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Special Issue

# A Naturalist between Two Worlds. Field Collecting in Claude Gay's Forging of a Scientific Career in Chile and France

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In the 1830s, European naturalists traveled to South America to gain experience as field collectors, a practice increasingly important to natural history and the production of scientific knowledge as the nineteenth century progressed. This article explores the strategies followed by the French naturalist Claude Gay (1800–1873) in his attempt to make a name for himself in the eyes of both the Chilean and French scientific communities and governments, as he established his career as a field collector. Gay had to forge credibility among local social circles and hierarchies to win the financial support of the Chilean government, while simultaneously pursuing a career and a reputation as a naturalist in France. This article analyzes Gay's practices and strategies for each community and discusses the extent to which his field practices were influenced not only by the scientific knowledge, experience, and instruments used, but also by the social, political, and economic context in which he developed his scientific work.

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In July 1830, Frenchman Claude Gay sent a letter to Chilean governmental authorities requesting funding for a scientific expedition in the young republic, which had claimed independence just over a decade earlier. In addition to the publication of the results of his natural history research, Gay promised to create a natural history cabinet in the capital city of Santiago.<sup>1</sup> According to Gay's proposal, this space dedicated to natural knowledge, the first of its kind in independent Chile, would house and display collections of most of the nation's natural specimens, under their common and scientific names.<sup>2</sup> This scientific project coincided with a long-time aspiration of the Chilean elite and authorities, who had been unsuccessfully promoting the formation of a natural history cabinet since the beginning of the country's independence process in the 1810s.<sup>3</sup> The government's interest in a scientific expedition of this type went beyond the cabinet as it felt an urgent need to understand the full extent of the nation's land and the potential of its natural resources for industry and trade.<sup>4</sup>

Obtaining the support of the Chilean government placed Gay in an advantageous situation compared with other foreign naturalists who, like him, had ventured to destinations outside of Europe that were little known to European science. He did so to carry out *in situ* research, based on collecting natural history objects, and to build his reputation as a scientist, as part of the community of naturalists associated with the Muséum National d'Histoire naturelle in Paris, where he studied.<sup>5</sup> The fieldwork Gay was seeking to

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<sup>1</sup> Gay to Portales, s/d, Ministry of the Interior Fund, NAC, vol. 51, 36v.

<sup>2</sup> *Ibid.*, 35v.

<sup>3</sup> Sanhueza, "Historia Natural de Santiago," 201–3; Serra, "El patrimonio coleccionable," 57–58.

<sup>4</sup> Sagredo, "Ciencia, estado, territorio," 139–72.

<sup>5</sup> Hereinafter referred to as Muséum. Outram, "New Spaces," 259–62; Strasser, "Collecting Nature," 315.

conduct in Chile would allow him to gain experience in the practice of scientific collecting, an area in which he had little expertise. Specific skills and knowledge were required for field labor and research, including the collection, conservation, transport, study, and illustration of natural specimens from the place they were gathered in the natural environment to their exhibition or storage in a museum or cabinet.<sup>6</sup> In addition to gaining experience as a field collector, a status expected of naturalists associated with the Muséum in Paris, Gay's Chilean natural collections were meant to serve as the basis for his research with which he hoped to contribute to the international body of natural knowledge, an effort undertaken by European scientific institutions such as the Muséum itself.

Acknowledging the contributions of Gay's scientific work to the nation-building process in Chile, highlighted by authors like Sagredo, this paper reveals the strategies followed by Gay in his attempt to establish his scientific career before the Chilean and French scientific communities as a field collector in Chile.<sup>7</sup> Delving into Gay's role in the formation of the Cabinet of Natural History, as addressed by Sanhueza, this article focuses on his fieldwork and collecting practices and shows how he adapted his behavior and scientific work to Chile's social and political context.<sup>8</sup>

Because the practice of collecting in 1830s Chile was embedded in a unique political, social, and economic context, as outlined below, Gay had to forge credibility as a field collector among local social circles and hierarchies to obtain funding for research. The local networks he built during his time in Chile, including his friendships with foreign scientists and members of the small local scientific community, were crucial to his scientific endeavors. These relationships and the first collections he gathered when he arrived in Chile helped him to gain credibility and therefore obtain state funding to carry out research on Chile's nature, an official endorsement highly desired by European naturalists who toured South America during the first half of the nineteenth century. Meanwhile, the Chilean natural objects he brought back to Paris would help him establish his credentials as a scientist there.

## An Agent of the Muséum National d'Histoire naturelle in Chile

On September 14, 1830, Claude Gay signed a contract with the Chilean government for the commission of a study on the country's natural history. The expectations placed on the scientific enterprise entrusted to Gay were considerable.<sup>9</sup> For this reason, the hiring of a relatively inexperienced naturalist as a field collector was part of international and local circumstances that worked in favor of the Gay's scientific aspirations. Chilean nature had been arousing interest from the European scientific community, particularly among scientists connected to Paris' Muséum: an institution that was the world leader in studies on Western nature at the beginning of the nineteenth century.<sup>10</sup> In an effort to gather and display nature from different locations on the planet, little-explored destinations such as Chile increasingly attracted the attention of the Muséum's professors. One example of this is Chile's appearances in the editions of the *Instructions pour les voyageurs*, edited by the museum starting in 1818 as a world guide for the collection of natural objects. In this first edition, Chile was only included in the botanical section but in the 1824 and 1829 editions, it was featured in the animal specimen section as well.<sup>11</sup> The Muséum's scientific endeavor led Claude Gay, a naturalist with limited experience as a field collector, to take interest in Chile, seeking to establish his reputation through fieldwork and natural history collections.

Between the ages of eighteen and twenty, Gay made excursions into the areas surrounding his hometown of Draguignan in Provence, France, near the Southern Alps.<sup>12</sup> Later, he moved to the French capital to continue his education in pharmaceuticals and medicine. Attending public courses at the Muséum, starting in 1820, deepened his interest in natural history and inspired him to pursue a career as a naturalist. During this period, he took herborization trips to Switzerland, Savoy, Piedmont, Sicily, Greece, and islands in Asia Minor; some of these trips were commissioned by the museum itself.<sup>13</sup>

<sup>6</sup> MacGregor, "Introduction," xxv; Bourguet, "A Portable World," 378; Daston, "Taking Note(s)," 444–45; Secord, "Pressed into Service," 284.

<sup>7</sup> Sagredo, "De la historia natural," 327–76.

<sup>8</sup> Sanhueza, "Historia Natural de Santiago," 201–18.

<sup>9</sup> El Araucano, 2 October 1830.

<sup>10</sup> Bourguet, "Le collecte du monde," 190–93; Pinkerton, et al., *Ansichten der Hauptstadt*, 52. Cited by Lacour, "El gran depósito," 27.

<sup>11</sup> Muséum d'Histoire naturelle, *Instructions pour les voyageurs*, 1818, 34; Muséum d'Histoire naturelle, *Instructions pour les voyageurs*, 1824, 19; Muséum d'Histoire naturelle, *Instructions pour les voyageurs*, 1829, 30.

<sup>12</sup> Stuardo, *Vida de Claudio Gay*, vol. 1, 234–35.

<sup>13</sup> Gay to the president of the Paris Academy of Sciences, 3 February 1856. Cited in Stuardo, *Vida de Claudio Gay*, vol. 2, 329; Stuardo, *Vida de Claudio Gay*, vol. 1, 235.

When presented with the opportunity to travel to Chile to work as a teacher for a school in Santiago, Gay sought support from his Muséum professors who recognized the possibility of amplifying the institution's almost non-existent collection of Chilean natural specimens.<sup>14</sup> Hence, they granted him the title of correspondent for the Museum and gave him 900 francs to finance the shipment of natural collections from Chile.<sup>15</sup> This kind of designation served to finance independent travelers, who sent natural objects from all around the world to enrich the museum collections.<sup>16</sup> For Gay, as for the rest of the museum's correspondents, this support was not limited to money. Along with financing the shipments of natural objects to Paris, it allowed him to maintain close contact with his professors (Adrien de Jussieu, Alexandre and Théodore-Adolphe Brongniart, among others), who provided him with assistance and scientific collaboration by exchanging notes, specimens, and observations on natural phenomena assembled in Chile.<sup>17</sup> Having the sponsorship of the Muséum, and thus becoming part of the lineage of naturalists linked to this prestigious institution, including the Prussian naturalist Alexander von Humboldt, was invaluable for a naturalist like Gay, who had just started his career.<sup>18</sup>

Like many naturalists of the time, Gay traveled to Chile seeking to gain experience as a field collector, when natural history was becoming a predominantly observational science built on a personal and direct encounter with the object under scrutiny.<sup>19</sup> Upon his arrival in Santiago in February 1829, he contacted other foreign scientists in the country. Among them was Carlo Giuseppe Bertero, an Italian doctor and botanist whom he had met in Paris in 1827. Bertero had been touring Chile and was known in the capital's intellectual and social circles. They shared their European naturalist contacts in addition to concerns about the financing of their scientific research in Chile, which were being funded by their other occupations: Gay as a teacher and Bertero as a doctor.

The limitation of economic resources was detrimental to natural history work, influencing the types of collections, the preparation of natural specimens and, therefore, the process of knowledge production. As Gay stated to one of his professors in Paris regarding his plant collections gathered during his first year in Chile:

Despite my zeal and passion for this [botanical] part of Natural History, it has been completely impossible for me to do more; in a country where everything is excessively expensive, my means do not allow me to travel with all the facilities that this kind of occupation requires.<sup>20</sup>

Lack of materials to adequately preserve specimens or funding for field trips away from major urban centers affected the practice of collecting. For this reason, obtaining stable financing for the exercise of scientific activity became an aspiration shared by many naturalists, Gay and Bertero among them. In addition to the financial problem, other obstacles limited scientific practice in Chile.

The political instability of the young country explains, in part, the absence of public policies encouraging scientific activity. Bertero's involvement with the liberal government led him to be entrusted with the founding of a botanical garden in Santiago, but the political crisis that broke out in November 1829 dashed his hopes.<sup>21</sup> The Italian's closeness to the defeated Liberal president made Bertero's stay in Chile increasingly unsustainable. He, therefore, left the country in September of 1830 and cleared the way for Gay to win support from the new administration.<sup>22</sup> Naturalists' plans were frequently affected by the social and political circumstances of the places they visited. Regarding this, Gay told another Muséum correspondent in Argentina, Alcide d'Orbigny, that the wonderful idea he had had in Paris to explore Chile, was faced with a grim reality:

<sup>14</sup> The museum had a small collection of plants thanks to the expedition made by the French naturalist Joseph Dombey to Chile and Peru between 1777 and 1784. Muséum d'Histoire naturelle, *Instructions pour les voyageurs*, 1818, 34.

<sup>15</sup> Gay, *Claudio Gay*, 188; Ministre de l'Intérieur to Muséum (3 June 1828), ANF, Financial aids brought to travellers, F/17/3971, dossier 88; Barros Arana, *Don Claudio Gay*, 27.

<sup>16</sup> Riviale, *Los viajeros franceses*, 52.

<sup>17</sup> Some examples in the NAC: "Rocks from Santiago," s/d, Claude Gay Fond vol. 56, leg. 27, fs. 65; "Instructions for collecting insects," leg. 31, fs. 69; "Instructions from Alexandre Brongniart," leg. 32, fs. 70–71. See also: Feliú Cruz and Stuardo, *Correspondencia*.

<sup>18</sup> List of Muséum correspondents, ANF, AJ/15/566.

<sup>19</sup> Other foreign naturalists who visited Chile at the time included Darwin, Poëppig, Cumming, Bertero, and Bridges.

<sup>20</sup> Feliú Cruz and Stuardo, *Correspondencia de Claudio Gay*, 1.

<sup>21</sup> Delprete et al., *Carlo Bertero*, 633.

<sup>22</sup> Bertero, "Extrait d'une lettre," 314–15; Delprete et al., *Carlo Bertero*, 364, 622, 631 and 636.

At the time of my arrival [in Chile] I saw the danger of travelling away from the city and, a few months later, revolutions broke out which made these dangers even more real, it was then that with M. Bertero we laughed at those good and credulous Parisians who urged us to cross this republic in zig-zag (...), we must admit that they are good children.<sup>23</sup>

Gay's words reveal the difficulties of naturalist fieldwork in countries like Chile, with precarious political, social, and economic situations, deprived of the protection and tranquility of the research carried out in museums or cabinets.<sup>24</sup> During this period, Gay had to limit his trips to the outskirts of Santiago, the capital city; some of his specimens were even looted in December 1829 during confrontations between the Liberals and Conservatives.<sup>25</sup> Despite the difficulties expressed by Gay regarding the scientific activity, the country's political contingency ultimately affected positively the career of the Frenchman, who knew how to take advantage of established networks with the local scientific community and the elite to benefit himself and his scientific project. As an example, his friendship with the apothecary and self-taught botanist, José Vicente Bustillos, with whom he made herbalization tours around Santiago, were tremendously beneficial, as will be seen.<sup>26</sup> Once the country achieved some political stability in April 1830, Bustillos recommended Gay to its authorities.<sup>27</sup> But he had to prove his ability to carry out the scientific endeavor he proposed.

### Field Collecting in Context: Chile in the 1830s

Prior to the hiring of Claude Gay in July 1830, the government appointed a commission to study the more than four thousand botanical and mineral specimens collected by the Frenchman in his first year in Chile and determine his ability to carry out the proposed scientific project.<sup>28</sup> Once again, the naturalist's social networking in the country proved valuable, since those in charge of analyzing his work were Vicente Bustillos and two of Gay's acquaintances from the Santiago elite: José Alejo Bezanilla, professor of physics at the National Institute, and Francisco García Huidobro Aldunate, prominent intellectual and director of Chile's National Library.<sup>29</sup> The Commission positively evaluated his collections and experience as a field collector, recommending his hire to the government and predicting great advantages to his scientific endeavor, highlighting the importance of the founding of a natural history cabinet in Chile with its rich, undiscovered natural elements.<sup>30</sup> From then on, the Commission members collaborated with the scientific project headed by Gay, playing roles in receiving, inspecting, and storing the natural collections that the naturalist would send to the capital, and managing the installation and organization of Santiago's natural history cabinet.<sup>31</sup>

With the support and financing of the State of Chile, Gay was able to venture beyond the area of the capital city on an expedition that took him all over the country between 1830 and 1842, during which time he amassed numerous and diverse collections that he sent periodically to Santiago and Paris.<sup>32</sup> The government requested the provincial authorities to provide information regarding the natural history and geography of their departments and dioceses, and, in Gay's words, with educated, experienced people who could assist him in his investigations.<sup>33</sup> The Frenchman was favorably received in the cities where he settled and was provided with material support and people to accompany him on his expeditions, as well as information, and documentation for studies related to the statistical and geographical part of his research.<sup>34</sup>

Considering the relevance of the local networks and the geopolitical situations of the places to be explored, Claude Gay traveled in the company of a diverse group of people who collaborated in the hunting

<sup>23</sup> Baulny, "D'Alcide d'Orbigny," 59.

<sup>24</sup> Kuklick and Kohler, "Introduction: Science in the Field," 1–2.

<sup>25</sup> Barros Arana, *Historia General de Chile*, 463–64; Béraud, "Alcide d'Orbigny," 133; Gay to Adolphe Brongniart, 9 December 1829. Cited in Feliú Cruz and Stuardo, *Correspondencia de Claudio Gay*, 1.

<sup>26</sup> Gay, *Claudio Gay*, 212.

<sup>27</sup> Barros Arana, *Don Claudio Gay*, 277; Orrego Luco, *Recuerdos de la escuela*, 38; Torres, "don José Vicente Bustillo," 285.

<sup>28</sup> Ministry of the Interior Fund, NAC, vol. 51, 36v.

<sup>29</sup> *Ibid.*; Thayer Ojeda, *Orígenes de Chile*, 55–56.

<sup>30</sup> Bezanilla et al., 12 August 1830. Ministry of the Interior Fund, NAC, vol. 51, fs. 37v.

<sup>31</sup> Serra, "La configuración," 51–76.

<sup>32</sup> For detailed information on Gay's destinations in Chile, see: Muñoz-Schick, "Claudio Gay," xix–xxviii.

<sup>33</sup> Portales, 1 September 1830, Ministry of the Interior Fund, NAC, vol. 51, fs. 40; Stuardo, *Vida de Claudio Gay*, vol. 1, 251.

<sup>34</sup> Historical work on Chile was an additional request made to Claudio Gay in 1839 by the Chilean government. Stuardo, *Vida de Claudio Gay*, vol. 1, 296.

and collection of natural specimens, the transport of scientific instruments, logistical assistance during the expeditions, and as guides through remote or difficult-to-access places.<sup>35</sup> While exploring Tagua-Tagua Lagoon in December of 1830, for example, the naturalist parted ways with the people who were hunting birds to tour the lagoon and study its vegetation.<sup>36</sup> In Gay's words, servants generally went on foot to look for plants, catch insects, and kill birds, among other activities.<sup>37</sup> Thus, while the scientific expedition depended a great deal on the Frenchman, it would not have been possible without those who assisted him during his expeditions, donated specimens, and provided him with information about the country's nature and history. Despite the few acknowledgments Gay gave them, his entourage reached twenty-five people, including at times natural specimen preparers, informants, soldiers, spies, and interpreters.<sup>38</sup>

The fieldwork led by the naturalist was strongly affected by the political situation and hazards in the places he visited. At the beginning of his stay in Chile, between 1829 and 1830, Gay said he felt unsafe due to the revolts across the country, which forced him to remain close to the capital.<sup>39</sup> However, once the new conservative political regime was established, there were new elements that affected the course of his travels. Exploring the province of Colchagua between 1830 and 1831, he had to repeatedly change his plans due to the threat of the Pincheira brothers who lead a *montonera* that looted some south-central Chile and Argentine cities between 1817 and 1832.<sup>40</sup> Likewise, during a trip through Araucanía in 1838, the naturalist had to modify his course because of the resistance he encountered from the indigenous people of the area. Previously, in December 1831, Gay had tried to enter those territories, but "the Tucapel [indigenous] were suspicious of the nature of my trip, they prevented my passage and forced me to return to Arauco."<sup>41</sup> In 1835, Gay tried again to visit the region, but the distrust of the natives made it impossible to enter their territory.<sup>42</sup>

Because exploring territories inhabited by indigenous people presented difficulties, Gay was assisted by translators and interpreters when he visited the lands of the Mapuche people in central and southern Chile. In 1835, for example, while visiting Futrono, he was able to study the customs and traditions of the natives, communicating with them thanks to an interpreter.<sup>43</sup> Not knowing the indigenous language created a barrier to understanding their culture, customs, and knowledge about the natural world, and the naturalist had no choice but to trust the interpreters. Gay was aware that this not only affected the type and quality of the information obtained, but also distorted the nature of his own questions. This had been a transversal problem in the practice of natural history since early modernity, due to the variety of informants who served as sources of information to naturalists.<sup>44</sup> In fact, the Frenchman wanted to learn the indigenous language so as not to need interpreters who, according to him, were rarely precise in translating expressions and ideas.<sup>45</sup> Despite mediation by the interpreter, Gay was able to gather valuable information from the indigenous people, particularly about plants and their medicinal functions, information of great interest to scientists associated with the Muséum.<sup>46</sup>

In order to acquire this knowledge, I have not only made use of people of Spanish origin, but also of the Indians themselves, who have provided me with quite valuable data on their remedies for illnesses, on the plants they use to dye their fabrics, and on other necessities.<sup>47</sup>

For Gay, the knowledge provided by the indigenous people, however empirical, was useful, suggesting important ideas that sometimes led to remarkable results.<sup>48</sup> In this way, without abandoning his conviction about the supremacy of Western scientific knowledge over indigenous empirical knowledge, Gay used these

<sup>35</sup> Gay, "les recherches d'histoire naturelle," 380–81; Safier, "Global Knowledge on the Move," 134.

<sup>36</sup> Gay, Scientific Commission Report on Colchagua. *El Araucano*. Newspaper. National Library of Chile.

<sup>37</sup> Gay, "les recherches d'histoire naturelle," 381.

<sup>38</sup> *Ibid.*, 383.

<sup>39</sup> Gay to Brongniart, 9 December 1829. Cited in Feliú Cruz and Stuardo, *Correspondencia*, 2.

<sup>40</sup> Gay, Scientific Commission Report on Colchagua. *El Araucano*. Newspaper. National Library of Chile; Contador, *Los Pincheira*.

<sup>41</sup> Gay to the Minister of the Interior, December 1838. Cited in Stuardo, *Vida de Claudio Gay*, vol. 1, 421.

<sup>42</sup> Gay to de Candolle, 13 June 13, 1835. Cited in Feliú Cruz and Stuardo, *Correspondencia*, 12.

<sup>43</sup> Gay, Scientific Commission Report on Valdivia, *El Araucano*. Newspaper. National Library of Chile. See: Gay, *Usos y costumbres*.

<sup>44</sup> Ogilvie, *The Science of Describing*, 273; Gänger, "The Secrets of Indians."

<sup>45</sup> Stuardo, *Vida de Claudio Gay*, vol. 2, 172.

<sup>46</sup> Gay, Scientific Commission Report on Valdivia and Chiloe, *El Araucano*. Newspaper. National Library of Chile; Schiebinger, *Plants and Empire*, 15; Safier, "Global Knowledge on the Move," 134.

<sup>47</sup> Gay, Scientific Commission Report on Valdivia and Chiloe, *El Araucano*. Newspaper. National Library of Chile.

<sup>48</sup> *Ibid.*; Daston and Galison, *Objectivity*, 209.



sources for his research on Chilean nature to describe medicinal properties, and the use and utility of plants.<sup>49</sup>

## Gay's Chilean Collections: Challenges and Contributions

Gay's interest as a collector was directed toward the full spectrum of natural specimens; he said, "take everything, investigate everything, do not overlook anything."<sup>50</sup> He was convinced that a country's Natural History should include all its products, even those that seemed of limited value. His work was dedicated to all natural objects, and he did not discriminate based on class, shape, or size. For example, his collections of insects were highlighted by European scientists, a striking fact given that naturalists usually paid less attention to entomology.<sup>51</sup> Considering that the fieldwork results varied depending on what, when, and where they were collected, the naturalist tried to take advantage of all the opportunities he had to collect as many varieties and samples of natural objects as possible, including flora, fauna, and minerals.<sup>52</sup> Gay's selection of natural specimens was guided by three main criteria: their novelty, as he sought to discover new species and to enrich the collection of the Parisian museum; their usefulness to Chile in terms of industry, exploitation, and medicinal properties; and representativeness, in order to establish in Santiago a natural history cabinet with the best possible representation of the country's nature.

One of the first herbaria Gay shipped to Santiago, analyzed by the Commission members in July 1831, presented problems, because it contained "a great number of vegetables which, due to being poorly desiccated, have not only lost their colors, but also their shape. These have remained unclassified, and, at most, some have been labelled with their Chilean names."<sup>53</sup> The problems related to the botanical specimens were due to the Frenchman's lack of experience, along with the difficulties inherent to the conservation of botanical samples, such as limited materials to work properly in the field, and complications in transporting the specimens.<sup>54</sup> Loss of color, for example, was a recurring problem that challenged botanists who hoped to use this distinctive trait for plant identification and classification.<sup>55</sup> In terms of the specimens losing their shape, Gay's extensive, prolonged excursions increased the likelihood of the objects' deterioration, since they were subjected to climatic effects such as humidity and heat, and to the wear of transport.<sup>56</sup> As a result, it was necessary to carry out desiccation in the field to better preserve the collected plants, but the limited number of instruments and suitable supplies for the management and conservation of the samples restricted the practice of field collecting. For example, when Gay was in the mountainous part of Colchagua Province in February 1831, he reported having a miserably small fire, due to the scarcity of firewood, to heat the paper needed to change the plants pressed the previous day.<sup>57</sup> This reveals how naturalistic fieldwork was dependent upon available resources and the setting in which it was done, in addition to the techniques specific to the management of botanical specimens.

The problems evidenced by the Commission in Gay's botanical collections, contrasted with the opinions expressed by his French scientific peers about his results as a botanical collector in Chile.<sup>58</sup> Worried about the success of his scientific career in France, Gay took advantage of a trip to Paris in 1832 to make known his nature work in Chile to the Parisian scientific community. His research and natural collections were examined by a group of scientists from the Muséum and members of the *Académie des sciences*.<sup>59</sup> The botanical part was entrusted to Gay's friend, the botanist Adrien de Jussieu, who studied Gay's reports and the botanical specimens deposited by him in the herbarium of the Parisian museum, several of them type specimens (see some examples in Figures 1–3).<sup>60</sup>

<sup>49</sup> Gay, *Historia física y política*, vol. 1, 8; Muñoz-Schick, "Claudio Gay," xxxi; De Vos, "Rare, Singular, Extraordinary"; Scott Parrish, "Diasporic African Sources."

<sup>50</sup> Gay, Scientific Commission Report on Valdivia, El Araucano. Newspaper. National Library of Chile.

<sup>51</sup> Ducrotay Blainville, "Rapport sur la partie zoologie," 295.

<sup>52</sup> Muñoz-Schick, "Claudio Gay," xxviii; Sagredo, "Geografía y nación," 236.

<sup>53</sup> Scientific Commission Report, July 16, 1830. Ministry of the Interior Fund, NAC, vol. 315, fs. 444.

<sup>54</sup> Secord, "Pressed into Service," 284; Klemun, "Live Plants on The Way," 32.

<sup>55</sup> McCracken, "Preserving Nature," 43.

<sup>56</sup> Zytaruk, "Preserved in Print," 190.

<sup>57</sup> Gay, "les recherches d'histoire naturelle," 383.

<sup>58</sup> Scientific Commission Report, July 16, 1830. Ministry of the Interior Fund, NAC, vol. 315, fs. 444–45.

<sup>59</sup> Gay, "les recherches d'histoire naturelle," 383.

<sup>60</sup> Jussieu, "Rapport sur la partie botanique," 176.



Figure 1: *Adesmia prostrata*, collected by Gay in Cauquenes, Herbarium of Adrien de Jussieu, Muséum d'Histoire naturelle.





Figure 2: *Polystichum flexum*, collected by Gay in Juan Fernandez Island, Adrien de Jussieu collection, Muséum d'Histoire naturelle.





**Figure 3:** *Adiantum poiretii*, collected by Gay in Colchagua, Herbier d'Adrien de Jussieu, Muséum d'Histoire naturelle.

Jussieu drew up a table that summarized almost a thousand species of Chilean plants, identifying the families to which they belonged, the number of species of each, pointing out which were already known and which were new, and the name of the genre represented by each family.<sup>61</sup> Jussieu stated that the naturalist not only studied the plants, their living conditions, and most outstanding characteristics, but also

<sup>61</sup> Ibid., 178.



**Figure 4:** *Thinocorus Orbignyianus* (male), collected by Gay in Santiago, Muséum d'Histoire naturelle.



**Figure 5:** *Thinocorus Orbignyianus* (female), collected by Gay in Santiago, Muséum d'Histoire naturelle.

investigated their medicinal properties, urging Gay to delve deeper into that aspect.<sup>62</sup> As seen previously in relation to expeditions in indigenous territories and later in his botanical work, he did pay more attention to this type of information, including at the end of each description of a gender or species, the notions that he managed to obtain about their medicinal properties.

Comparing the reports sent by Gay to the Commission in Santiago with the table of plants made by Jussieu, it is possible to verify that the naturalist brought to France specimens of the same plants inspected by the committee in Chile.<sup>63</sup> The contrast between Jussieu's appraisal and the opinion of the members of the Chilean Scientific Commission regarding the status of Gay's botanical collections, could have been due to Gay's interest in forging his scientific career in Paris.

Something similar happened with the first zoological collections organized by the Frenchman. At the end of February 1831, Gay managed to collect the following animal specimens, as he reports to the Commission:

- 155 Birds of different sizes, almost all with their nests.
- 350 insects of all genera and classes.
- 11 quadrupeds and 7 reptiles.<sup>64</sup>

<sup>62</sup> Ibid., 185.

<sup>63</sup> Ibid., 178–82.

<sup>64</sup> Gay, Scientific Commission Report on Colchagua. El Araucano. Newspaper. National Library of Chile.





**Figure 6:** *Thinocorus Orbignyianus* (male), Lesson, *Centurie zoologique*, pl. 48.

When reviewing these specimens, the Commission in Chile noticed problems in their preparation, finding a “lack of classification and many of them very poorly preserved.”<sup>65</sup> This is not surprising since Gay had limited training in zoology and almost no experience in preparing samples from the animal world. This news contrasts again with the reception in France, where the rich collection of birds was pointed out. Birds were animals that offered advantages to naturalists due to their small size, the brilliance of their plumage, and how easily they could be hunted with rifles or other firearms.<sup>66</sup> Assisted by hunters who helped him collect all kinds of birds, Gay gathered hundreds of specimens of different sizes, almost all with their nests.<sup>67</sup> Among the species were “‘swans,’ *Cignus melancorhynchus*; the ‘flamingos,’ *Phoenicopterus chilensis*; the ‘Roseate Spoonbill,’ *Platalea ajaja*; the ‘herons,’ the ‘kingfishers,’ the ‘ibis’ and an infinite number of other species new both to me and to science.”<sup>68</sup> In addition to these specimens, destined for Santiago’s Cabinet, several were transported to Paris, among them herons, ibis, ajaja, and more.<sup>69</sup> Within the diurnal birds of prey, for example, he sent a young specimen of a condor “taken from the nest and already three feet long.”<sup>70</sup> Some new species are recognized among the bird collections directed to the Muséum. For example,

<sup>65</sup> Scientific Commission Report, July 16, 1830. Ministry of the Interior Fund, NAC, vol. 315, fs. 444.

<sup>66</sup> Stuardo, *Vida de Claudio Gay*, vol. 1, 252; Larsen, “Equipment for the Field,” 370.

<sup>67</sup> Gay, Scientific Commission Report on Colchagua. *El Araucano*. Newspaper. National Library of Chile.

<sup>68</sup> *Ibid.*

<sup>69</sup> The online catalog of the *Muséum d’Histoire naturelle*, registers 744 specimens of Chilean animals donated by Claudio Gay.

<sup>70</sup> Stuardo, *Vida de Claudio Gay*, vol. 2, 364.



**Figure 7:** *Thinocorus Orbignyianus* (femelle), Lesson, *Centurie zoologique*, pl. 49.

a *Megalonix* specimen that would have served to establish and create a new genus and a new species of *Migisthena* and of *Cynolanea* de Vieillot, remarkable for its spiny tail.<sup>71</sup>

Henri Marie Ducrotay de Blainville, professor of zoology and comparative anatomy at the Muséum, made the reports on the animal specimens sent to Paris. He highlighted the bird collection, stating, “M. Gay has observed and collected birds from all the great ornithological classifications and, in a welcomed innovation, he has not neglected the nests or the eggs in which his collection is highly rich.”<sup>72</sup> In several cases, Gay collected male and female birds, eggs, nests, and skeletons, as recommended in the *Instructions pour les voyageurs* published by the Parisian museum.<sup>73</sup> Once again, perhaps Gay took more care with the specimens donated to the Muséum, focusing on the evaluation that French scientists would make of his work given his interest in obtaining recognition from the Parisian scientific community. And it paid off. As an example, male and female adult specimens of Grey-breasted Seedsnipe (*Thinocorus Orbignyianus*) collected by Gay served to enrich the Parisian museum syntype collections (see Figures 4–5) and were described and illustrated by the naturalists Étienne Geoffroy Saint-Hilaire and René Primevère Lesson in 1831 (Figures 6–7).<sup>74</sup>

<sup>71</sup> Ducrotay Blainville, “Rapport sur la partie zoologie,” 294.

<sup>72</sup> Stuardo, *Vida de Claudio Gay*, vol. 2, 364.

<sup>73</sup> Muséum d’Histoire naturelle, *Instructions pour les voyageurs*, 1824, 5; Ducrotay Blainville, “Rapport sur la partie zoologie,” 294.

<sup>74</sup> Lesson, *Centurie zoologique*, 137–39.



On the other hand, the rather self-taught scientific training of the members of the Commission in Santiago could have led Gay to submit lower quality preparations of the collections to the capital. Furthermore, over the years, he perfected the information, procedures, and classification of his natural collections from later expeditions. Thus, his field experience simultaneously proved to be a learning experience regarding natural history collecting techniques and methods.

## Field Collectors and Armchair Naturalists

When he embarked for Chile in 1828, Gay said he was happy to contribute to enriching the Muséum collections. As their correspondent, he recognized the museum scientists' authority on collections sent to their institution. Having just arrived in Valparaíso in December 1828, he sent a first shipment to France with the botanical specimens he had gathered at the places he visited on route to Chile. The plants collected in Rio de Janeiro and Buenos Aires were sent to Adolphe Brongniart, professor of botany at the museum. Some of these were mentioned in the work *Flora Brasiliae Meridionalis* prepared by botanists Adrien Jussieu, Auguste Saint-Hilaire, and Jacques Cambessèdes.<sup>75</sup>

Despite this, Gay expressed some concern about the possibility that the collections sent to Paris might fall "into the hands of opportunists who could take advantage of his work" and publish the descriptions of new species.<sup>76</sup> The naturalist aspired to offer numerous entirely new specimens to science, but he did not anticipate what would happen. In his report on the herbaria sent by Claude Gay in 1832, Jussieu referred to the contribution of the Frenchman, pointing out that the number of new species would have been larger in number "If not for the recent publication made in England by Mr. Hooker on the flora of this same country, some of the species which have come to light we would have indicated as never before published if our report had been made a few months earlier."<sup>77</sup> Indeed, in the first volume of the *Botanical miscellany* magazine, edited in 1830 by the English botanist William Jackson Hooker, an article was published in which he and the Scottish botanist George A. Walker Arnott described a series of Chilean plants received thanks to donations of botanical specimens from various naturalists who traveled the southern tip of the American continent, including Mary Graham, Alexander Cruckshanks, John Gillies, and Hugh Cumming.<sup>78</sup> Unfortunately for Gay, this publication appeared while he was still touring Chile. So, although several of the specimens described by Hooker had also been collected by Gay, the Englishman published the descriptions first and lengthened his list of new plants.<sup>79</sup> Nevertheless, a significant portion of Gay's botanical collections were kept in the Muséum, constituting an important collection for the study of Chilean flora.<sup>80</sup> And with the publication of its eight volumes dedicated to Chilean botany, the country became the first in South America to have a comprehensive record of its flora.<sup>81</sup>

The episode between Hooker and Gay, in addition to showing the competition between naturalists from different countries that used South America as a setting for their scientific wars, evidences the impact of fieldwork on the careers of naturalist travelers such as Gay, who could not control the publication of new species collected by him. At the same time, it illustrates some of the changes that began to occur in the 1830s in the specialization of practitioners as armchair naturalists and field collectors.<sup>82</sup> The former had been studying specimens sent by correspondents, in addition to books and magazines, to identify new species, and thereby were dominant in the natural scientific world.<sup>83</sup> However, as the nineteenth century progressed, field collectors organized their own personal collections motivated by the discovery of new specimens and scientific recognition. Gay accumulated a significant personal collection for later study by asking his professors at the Muséum to set aside some of his specimens, most of which were published in his multi-volume work *The Physical and Political History of Chile*.<sup>84</sup> Along with his collections, he also sent

<sup>75</sup> Gay to Brongniart. December 9, 1829. Letter. Cited in Feliú Cruz and Stuardo, *Correspondencia*, 1; Saint-Hilaire et al., *Flora Brasiliae Meridionalis*, vol. 3, 57.

<sup>76</sup> Gay, *Claudio Gay*, 188.

<sup>77</sup> Jussieu, "Rapport sur la partie botanique," 182.

<sup>78</sup> Hooker and Arnott, "Toward a Flora of South America," 129–212.

<sup>79</sup> Later descriptions by Hooker appeared in subsequent volumes of the *Botanical miscellany magazine* between 1831 and 1833. On French and British competition in natural history, see Sloan, "Le Muséum de Paris," 607–34.

<sup>80</sup> The online catalog of the Muséum d'Histoire naturelle records 3,439 botanical specimens donated by Claude Gay. In total, the catalog holds 4,500 Chilean botanical, animal, and mineral specimens, along with 500 specimens collected in Peru, Brazil, and Uruguay.

<sup>81</sup> Muñoz-Schick, "Claudio Gay," xxxv.

<sup>82</sup> Schiebinger, *Plants and Empire*, 24.

<sup>83</sup> Coniff, *Cazadores de especies*, 144.

<sup>84</sup> Muñoz-Schick, "Claudio Gay," xxix–xxx.

natural specimens to scientists in other European countries, seeking their collaboration, and organized a collection in Santiago that would make up the first natural history cabinet in independent Chile.<sup>85</sup>

## Conclusion: Fieldwork in Naturalists' Practice

Claudio Gay's scientific work in Chile shows how relevant it was for naturalists in the 1830s to acquire expertise in collecting practices and to achieve credibility as field naturalists in order to pursue a scientific career in Europe.<sup>86</sup> Back in France in 1843, Gay abandoned fieldwork to devote himself entirely to research carried out from his studio.<sup>87</sup> When analyzing the fieldwork and collections accomplished by Gay in Chile, it is evident that much of his work and the natural knowledge he produced was conditioned by the social, economic, and political situation of the country, along with the material and logistical difficulties involved in collecting, preserving, and transporting the specimens from the collection sites to Santiago or Paris. In this sense, the advance in natural knowledge about Chile depended on the effort, creativity, and adaptability of Gay and his crew in solving many of the problems faced during expeditions. Moreover, this case study sheds new light on the role of fieldwork in developing a scientific career for naturalists in the 1830s. To succeed, Gay learned to navigate between two different worlds: Chile, characterized by an unstable political and economic context, the limitation of resources to carry out his scientific practice, and a local scientific community in its early stages; and France, one of the main centers of Western natural knowledge with an extended and consolidated network of scientists associated with the Muséum. The ability to adapt to dissimilar contexts was acquired by fieldwork naturalists who, like Gay, pursued a scientific career as naturalists. Ultimately, the conditions under which he engaged in his fieldwork not only determined the type of objects collected, but also the scope of his contributions to knowledge about Chile's natural environment. In that sense, the collecting practice carried out by Gay shows that the production of natural knowledge about Chile was a complex process, supported not only by French scientific knowledge, but also by local informal and indigenous knowledge about the natural environment.

## Competing Interests

The author has no competing interests to declare.

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<sup>85</sup> Gay, *Diario de su primer*, 188; Serra, "Minerales de colección," 156.

<sup>86</sup> MacGregor, "Introduction," 9.

<sup>87</sup> Gay to Montt. October 31, 1859. Letter. Cited in Cruz and Stuardo, *Correspondencia*, 137.



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