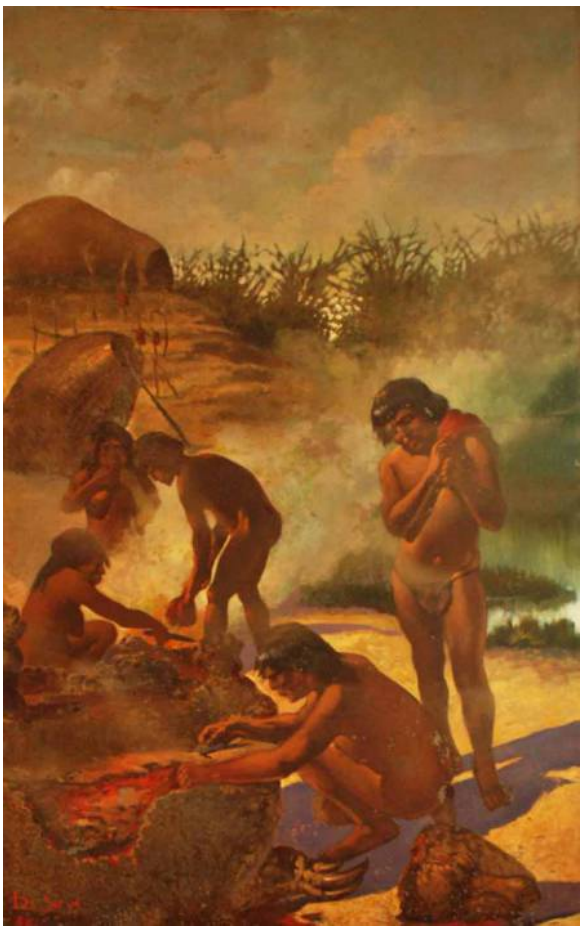


Figure 1 The "Man of the Great Armadillo" (courtesy of Archivo histórico del Museo de La Plata).

In 1880, Ameghino published *La antigüedad del Hombre en el Plata* (*Man's Antiquity in the la Plata Basin*), where he arranged the prehistoric tools from the Pampas in a sequence that paralleled with the European sequence set by Gabriel de Mortillet. Ameghino (1880–1) proposed that humans had lived among Megatheria and announced the discovery of the early Americans' actual dwelling place: the carapace of a *glyptodont*. In the midst of the Pampas, on those vast plains without a tree or rock behind which humans might find shelter, humans dug a hole in the ground and roofed it with the shell of a glyptodont, thus forming a cave-like retreat. However, it was difficult to define the era of "the Man of the Great Armadillo" (Figure 1), as de Mortillet had baptized this prehistoric human type, meaning with that there should be a "Great Armadillo Age," as there was in Europe an Elephant and Hippopotamus Age, a Cave Bear and Mammoth Age, and a Reindeer Age (Podgorny 2009, 2011). However, from a geological and paleontological point of view, South America was—along with Australia—the most isolated and singular region of the world, difficult to correlate with geologic formations of the Northern Hemisphere (Scott 1907: 466).

3. Tertiary man

3.1 Argentina as the cradle of humankind

In 1889, Ameghino published his *Contribución al conocimiento de los mamíferos fósiles de la República Argentina* (*Contribution to the Knowledge of the Fossil Mammals of the Republic of Argentina*), re-classifying the so-called Pampean Formation. Ameghino claimed that the progress of paleontology in Argentina proved that "there was a national science, which works with its own elements and new methods, and which every year gives to science a considerable amount of data" (Ameghino 1889: 30). Among these local elements, he counted Santiago Roth (1850–1924), a Swiss collector, who lived in the North of the Province of Buenos Aires selling fossils to European institutions. By that time, Roth had

classified the Pampean Formation as representing all of the strata between the recent Alluvium and the Eocene. For him, the lower and middle Pampean represented the Tertiary (Miocene and Pliocene), and the upper, the Quaternary (Pleistocene). This classification made the lower Pampean Formation older than it had been considered until that point. Searching for fossils, Roth found several human skeletons attributed to the upper and middle Pampean. In fact, the discovery of a geologically ancient human skeleton in the middle Pampean was presented as the most ancient human skeleton in South America.

Ameghino, in his *Contribución*, updated local prehistory with all recent findings of fossil human remains. Insisting on the Tertiary character of the Pampean Formation, he presented "Pliocene man" as a matter of fact. He went further to suggest having found some vestiges of the actions of humans in even older strata, equivalent to European lower Pliocene and Miocene layers. The remains attributed to Miocene man had been found in the so-called Araucanean Formation. They consisted of worked stones, burnt bones, and fireplaces; however, no skeletal remains had been detected. Ameghino concluded that he was facing the same problem the Europeans had: there were cultural vestiges of a hypothetical South American *Anthropopithèque* (a Miocene human ancestor) but the fossil evidence was lacking (Ameghino 1889: 154–6).

In the following years, Ameghino solidified himself as an international authority on South American fossil mammals. Sponsored by some Argentinean politicians and European museums, he sent his brother Carlos on several trips to Patagonia, amassing meaningful collections of fossil mammals (Podgorny 2000, 2005). In 1902, he was appointed director of the Museo Nacional de Buenos Aires, participating in several international debates about the origins of mammals and the chronology of Argentina's geological formations. Several European and American paleontologists turned their attention to "his" findings, looking for further evidence of the evolution of South American mammals (Bowler 1996; Rainger 1991; Simpson 1984). In 1904, when his name as a mammal paleontologist was known worldwide, Ameghino, working in a field that he called "phylogenetic morphology," shifted his attention to the problem of the origins of humankind (Ameghino 1904).

Previously, in his book *Filogenia. Principios de clasificación transformista basados sobre leyes naturales y proporciones matemáticas* (*Phylogeny. Principles of Transformist Classification Based on Natural Laws and Mathematical Proportions*), Ameghino (1884) had discussed the principles of zoological classification, proposing a natural system based on some general principles or laws of evolution, and the possibility of establishing a genealogical classification connecting fossil and living mammals. He had also proposed a theoretical phylogenetic tree for the development of humankind, describing human ancestors and predicting the species that would be found in the years to come.

It is worth noting that in the second half of the nineteenth century, morphologists and paleontologists reinterpreted their research programs in terms of phylogenetic study (Bowler 1996; Delisle 2007). Whereas Darwin's theoretical scheme of 1859 associated filiation and time, Ernst Haeckel proposed phylogenetic trees relating fossil and living beings on the basis of embryology and evolutionary morphology. In 1866, the French paleontologist Albert Gaudry (1827–1908) published a tree connecting living and extinct mammal species based on the fossils of Europe (Laurent 1997). For Gaudry, one of Ameghino's few respected authorities in the field of mammal paleontology, the fossil record and stratigraphic sequences provided facts for constructing more reliable relationships than those obtained by embryological criteria. Relationships between ancestors and offspring could be read in the geological strata, with the phylogenetic tree being a representation of what the paleontologist had actually found. The first phylogenetic trees representing the evolution of humankind, however, were not based on the scarce and contested fossil record of humans' zoological history; rather, they were traced with hypothetical entities such as those proposed by Haeckel and de Mortillet. It was not until late in the nineteenth century that entities such as *Pithecanthropus erectus* and Neanderthals came into being as actual pieces of human phylogeny. The classification of prehistoric industries was then associated not only with extinct fauna and geological strata but also with those "fossil men."

Ameghino's *Filogenia* was shaped by Gabriel de Mortillet's inventions and Haeckel's reconstruction of the human ancestral tree (Ranea 2011). Embryological collections in Buenos Aires, however, were very poor and not suitable for evolutionary studies (Ameghino 1884: 372). Thus, like Gaudry, Ameghino gave less importance to embryology and relied more on fossil collections and theoretical projections. Argentinean museums and private collections were rich in fossil mammals, the material basis for the so-called "mathematical classification" that Ameghino was proposing, that is, a system for transforming verbal descriptions into formulas and graphics, where the numbers of anatomical pieces and anatomical characters were transformed into formulas that reduce a page of words to a line of symbols (Figure 2).

In *Filogenia*, Ameghino restored the genealogy of man and living anthropomorpha, proposing names for the

not-yet-found ancestors, defined by their hypothetical number of vertebrae, motion postures, and the peculiarities to be expected in their skulls (Figures 3,4). These were a "logical consequence" of evolutionary laws, not the result of empirical evidence at hand. Thus, he described the hypothetical genus *Prothomo*, *Diprothomo*, *Triprothomo*, and *Tetraprothomo* (the four ancestors of humans); *Prothylobates* (the gibbon's ancestor); *Collensternum* (common ancestor of humans and gibbons); *Protosimia*, *Diprotosimia*, and *Triprotosimia* (orangutan ancestor); *Coristernum* (common ancestor of gibbons, orangutans, and humans); *Protroglodytes*, *Diprotroglodytes*, and *Triprotroglodytes* (common ancestors of gorillas and chimpanzees); *Anthropomorphus* (common ancestor of humans and anthropomorpha); and *Proanthropomorphus* (*Anthropomorphus*' ancestor). Ameghino—like Haeckel—assumed the affinities between the ancestors of humans and gibbons, an assumption that related humankind to lesser apes from the Indo-Malayan forests.

Whereas in 1884, Ameghino was proposing a theoretical phylogenetic tree for humankind as a whole, with no references to either geologic time or continent,

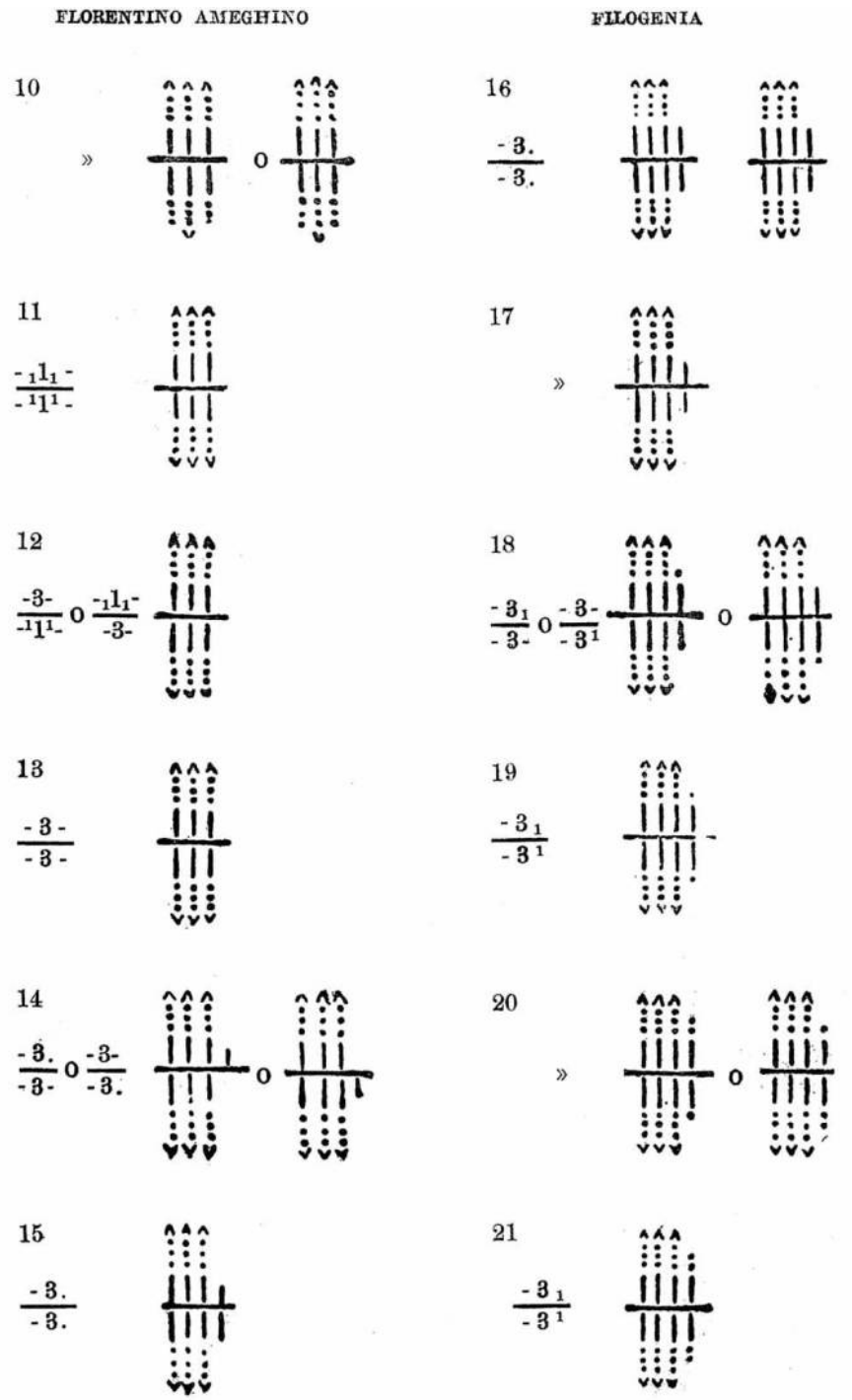
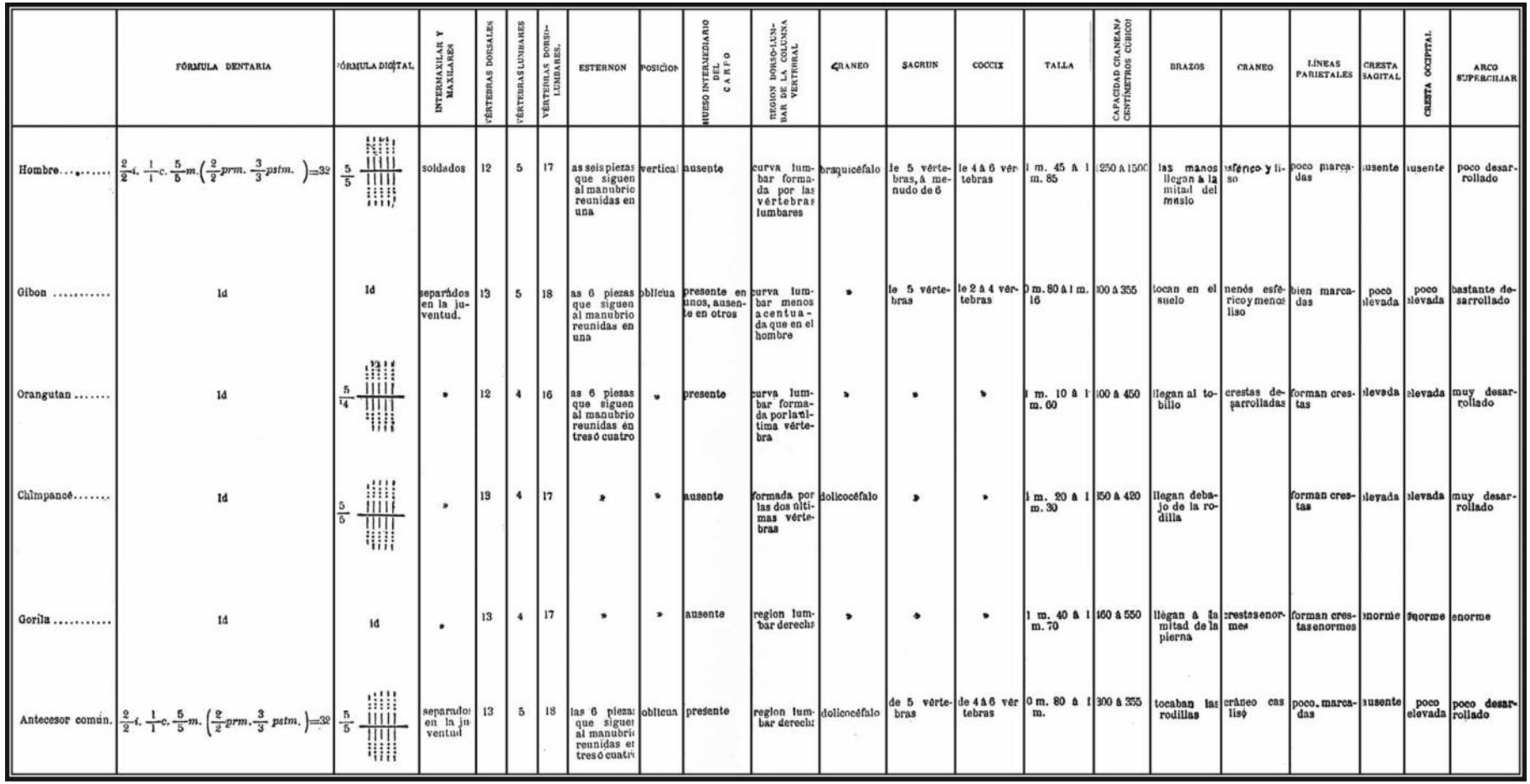


Figure 2 Evolution of the horse, as published in Ameghino's *Filogenia* (1884).



	FÓRMULA DENTARIA	FÓRMULA DIGITAL	INTERMAXILAR Y MAXILARES	VÉRTEBRAS DORSALES	VÉRTEBRAS LUMBARES	VÉRTEBRAS DORSO-LUMBARES	ESTERNON	POSICION	MUESO INTERMEDIARIO DEL CARPO	REGION DORSO-LUMBAR DE LA COLUMNA VERTEBRAL	CRANEO	SACRUN	COCCIX	TALLA	CAPACIDAD CRANEANA CENTÍMETROS CÚBICOS	BRAZOS	CRANEO	LÍNEAS PARIETALES	CRESTA SAGITAL	CRESTA OCCIPITAL	ARCO SUPERCILIAR
Hombre.....	$\frac{2}{2}i.\ \frac{1}{1}c.\ \frac{5}{5}m.\left(\frac{2}{2}prm.\ \frac{3}{3}pstm.\right)=32$	$\frac{5}{5}$	soldados	12	5	17	as seis piezas que siguen al manubrio reunidas en una	vertical	ausente	curva lumbar formada por las vértebras lumbares	braquicéfalo	le 5 vértebras, á menudo de 6	le 4 á 6 vértebras	1 m. 45 á 1 m. 85	1250 á 1500	las manos llegan á la mitad del muslo	esférico y liso	poco marcadas	ausente	ausente	poco desarrollado
Gibon	Id	Id	separados en la juventud.	13	5	18	as 6 piezas que siguen al manubrio reunidas en una	oblícua	presente en unos, ausente en otros	curva lumbar menos acentuada que en el hombre	»	le 5 vértebras	le 2 á 4 vértebras	0 m. 80 á 1 m. 16	300 á 355	llocan en el suelo	nenós esférico y menos liso	bien marcadas	poco elevada	poco elevada	bastante desarrollado
Orangutan	Id	$\frac{5}{4}$	»	12	4	16	as 6 piezas que siguen al manubrio reunidas en tres ó cuatro	»	presente	curva lumbar formada por la última vértebra	»	»	»	1 m. 10 á 1 m. 60	400 á 450	llegan al tobillo	crestas desarrolladas	forman crestas	elevada	elevada	muy desarrollado
Chimpancé.....	Id	$\frac{5}{5}$	»	13	4	17	»	»	ausente	formada por las dos últimas vértebras	dolicocéfalo	»	»	1 m. 20 á 1 m. 30	350 á 420	llegan debajo de la rodilla		forman crestas	elevada	elevada	muy desarrollado
Gorila	Id	Id	»	13	4	17	»	»	ausente	region lumbar derecha	»	»	»	1 m. 40 á 1 m. 70	460 á 550	llègan á la mitad de la pierna	crestas enormes	forman crestas enormes	enorme	enorme	enorme
Antecesor común.	$\frac{2}{2}i.\ \frac{1}{1}c.\ \frac{5}{5}m.\left(\frac{2}{2}prm.\ \frac{3}{3}pstm.\right)=32$	$\frac{5}{5}$	separados en la juventud	13	5	18	las 6 piezas que siguen al manubrio reunidas en tres ó cuatro	oblícua	presente	region lumbar derecha	dolicocéfalo	de 5 vértebras	de 4 á 6 vértebras	0 m. 80 á 1 m.	300 á 355	tocaban las rodillas	cráneo casi liso	poco. marcadas	ausente	poco elevada	poco desarrollado

Figure 3 Human evolution as proposed in Ameghino's *Filogenia* (1884).

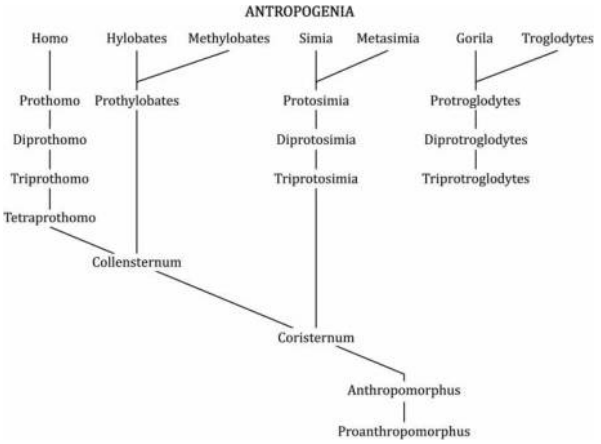


Figure 4 Human evolution as proposed in Ameghino's *Filogenia* (1884).

by 1910, his hypothesis came into being as actual species based on materials collected in Argentina. Thus, in July, celebrating the anniversary of Argentinean independence, he reported before the International Scientific Congress held in Buenos Aires: "It seems as if the ancient and now extinct species and races of man that inhabited our land have awoken from *ultra tumba*, in order to attend, even though only with their inanimate bones, the celebration of our centennial" (Ameghino 1910a).

At the same time, Ameghino (1906) modified his classification system of the strata from Patagonia and the Pampas, and presented his interpretation of the ancient connections between South America, Australia, Africa, and North America during the Cretaceous and early Eocene. Along with German malacologist Hermann von Ihering in Brazil (Lopes 2001), he proposed that a series of continental land bridges could explain plant and animal distributions in geologic times (Lopes and Podgorny 2007; Oreskes 1988; Podgorny 2005). According to Ameghino (1906), Patagonia became not only the center of origin and distribution of mammals but also the actual scenario of his phylogenetic tree from 1884: the genus *Homo* and all Old World human fossil specimens (namely, the Neanderthal skeletons of Spy found in 1886, *P. erectus* found in 1891/2 in Java, and the mandible from Mauer, found near Heidelberg in 1907) were offspring of the small bipedal *Homunculus* from the early Tertiary of Patagonia. Furthermore, Ameghino classified contemporary humans into two species: *Homo sapiens* (American and Caucasian races) derived from *Homo pampæus* and *Homo ater* (Negroes and Australians) (Figure 5). The lack of anthropomorpha in South America—the main objection to the possibility of a South American cradle of human evolution—was explained by inverting the accepted direction of evolution: man was not the offspring of the apes; rather, the apes were bestialized forms of man (Ameghino

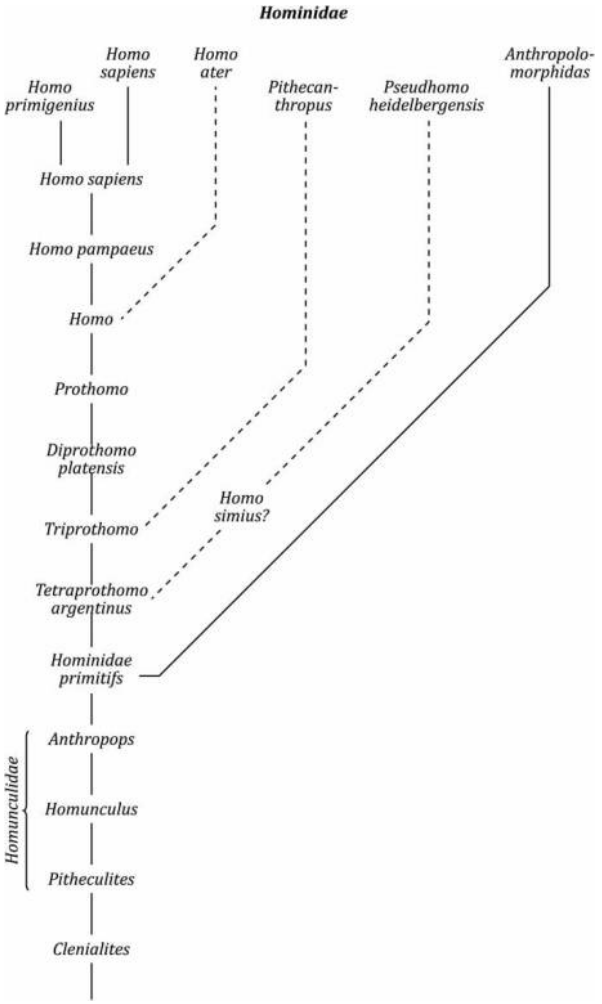


Figure 5 Human evolution in South America, as proposed in Ameghino (1906).

1906: 558; see Podgorny 2005).[3] For him, the Neanderthal specimens became examples of men on the path to bestialization; Argentina was the place that provided the most reliable skeletal remains of Pliocene man, namely *H. pampæus*, the first species that had migrated to other continents through the land bridges. Thus, in the first decade of the new century, South America became the location of human origins and the center of dispersion of human ancestors. For Ameghino, this part of the world possessed more ancient, more numerous, and more convincing materials than those that had been furnished by the "Old World." Buenos Aires and Monte Hermoso were the localities where this supposition could be demonstrated.

3.2. Monte Hermoso

Monte Hermoso, on the Atlantic coast of Buenos Aires, had long been one of the meccas for local institutions and collectors (Fernicola 2011). The La Plata Museum had sent several of its employees there to look for fossils in the 1880s. Among the pieces they found was a human-like atlas of small size, which

was soon forgotten, buried in un-cataloged collections. Many years later, it was rediscovered and transferred to the anthropological section headed by Robert Lehmann-Nitsche (1872–1938), a German anthropologist who had been in charge of the section since 1897. There, the atlas lay unattended, until the second half of the 1900s, when it attracted Ameghino and Lehmann-Nitsche's interest.

Ameghino probably went back to the concept of "fossil man" in reaction to Lehmann-Nitsche's *Nouvelles recherches sur la Formation Pampéene* and his question of whether the existence of Tertiary man in South America could be accepted as a matter of fact. For him, the main problem was again how to determine the geologic age of the different layers of the Pampean Formation. Lehmann-Nitsche (1907: 193–194, note 1) proposed as *conditio sine qua non* that modern paleoanthropology could only be done by the joint fieldwork of geologists and anthropologists in cooperation with other disciplines. Thus, he went into the field with professional geologists; sending collections of mollusks to be examined in São Paulo and Bonn, sediments to the labs of Zürich and Leipzig, and bones to Zürich and Gand (Lehmann-Nitsche 1907). After gathering the results of these studies, Lehmann-Nitsche attributed the atlas to *Homo neogaeus*, a South American species from the Tertiary of Monte Hermoso (Lehmann-Nitsche 1907). Ameghino (1907), rather, said it belonged to *Tetraprothomo argentinus*, a supposed bipedal human form that he created with this atlas as well as a femur that his brother Carlos had found some time before at Monte Hermoso. In addition, at this time, a skull found in 1896 in the docks of Buenos Aires and donated to the Museo Nacional was also rediscovered in the collections. In 1909, Ameghino presented it as a remnant of *Diprothomo platensis*, a forerunner of man from the lower Pliocene akin to the most primitive primates. Ameghino (1909b) dated *Diprothomo* as lower Pliocene.[4]

Tetraprothomo argentinus and *D. platensis* came into being by rejecting what Ameghino with disdain called the "anthropologist's point of view." Defining his work as "morphology" in the sense of Giuseppe Sergi, the Roman professor of anthropology, he meant to have his own "morphological conception" (Ameghino 1912: 2),[5] always having in mind a perfect idea of general mammal morphology as follows:

> "I have more confidence in what my eyes see, in accord with my knowledge, than in all the mechanical procedures and measurements that can be imagined [...] I accept mechanical procedures, or those of precision, simply as a means of confirmation of what is expressed to me by morphology." (Ameghino 1912: 2)

These "ideas" allowed him to "see" the entire animal body, whereas professional and modern anthropologists claimed to base their reconstructions on statistics, mechanical, and measurement procedures, which provided a material basis—that of the apparatus—for making inferences. In this context, Ameghino's method seemed quite speculative and old fashioned.

His interpretation of bones, geological strata, and other material remains associated with the local human ancestors did, however, not go unnoticed, as some scientists had hoped (Friedemann 1910). Rather, his proposals provoked local and international reactions. His ideas were supported in Italy by Sergi, who referred to *H. pampæus* and other Argentinean findings in his theory on polygenism (Sergi 1909, 1910). While his findings were reviewed with caution by Paul Rivet in France (*L'Anthropologie*) and by Georg Buschan in Germany (*Zentralblatt für Anthropologie*), there were also many pages arguing against the Argentinean origin of humans.

The critics adopted different strategies but some topics were common to all of them. One of the main problems was how to judge evidence originating in distant territories; the second, it was proposed by a respected scientific authority to demonstrate what was regarded as an absolutely untenable conception. The multidimensional side of the problem did not help: Ameghino's controversial statements contrasted with the scientific specialization prevailing in other scientific centers. Disciplinary boundaries and expertise seemed to disappear in Ameghino's work. Anthropologists confessed that they could not judge the geological evidence; geologists, on the other hand, needed fieldwork to make a determination about the antiquity of the strata. Ameghino worked alone and analyzed the geologic sequences as well as the paleontological and archaeological evidence.

In 1910, Aldobrandino Mochi (Museo Nazionale d'Antropologia di Firenze) argued that the characteristics that Ameghino attributed to *Diprothomo* depended upon the orientation of the fragmented skull and on a series of subjective views (Mochi 1910–11: 69). Mochi, following a different orientation, obtained a human physiognomy. German anatomist Gustav Schwalbe attacked Ameghino's poor anthropological methods, focusing on the problem of conventions and representation. Schwalbe insisted on the lack of accuracy of the media used by Ameghino: photographs differed markedly from Ameghino's drawings, where he exaggerated some of the features. For Schwalbe (1910), the posing of the fragment was completely incorrect and was responsible for the apparent resemblances to lower zoological forms. Critics pointed out that Ameghino looked at the callotte as it lay on the table, as "naturally posed;" thus, the specimen had the characteristics that Ameghino described. But when the fragment was

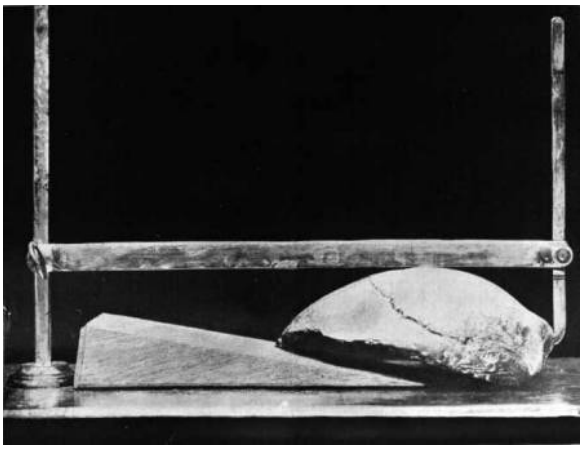


Figure 6 Craniorientor (from Ameghino 1912).

"properly" elevated, a considerable part of the primitive features vanished. Ameghino replied by developing an "absolute exact" instrument of cranial orientation: he invented a "craniorientor" where the callotte showed itself in the same orientation as the one he had presented earlier on the basis of "morphological characteristics" (Ameghino 1912) (Figure 6).

Anthropometric instruments—as Ameghino showed—could prove whatever scientists wanted them to prove. In 1912, a doctoral dissertation titled *El atlas de Monte Hermoso* supervised by Robert Lehmann-Nitsche discussed whether the atlas belonged either to an early ancestor of humans or to the genus *Homo.* On the basis of measurements and comparisons with a series of atlases stored in the La Plata Museum, (and following a classification published in the *Bulletin de la Société d'Anthropologie de Lyon* in 1907 (Urquiza 1912)), the doctoral candidate combined different methods and instruments, adapting the instrument to the object under study to conclude that the atlas belonged to a South American species of *Homo.* The dissertation displayed the wide variety of instruments and conventions used in anthropology that could lead—as Ameghino stressed—to multiple interpretations of the same object. The experimental systems (Rheinberger 1997) defined by the different instrumentation and inscription devices constructed by Ameghino, Urquiza, Mochi, and Schwalbe, as well as the models and concepts to which the objects were related, allowed for multiple designations, such as *H. neogaeus,* a modern human, or a distant ancestor of humans.

3.3. *Tierra cocida and primitive industries*

Ameghino's evidence included also *tierra cocida* (baked earth), a material that resembled brick and occurred in the form of small pebbles in various geologic horizons. For Ameghino (1908, 1909a) they were the by-products of humans burning grasses and maintaining fires that had calcified and fused sediments. In such a way, the bipedal genus *Tetraprothomo* became a being that could keep fireplaces in the Miocene of the Pampas. The German geologist Gustav Steimann (1907: 463) mocked him: "Les traces de l'action du feu au Cap Corrientes […] ne sont pas des témoignages de l'*Homo americanus*, mais des produits naturels marqués au sceau des produits artificiels par la fantaisie de l'*Homo europaeus* importé" ("The traces of the action of fire at Cape Corrientes […] are not evidence of *Homo americanus*, but natural products marked with the seal of artificial products by the fantasy of the imported *Homo europaeus*"). However, Steimann's alternative hypothesis for explaining the genesis of the burnt earth, that is, volcanic activity, was just as untenable. *Tierra cocida* became a crucial element for lending credence to the Tertiary ancestors from Buenos Aires, acting as what Rheinberger (2000: 273) calls an "unprecedented event" that subverts "the finite capacities of imagination of a scientist who remains always embedded in a particular thinking frame and a local experimental culture" (Figure 7).

The third kind of evidence for South American human ancestors consisted of two primitive industries. In 1909, Ameghino (1908: 398) presented "very crude stone implements of an unknown type, more primitive than that of the eoliths of Europe" found at Mar del Plata and later attributed to *H. pampæus,* who in the Middle Pliocene was interpreted to have inhabited

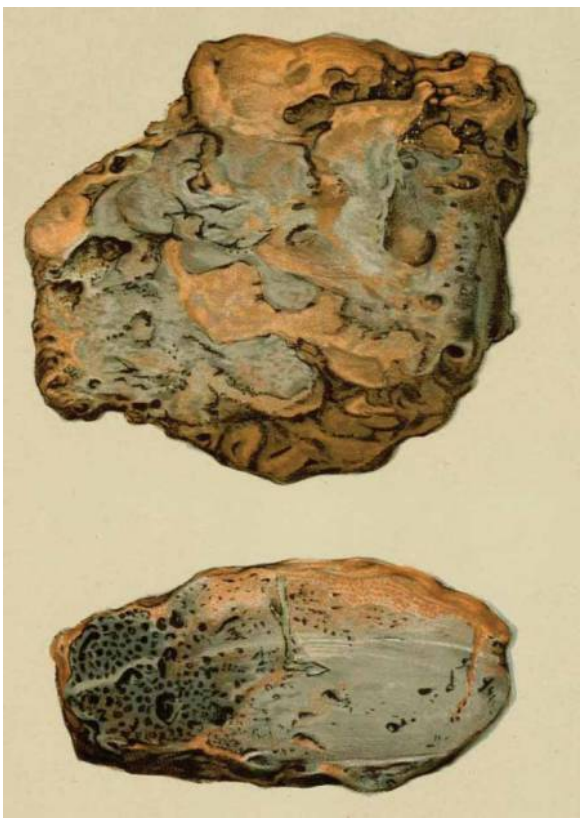


Figure 7 Ameghino's *tierra cocida*, which he interpreted to represent Miocene-aged baked earth (from Ameghino 1908).

the seashore (Ameghino 1911b). Designated as a "split-stone industry" ("l'industrie de la pierre fendue"), these included large rolled and elongated pebbles made of materials absolutely foreign to the country where they were found. Ameghino meant these implements were made by people who did not know true flaking by percussion, splitting the stones by strokes at one end of their long axis for the purpose of utilizing the pointed and sharp fragments resulting from the separation.

Even more ancient were the worked stones from Monte Hermoso that Ameghino reported at the Scientific Congress of 1910 and attributed to a broken-stone industry (*piedra quebrada*) from the lower Pliocene, still more primitive than the eoliths (Ameghino 1910b). These water-worn pebbles of quartzite had been broken—according to Ameghino—by striking strongly one against the other without any determined direction. Many still preserved the natural surface of the rolled pebble.

Ameghino's former collaborator Félix Outes (1878–1939) contested the alleged evidence of early man. Both Ameghino and Outes lost their tempers and published a series of articles impugning each other's reliability (Ameghino 1909c, 1909d, 1909e, 1911a; Outes 1909a, 1909b, 1909c; Outes et al. 1908; Outes and Bücking 1910–11). Outes opposed both the geologic antiquity attributed to the so-called industries and the primitiveness of the workmanship. For him, they were Neolithic objects, representing a local phase of the tools of the region's recent prehistoric groups (Outes 1909c). Outes promised "une sévère critique de restitution et de provenance" ["severe criticism of restitution and provenience"] (Outes 1909a: 35). Like Lehmann-Nistche before, Outes did appeal to the expertise of chemists and petrographers, relying on the results of their chemical and microscopic analyses. He also asked for both geologic profiles in archaeological publications and positive criteria for identification of true implements. Outes introduced William H. Holmes' points of view onto the Argentinean scene, remarking that his 1897 monograph had solved the controversial Paleolithic character of the Potomac-Chesapeake stone implements, proving that they were remains left by historic tribes. Holmes—also a Haeckelian in America (Meltzer and Dunnell 1992)—"rejected the effort to establish New World archaeological periods of technology to parallel those of Western Europe" (Hinsley 1981: 105). Outes' work adopted Holmes' criteria for steps in the evolution of species of the arrow-point but also his conclusions: Paleolithic man occurred neither in North America nor in South America.

Ameghino published his angry reply to Outes in Spanish in a letter to the editor of a Buenos Aires newspaper, a strategy he had used since his youth (Podgorny 1997, 2015). By publishing in Spanish and in the press, Ameghino transferred the debate to the public opinion. Outes, then, translated his note into French and included it in the *Revista del Museo de La Plata*, accusing Ameghino of "confier aux colonnes de la presse quotidienne la résolution de controverses qui ne doivent jamais sortir des pages de publications spéciales de caractère purement scientifique" ["assigned to the columns of the daily press to resolve controversies that should never leave the pages of special publications of pure scientific character"] (Outes 1909a: 34). The use of the French language led the debate to the international arena. Ameghino, then, accused Outes of being "a young man eager for premature fame."

In fact, the differential use of Spanish and French was a measure of the intended readership of the publications. Papers, communications, and monographs looking for international readers were mostly published in French, as Ameghino normally did in his home journal *Anales del Museo Nacional de Buenos Aires.* Outes, aware of international conventions on terminology, promoted some of the new methods that proposed an international common framework for professional archaeologists. Language, in such a way, became inextricably linked to spaces of emergence, visibility, promotion, and disappearance of those scientific objects. Thus, Ameghino's anthropogenetic work was received as a matter of fact by the group of pedagogs from the University of La Plata, who celebrated "Ameghino's definitive answer to the question of all questions" (Podgorny 1997; Senet 1909).

After his death in 1911, Ameghino became a national icon for his role in creating national science and culture. In this context, the debates about the Tertiary man of Buenos Aires, continued by his brother in the 1910s, were interwoven with unsolved controversies and questions of national pride (Daino 1979; Podgorny 1997). In the 1910s and 1920s, prehistoric archaeology in Argentina lost its international scope and instead confined itself to local problems and cultures. While early humans as scientific objects were displaced from the local agenda, French was replaced by Spanish as the language of Argentinean national science.

4. Concluding remarks

Far beyond La Plata and Buenos Aires, casts of South American human ancestors were exhibited to observe their morphology and to question Ameghino's interpretations. In this context of overt controversy, Aleš Hrdlička visited Buenos Aires in 1910 to study in situ the evidence presented by Ameghino, Outes, and Lehmann-Nitsche (Podgorny and Politis 2000). He left Argentina

> "feeling that the time at his disposal there […] was all too brief. The country abounds in anthropologic problems and material and large sections

> as yet have not been explored. But the opportunities suggested by these considerations belong to the future […] Unfortunately the general results of the inquiry […] are not in harmony with the claims of the various authors who reported the several finds […] The evidences is, up to the present time, unfavorable to the hypotheses of man's great antiquity, and especially to the existence of man's predecessors in South America; and it does not sustain the theories of the evolution of man in general, or even of that of the American man alone, in the southern cone. The facts gathered attest everywhere merely the presence of the already differentiated and relatively modern American Indian." (Hrdlička et al. (1912: VIII)

Ameghino's death in 1911 meant that he did not read Hrdlička's conclusions published in 1912.[6] Hrdlička's rejection of South American evidence was, however, not definitive for European anthropologists, who continued to analyze the evidence following their own methods and hypotheses (Podgorny 2005; c.f. Willey and Sabloff 1974). In Argentina, the disappearance of local ancestors of humans happened little by little, helping to dismantle the agreement reached in the 1880s on the occurrence of humans among glyptodonts. Ameghino's *Tetraprothomo* and *Diprothomo* were treated as a fantasy all along, yet their relative existence (Latour 2000) as objects of historical and transitory character (Daston 2000; Rheinberger 1997) tells us another story. South American forerunners of man were a kind of object that existed until the first decade of the twentieth century, when for some years, the New World seemed to be the cradle of humankind and was perceived to be the real "Old World." The constitution of this scientific object was a result of classification problems inherent in archaeological, geological, and anthropological evidence and materials at that time. It was a materialization of the fragmentation of these disciplines that, however, permitted establishment of a common international classification and a universal prehistoric process in the realm of a new discipline. Thus, it can be argued that these objects were essential during the period of consolidation of the scientific disciplines analyzed here. The Argentinean fossil ancestors of man appeared and faded away like a human face on the seashore; the disciplines called prehistoric archaeology and paleoanthropology remain as vestiges of these creatures of ancient times in the Pampas.

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Notes

1 In 1878, Gabriel de Mortillet proposed the name *Anthropopithèque* for the hypothetical common ancestor of humans and apes, to which the instruments found in European Tertiary strata should be attributed (Richard 1991). A jaw attributed to a fossil ape named *Anthropopithecus*, found in the Punjab in 1878, and an orangutan-like tooth found in the same deposits were the basis for proposing British India as the region where ancestral apes had inhabited. Haeckel (1866, 1898) coined several names for his hypothetical branches or missing links between humans and apes. For example, "Pithecanthropus" (ape-man), created in 1866, was later adopted by the Dutch military surgeon Eugène Dubois (1858–1940) for the skeletal pieces found in Java in the 1890s (Theunissen 1989).

2 "*Ante-diluvian man*" refers here to the period of earth history just prior to the last great catastrophe that led to the extinction of such animals as the mammoth, woolly rhinoceros, and cave bear, and that left the distinctive layer of gravel with the retreat of the Ice Age glaciers (Pelayo 2009; Podgorny 2011; Sommer 2011).

3 It is worth remarking that Ameghino did not argue for a great antiquity of the modern human form as supporters of the pre-sapiens hypothesis did.

4 *Pithecanthropus erectus* of Java was defined on the basis of three skeletal elements (Marsh 1896).

5 Sergi proposed a so-called natural system of skull forms, based not on figures and measures but on the subjective observation of the form. He described his method as a zoological procedure.

6 Recent research has shown that many of the objects involved in Ameghino's controversies are taking on new life. Scoriae are being interpreted as impact structures (Schultz et al. 2006). The research by Politis and Bonomo (2011) provided new insights into the industries of Mar del Plata and the Atlantic coast as well as into the human skeletal remains.

References

Ameghino, Florentino. 1880–1. *La antigüedad del Hombre en el Plata*. Paris and Buenos Aires.

Ameghino, Florentino. 1884. *Filogenia. Principios de clasificación transformista, basados sobre leyes naturales y proporciones matemáticas.* Buenos Aires.

Ameghino, Florentino. 1889. *Contribución al conocimiento de los mamíferos fósiles de la República Argentina*. Buenos Aires: Actas de la Academia Nacional de Ciencias 6.

Ameghino, Florentino. 1904. "Recherches de morphologie phylogénétique sur les molaires supérieures des ongulés." *Anales del Museo Nacional* 3. Buenos Aires.

Ameghino, Florentino. 1906. "Les Formations sédimentaires du Crétacé supérieur et du Tertiaire de Patagonie." *Anales del Museo Nacional* 8. Buenos Aires.

Ameghino, Florentino. 1907. "Notas preliminares sobre el *Tetraprothomo argentinus*: un precursor del hombre del Mioceno superior de Monte Hermoso." *Anales del Museo Nacional* 9: 107–242. Buenos Aires.

Ameghino, Florentino. 1908. "Las formaciones sedimentarias de la región litoral de Mar del Plata y Chapalmalán." *Anales del Museo Nacional* 10: 343–428. Buenos Aires.

Ameghino, Florentino. 1909a. "Productos píricos de origen antrópico en las formaciones neogenas de la R. Argentina." *Anales del Museo Nacional* 12: 1–25. Buenos Aires.

Ameghino, Florentino. 1909b. "Le *Diprothomo platensis*, un précurseur de l'homme du Pliocène inférieur de Buenos Aires." *Anales del Museo Nacional* 12: 107–209. Buenos Aires.

Ameghino, Florentino. 1909c. *Le litige des scories et des terres cuites anthropiques des formations néogènes de la République Argentine*. Buenos Aires: Imprenta de Juan A. Alsina.

Ameghino, Florentino. 1909d. "Dos documentos testimoniales a propósito de las escorias producidas por la combustión de los cortaderales." *Anales del Museo Nacional* 12: 71–80. Buenos Aires.

Ameghino, Florentino. 1909e. "Examen critique du mémoire de M. Outes sur les scories et les terres cuites." *Anales del Museo Nacional* 12: 459–512. Buenos Aires.

Ameghino, Florentino. 1910a. "Descubrimiento de un esqueleto humano fósil en el pampeano superior del Arroyo Siasgo." *Congreso Científico Internacional Americano*. Offprint. Buenos Aires.

Ameghino, Florentino. 1910b. "La industria de la piedra quebrada en el mioceno superior de Monte Hermoso." *Congreso Científico Internacional Americano*. Offprint. Buenos Aires.

Ameghino, Florentino. 1911a. "Énumération chronologique et critique des notices sur les terres cuites et les scories anthropiques des terrains sédimentaires néogènes de l'Argentine." *Anales del Museo Nacional* 13: 39–80. Buenos Aires.

Ameghino, Florentino. 1911b. "Une nouvelle industrie lithique : L'industrie de la pierre fendue dans le Tertiare de la région littorale au sud de Mar del Plata." *Anales del Museo Nacional* 13: 189–204. Buenos Aires.

Ameghino, Florentino. 1912. "La callotte du *Diprothomo* d'après l'orientation frontoglabellaire." *Anales del Museo Nacional* 15: 1–9. Buenos Aires.

Bowler, Peter. 1996. *Life's Splendid Drama. Evolutionary Biology and the Reconstruction of Life's Ancestry. 1860–1940*. Chicago: University of Chicago Press.

Burmeister, Hermann. 1864. "La paleontología actual en sus tendencias y resultados." *Anales del Museo Nacional* 1: 12–31. Buenos Aires.

Cohen, Claudine, and Jean J. Hublin. 1989. *Boucher de Perthes 1788–1868. Les origines romantiques de la préhistoire*. Paris: Belin.

Comas, Juan. 1974. *Cien Años de Congresos Internacionales de Americanistas. Ensayo Histórico-Crítico y Bibliográfico*. México: UNAM.

Coye, Noel. 1997. *La préhistoire en parole et en acte. Méthodes et enjeux de la pratique archéologique, 1830–1950*. Paris: L'Harmattan.

Daino, Leonardo. 1979. "Exégesis histórica de los hallazgos arqueológicos de la costa atlántica bonaerense." In *Prehistoria Bonaerense*: 1979, Año del Centenario de la Conquista del Desierto, edited by Guillermo B. Madrazo, Floreal Palanca, and Leonardo Daino, 95–195. Buenos Aires: Municipalidad de Olavarri.

Daston, Lorraine. 2000. "The coming into being of scientific objects." In *Biographies of Scientific Objects*, edited by L. Daston, 1–14. Chicago: University of Chicago Press.

Delisle, Richard. 2007. *Debating Humankind's Place in Nature, 1860–2000: The Nature of Paleoanthropology*. Upper Saddle River: Pearson Prentice Hall.

Exposition. 1879. "La Exposition anthropologique de la République argentine à l'Exposition universelle." *Revue d'Anthropologie* A8, Ser. 2, T2: 167–172.

Fernicola, Juan C. 2011. "1886–1889: Ascenso, auge y caída de la sociedad entre Florentino Ameghino y Francisco P. Moreno." *Asociación Paleontológica Argentina, Publicación Especial* 12: 35–49.

Friedemann, Max. 1910. "Vorlage eines Gipsabgusses des Schädeldaches von *Diprothomo platensis* Ameghino." *Zeitschrift für Ethnologie* 6: 934–935.

Grayson, Donald. 1983. *The Establishment of Human Antiquity*. New York: Academic Press.

Haeckel, Ernst. 1866. *Generelle Morphologie der Organismen*. Berlin: Georg Reimer.

Haeckel, Ernst. 1898. *Über unsere gegenwärtige Kenntniss vom Ursprung des Menschen*. Bonn: Emil Strauss.

Hinsley, Curtis. 1981. *The Smithsonian and the American Indian. Making a Moral Anthropology in Victorian America*. Washington: Smithsonian Institution Press.

Hrdlička, Aleš, William H. Holmes, Bailey Willis, F. E. Wright, and Clarence N. Fenner. 1912. *Early Man in South America*. Smithsonian Institution Bureau of American Ethnology Bulletin 52. Washington: Government Printing Office.

Kaeser, Marc A. 2002. "On the international roots of prehistory." *Antiquity* 76: 170–177.

Latour, Bruno. 2000. "On the partial existence of existing and non-existing objects." In *Biographies of Scientific Objects*, edited by L. Daston, 247–269. Chicago: University of Chicago Press.

Laurent, Goulven. 1989. "Idées sur l'origine de l'homme en France de 1800 à 1871 entre Lamarck et Darwin." *Bull. et Mém. de la Soc. d'Anthropologie de Paris* 1(3–4): 105–130.

Laurent, Goulven. 1993. "Eduard Lartet (1801–1871) et la paléontologie humaine." *Bulletin de la Société Préhistorique Française* 90(1–2): 22–30.

Laurent, Goulven. 1997. "Albert Gaudry et la paléontologie évolutive." In *Le Muséum au premier siècle de son histoire*, edited by C. Blanckaert, C. Cohen, P. Corsi, and J.-L. Fischer, 295–311. Paris: Muséum National d'Histoire Naturelle.

Lehmann-Nitsche, Robert. 1907. "Nouvelles recherches sur la Formation Pampéenne et l'Homme Fossile de la République Argentine. Recueil de Contributions Scientifiques." *Revista del Museo de La Plata* 14: 143–488.

Lopes, Maria M. 2001. "Viajando pelo campo e pelas coleções: aspectos de uma controvérsia paleontológica." *História, Ciência Saúde –Manguinhos* 8: 881–897.

Lopes, Maria M., and I. Podgorny. 2000. "The shaping of Latin American museums of natural history." *Osiris* 15: 108–118.

Lopes, Maria. M., and I. Podgorny. 2007. "Oceanos e continentes em debate." *Fénix-Revista de História e Estudos Culturais* 4(3): 1–19.

Marsh, Othniel. 1896. "On the *Pithecanthropus erectus*, from the Tertiary of Java." *American Journal of Science* 1(6): 475–82.

Meltzer, David J. 1983. "The antiquity of man and the development of American archaeology." In *Advances in Archaeological Method and Theory 6*, edited by M. B. Schiffer, 1–51. New York: Academic Press.

Meltzer, David J., and Robert Dunnell. 1992. "Introduction." In *The Archaeology of William Henry Holmes, VII-L*, edited by D. J. Meltzer and R. C. Dunnell. Washington: Smithsonian Institution Press.

Mochi, Aldovandrino. 1910–11. "Nota preventiva sul *Diprothomo platensis* Ameghino." *Revista del Museo de La Plata* 17: 69–70.

Oreskes, Naomi. 1988. "The rejection of continental drift." *Historical Studies in the Physical Sciences* 18: 311–348.

Outes, Félix, Enrique Herrero Ducloux, and Hugo Bücking. 1908. "Estudio de las supuestas 'escorias' y 'tierras cocidas' de la serie pampeana de la República Argentina." *Revista del Museo de La Plata* 15: 138–197.

Outes, Félix. 1909a. "Les scories volcaniques et les tufs éruptifs de la série pampéenne de la République Argentine. Avertissement aux spécialistes à propos d'une mémoire du docteur Florentino Ameghino." *Revista del Museo de La Plata* 16: 34–36.

Outes, Félix. 1909b. "Los pretendidos instrumentos paleolíticos de los alrededores de Montevideo (Rep. O. del Uruguay)." *Revista del Museo de La Plata* 16: 39–49.

Outes, Félix. 1909c. "Sobre una facies local de los instrumentos neolíticos bonaerenses." *Revista del Museo de La Plata* 16: 319–339.

Outes, Félix, and Hugo Bücking. 1910–11. "Sur la structure des scories et 'terres cuites' trouvées dans la série pampéenne, et quelques éléments de comparaison." *Revista del Museo de La Plata* 17: 78–85.

Pelayo, Francisco. 2009. "¿'Hombre Terciario' o orecursor humano? Sílex, transformismo y los orígenes de la Humanidad." In *Darwinismo, Meio Ambiente, Sociedade*, edited by Heloisa M. B. Domingues, Magali Romero Sá, Miguel A. Puig-Samper, and Rosaura R. Gutierrez, 161–176. Rio de Janeiro: Via Lettera.

Podgorny, Irina. 1997. "De la santidad laica del científico: Florentino Ameghino y el espectáculo de la ciencia en la Argentina moderna." *Entrepasados* 13: 37–61.

Podgorny, Irina. 2000. *El argentino despertar de las faunas y de las gentes prehistóricas. Coleccionistas, estudiosos, museos y universidad en la creación del patrimonio paleontológico y arqueológico nacional (1875–1913)*. Buenos Aires: Eudeba.

Podgorny, Irina. 2005. "Bones and devices in the constitution of palaeontology in Argentina at the end of the nineteenth century." *Science in Context* 18(2): 249–283.

Podgorny, Irina. 2009. *El sendero del tiempo y de las causas accidentals. Los espacios de la prehistoria en la Argentina, 1850–1910*. Rosario: Prohistoria.

Podgorny, Irina. 2011. "Los reyes del Diluvium. La geología del Cenozoico sudamericano en la década de 1880." *Asociación Paleontológica Argentina, Publicación Especial* 12: 21–34.
Podgorny, Irina. 2015. (in press). *Florentino Ameghino y Hnos. Empresa Argentina de Paleontología Ilimitada*. Buenos Aires: Edhasa.
Podgorny, Irina and M. Lopes. 2008. *El desierto en una vitrina. Museos e historia natural en la Argentina, 1810–1910*. Mexico: Limusa.
Podgorny, Irina and Gustavo Politis. 2000. "It is not all roses here. Aleš Hrdlička's travelogue and his trip to Argentina in 1910." *Revista de História da Arte e Arqueologia* 3: 95–105.
Politis, Gustavo, and Mariano Bonomo. 2011. "Nuevos datos sobre el 'Hombre fósil' de Ameghino." *Asociación Paleontológica Argentina, Publicación Especial* 12: 101–119.
Quesada, Ernesto. 1879. "Estudios americanistas en Europa (Congresos y asociaciones)." *Revista de Ciencias, Artes y Letras, Boletín de las Universidades, Facultades, Colegios y Escuelas de la República Argentina* 1: 126–130.
Rainger, Ronald. 1991. *An Agenda for Antiquity. Henry Fairfield Osborn and Vertebrate Paleontology at the American Museum of Natural History, 1890–1935*. Tuscaloosa and London: The University of Alabama Press.
Ranea, Alberto G. 2011. "Florentino Ameghino, Ernst Haeckel y la dimensión cósmica de la evolución." *Asociación Paleontológica Argentina, Publicación Especial* 12: 137–144.
Rheinberger, Hans-Jörg. 1997. *Toward a History of Epistemic Things. Synthesizing Proteins in the Test Tube*. Stanford: Stanford University Press.
Rheinberger, Hans-Jörg. 2000. "Cytoplasmic particles. The trajectory of a scientific object." In *Biographies of Scientific Objects*, edited by L. Daston, 270–294. Chicago: University of Chicago Press.
Richard, Nathalie. 1991. "L'Anthropithèque de Gabriel de Mortillet, le débat sur l'ancêtre de l'homme au XIXe siècle." *Les nouvelles de l'archéologie (Dossier: L'archéologie démarches savantes et conceptions naïves)* 44: 23–29.
Schultz, Peter H., Marcelo Zárate, Willis E. Hames, R. Scott Harris, T. E. Bunch, Christian Koeberl, Paul Renne, and James Wittke. 2006. "The record of Miocene impacts in the Argentine Pampas." *Meteoritics & Planetary Science Archives* 41(5): 749–771.
Schwalbe, Gustav. 1910. "Studien zur Morphologie der südamerikanischen Primatenformen." *Zeitschrift für Morphologie und Anthropologie* 13(2): 209–258.
Scott, W. 1907. "La corrélation des formations tertiaires et quaternaires dans l'Amérique du Sud." In *Nouvelles Recherches sur la Formation Pampéenne et l'Homme Fossile de la Republique Argentine*, edited by Robert Lehmann-Nistche, 465–470. Buenos Aires: Coni Fréres.
Senet, Rodolfo. 1909. "Los ascendientes del hombre según Ameghino." *Boletín de la Instrucción Pública* 2(6): 1–52.
Sergi, Giuseppe. 1909. "L'apologia del mio poligenismo." *Atti della Società romana di antropologia* 15: 187–195.
Sergi, Giuseppe. 1910. "Paléontologie sud-Américaine." *Scientia* 8: XVI–4.
Sherratt, Andrew. 2002. "Darwin among the archaeologists: The John Evans nexus and the Borneo Caves." *Antiquity* 76: 151–157.
Simpson, George. G. 1984. *Discoverers of the Lost World. An Account of Some of Those Who Brought Back to Life South American Mammals Long Buried in the Abyss of Time*. New Haven: Yale University Press.
Sommer, Marianne. 2011. "Human tools of the European Tertiary? Artefacts, brains and minds in evolutionist reasoning, 1870–1920." *Notes & Records of the Royal Society* 65: 65–82.
Steimann, Gustav. 1907. "Sur les scories intercalées dans la formation pampéenne inférieure." In *Nouvelles Recherches sur la Formation Pampéenne et l'Homme Fossile de la Republique Argentine*, edited by Robert Lehmann-Nistche, 461–465. Buenos Aires, Coni Fréres.
Theunissen, Bert. 1989. *Eugène Dubois and the Ape-Man from Java: The History of the First Missing Link and its Discoverer*. Dordrecht/Boston: Kluwer.
de Teodoro, Urquiza. 1912. *Paleo-Antropología Argentina. Nuevas investigaciones sobre el atlas de Monte Hermoso*. La Plata: Museo y Facultad de Ciencias Naturales.
Van Riper, A. Bowdoin. 1993. *Men among the Mammoths. Victorian Science and the Discovery of Human Prehistory*. Chicago: University of Chicago Press.
Willey, Gordon, and Jeremy Sabloff. 1974. *A History of American Archaeology*. San Francisco: Freeman.
Zeballos, Estanislao. 1879. "Noticias preliminares sobre el hombre primitivo de la Provincia de Buenos Aires (Obra inédita) Capítulo Sesto, Conclusiones fundamentales." *Revista de Ciencias, Artes y Letras* 1(1): 39–51.
Zeballos, Estanislao and Walter Reid. 1876. "Notas geológicas sobre una escursión a las cercanías de Luján." *Anales de la Sociedad Científica Argentina* 1: 313–319.

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