

Darwinism in Argentina, 1870-1920



From Man to Ape



ADRIANA NOVOA & ALEX LEVINE



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ALEX LEVINE

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CHAPTER TWO

The Reception of Darwinism in Argentina

Early Knowledge of Darwin's Evolutionary Views

The government's sponsorship of Martin de Moussy discussed in the previous chapter bespoke a change of official attitudes toward the role of science in public policy whose full force would not be felt until the 1860s. Legislatively mandated changes in institutions, like the rehabilitation of the Museo Público Rivadavia had founded in 1812, but which Rosas had left languishing, were slow to materialize. In 1857 Francisco Muñiz wrote to M. Trelles, secretary of the museum, to arrange for the transfer of another collection of fossils—a collection smaller than the one Rosas had sent to France, which “circumstances beyond my control had removed from my power, allowing valuable materials, intended for the Museo de la Patria, to be *sent out of the country*” (quoted in Sarmiento 1885b, 201; emphasis in original). Despite this donation—which did not include the beloved saber-tooth specimen—the museum would not find itself on a modern, scientific footing until the arrival of Hermann Burmeister, five years later.

In continental Europe, the revolutionary movements and their aftermath had given some liberal and radical intellectuals new reasons to undertake research overseas, preferably as far from Europe as possible. One of these intellectuals was the world-renowned Burmeister, a friend and protégé of Alexander von Humboldt and “long known to the world of science as one of the most learned and most active of the present generation of naturalists” (“Mammals of La Plata” 1863). From 1850 on, he spent most of his time in South America, and in 1861 he accepted the directorship

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1 of the Museo Público, having been recruited by Bartolomé Mitre and Do-
2 mingo Sarmiento (Lopes and Podgorny 2000; Pyenson and Sheets-Pyenson
3 1999, 350–80; Sheets-Pyenson 1988, 59–68). He found the collection, which
4 had never been professionally managed, in a somewhat chaotic state. Bur-
5 meister brought his training, expertise, and prestige to the table. It would
6 not be too much to date the beginning of the systematic, scientific pursuit
7 of paleontological research in Argentina to his arrival.

8 Shortly thereafter, he made the acquaintance of Muñiz, then in his
9 sixties, and entered into negotiations over the *Muñi-felis* specimen. Writ-
10 ing in 1866, Burmeister would offer the following secondhand account of
11 some of the exchanges related in chapter 1: “Some years before [1845],
12 Darwin . . . had been in Buenos Aires, and entered into correspondence
13 with Dr. Muñiz. . . . He heard of the interesting skeleton from his friend,
14 and offered Dr. Muñiz the sum of 500 pounds sterling in order to acquire
15 it for the British Museum. But Dr. Muñiz, so magnanimously devoted to
16 the study of his Fatherland’s fossil relics, refused to relinquish the skele-
17 ton, loudly declaring that he would transfer it only to the museum of his
18 hometown” (Burmeister 1867, 181). Burmeister proceeds to recount having
19 agreed with Muñiz on a sum equivalent to 1,600 Prussian Thalers, or about
20 240 pounds sterling. Reluctant to put what was, after all, a not inconsid-
21 erable sum on the public tab, he sought a private benefactor (D. Guil-
22 lermo Wheelwright of the Central Argentine Railway), finally acquiring
23 the specimen, for the negotiated price, on October 24, 1865. Argentina’s
24 acquisition of Burmeister and his reorganization of the museum show the
25 interest on the part of the government in patronizing scientific activity.
26 The implementation of this policy also coincides with an increase in spe-
27 cific references to Darwin’s evolutionary writings in prominent journals.

28 Another vector for the spread of Darwinism was the continuous
29 presence in Argentina of an active English-speaking community, within
30 which ideas coming from England circulated quickly. As we have noted,
31 Darwin established relationships with members of this community, such as
32 Dr. Edward Lumb, during his stay in Argentina and continued to maintain
33 them after his return. These connections on occasion led other Englishmen
34 living in Argentina to consult with this leading English naturalist. One
35 example is John Coghlan, an engineer with the railroad, who wrote Dar-
36 win in 1871 to offer his services in collecting specimens and again in 1878
37 to report the finding of an eight-legged horse.¹ Alfred Lumb, the son of
38 Darwin’s friend and correspondent in Buenos Aires, also continued the
39 family tradition of facilitating scientific exchange; in 1874 *The Zoologist*

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(2nd ser., 9, 4203) would report the arrival of “four rufous tinamous (*Rynchotus rufencens*) from the Argentine Republic, presented by Mr. Alfred O. Lumb.”

But the best-known example of the influence of Darwinian thought among English-speaking residents of Argentina is that of William Henry Hudson (1841–1922), an Argentine-born son of parents from the United States. Hudson was an autodidact who first learned of the new evolutionary theory when an older brother returned from England with a copy of the *Origin*. Though he lived on the Indian frontier and had absolutely no formal education, Hudson was able to assimilate this and other scientific works, in 1867 becoming a correspondent of the Smithsonian Institution (see Arocena 2003, 37).² The fact that someone like Hudson, living at the outermost periphery of the scientific enterprise and with no formal training, could nonetheless gain access to the scientific establishment was another advantage of the presence, beginning in 1861, of Burmeister, who enjoyed a sterling reputation and connections with the main scientific institutions in Europe and the United States.

The connection with the Smithsonian came about through Burmeister’s friend Hinton Rowan Helper, who wrote a letter to Dr. Spencer Fullerton Baird, who worked at the Smithsonian, on behalf of Hudson (Tomalin 1954, 36). Helper was the American consul in Buenos Aires and became close to the director of the Buenos Aires Museum.³ Helper later described an encounter with Burmeister in one of his books, providing us with a good example of the kind of scientific exchanges taking place in Argentina by 1867.

I was somewhat amused, four years ago, at my learned friend, Dr. Burmeister, the scientific German Director of the Museum of Natural History at Buenos Ayres, who came into the Consulate one day, and espying on my mantle-piece a huge tooth that had been unearthed and sent to me by another friend, Mr. Simon Ernsthall, of Cordova, in the Argentine Republic, he took it in his hands, slowly turning it over and over, and surveying it in the most thorough manner,—after which, looking at me, he remarked,

“You have here, strange enough, a tooth of a species of Mastodon that has been extinct for at least fifteen thousand years.” (Helper 1871, 145)

In 1866 Burmeister inaugurated the Paleontological Society of Buenos Aires, whose minutes were published in his new *Anales del Museo Público* (Annals of the Museo Público). Members of the Society were drawn

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1 from wealthy families whose interest in science was tied to their political
2 and economic ambitions. Reports of their early meetings frequently men-
3 tion Darwin in connection with discussions of species or localities he had
4 studied. He and Richard Owen are cited, for example, in the minutes of
5 the meeting of October 10, 1866, in an account of a recently discovered
6 *Toxodon* specimen (Sociedad Paleontológica de Buenos Aires 1864–1869,
7 1:xvi). Burmeister himself delivered most such reports. The character of
8 Burmeister’s *Museo Público*, and of the man himself, was such as to ensure
9 that the scientific activity of both museum and Society remained open only
10 to those who, by dint of social class or specialized knowledge, were admit-
11 ted to his select group.⁴ Through Burmeister, this group had access to all
12 the leading scientific journals, including the *Proceedings of the Linnaean*
13 *Society*, in which Darwin and Wallace had published their celebrated pa-
14 per of 1858. It was Burmeister who appears to have directed the course
15 of Argentina’s first serious scientific discussion of Darwin’s evolutionary
16 theory. In his latter years, and especially posthumously, Burmeister was
17 saddled with a reputation of trenchant opposition to Darwinism in all of
18 its forms. This view of Burmeister appears to have originated with the
19 generation of Argentine naturalists who labored in the shadow of, and
20 sometimes rebelled against, his authoritarian presence. In particular, Flor-
21 entino Ameghino repeatedly expressed it, even while acknowledging that
22 Burmeister’s work “must be considered among the precursors of Darwin-
23 ism” (1950, 79). A caricature of Burmeister as a “Biblical creationist,”
24 probably derived from Ameghino, also appears in Simpson (1984) and
25 Montserrat (2001).⁵

26 This description is surely false, as is clear from the seventh German
27 edition (1867) of his *History of Creation* and its French translation (1870).
28 To be sure, Burmeister did resist Darwin’s most provocative conclusions,
29 as evidenced by the minutes of the July 10, 1867, meeting of the *Sociedad*
30 *Paleontológica*: “There followed an account by Dr. Burmeister on current
31 opinion concerning the origins of the human race, and opposing the view
32 that it descended from the apes. By means of an analysis of the configu-
33 ration of the foot, of all the parts of the human body the most particular
34 in its construction, he demonstrated the fundamental difference between
35 humans and apes” (*Anales del museo público* 1864–69, 1:xxx). Burmeis-
36 ter’s vast reputation in the European scientific world contributed both to
37 the tremendous authority he wielded in Argentina and to his capacity to
38 gain outside recognition for Argentine science (see above, p. XX, for an
39 account of Broca’s praise of Burmeister’s erstwhile student Moreno) at a

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time when the “South American lands that provided European museums with large fossil mammals” (Lopes and Podgorny 2000, 111) had resumed funding the institutions responsible for collecting such materials, including the Museo Público. Well before his appointment as director, Burmeister had become established as “the outstanding general systematist in the developmental period in entomology” (Essig 1936, 88). His entomological handbook (Burmeister 1835) and natural history of the *Cirripedia* (Burmeister 1834) were cited extensively, the latter by Charles Darwin in his own 1854 monograph on the subject (C. Darwin 1854). His reputation did not simply evaporate with his permanent relocation to South America. In 1873 he was elected to the Entomological Society of London (*Entomologist’s Monthly* 1872–73, 274).

He was also an Honorary Member of the Royal Geographic Society, which published an obituary on the occasion of his death, noting that “one hundred and sixty-four scientific papers from his pen are recorded in the Royal Society’s Catalogue, and in addition he published several books of his journeys” (*Proceedings of the Royal Geographic Society* 1892, 477). Burmeister’s published accounts of his travels in Brazil in 1850–1852 became well known in both Europe and the United States. In 1862 H. W. Bates wrote Darwin to comment on his criticism of Burmeister’s description of the tropical forests (quoted in C. Darwin 1985–, 10:7). Burmeister’s impressions of the tropics and of Brazilian slavery would become standard references for those who wrote on these topics, in both scientific and popular forums. Reputable authors would continue to refer to his descriptions of the Brazilian natural environment and of Brazilian slaves well into the twentieth century (see, e.g., P. Martin 1933).

Among the coterie of large estate holders who supported Burmeister, there was particularly strong interest in Darwin’s account of natural selection. This interest may be traced in large part to the essential role played in Darwin’s argument by the analogy to domestic breeding. Thomas F. Glick has studied the reception of Darwinism among ranchers in neighboring Uruguay, noting that by 1871 the members of the Rural Association, many of them foreigners, found themselves debating “whether selection was a sufficient way to upgrade the national herd” (Glick 2001, 29; for further discussion, see Mañé Garzón 1990). Sarmiento, in his study of Francisco Muñiz, describes this important function that Darwin’s theory had for Argentina. By his account, selective breeding had been an essential part of the modernization of the national herds that characterized the civilization of Argentina. The elimination of the *vaca ñata* in favor of the European

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1 breeds was “achieved by taking exquisite care to cultivate and propagate
2 the most perfect types” (Sarmiento 1900d, 192). We find similar discussions
3 of breeding and the perfection of types in association with the replace-
4 ment of the gauchos and mestizos by European immigrants.

5 Another fact that explains the involvement of the landowners is that,
6 while exploring their own lands, Argentine ranchers came across intrigu-
7 ing fossil specimens. Those interested in studying and learning to clas-
8 sify them turned to Burmeister for instruction. On July 11, 1866, the first
9 meeting of the Paleontological Society featured an analysis by Burmeister
10 of “some bones recently found on Sr. Favier’s lands” (Sociedad Paleon-
11 tológica de Buenos Aires 1864–1869, 1:xi). This became a regular pattern.
12 By the 1870s, as Irina Podgorny explains, collecting fossils was quite com-
13 mon outside the city of Buenos Aires. In several towns “the curiosity of
14 teachers, priests, landowners, public employees, and doctors and phar-
15 macists competed with those who provided fossils to European institu-
16 tions specialized in natural history. It also competed with politicians from
17 Buenos Aires interested in creating collections and with the increasing
18 organization of the naturalist’s practice in Argentina” (1997, 41).

19 The publication of the first issue of the *Anales* was a big event, eagerly
20 anticipated. In an 1865 article in the widely read *Revista de Buenos Aires*,
21 Angel J. Carranza foresaw that the journal would allow Burmeister and
22 the museum to “establish ties with others of [their] class.” Furthermore,
23 such journals “bring honor to the nations that produce them, while at the
24 same time setting the tone for the intellectual movements emerging in
25 those nations” (1865, 521). Praising Burmeister for his appreciation of the
26 importance of science in modern society, Carranza credits him with raising
27 the level of Argentine scientific culture. Carranza further states that
28 Burmeister’s forthcoming article in the *Anales*, “Noticias preliminares
29 sobre los fósiles del Museo” (Preliminary Notice on the Fossil Collections
30 of the Museum), shows Burmeister to be well equipped for the difficult
31 work that had “opened the gates of immortality to Cuvier, Owen,
32 d’Orbigny, and Darwin” (520).

33 Carranza’s account shows that at this time there was no awareness of
34 the gulf between Burmeister’s and Darwin’s work. In his view, both sci-
35 entists were part of the same scientific current that originated in Europe.
36 So while Darwin’s name was well known to Argentine intellectuals in 1865,
37 the revolutionary character of his evolutionary work was not completely
38 understood. *Origin of Species* had been published in 1859, and by the
39 mid-1860s, some sense of the stir it was causing in Europe had reached

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the southern shores. Carranza speaks of “a great revolution” in natural history on the horizon, but without explaining what was revolutionary in it (520).

In a November 1865 article in the *Revista de Buenos Aires*, Vicente F. López offers a fascinating comparison between the science of classical period Europeans and that of Kys-Huas and Aymara Indians. “Taking classical erudition as a point of departure,” López set out to reinterpret indigenous American knowledge, promising “surprising” results. Furthermore, “the analogies we hope to extract from this procedure will justify the extravagance of our methods” (1865, 277). According to López, both classical and indigenous sources employ the same sorts of analogies in explaining the origins of life. Assuming that the classical analogies expressed secrets revealed to the initiates of the mystery cults, he asks whether “we might deduce that the American races had rested their knowledge of organic laws on a similar foundation.” For an answer, he turns to Apuleius’s *Metamorphosis*, or *The Golden Ass*.

López’s reading of a central analogy (or allegory) of *The Golden Ass* is of interest to us not so much for what it reveals about indigenous scientific knowledge, but because it affords us a glimpse into López’s understanding of Darwin. Apuleius’s ass “attained newfound human existence after symbolically inhabiting many other animal organisms.” This myth contains “profound moral and zoological truths”: “Seventeen centuries after Apuleius, his myth has become the scientific basis of the great discoveries of Cuvier, Goethe, and Darwin on the relationships and links between all animal species. And it was known and taught by the Egyptians!” (281). López’s text demonstrates, first of all, that he was aware both of Darwin’s views and of previous evolutionary ideas. Second, his argument for the common origin of all cultures rests less on any particular event in our shared biological history than on the universality of the analogies by means of which we describe and explain that history. Third, López’s analysis reveals the extent to which Darwin was catching on, not only because of the acuity of Darwin’s observations, but also because of the narrative power of his hypotheses. Here evolution becomes a process of metamorphosis, known for centuries from an analogy inherent in myth. According to this analogy, we change form without losing anything in the process. Metamorphosis does not require selecting and discarding either traits or individuals.

López’s interpretation of Darwin is probably indebted to the work of Jules Michelet, whose popularity in Argentina was in part responsible for

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1 the continuous spread of Lamarckianism.⁶ Michelet was also interested in
2 the analogy between evolution and metamorphosis, and his vision of nature
3 stood in stark contrast to the seemingly bleak materialism of the *Origin*.
4 As Edward Kaplan has argued, for Michelet, metamorphosis “bridges
5 nature’s differences. Michelet’s references elsewhere to Goethe, author of
6 *The Metamorphosis of Plants*,” reinforce “Lamarck’s putative spiritualism”
7 (1977, 22). Indeed Lamarck, as Michelet understood him, sounds a
8 lot like López. “The genius of metamorphosis had just been emancipated
9 by botany and chemistry. It was a bold but fortunate stroke to remove
10 Lamarck from the botanical pursuits which had occupied his life, and to
11 impose upon him teaching about animals. This fervent genius, accustomed
12 to miracles by the transformation of plants—full of faith in the oneness
13 of all life—evoked the animal creation, and that great animal, the globe,
14 from the petrification in which they had previously lain. He re-established
15 from form to form the circulation of spirit” (cited in Kaplan 1977, 22). The
16 failure at the time of López and many of his contemporaries to recognize
17 that Darwinism was something very different from what Michelet and Lamarck
18 were doing accounts, in part, for their refusal to see Darwinism as a
19 departure from ideals of the French Enlightenment and Romanticism. Like
20 Rawson a generation earlier, they saw evolution as an essentially benign
21 process grounded in a spiritual principle. Michelet’s “circulation of spirit”
22 would continue to inspire an Argentine culture moved to reject a materialism
23 that made no provision for design or progress in nature. In Argentina’s
24 reception of Darwinism, this would remain the most disturbing issue for
25 Darwinians and anti-Darwinians alike: coming to terms with an idea of
26 civilization whose progress toward perfection, unity, and harmony is neither
27 intrinsic nor inevitable. Jean Baptiste Lamarck and Alexander von Humboldt
28 would become the idols of those who opposed a strictly materialistic
29 Darwinian account of evolution. In seeking a spiritual principle in the
30 service of national unification, many would follow Michelet. “Society and
31 freedom have conquered nature, history has effaced geography. In the
32 marvelous transformation mind [or spirit] has triumphed over matter, the
33 general over the particular, and the ideal over the real. This individual man
34 is materialist, he willingly submits to local and private interest; human
35 society is spiritualist, it tends ceaselessly to free itself from the miseries
36 of local life, and to attain the lofty and abstract unity of the nation”
37 (Kaplan 1977, 22).

38 In the minds of such intellectuals as López, the whole of European
39 science and culture had to be woven together into a single narrative in

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which the central strand was a principle of unity, design, and perfectibility quite incompatible with the notions of struggle and variation. It would take a few more years before the truly revolutionary character of Darwinism was properly appreciated. When that happened, Darwinian evolution would consign to a world of truncated posterity and extinction all those who failed to meet a certain material condition: that of belonging to the right lineage.

Darwin makes the same sort of appearance in the *Revista de Buenos Aires* in 1868, in an article by Chilean writer and politician José V. Lastarria (1817–1888) on the geology of mountain chains. This piece follows almost word for word Jules Michelet’s *The Mountain*, published earlier that same year after Michelet had read Clémence Royer’s 1862 French translation of *Origin* (Lastarria 1868). Significantly, Lastarria uses Darwin in much the same way as Vicente López had three years earlier. He presents *Origin* as an updated version of theories propounded by Lamarck and Humboldt, downplaying the importance of struggle in favor of a vision of a world reaching toward unity. Lastarria follows Michelet, who had built “a case for a peaceful version of creation. His theory of knowledge implies that science and politics can reveal the same reality” (Kaplan 1977, 44). Paraphrasing Michelet, Lastarria contrasts two schools: the school of peace and the school of war. “[The school of war] is gaining ground. But the spirit of peace at all costs, which [Richard] Cobden allowed to prevail in the business of his country, appears to be what animates Lyell and Darwin. They have deemphasized the role of combat in nature, preferring that the Earth go about its business without great upheavals, transforming itself insensibly over the millions of centuries” (1868, 101). If something like this “spirit of peace” informs Lyell’s geological uniformitarianism (as contrasted with Cuvier’s catastrophism), the same can hardly be said of Darwin’s theory of evolution, gradualistic and uniformitarian though it may be. In discussing evolution, Lastarria uses the word *metamorphosis*, where it was common at this time “to use ‘metamorphosis’ to express a transformist—as opposed to fixist—interpretation of species development” (Kaplan 1977, 24). Also from Michelet comes Lastarria’s sense that such metamorphosis is “peaceful,” and the Earth itself “beautiful” (1868, 101). Lastarria acknowledges destruction, but his sense that nature is subject to a guiding spiritual force allows his optimism to prevail.

Of course, such literary description of transformations in nature belongs to ancient tradition. In the minds of Darwin’s contemporaries, the extent to which Darwin’s efforts continued that tradition, as opposed

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1 to departing from it, could hardly have been immediately clear. When
2 Vicente López, following Michelet, expresses his belief that biological
3 evolution can be illuminated by reference to classical literary sources con-
4 taining analogies similar to Darwin's, he understands Darwin as simply
5 taking up an age-old theme. In tying the new ideas to ancient descriptions
6 of transformation, he completely misses the fact that Darwin was not
7 interested in explaining the great chain of being, but in the much more
8 radical task of understanding variation in nature.

9 In Argentina, as in France during the same period, science and politics
10 were inseparable. Throughout the 1860s, French Republicans made con-
11 stant reference to science in their attacks on Church and Empire. This ten-
12 dency became even more pronounced the following decade, in the early
13 years of the Third Republic. The role of French Darwinism in Argentina
14 is particularly significant because, until 1873, Clemence Royer's French
15 translations of 1862 and 1866 were the main texts of the *Origin* acces-
16 sible to those who didn't read English. This was the same translation read
17 by Michelet. It was not until 1877, nearly eighteen years after its initial
18 publication in English, that *Origin* appeared in Spanish.⁷ *Descent of Man*,
19 published in English in 1871, was translated into French in 1872 by Jean
20 Jacques Moulinié, who had earlier translated Darwin's *Variation of Plants*
21 *and Animals under Domestication*. When first contacted by Darwin's cor-
22 respondent Carl Vogt, who at Darwin's instigation was actively searching
23 for a replacement for Royer, Moulinié announced his fervent hope that
24 his work would be "better than Mmle. Royer's [translation] of his book
25 on species."⁸

26 Royer's translation was thoroughly impregnated with her own views
27 and, in particular, with her appropriation of Darwin as a weapon in her
28 attack on the Imperial establishment. In a June 1862 letter to Asa Gray,
29 Darwin reports having recently received "a French Translation of the Ori-
30 gin by a Mad^{elle} Royer, who must be one of the cleverest & oddest women
31 in Europe is ardent Deist & hates Christianity, & declares that natural
32 selection & the struggle for life will explain all morality, nature of man,
33 politicks &c &c!!!"⁹ But Darwin's enthusiasm was short-lived. By Septem-
34 ber of that same year, he expressed his frustration with the liberties Royer
35 had taken in a letter to J. D. Hooker. "Almost everywhere in *Origin*, when
36 I express great doubt, she appends a note explaining the difficulty or saying
37 that there is none whatever!! It is really curious to know what conceited
38 people there are in the world, (people for instance after looking at *one* cru-
39 ciferous flower, explain their homologies!!)." ¹⁰ Darwin's strong criticism

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of Royer's first edition led her to attempt a second, published in 1866, for which the English naturalist supplied notes. However, he was unable to rid the text of Royer's own views.¹¹ Her commercial success led other translators to try their hands: "J.J. Moulinié, published by Reinwald in 1873, and Edmond Barbier, also published by Reinwald, in 1876." Despite their efforts, Royer's translations remained popular, and new editions appeared in 1883 and 1918 (Clark 1981, D1028; see also Harvey 1997).

Throughout her translation, Royer had "corrected" Darwin so as to bring him in line with her political agenda. Darwin's letter points to the discontinuity between his own descriptions and analogies and those of people like Royer. Royer's alterations also imported a Lamarckian tone into discussions of natural selection, a spirit consistent with the pre-Darwinian views on evolution predominant in Argentina at the time. As rendered by Royer, Darwin's text and the analogies it contained were converted from a treatise on nature into a naturalization of the translator's politics, making her translation even more useful for some of those who sought Darwinian support for their own political agendas. According to Thomas F. Glick, Royer's interpretation conflated natural and artificial selection, while dissociating selection and struggle. Selection was presented as a "zotechnical act" in which struggle and competition had no place (1989, 38).

Readers of Royer's work "automatically encountered bits of social Darwinism." She shocked religious sensibilities "by announcing that the book challenged Christian dogma" and also provided support "for laissez-faire economics and the naturalness of inequality among races or individuals within a nation or race." She "condemned 'blind and imprudent charity' for weakening the 'human race' by its promotion of the survival of feeble individuals who, left unaided, would have perished" (Clark 1981, D1028). The influence of Royer's reading would predominate in Argentina until well into the 1870s, and Florentino Ameghino cites her several times in his 1880 monograph on the antiquity of man in the Plata region (192, 208, 209).

Another of Darwin's contemporaries who explained natural change by recourse to literary tropes, also under the influence of Royer, was the French scientist Armand de Quatrefages, whose *Metamorphosis of Man and the Lower Animals* begins with a quotation from Ovid, "Our bodies undergo transformations; we shall be to-morrow, neither what we are to-day, nor what we were yesterday" (1862; 1864, 1). Quatrefages would frequently be cited in support of the attribution of change in nature to a vital principle, rather than to strictly materialistic laws. Throughout the early decades of the reception of Darwinism in Argentina, these and other

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1 French sources are invoked in the search for a less material, more spiritual
2 dimension to evolution.

3 But if early references to Darwin's evolutionary work treated it as a con-
4 tinuation of accounts of nature predicated on Humboldtian romanticism,
5 by the 1870s it had become clear what a drastic change the new evolution-
6 ism implied. In Argentina, the presence of a European authority such as
7 Burmeister hastened this recognition. Interestingly, as we have shown, he
8 helped to mitigate the peripheral position of Argentina through his net-
9 work of scientific contacts, increasing the speed with which the country
10 learned of debates taking place in Europe and the United States; but, on
11 the other hand, the insulated and powerful position that Burmeister had
12 consolidated for himself allowed him to maintain the same ideas he had
13 defended before the publication of *Origin* without any major challenge.
14 His work is thus a good example of what the introduction of Darwin's
15 theory of evolution meant for established conceptions of nature, not only
16 for Argentina, but for the European scientists who had made their careers
17 defending them.
18
19

20 **Darwinism and Peripheral Science: The Case** 21 **of Hermann Burmeister**

22
23 Karl Hermann Konrad Burmeister was born in 1807 in the Prussian Baltic
24 port of Stralsund, until 1815 a Swedish possession (Deutsches Meeres-
25 museum 1993, 7–32). In 1827 he began his studies in Halle, under the di-
26 rection of celebrated physician and botanist Kurt Sprengel (1766–1833).
27 He was awarded his M.D. in 1829 with a thesis on insect taxonomy. Shortly
28 thereafter, he gained his PhD, presenting an overview of fish anatomy.
29 The following year he moved to Berlin, taking up a post as surgeon to
30 the Kaiser Franz Grenadier Regiment. He apparently hoped, ultimately,
31 to serve as a military surgeon in the tropics, perhaps in the Dutch East
32 Indies. When this ambition was thwarted, he abandoned medical practice
33 in favor of natural history, remaining in Berlin, in close proximity to his
34 friend Alexander von Humboldt. He lectured in Berlin *Gymnasien*, then
35 at the University, from 1831 to 1837, when he returned to the University of
36 Halle-Wittenberg, first as lecturer, then professor of zoology. His charge
37 included the University's museum, whose collections expanded greatly un-
38 der his direction. 1843 saw the first publication of his great *Geschichte der*
39 *Schöpfung* (History of Creation), destined to go through several editions

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in both German and French. In scope and spirit, the first edition of this work is in many respects a precursor to Humboldt's *Cosmos*.

The volatile year 1848 found Burmeister politically engaged, active in socialist organizations of markedly nationalist stripe.¹² In 1849 he was elected to a seat in the Prussian Herrenhaus, which he resigned in frustration the following year. That same year, 1850, with his friend Alexander von Humboldt's support, Burmeister finally fulfilled his desire to visit the tropics. He spent nearly two years in Brazil, including several weeks in the company of pioneering Danish-born paleontologist Peter Wilhelm Lund (1801–1880; see Simpson 1984). Despite a leg injury that forced him to walk with a cane for the rest of his life, and a collision at sea, he returned to Halle in 1852 with vast additions to the museum's collections in tow (see Taschenberg 1894).

Burmeister's return to Halle in 1852 took him through Paris, where he met Juan B. Alberdi, then the Argentine Confederation's Ambassador to France. Alberdi subsequently wrote President Urquiza on behalf of Burmeister, who was already planning his next voyage. This second trip, also sponsored by Humboldt and beginning in 1856, took Burmeister from Rio de Janeiro to Montevideo and Buenos Aires. In Argentina, having secured government sponsorship, he set out to explore and describe the geology of Mendoza. On his return to Buenos Aires, he purchased an agricultural estate on the banks of the Paraná, which he directed his son Heinrich Adolph to manage. This venture ultimately failed. Heinrich returned to Buenos Aires in 1859, establishing himself as a successful merchant, while his father resumed his explorations. He set out first for San Miguel de Tucumán, crossed the Andes to Chile, then sailed for Peru, returning to Europe via Panama in 1860. According to museum records, the scientific bounty of this expedition was nothing short of astounding.

To his disappointment, however, Burmeister found himself largely marginalized back in Halle (see Taschenberg 1894; Nyhart 1995, 101). Natural history had been relegated to the status of an elective in the medical curriculum, leaving his lectures virtually empty. He had gained recognition and connections in Argentina and was thus in the know when, just as his disgruntlement in Halle reached its peak, the position of director of the new Museo Público in Buenos Aires was created. French naturalist Auguste Bravard had recently declined the job (he would, in any case, die in the Mendoza earthquake the following year) and Burmeister saw his chance. After securing the sponsorship of Bartolomé Mitre and Domingo Sarmiento, he embarked for Buenos Aires in 1861. By the time he arrived,

1 the political fortunes of these sponsors were in eclipse, and Burmeister's
2 appointment was not confirmed for some months. Eventually, however, he
3 set about the task of organizing the collections of the *Museo* and of pub-
4 lishing the widely distributed, scientifically rich *Anales del museo público*
5 (see Andermann n.d.; Berg 1895; Biraben 1968).

6 It is in the first volume of the *Anales*, in 1866, that we find the first pub-
7 lished discussion of *Muñi-felis bonaerensis*, its skeleton now rechristened
8 *Machaerodus neogaeus*, since Muñiz's article in the *Gaceta Mercantil* over
9 twenty years earlier (Burmeister 1864–1869). Burmeister's redescription of
10 the specimen agrees with Muñiz in most of its measurements but corrects
11 his nomenclature, on grounds of the priority of Cuvier's *Machaerodus*,
12 of which Muñiz had apparently been unaware. While he was publishing
13 the *Anales*, Burmeister's participation in European forums continued un-
14 abated.¹³ The following year, Burmeister published much the same de-
15 scription of the specimen in the German report cited earlier, the “Bericht
16 über ein Skelet von Machaerodus, im Staats-Museum zu Buenos Aires”
17 (Report on a Skeleton of Machaerodus in the State Museum of Buenos
18 Aires). While this account agrees with the Spanish text in its technical de-
19 tails, it is much richer in color, containing among other tidbits the account
20 of Muñiz's interchange with Darwin.

21 A professional naturalist who shared Darwin's entomological inter-
22 ests, it appears at first glance as though Burmeister may have heard of
23 Darwin even before the voyage of the *Beagle*. If so, he would have heard of
24 Darwin before nearly anyone else outside of Cambridge. His 1832 *Manual*
25 *of Entomology* mentions Darwin's observations of “a sand-wasp (*Sphex*
26 *sabulosa*) which wished to carry off a large fly,” shearing off the wings of
27 its prey first (Burmeister 1832; 1836, 500). But Burmeister is here refer-
28 ring to Charles Darwin's well-known grandfather, Erasmus, who claimed
29 that this example “shewed the power or reason in a wasp, as it is exercised
30 among men” (E. Darwin 2007, 176).¹⁴ In later work, as we have noted, Bur-
31 meister always showed profound respect for Charles Darwin the geologist,
32 zoologist, and explorer, citing him frequently (see, e.g., 1856b, 139). His
33 relationship with Darwin the intellectual revolutionary was much more
34 complicated, leading to a curious layering of Burmeister's later legacy. In
35 Germany, he had been known, and often vilified, as a radical materialist
36 and socialist, a vocal opponent of religion, and sometime member of the
37 “extreme left” delegation (*die äußersten Linken*) to the Herrenhaus. But
38 as a *Naturphilosoph* of Humboldtian stripe, his approach to nature re-
39 mained largely irreconcilable with Darwinism. In Argentina, this tension,

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coupled with his own authoritarian character, left him often at odds with younger scientists who had embraced the new theories.

True, Burmeister was no Darwinian, explicitly rejecting the hypothesis of common descent as it applied to humans in his *Der Mensch* (Man) (1868) and in later editions of the *History of Creation*. But of course this skepticism regarding the descent of humans was hardly unusual, even among figures otherwise favorably disposed to the theory of evolution by natural selection. We recall that, as noted above, one of Burmeister's chief objections, as expressed at the July 10, 1867, meeting of the *Sociedad Paleontológica*, concerned the anatomy of the human foot. As regards the relevance of this particular morphological peculiarity to the typological distinction between humans and apes, his convictions regarding the human foot date back at least to 1851: "We now assert that it is not the head, the hand, or the chest, but rather the leg, and most especially the foot, by which man is best distinguished, in zoological terms, from the animals. Nowhere else is man's bodily peculiarity more apparent, for besides the foot, no other body part has diverged so far from the corresponding parts of animals" (Burmeister 1851, 13). Burmeister's understanding of the taxonomic significance of the human foot had not changed in sixteen years; what had changed was the polemical context. The seventh German edition of the *History of Creation*, its final chapter updated to address the doctrine of common descent as it applied to human origins, also appeared in 1867. A French translation of this edition was published in 1870 and would be widely read in Argentina. In both texts Burmeister asserts,

Some have been tempted to overcome this difficulty [the diversity of the human species] by recourse to the theory of species variability as advanced by Lamarck, and renewed, in more recent times, by Darwin. According to this naturalist, when a species is subjected to different external conditions, it may be gradually transformed, such that forms originally indistinguishable from one another become differentiated into numerous distinct species with their distinctive characters, over the course of geological evolution. In this way, the original specific unity of the human race has dissolved into a multiplicity of diverse types. Even the positive anatomical difference between Human and Ape feet has been described as a consequence of the modification of a primordial type, and Man himself has been viewed, in all seriousness, as a modified, perfected Ape.

But we are disinclined to give our own assent to this hypothesis, though it has struck many as ingenious. As exact naturalists we must insist that problems of this sort lie outside the domain of healthy experimentation, and that it is far

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1 better to devote oneself to what can be known scientifically, and subjected to
2 positive scrutiny, than to become attached to conjectures that escape observa-
3 tion. Today, Man and Ape are both zoologically and psychologically distinct,
4 and as we cannot abandon the principle of the invariability of species characters
5 without overturning the whole of scientific zoology, we have every reason to
6 believe that the differences between them are primitive, have always existed,
7 and will persist in the future. (Burmeister 1870, 642–43)

8
9 The well-known biologist Emile Maupas executed the French transla-
10 tion, and the book was reviewed in some of the most important publi-
11 cations of the time. A review by biologist Eugène Fournier is generally
12 representative of its French reception. While noting his differences of
13 opinion with the German naturalist, Fournier feels obliged to do justice to
14 “a book for which the labors of its author have earned it the respect owed
15 to a legitimate scientific authority, conceived in an independent spirit,
16 and without any preconceived attachment to one or another cosmogony”
17 (1870, 136).

18 But Fournier takes Burmeister to task on the question of spontaneous
19 generation, noting that, while “he cannot deny that recent experiments
20 have rendered its existence in the present epoch extremely improbable,
21 still he asserts that ‘in the earliest ages everything was different, and so the
22 manner of origins must also have been of different nature. Lest we take
23 refuge in miracles and mysteries, we must concede that the appearance
24 on the Earth of the first organized beings was the result of the free play of
25 the generative forces of nature herself.’” In response, Fournier asserts that
26 “at first blush it is precisely *this* hypothesis that is mysterious—that after
27 the most delicate scientific investigations, we should still find it impossible
28 that the production of organized beings have occurred by means of the
29 physical and chemical forces regulating their material molecules—that
30 would be nothing short of miraculous” (1870, 136).¹⁵

31 Fournier’s review concludes by considering the curious paradox of the
32 final chapter of Burmeister’s book, “Man: the Youngest of the Earth’s Cre-
33 ations.” After citing Burmeister’s insistence on the taxonomic disparity
34 between man and the apes, Fournier remarks, “Despite this claim . . .
35 the author here abandons logic, for he rejects the notion that all humans
36 descend from a single couple. What’s more, he insists that antediluvian
37 humanity exhibits a different organization from postdiluvian humanity,
38 on which point he is much closer to the Darwinists, and to Mme. Royer,
39 than he appears to believe. And so with all due respect to the author’s

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specialized knowledge, we have our reservations, and feel obliged to alert our readers of the consequences to which, for want of logic, this History of Creation will lead them” (Fournier 1870, 137).¹⁶ As we have noted, by the time the edition reviewed by Fournier appeared, Burmeister had been living in Argentina for nine years and had become the leader of the anti-Darwinian front among Argentine scientists. But his arguments against common descent, as Fournier points out, were obscure and appeared to contradict some of his own views. It seems clear that he was also struggling to come to terms with how the Darwinian revolution was changing the basic paradigms that he and Alexander von Humboldt had defended for so long. By the end of the 1870s, Burmeister’s view of Darwin may have evolved slightly. In 1879 he writes,

Modern science is obliged to acknowledge original generation as the inevitable hypothesis. The observation of the remains of organized beings in the sedimentary deposits of our world reveals that primitive plants and animals were in some respects inferior to contemporary types, which must have emerged little by little, changing successively over the course of the geological epochs of their presence on this globe, until finally the arrival of man, and of the most perfect plants and animals, signals the completion of our planet’s final and most sublime product. . . . On this basis, I am wholly convinced that the beings found in the older formations of our globe are the prototypes of contemporary beings, and in this respect, I declare myself a partisan of the hypothesis recently developed in detail, and as a natural law, by Darwin and his followers. But I must confess that their experiments have not provided me with any proof that any fundamental change in type is possible. . . . An insect, for example, may never transform itself into a vertebrate, because it belongs to a fundamentally opposed type. (Burmeister 1879, 11–12)

Of course, Burmeister’s Darwinian “partisanship” is hardly wholehearted. To begin with, his understanding of contemporary organisms as descended from antediluvian fossils predates Darwin’s *Origin* and may be found clearly expressed in his corpus at least as early as 1856. This is not a strictly Darwinian hypothesis. Furthermore, we note that despite his superficially conciliatory tone, Burmeister’s objections to common descent must be understood as very deep-seated indeed. “Characters” or “types” do not, in his view, inhere only, or even primarily, in Linnaean phyla or classes, but rather in *species*. To question the possibility of “fundamental change in type” is thus to question the possibility of speciation. Indeed, like many

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1 naturalists of his generation, Burmeister was a nominalist (or convention-
2 alist) about the higher levels of the Linnaean hierarchy, but a *realist* about
3 species. Nowhere is this more evident than in his *Zoonomische Briefe*
4 (Zoonomic Letters). “The only real being at hand is the final, lowermost
5 division, called species. It alone may be seen, grasped, collected, and com-
6 piled. All of the other, higher groups are mere notions, established on the
7 bases of one or another common feature, but whose real existence must
8 be denied . . . strictly speaking [they] have as little reality as the types they
9 encompass; they are human creations, ideal shapes that the naturalist de-
10 rives from the real forms of the species, and thus more the product of intu-
11 tion than any determinate rule. This is the basis for the wavering, variable
12 quality of the [Linnaean] system” (Burmeister 1856c, 7). Despite the 1879
13 passage quoted above, we find no reason to believe that Burmeister ever
14 changed this view and plenty of evidence that he maintained it until his
15 death in 1892.

16 It is important to set the record straight regarding the nature and extent
17 of Burmeister’s resistance to Darwinism, for several reasons, all related
18 to a central theme of this book. Among other things, we are concerned
19 with the study of peripheral science as a means of illuminating the cul-
20 turally contingent aspects of scientific activity. Burmeister’s intellectual
21 peculiarities are as much cultural as they are individual. To a degree, his
22 trouble coming to terms with Darwinism is a reflection of deep tensions
23 between Darwin’s theory and the German tradition of natural philosophy,
24 a tradition from whose post-Darwinian currents Burmeister was at least
25 partially cut off after his emigration.¹⁷ In 1871 Charles Darwin quoted
26 Burmeister’s countryman Carl Vogt as asserting, two years earlier, that
27 “no one, *at least in Europe*, any longer maintains the independent crea-
28 tion . . . of species” (qtd. in C. Darwin 1874, 1; emphasis added). One
29 cannot help but be reminded of two great naturalists who *had abandoned*
30 *Europe for the Americas*, Louis Agassiz and Hermann Burmeister, and of
31 their continued, increasingly insular opposition to Darwinism.

32 In this regard, Burmeister’s persistent (if, in later years, somewhat
33 hedged) rejection of Darwinism is of interest because of the cultural tran-
34 sition he himself undertook. He left Europe for Argentina as a mature
35 thinker two years after the first publication of *Origin*, before the book was
36 translated into French, and consequently before the community of conti-
37 nental naturalists had had time to assimilate its arguments. But assimilate
38 them they would, in Germany as in France. The German champion of
39 Darwin par excellence was Ernst Haeckel, who had much in common with

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Burmeister, despite their differences. In Argentina, Haeckel's influence mounted just as Burmeister's began to decline. Given Burmeister's impact on Argentina and Haeckel's impact on the whole of Latin America, certain cultural affinities with Germany merit closer examination, along with the grounds for Burmeister's resistance to, and Haeckel's acceptance of, Darwinism. In this story, as elsewhere in this book, analogies have a big role to play.

Burmeister's published objections divide into two categories: epistemological and metaphysical. In epistemological terms, he insists that the Darwinian hypotheses be excluded from scientific discourse because they weren't subject to "positive scrutiny" (Burmeister 1870, 643).¹⁸ We are reminded of similar scruples on the part of Darwin's countrymen William Whewell, John Herschell, and John Stewart Mill (see Hull 1989). Common descent is unverifiable; it lies outside the bounds of "healthy experimentation." His metaphysical objections amounted to a defense of species fixity as essential to the *system* of scientific zoology as he understood it: "We cannot abandon the principle of the invariability of species characters without overturning the whole of scientific zoology" (Burmeister 1870, 643).

In other words, what Burmeister clearly observed was that the new evolutionism threatened philosophical ideas at the core of what he thought was the basis of civilized science. He was unable to negotiate the resulting changes or provide a new philosophical grounding for science, because, having become himself the appointed authority on European science, he had no incentive to do so. In a country that had based its political system on the correctness and superiority of the very ideas he championed, his old view of progress and evolution remained highly congenial. Cultural contingency protected him from the evolving scientific context of the time. Had he remained in Europe, he would have been in a very different position, as were those of his colleagues he had left behind. Even had he continued maintaining the same views, he would have been pressed to address the new evolutionism more carefully, responding in a more detailed way to some of Darwin's revolutionary claims. The best illustration of Burmeister's peripheral situation may be found in a series of bitter conflicts between him and later European émigrés, scientists whom he himself helped to recruit.

In 1868, shortly before Sarmiento became president, Burmeister sent him a report in which he recommended establishing scientific institutions in the city of Cordoba, which led to the hiring of several foreign professors.

1 The Academia de Ciencias (Academy of Science) was founded in 1869,
2 and after the newly recruited academics began to arrive, Burmeister was
3 named its first president in 1873. In this capacity, he drafted its original
4 by-laws in 1874. During this period, Burmeister brought to the country im-
5 portant figures in chemistry (Max Siewert from Halle University), botany
6 (Pablo Lorentz from the University of Munich), geology (Alfred Stelzner
7 from the Bergakademie of Freiberg), and zoology (Hendrik Weyenbergh,
8 Utrecht and Göttingen Universities) (see Leanza 1992, 392).

9 But just as Burmeister's hold on the scientific establishment was reach-
10 ing its peak, extending into new regions and institutions, Darwinian ideas
11 were spreading, both in Europe and Argentina. The new professors of zo-
12 ology and botany were hired from institutions with which Burmeister was
13 eminently familiar, but they had been forced to participate in the latest
14 evolutionary debates and had found ways to reconcile received philosoph-
15 ical premises with the new reality of post-Darwinian science. In the 1860s
16 and early 1870s, while Burmeister had been shielded by his peripheral po-
17 sition, they had found themselves in the thick of the redefinition of science
18 that was taking place in Europe. But to their surprise and amazement, the
19 very colleague who had recommended their appointment became an im-
20 placable enemy, unwilling to forgive their betrayal of strict pre-Darwinian
21 tradition. Because Darwin's influence was strong in zoology, this field was
22 the target of Burmeister's particular scrutiny.

23 In an 1875 issue of the *Periódico Zoológico* (Zoological Journal), the
24 president of the Zoological Society, Hendrik Weyenbergh, alludes to a
25 confrontation “with a man who ought to have been [the society's] sup-
26 port and strength, but who instead has sought by all means to destroy it”
27 (1875b, 3).¹⁹ In this same issue, Weyenbergh also introduces the first article
28 written by a native-born Argentine, the young Eduardo Holmberg, and
29 uses the occasion to attack Burmeister, revealing an obvious generational
30 and cultural conflict with the younger scientists who had been weaned on
31 the debates sparked by the Darwinian revolution. “I have never agreed
32 with Dr. Burmeister, who believes that the sons of the Argentine Republic
33 are incapable of serious work in the exact sciences. Dr. Burmeister has of-
34 ten told me that all Argentines are inept boys, from whom no work in the
35 natural sciences can be expected. He speaks in the same terms of disdain
36 of all the eminent men of the Republic” (Weyenbergh 1875a, 277–78).

37 Clearly the new generation of promising native scientists was interested
38 in Darwin, a proclivity that would hardly raise their stock in the eyes of
39 a Burmeister. Weyenbergh and the journal that he directed encouraged

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1 this interest, and he directly cites the new theory in this same issue. In an
2 article on recent zoological work on South America, he refers to the “de-
3 decisive importance of Darwin’s theory” in a discussion of migration (1875c,
4 307). Burmeister’s role in this debate and his battles with other scientists
5 cemented his growing reputation as interested only in his European con-
6 tacts, an aristocrat dismissive of local talent. His limited engagement with
7 Darwinism also contributed to this image of a man out of touch with Ar-
8 gentine reality (for more information, see Acosta 2006).

9 Ironically, in the world he had left behind, Burmeister’s legacy was
10 being read rather differently. In Europe his reputation as a materialist
11 and opponent of religion was so strong that Father Ceferino González, in
12 his *Historia de la Filosofía (History of Philosophy)*, published in Spain in
13 1886, branded Burmeister a “radical Darwinian” aligned with the Darwin-
14 ian evolutionist Ernst Haeckel (288). He also classified him as a member
15 of the “Hegelian left” with, among others, Émile Littré, Thomas Henry
16 Huxley, and Paolo Mantegazza (229). We can only imagine the horror
17 that Burmeister would have felt at being placed in such company, but this
18 example shows the degree of confusion to which evolutionary ideas had
19 given rise. In fact there *were* many common elements between Burmeister
20 and Haeckel, because Haeckel’s evolutionary phylogeny was strongly
21 influenced by Burmeister’s approach to systematic zoology. More impor-
22 tantly, an idealist conception of type was important to both of them in
23 their understanding of racial differences.

24 But by the 1860s Haeckel had already been recognized as having out-
25 done Burmeister even in his own favorite field of morphological system-
26 atics (Jaeger 1871,282). What’s more, this accomplishment was widely
27 credited to Haeckel’s willingness, *contra* Burmeister, to take Darwinian
28 phylogeny into account in taxonomy. For example, in an 1869 article on
29 recent advances in the study of rotifers, Samuel Bartsch notes that the tax-
30 onomic place of the rotatoria had long been a point of contention among
31 zoologists, with “Ehrenberg . . . placing them among the infusoria, while
32 Burmeister and Leydig did everything they could to find them a place
33 among the crustaceans.” Now, with Haeckel’s help, “they have found their
34 true place, thanks to the theory of common descent” (Bartsch 1869, 325).

35 But despite the brief refutation of Darwinism in the seventh German
36 edition (1867) and first French edition (1870) of the *History of Creation*,
37 neither volume contains a single mention of Haeckel, an omission too
38 remarkable to put down to mere oversight (though a cursory reference
39 to Haeckel may be found in Burmeister 1879, 24). For his part, Haeckel

1 frequently refers to Burmeister, and often—though not always—in com-
2 plimentary terms. One such reference occurs in Haeckel's own great
3 contribution to morphology, his *Generelle Morphologie der Organismen*
4 (*General Morphology of Organisms*; 1866). In short order, Haeckel waves
5 aside both Burmeister's metaphysical objection (his insistence on species
6 fixity as constitutive of systematic zoology) and his epistemological ob-
7 jection. Reflecting on the pre-Darwinian attitude of naturalists toward
8 the species category, Haeckel observes, "Until recently, the majority of
9 naturalists, even when prepared to admit a certain degree of arbitrariness
10 [in classification] nonetheless treated the species-concept as an exception.
11 The species-category alone was supposed to constitute an absolutely de-
12 terminate, real, clearly defined sum of forms, grounded in nature herself"
13 (1866, 378). As an exemplary advocate of this now outdated view, he cites
14 Burmeister.

15
16 This conception both of the [taxonomical] system and of its various catego-
17 ries, which more or less dominates the understanding of most zoologists and
18 botanists, and is applied throughout systematics, is expressed most clearly by
19 Burmeister, a systematist who distinguishes himself from many others by virtue
20 of his clarity and perspicacity, in his *Zoonomische Briefe*. Like Linnaeus, he
21 compares the customary categories of the schema we have just described with
22 the hierarchy of groupings in an army. The phyla, classes, orders, families and
23 genera of the animal and plant kingdoms, like the divisions, regiments, bat-
24 talions, companies, platoons, and squads of an army, are mere notions, ideal
25 abstractions, meaningful only by virtue of the plurality of real bodies, the indi-
26 viduals that underlie them. In an army, these individuals are particular soldiers.
27 According to Burmeister, in the organic system, they are the species. He says,
28 'The only real being at hand is the final, lowermost division, called species. . . .'
29 Burmeister defends this view in detail . . . , and his exposition is especially
30 noteworthy because it so clearly reveals the prejudice with regard to the
31 species-concept under which this superlative systematist labors, one who plies
32 the systematic trade with more sense and understanding than most others.
33 (1866, 378–79)

34
35 But Burmeister's problem isn't just that he continues to adhere to the
36 doctrine of species fixity, made obsolete by Darwin. In doing so, Haeckel
37 accuses, he fails to follow through on *the logical consequences of an anal-*
38 *ogy* he himself has accepted: "If Burmeister, in his treatment of the very
39 revealing comparison between the systematic categories and the hierar-

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chical groupings of an army, locates the real individual, corresponding to the individual soldier, at the level of the species, then he has taken a great step backwards even from Linnaeus, in whose schema *miles* [soldier] is aligned with *individuum*” (379; emphasis added). Analogies carry scientific weight, and Burmeister, Haeckel charges, has paid insufficient care to entailments of his own analogies. Seen in this light, Burmeister’s insistence on positive evidence, like William Whewell’s insistence on the canons of inductive reasoning, is a perfectly intelligible response to a scientific theory based—more, perhaps, than any other—on *arguments from analogy*.

Because, as we argued in our introduction, analogies and the scientific arguments based on them must be understood as contingent on the cultural contexts in which they are articulated, Burmeister’s situation is a good case in point. As the designated champion of a certain brand of the Enlightenment in Argentina, he saw its defense as essential to the preservation of science itself. By contrast, homegrown scientists were free to blend old and new ideas without the concerns that affected Burmeister. Regardless of the degree of his intellectual dogmatism, within two decades of his arrival the scientific culture of the country had been transformed. Writing in 1888, Emilio Daireaux offers the following observations on Burmeister and his disciples:

A school . . . has arisen in pursuit of yet another class of discovery. Its members seek to unearth the country’s historical secrets, and include anthropologists, like Don Francisco Moreno; ethnographers, like Estanislao Zeballos; and explorers, like Lista and Zeballos. These men have followed in the footsteps of those illustrious savants who have explored this country and its neighbors since the beginning of the century, whose names include Humboldt, Bonpland, D’Orbigny, Darwin, and Bravard. . . . The distinguished members of this new school, to whose excellence their own work testifies, all owe a great deal to this eminent scholar [Burmeister], who has shown by his own example the path by which we might follow our illustrious forebears, and who with his own books, in which he relates his daring explorations, has contributed so much to the understanding of our national origins, and of prehistoric races. (1888, 431)

Burmeister had brought German systematicity to Argentina—though, as all of the Argentine disciples Daireaux cites were well aware, the younger Haeckel had outdone him on this very score. Haeckel had integrated Darwin’s insights into a philosophical system eminently congenial with the predilections of midcentury Argentine intellectuals. He forged a

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1 philosophical continuity between the world before and after Darwin. We
2 will return to consider the ultimate fate of this system in later chapters,
3 and particularly to the ways in which its ability to connect politics and
4 science made him a key figure in the process of making Darwinian ideas so
5 integral to Argentine thought.
6

7 **The Understanding of Darwinian Evolutionism**

8

9
10 As is evident from the debates discussed in the previous section, by the
11 1870s it was clear that Darwinian ideas were no mere continuation of the
12 old tradition of natural philosophy or French Enlightenment ideas, but a
13 radical departure from them. Recognition of this fact left the whole con-
14 ception of science as an expression of a universal culture inherent in civi-
15 lized nation building in jeopardy. Darwin was not interested in creating
16 a universal narrative that cast nature and human societies in analogous
17 terms. More importantly, his notion of temporality was perhaps the most
18 damaging aspect of his theory, because his account of evolutionary con-
19 tingency undermined the notion of a universal timescale along which the
20 shared progress of all individuals toward their unified destiny could be
21 measured. Because populations evolved in different directions and at dif-
22 ferent speeds, both the unified destiny and the uniform temporality of
23 progress were called into question. As was correctly understood not only
24 in Argentina, but elsewhere in Latin America, the Darwinian revolution
25 left a philosophical void that was difficult to fill.

26 The old Kantian idea of a philosophical system appealed greatly in
27 Spanish America and continued to operate in the reception of Darwin-
28 ism. In 1877, for example, the *Revista de Cuba* published an article by
29 Julián Gassié (1850–1878) on the work of Haeckel that makes it clear how
30 Haeckel could be read as having addressed the metaphysical objections
31 of someone like Burmeister.²⁰ According to Gassié, since 1868, with the
32 publication of Haeckel's *Natürliche Schöpfungsgeschichte* (Natural His-
33 tory of Creation), Darwinism had increasingly become the focus of revo-
34 lutionary thought, such that by 1877 it boasted “hundreds of partisans on
35 both continents” (Gassié 1877, 256). Germany's receptivity to Haeckel's
36 Darwinism owes much, Gassié claims, to Goethe, a precursor to Darwin,
37 to “the genial qualities of the [German] race, and to the preparation of its
38 spirits by way of the well-known Hegelian principle of *process* (the meta-
39 physical conception corresponding to the scientific doctrine of evolution),

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which greatly facilitated [Darwinism's] diffusion. What's more, thanks to the capacity for generalization and breadth of spirit that have made the Germans, like the Aryans of India, the synthetic race *par excellence*, the German savants have applied the principles of Darwin's system to linguistics, psychology, history, morality, medicine, and nearly every branch of the human sciences" (257).

Darwinism per se, with its implicit materialism and its emphasis on struggle, may have been too inconsistent with past ideas—but as corrected by Haeckel, supplemented by a metaphysical account of progress and reconciled with German idealism, it becomes much more congenial to the pre-Darwinian ideology that had been so important in Spanish America. Whereas Darwin lacks Haeckel's "generalizing intelligence," the German naturalist combines intelligence, imagination, and intuition, allowing him to "comprehend nature in its unity, without losing sight of it in the details of merely empirical research." Darwin offers no philosophical system in which his ideas might be reconciled with those of the past, nor is he interested in formulating the kind of synthesis that might serve as the underpinning of a well-defined philosophical movement. Gassié agrees with Haeckel that "empirical naturalists who don't take the trouble to arrange their observations philosophically, or who lack any general insight, do very little toward the advancement of science." The main worth of their "painstakingly collected details consists in the general results some more comprehensive intellect will extract from them later" (262).

The recognition of the philosophical problem brought on by Darwinism was not unique to Spanish American thinkers. French positivism, which was very influential in Argentina, was caught in the same dilemma. Emile Littré, who was responsible for the dissemination of Comte's ideas in France and England, regarded the new theory as "rationalistic and not experimental, ingenious but lacking sufficient evidence." More importantly, he considered the new evolutionism a matter "of purely biological and not of philosophical interest; even if Darwin's hypothesis were proved, it would carry no philosophical implications" (Simon 1963, 25–26).

Gassié's article is representative of a broad-based tendency on the part of Spanish American thinkers of his generation to look to Haeckel for a philosophical correction of Darwin. This tendency must have been galling for Burmeister, but it shows how, among intellectuals who labored under the Spanish colonial legacy, Haeckel's work could be read as an attempt to reconcile old and new ideas. Contrary to those who believe that the chief participants in this debate were unable to distinguish Darwin from

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1 Spencer, for example, we are more inclined to read them as deliberately
2 “correcting” both, in an attempt to produce a self-conscious evolutionary
3 fusion that would prove beneficial to the country.²¹

4 In most cases, this blending of the Positive method with Darwin’s,
5 Haeckel’s and Spencer’s ideas reflects not ignorance, but a creative effort
6 bent on overcoming the contradictory character of civilized thought. When
7 an intellectual went with Spencer over Darwin, it is not because he failed
8 to understand the latter’s work, but because he thought, with some reason,
9 that the political consequences of his analogies contrasted far too sharply
10 with the faith in progress he felt was essential to the idea of civilization and
11 the successful organization of the nation. Darwinism was a complicating
12 factor in Positive Science’s straightforward method for bridging scientific
13 and political worlds. Its lack of any strong teleology undermined the inevi-
14 tability of progress—and thus the obsession with progress so typical of the
15 intellectual discourse of the 1880s is a sign of the perceived need to bolster
16 a belief in it that the advent of Darwinism had called into question.

17 During the 1870s, the recognition of the revolutionary character of
18 Darwin’s theory is revealed by the interest among intellectuals in the self-
19 conscious admixture of all sorts of evolutionary thought, derived from
20 English, French, and German sources. As we have discussed in the case of
21 Rawson, Lamarck’s ideas were important well before Darwin, and with the
22 publication of *Descent of Man* in 1871, quasi-Lamarckian approaches to
23 inheritance made a comeback. In Argentina, as we have suggested, those
24 interested in Darwinism were working to appropriate this revolutionary
25 theory while simultaneously “correcting” it. And much the same was true
26 elsewhere. As the work of Ernst Haeckel and later August Weismann
27 demonstrates, there remained tremendous gaps in evolutionary theory,
28 especially with regard to the mechanisms of heredity and variation, and
29 consequently a great need for a new synthesis that would explain what, ex-
30 actly, evolution was and how it worked. Most of the figures covered in this
31 book were engaged in one or another aspect of the attempt at synthesis,
32 though their approaches varied with their particular areas of expertise.

33 The tensions brought on by the Darwinian scientific revolution are no-
34 where more in evidence than in the later works of members of the Gen-
35 eration of 1837 who had been responsible for the supremacy of science in
36 Argentina. Two of its most prominent intellectuals and politicians ended
37 their lives trying to make sense of the new evolutionism, and how it fit
38 or failed to fit their designs for the country. Juan B. Alberdi wrote his
39 *Luz de día* (Daylight) while in London, publishing it in the same year as

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Darwin's *Descent of Man*. In one section, he contemplates the consequences of applying Darwinian thought toward the organization of a nation. In a pointed satire, Alberdi observes that Darwinism has "heated" a great many heads, singling out Sarmiento for particular ridicule. Slyly, he remarks on the close association between the promotion of the new science and the consolidation of power in the hands of Bartolomé Mitre and his followers (Paz 1979, 69).

Sarmiento's considered response came in 1883, with the publication of *Conflicto y armonías de las razas en América* (Conflict and Harmony of Races in America), in which he updated his famous *Civilization and Barbarism* to reflect Darwinian insights, while also refuting the charges leveled against him by Alberdi and others. Both authors offer mixed interpretations of Darwin, revealing just how hard they were struggling toward new conceptions of progress and civilization (see Novoa 2007). Both of them, but particularly Sarmiento, wanted to add design to Darwin so as to allow them to conclude, as they always had before, that evolution was a force toward perfection in accordance with some rational plan. In short, they tried to assimilate the new ideas to the tradition they had been defending since their youth.²²

It is difficult to pinpoint exactly when each of them first read Darwin's evolutionary work. Sarmiento wrote in 1868, while en route from the United States back to Buenos Aires, that he was aware of the disputes between Agassiz and Darwin, further asserting that "Darwin's theory was Argentine" and that he would "nationalize it with the help of Burmeister" (Sarmiento 1900j, 321).²³ He was evidently unaware of Burmeister's opposition to Darwin. Alberdi must have become aware of the new theory by around the same time, if not earlier. In 1869 he wrote that, if we accept a science that sees "the mixing" of races as the path to the perfection of the species, "racial distinctions make no sense." Lending further authority to this claim, he asserts that "the naturalist Darwin has cleared away any doubt concerning this natural truth, that is much more important than generally believed to the freedom of the human lineage [*género humano*]" (Alberdi 1899, 349). By the 1870s, Alberdi made use of Darwin in his political writings. He found the latter congenial in part because both he and Darwin had been influenced by the same sources in economic theory.²⁴

During the decade of the 1870s, allusions to Darwin no longer consist mostly of references to his geological studies.²⁵ Now they are informed by a shared understanding of the scope of the revolution his discoveries had sparked. Many of the major intellectuals of the time had, in one way

1 or another, weighed in on the new theory of evolution. In 1875 Eduardo
2 Holmberg (1852–1937), then a medical student, wrote *Dos partidos en*
3 *lucha* (Two Battling Parties), a fantastic allegory of the battle between
4 those who favored the Darwinian revolution and those who opposed it.
5 Holmberg's representation of the opponents is particularly interesting, as
6 their motives include not only religious conservatism, but also adherence
7 to traditional ideas on the meaning of civilization.

8 Holmberg's intervention coincided with the reorganization of the
9 University of Buenos Aires in 1874 and the inauguration of its School of
10 Physics and Natural Sciences the following year (Pyenson 1978). After the
11 establishment of the the Academy of Sciences and the National Observa-
12 tory in Cordoba, in 1869 and 1871 respectively, the Academy of Mathe-
13 matical Sciences and the Academy of Physics and Natural Sciences (1874),
14 the Museum of Paleontology and Archeology (1877), and the Geographi-
15 cal Institute (1879) all followed in quick succession (see Terán 1986). The
16 capitalist expansion and the modernization that ensued had prepared
17 the way for the introduction of new scientific ideas and especially for a
18 revolutionary transformation in the understanding of humanity's relation-
19 ship with nature. Also in 1875, Holmberg introduced Darwinian science
20 to the curriculum at the *Escuela Nacional de Maestras* in the hopes of
21 encouraging future teachers to bring the latest scientific developments into
22 their own classrooms. This move was highly controversial, and Domingo
23 Sarmiento emerged as the chief advocate for teaching Darwinism in the
24 schools. Sarmiento's opposition to religious domination of education is
25 evident in several pamphlets in which he opposes the teaching of creation-
26 ism (Sarmiento 1900f, 92; orig. publ. 1881).

27 The importance that science had acquired in Argentina by the mid-
28 1870s was also recognized outside the country. In March 1876, C. Gilbert
29 Wheeler (1836–1912), professor of chemistry at the University of Chicago,
30 dispatched a report from Buenos Aires on his experience in the country.
31 Published in *Popular Science* the same year, his account offers an interest-
32 ing picture of a scientific community in the midst of the upheaval of revo-
33 lutionary change. Wheeler captures the tension between Burmeister and
34 his colleagues when he refers to the “anomalous relation” between these
35 scientists, subordinated to the Academy of Sciences and its president, and
36 the members of the faculty at the University of Cordoba.

37 Wheeler also notes the devotion of certain young members of the
38 educated elite to the study of science. In addition to a “considerable
39 number of foreign eminent men,” Argentina had a few “natives, mostly

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younger men, who are devoting themselves to scientific pursuits” (465). As we have noted, these young men were mostly part of the local elite that took research as a patriotic act, and began to chafe against Burmeister’s authority. They gathered in the *Sociedad científica argentina* (Argentine Scientific Society), where they had a comfortable space “well supplied with scientific periodicals. There are seven hundred books in the library” (464). The society hosted a lecture every July 28th, and Wheeler makes a point of noting that at these events “ladies are also present” (464). Finally, the report ends by mentioning the scientific journals published at the time. Significantly, the author comments on the interest that the popular press had in publishing scientific communications. He explains that the prevalence of “some taste among the general public for scientific reading is exhibited by the circumstance that the daily papers find it worth their while to frequently admit scientific articles (467).

The *Sociedad científica argentina* was founded in 1872, its agenda largely dictated by government interest in harnessing science in the service of national identity. As Oscar Terán (1986) has argued, this interest was characteristic of Latin American (as opposed to European) positivism; Argentine positivism, in particular, was *programmatic*. Programmatic relationships between new scientific ideas and the modernization of the country are in evidence throughout the early volumes of the society’s *Anales*. Naturalists’ accounts appeared side-by-side with articles on economic modernization. The January 1877 issue featured a geological study, a statistical survey of the railways of the world, and a piece on indigenous customs, including the use of sulfur in treating animal hives.

Darwinism was thus catching on at a time when members of the intellectual elites saw science, industry, and economics as closely intertwined in the program of modernization. But uniting such diverse activities under the umbrella of the *Sociedad científica* also caused new tensions. In a January 1876 meeting of the *Sociedad*, Estanislao Zeballos complained about the relative abundance of funds for the purchase of books on engineering, compared with the scarce allocation for books in other scientific fields. He argued for reapportionment. Luis A. Huergo, an engineer, disagreed, replying that, in his view, the Society’s library was quite representative. Zeballos rejoined that it was absolutely “necessary to acquire for the library a collection of scientific works on the Republic, including those of D’Orbigny, Darwin, Bravard, etc.” (1877, 9–10). His reference to Darwin is fairly typical of this period, by which time the Englishman was already generally acknowledged as one of the world’s foremost scientific minds.

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1 The fact that Darwin had studied Argentina placed the country in contact
2 with a form of modernity that Zeballos sought to enhance. Argentina was
3 part of the story of modern science, and so science must become part of
4 the story of modern Argentina (Zeballos 1877).

5 In addition to its active members, the *Sociedad científica* included such
6 prestigious honorary members as Guillermo Rawson, Pedro Visca, Mario
7 Isola, Hermann Burmeister, and the astronomer Benjamin Gould. It also
8 had its international correspondents, including Leon Domecq in Spain,
9 Pellegrino Strobel in Italy, Ladislao Netto, director of the Museum of Rio
10 de Janeiro, in Brazil, and John Lubbock and Walter F. Reid in London.
11 Lubbock, for his part, was close to Darwin, a frequent correspondent and
12 sometime neighbor. Reid also knew Darwin, and it was he who communi-
13 cated the Society's offer of honorary membership, which Darwin accepted
14 in 1877.²⁶ In 1878 the *Academia nacional de ciencias* (National Academy
15 of Sciences) in Córdoba followed suit with an honorary membership of
16 its own, and in 1879 Darwin also accepted honorary membership in the
17 *Sociedad zoológica* (Zoological Society).²⁷ Darwin's election to the *So-*
18 *ciedad científica* (Scientific Society) triggered a crisis that resulted in the
19 resignation of Carlos Berg, a close ally of Hermann Burmeister's (Mont-
20 serrat 2001, 13). The most important scientific association of the land had
21 endorsed Darwinism, over Burmeister's objections.

22 This Darwinian turn by the scientific institutions coincided with the
23 strengthening of ties between these same institutions and the government.
24 In an 1877 letter to the Minister of Justice and Education, Guillermo
25 White, president of the society, and Estanislao Zeballos, its secretary, re-
26 ported their decision to fund an expedition by Ramón Lista to Patagonia
27 (Lista 1879, 9). Lista was inspired by the widely reported success of an ex-
28 pedition by fellow Burmeister protégé Francisco P. Moreno a year earlier.
29 In his application for funding, he touted potential benefits both commer-
30 cial and anthropological, claiming that because "the origins of American
31 man are lost in the mists of time," anyone interested in "reconstructing
32 the customs, beliefs, and physiognomy of prehistoric races" would do well
33 to look to Patagonia, where "in the bowels of the Earth the remains of an
34 autochthonous dolicocephalic race" may yet be found (8).

35 The search not only for the origins of species, but also for the origins
36 of Argentine man, would become a guiding theme, with clear political im-
37 plications, for the homegrown naturalists who now explored the country.
38 White's letter to the Minister of Justice and Education notes that such
39 expeditions exert an "enlivening influence on the spirit of our youth, en-

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1 couraging them to devote their ardor to significant research” (Lista 1879, 10). And like Lista, young people who dedicated themselves to naturalistic studies inevitably saw themselves as following in Darwin’s footsteps. 2
3
4 In Lista’s words, Darwin, D’Orbigny, Bravard, and Burmeister had left
5 “much to study, and not a little to discover, in this fantastic land where the
6 poetic imagination of the Spaniards sited the city of the Emperors” (Lista
7 1879, 8).

8 The extent of the expansion of science during the 1860s and 1870s
9 becomes even more apparent when we consider the number of scientific
10 journals that had come into being by 1876. In 1879 the Harvard Library
11 published its *Catalog of Scientific Serials, 1633–1876*. In its preface, Samuel
12 H. Scuder notes that it has become impossible “for the working naturalist
13 or physicist to keep track of the rapid growth of scientific literature during
14 the past twenty years” (1879, viii). For Argentina, the *Catalog* lists eleven
15 institutions and their journals, none of which had existed a mere fifteen
16 years earlier (260).

17 The 1880s saw a renewed call for naturalists to ply their trade, espe-
18 cially in the recently pacified southern provinces. The “Desert Expedi-
19 tion” of 1879 served the purpose of heralding a new era in the emergence
20 of modern Argentina. The forced removal of the indigenous populations
21 and their supposed extinction after coming into contact with civilization
22 were touted as a sign of evolution at work (Novoa 2009a). In their later
23 recollection of the 1879 campaign, Adolfo Doering and Pablo Lorentz de-
24 scribed it as the “final, definitive operation to subject the entire Southwest
25 of the Argentine Republic to civilization and cultivation” (Doering 1916,
26 301). Concurrent and subsequent scientific expeditions were mounted to
27 investigate natural conditions in the newly conquered territories and to
28 properly certify the extinction of the Indians.

29 For its part, the Academy of Sciences was quick to recognize the sci-
30 entific opportunities inherent in the Patagonian campaign. Oscar Doer-
31 ing, its interim president, wrote Julio Roca, the general in command of
32 the expedition, to request his assistance in collecting zoological, botani-
33 cal, and mineral samples. Doing so would, he claimed, “be a great service
34 both to the country, and to science, simultaneously enriching the collec-
35 tions of national museums and bringing to light animal, plant, and min-
36 eral specimens the like of which may perhaps be found only in that part
37 of the Pampa” (302). This letter triggered the organization of a scientific
38 expedition operating in parallel with the military campaign. Its members
39 were Adolfo Doering, a zoologist; Pablo G. Lorentz, a botanist; Gustavo

1 Niederlein, botanist's assistant; and Federico Schulz, zoologist's assistant.
2 Their accounts serve to document not only their scientific findings, but
3 the close relationship between scientific, military, and political projects of
4 Argentine nation building.

5 As we mentioned, 1879 also saw the publication of the third volume of
6 the French edition of Burmeister's physical description of the Argentine
7 Republic, first published in German four years earlier (Burmeister 1875).
8 The first volume of the French edition appeared in 1876 with an effusive
9 dedication to Domingo Sarmiento, the author's "protector and most ex-
10 cellent friend" (1876). In testimony to the ongoing official sponsorship of
11 science, and of Burmeister in particular, subsequent volumes were printed
12 in Buenos Aires, appearing when treasury funds were made available to
13 subsidize their publication. As discussed above, the third volume is of par-
14 ticular interest, as it reveals that by 1879, even Burmeister felt obliged to
15 clarify (or revise) his views on Darwinism.

16 As we noted, in place of the stern objections of 1866 and 1870, he now
17 offers a tepid endorsement (Burmeister 1879, 11–12). But Burmeister's
18 close identification of the Darwinian hypothesis with the hypothesis of
19 "original generation," a claim so ancient as to be traceable to pre-Socratic
20 "philosophers of the Ionian school" (10), suggests that, like many of his
21 Argentine contemporaries, he was unwilling to break with his traditional
22 legacy. Even when forced to acknowledge the apparent truth of some of
23 Darwin's hypotheses, he still insists on maintaining the old conceptions of
24 progress, perfectibility, and design. Furthermore, as he makes clear, fun-
25 damental differences in type are what separate not only Linnaean phyla
26 (insects and vertebrates), but species—"or to speak of man, black [from]
27 white" (13). The conjunction of a quasi-Darwinian evolutionary hypoth-
28 eses with a racial essentialism based on the existence of ideal types would
29 continue to be important in Argentina for years to come and was one of
30 the ways in which idealism managed to survive, blended with a strict Dar-
31 winian materialism. As we have noted, Haeckel provided the transition
32 that Burmeister refused to consider. Racial archetypes, defended by both,
33 would become the expression of the spiritual and aesthetic values of the
34 nation, as we will discuss in the coming chapters.

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