

Chapter 2

Collecting and the Pursuit of Scientific Accuracy: The Malaspina Expedition in the Philippines, 1792

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Introduction

This chapter focuses on botanical collecting, an important aspect of Spanish scientific voyaging in the Enlightenment and one of the most significant achievements of the Malaspina expedition. I will discuss the expedition's collecting in the Philippine Islands, Spain's Pacific possession. The information collected by the expedition, I will show, was distinguished by scientific accuracy, the pursuit of which profoundly influenced all the expedition's data-gathering tasks, from surveying and mapping to botanizing and drawing.

Toward the end of July 1789, Alejandro Malaspina, a brilliant 34-year-old Italian-born naval officer in the employ of the Spanish Crown, set sail from Cádiz in command of an ambitious expedition organized by the Spanish Crown and what would be one of the best examples of expeditionary science in the Spanish Enlightenment. The chief officer of the expedition was his friend and fellow officer José Bustamante y Guerra, a capable and courageous Spaniard, several years Malaspina's junior. Their ships were the *Atrevida* and the *Descubierta*, three-masted corvettes, each 120 feet long, each carrying 102 men, supplied with books, manuscripts, maps, and the latest scientific instruments; the accompanying personnel comprised naturalists, artists, draughtsmen, and a cartographer—men of exceptional learning, experience, and possessed of eclectic interests. The voyage, it was estimated, would take three-and-a-half years, and would attempt a comprehensive scientific exploration of Spanish territories in the Americas and the Pacific. Ultimately the journey took five

years, following routes that explored the west coast of the Americas from Cape Horn to the Gulf of Alaska, several Pacific islands, the Philippines, New Zealand, Australia, and Atlantic Patagonia. Though celebrated on his return to Spain in 1794, Malaspina soon after became embroiled in political intrigues and he incurred the displeasure of Manuel de Godoy, a high-ranking minister at the court of Carlos VI. The entanglement cost him dearly. He was arrested for treason, imprisoned for six years (from 1796 to 1802) and, upon his release, was exiled for life in Italy, where he died in obscurity in 1810. As a consequence of Malaspina's fall from grace, the vast amount of valuable information collected by the expedition was impounded and suppressed, remaining unpublished until the late nineteenth century.¹

The scale of this tragedy moved Alexander von Humboldt to remark that Malaspina was more famous for his misfortunes than for his discoveries.² The significant scholarly attention the expedition has lately received, however, has brought some vindication. The interests of Malaspina's select team of natural historians, artists, and hydrographers were so many and diverse that scholars have described the scope of the expedition as encyclopedic.³ Dolores Higuera, curator of the data amassed by the expedition currently housed in the Museo Naval in Madrid, has shown that the expedition produced over 300 journals and logbooks; 450 albums of astronomical observations, 1500 hydrographic reports, 183 charts, 361 views of coastal elevations, and almost 1000 botanical and ethnographic drawings. The expedition made a contribution to science that, to paraphrase Felipe Fernandez-Armesto, "enhanced the world-picture."⁴

The expedition's sojourn in the Philippines in 1792 is an aspect of the voyage largely ignored by scholars.⁵ The Islands were important to Spain at the time mainly because Manila functioned as an *entrepôt* for trade. From the city, the famed "Manila galleons" plied between Acapulco on the west coast of Mexico and Manila bringing shipments of silver bullion and minted coin to be exchanged for cargoes of Chinese goods, mainly silk.⁶ Malaspina had been to the Philippines twice previously. In 1777, captaining the ship *Astrea*, he had sailed to and from the archipelago via the Cape of Good Hope, and in 1784, in the service of the Royal Philippine Company, he embarked on a circumnavigation of the globe traveling through ports on the east coast of South America, around Cape Horn before sailing north to Lima, and crossing the Pacific to the Philippines before returning to Spain via the Cape of Good Hope. It was these voyages that opened his eyes to the possibilities of new discoveries, and, inspired by the journeys

of James Cook and Jean-François de La Pérouse, he put forward, in 1788, his ambitious “Plan of a Scientific and Political Voyage Around the World.”⁷

Malaspina allotted a period of six months for the visit, or at least while favorable northeast winds blew, during which time he would collect hydrographic measurements and data on the depth of near-shore waters, survey and map coastlines, and collect botanical and animal specimens. The expedition stayed for nine months and for almost each day of those months, Malaspina kept a maritime diary describing in detail, and often in technical language, his activities—how tasks were undertaken, the logistical challenges faced, and the encounters with local peoples.

Science and the Collection of Plants and Animals

Since the early Renaissance, Europeans invested considerable time and energy in collecting objects from different cultures and distant places. Botanicals, things from nature (*naturalia*), curiosities, and rarities—the marvelous (*mirabilia*), those that originated from strange places (*exotica*), and human-made artifacts (*artificialia*) intellectually delighted, intrigued, and materially profited European audiences. As objects of fascination and appreciation, wondrous natural exotica and their collection and display in European museums and private curiosity cabinets have garnered the lion’s share of scholarly attention.⁸ To some extent, the imbalance has been redressed in recent years by an upsurge in works that have examined European collecting in India, the Atlantic world, colonial Latin America, and the Dutch East Indies.⁹ These studies demonstrate the need to examine the connective tissues that linked intellectual, medical, and mercantile interests with imperialism, patriotism, and early globalization, factors which shaped thinking about nature and the so-called tropics. They richly describe the reliance of Europeans on local informants in the production and translation of scientific information, the strategies employed in the dissemination and circulation of knowledge, and the contributions to the Scientific Revolution made by exploring and collecting expeditions. Generally speaking, however, the early modern quest for, and collection of, medicinal plants and naturalia in what is today known as Southeast Asia, is less well studied. In the case of the Philippines under Spanish rule, the field has been almost entirely neglected.¹⁰

Spain’s commercial rivalry with the British, French, and Dutch in the location, exploitation, and trade in valuable natural commodities

such as pepper, spices, and tea is well known.¹¹ Historical research on Spanish scientific expeditions in the Spanish Empire has rightly emphasized Spain's competitive drive to collect botanicals for medicines and to profit from the global trade in spices and other luxuries. Like other European powers in the Enlightenment, Spain sought to explore the natural resources of far-flung regions for economic, political, and scientific gain. It was a utilitarian mind-set that was often allied to an equally fervent state intent on inventorizing resources and producing highly detailed information on Spain's possessions.¹² From out of 56 expeditions organized by the Spanish Crown from the mid-eighteenth century and prior to the nineteenth century, 5 were solely focused on plant collecting.¹³ It is also likely that, as in the case of Malaspina's expedition, naturalist-botanists joined expeditions whose aims were not specifically botanical. From 1735 to 1805, 9 of those expeditions were specifically sent to the Philippines.¹⁴ Naturalists, botanists, and artists, of diverse nationalities, joined these expeditions and utilized specific practices and technologies to collect and visualize the flora and fauna of Spanish possessions.¹⁵

The production of images based on careful observation and representation of people, plants, and animals encountered in new lands was a cornerstone of early modern European scientific practices in relation to natural history. However, in the Spanish Empire, visual representations of nature functioned on a host of other levels. Daniela Bleichmar has recently argued that a "way of knowing based on visibility" or what she has termed "visual epistemology" became an integral part of the Spanish imperial apparatus. Drawings of flora and fauna did not just serve natural history, they carried the imperial purpose "of making the New World knowable and governable [which] involved making it visible."¹⁶ Paula De Vos has explored the extent to which the Spanish Crown also gave importance in the early eighteenth century to the collection of natural curiosities and rarities.¹⁷ For instance, out of the 335 shipments of commercially useful plants that were sent to Madrid from all over the Empire in the latter half of the eighteenth century, 25 boxes contained curiosities. Those collected from the Philippines included live and preserved animals, shells, corals, and minerals, and an assortment of "monsters." These specimens, destined for the Bourbon royal cabinet and botanical garden, were important markers of power, status, and prestige.¹⁸

The recruitment of three naturalist-botanists for the Malaspina expedition reflected Spain's appetite for global botanizing. Malaspina's appointments are notable for their diverse nationalities and the wide-ranging accomplishments and expertise of those selected. Antonio

Pineda y Ramírez, appointed the expedition's chief of natural history, was a Spanish army officer born in Guatemala in 1753. He had served in the Royal Spanish Guards and had been assigned at the Royal Museum of Natural Science where he finished a work on the museum's collection of birds. Malaspina described him as intelligent, experienced in all branches of the natural sciences, and a man of "admirable energy and disposition."¹⁹ The second naturalist of the expedition was a Frenchman, Luis Néé, who was born in Paris but had worked for most of his life in Spain. Néé had been employed for a number of years by the Royal Botanical Garden in Madrid. He had collected plants in the Basque region sending over 1,200 species from Navarre to Madrid in one year and had completed a study on the vegetation of southern Spain. As Malaspina noted, Néé was "well-versed in theoretical and practical botany, was indefatigable in his investigations."²⁰ The third recruit was the 28-year-old brilliant, resourceful Bohemian adventurer Tadeo Haenke. A polyglot, Haenke was fluent in Spanish, French, Latin, Italian, and German; he held a doctorate from the University of Prague, and had visited Syria, Corinth, and Tyrol. Arriving on board the expedition in spectacular fashion, Haenke had narrowly missed the expedition's departure from Cadiz and attempted to catch up in Buenos Aires. There, the boat he was on was shipwrecked and he managed to swim ashore bringing with him only a copy of Linnaeus. Missing the expedition again, he made his way to Santiago de Chile, the expedition's next stop, walking overland and collecting 2,500 plants along the way. He caught up with the expedition in 1790.²¹ Finally, the expedition's physician and surgeon aboard the *Atrevida*, Pedro María González, was also a naturalist and contributed by describing a quantity of zoological specimens collected in Acapulco.²²

Accompanying the work of the collectors were several artists who joined the expedition at separate phases of the journey. José Guió, a young artist and taxidermist, stayed with the expedition until Acapulco where they arrived in 1791; the highly educated and talented artist of perspective serving the *Descubierta*, José del Pozo was replaced by Tomás de Suría on account of the former's indolence; initially joining as a servant, the Spanish draughtsman José Cardero was recognized as an official artist of the expedition by the time they arrived in Acapulco, industriously working throughout the time in Alaska drawing the Tlingit before departing to join another expedition. The artists responsible for drawings undertaken in the Philippines were two Italians, the 28-year-old Milanese Fernando Brambila, and Juan Ravenet, the latter being Malaspina's family acquaintance.²³

Political Contexts, National and Personal Motivations

The Malaspina expedition was assigned three tasks: (1) to map coastlines and trace navigation routes; (2) to inventory, classify, and evaluate the natural resources of Spanish territories; and (3) to undertake an investigation of the Empire's border zones. Broadly, the Spanish Bourbon monarchy attached the utmost importance to maintaining maritime control in the Pacific and reinforcing internal government within its viceroalties. The expedition to Peru in 1735 by La Condamine, accompanied by Jorge Juan and Antonio de Ulloa, marks the first of 63 scientific expeditions that were organized by the Spanish monarchy throughout the eighteenth century until the early nineteenth century.²⁴ During this period, Spain allocated a bigger budget for scientific expeditionary purposes than any other European state. From 1765 onward, Charles III, renowned in his interest in and support for the development of natural sciences, sponsored a number of important expeditions whose range of objectives embraced global, hydrographic, botanical, cartographic, geostrategical, and astronomical aims. Between 1775 and 1800, nine expeditions set out for America with the particular purpose of studying its flora, fauna, and natural resources.²⁵ Of the expeditions sent out specifically to the Philippines, almost all were planned as hydrographic missions indicative of the crown's interest in defending shipping routes and the safety of navigation.²⁶ Spain sought, firstly, to ensure the defense and security of trade and navigation routes; secondly, to defend national honor; thirdly, to pursue scientific interests; and fourthly, political gain.²⁷ Similarly, the motives of French and English exploration of the Pacific in the 1760s and 1770s have often been identified as prosaic—motives of pride, rivalry, and national defense. The English desired to maintain their naval preeminence, a position which they were justly proud, and both countries were prepared to invest heavily in commercial prospects, expansion and the development of new arenas for trade.²⁸ In the age of Enlightenment, exploratory voyages made manifest the elevation of science, deeper philosophical interests in human societies and their development, and the concept that scientific achievement was closely linked to human progress. That said, Spain was, to be sure, also stimulated into action by the scientific activities of the English, French, and Russians in the Pacific. Spain's alarm at their activities stemmed from her belief that the area was exclusively reserved for her own trade and navigation. Spain's indignation clearly surfaced when British whalers were sighted off South American coasts and British fur traders at Nootka Sound.²⁹ Certainly, the Spanish did not attribute

solely scientific aims to British exploration. Captain Cook's voyage in 1788, for instance, was perceived in terms of not only enriching scientific knowledge, but also strategically acquiring land. Speaking about the British settlement in New South Wales, one Spaniard noted: "The endeavours of the energetic Cook . . . have placed his Nation in a position to compensate itself for the loss of North America by the acquisition of a country almost as vast."³⁰

But the threat to trade routes was not the only factor that angered Spain. Spanish expeditionary activity was also set within a political context that saw the country defending her beleaguered national honor. In examining eighteenth-century Spanish political economy, Jorge Canizares-Esguerra has recently shown that a characteristic of the Spanish Enlightenment was the tension between the patriotic repudiation of foreign criticism and confronting the reality of decline.³¹ It was claimed that Spain had turned inward, inclined to keep itself, and others, from knowing more about the Pacific. During the first two decades of the eighteenth century, France and England had been busy exploring the west coast of South America for exploitable wealth. Mocking Spain for her alleged ignorance and backwardness, French and British intellectuals of the European Enlightenment would talk of Spain's "decline," pointing to a number of purported faults—from a mismanaged economy, indulgent and emasculated courtiers, to an idle population. Spain was censured for failing to accept new sciences and technologies produced by the Scientific Revolution, for her lack of knowledge about the New World, of the region's plants and natural history, and the general absence of scientific interest. To counter these accusations, Spain heavily funded and launched scientific expeditions and established botanical gardens.

Malaspina's project was commissioned by a Spanish monarchy partly in response to the threat made on its security and trade in the Pacific, and partly because Spain was defending its reputation against allegations of national decline. The expedition's purpose was to make a systematic investigation of Spain's possessions and survey imperial strengths and weaknesses. Its commitment to science was always linked to politics, commerce, and national honor.³² In keeping with Enlightenment ideals, motives that aimed to advance sea navigation, geography, and the progress of humanity ostensibly did much to replace old sixteenth-century imperialist attitudes of conquest, religious conversion, and economic exploitation with which the Indies were typically regarded.³³ There was the expectation that the expedition would make: "new discoveries, careful cartographic surveys, important geodesic experiments in gravity and magnetism, botanical

collections, and descriptions of each region's geography, mineral resources, commercial possibilities, political status, native peoples and customs."³⁴ To ensure the efficient organization and successful implementation of scientific tasks, the expedition followed a core set of procedures, or principles. Scientists were carefully chosen; learned institutions and scientists were consulted; and accumulated materials were to be systematically sent back to Spain. Moreover, following established practice, information would be obtained through carefully drafted questionnaires that would be completed with the cooperation of local scientists and institutions.³⁵

But political gain remained an important subtext, and Malaspina's mission brought together scientific interests with the business of reporting on the political and economic state of the Spanish Empire, or, as it was spelled out: "to explore, examine, and knit together Madrid's far flung empire, report on problems and possible reforms, and counter the efforts of rivals to obtain colonial possessions at Spain's expense."³⁶ The aim was to obtain reliable data in order to gain a clear idea of Spain's overseas dominions, and the resources that could be harnessed for securing and maintaining Spanish hegemony in the Pacific.³⁷

Did Malaspina go beyond these directives? Disdain for the old motives of imperial acquisitiveness, commerce, and power was not uncommon, and European intellectuals were wont to show both imperial and scientific high-mindedness.³⁸ Malaspina, however, appears to have emphasized the importance of science and politics in equal measure. Juan Pimentel has recently portrayed the Tuscan-born navigator and explorer as a "social Newtonian," whose moral standpoint, global vision, and Enlightenment ideals imprinted a universal character upon the expedition. Malaspina believed in a fundamental set of truths or what he called ten "axioms" that he deemed necessary for Spain's regeneration. Elaborated in *Axiomas políticos sobre la América* (1789), a work written before the departure of the expedition, they included a call for the liberalization of trade and local political institutions, the reform of Hispanic bureaucratic systems, and opposition to conquest and commercial monopolies.³⁹

Malaspina in the Philippines

By the time the expedition arrived in the Philippines, the voyage was in its third year and had journeyed through Montevideo; the Rio de la Plata, the Falklands, and Tierra del Fuego; crossed South America and the Andes on foot; visited Lima, Panama, Prince William Sound off

the Gulf of Alaska; Nootka Sound in present-day British Columbia; Acapulco; and Guam. "The nearer we came to the Philippines," wrote Malaspina on 22 February 1792, "the greater was my preoccupation regarding good planning to ensure that the expedition produced the best results without risking failure by being excessively adventurous." Written en route to Port Palapag in the Philippines from Guam, the diary entry offers a glimpse of Malaspina's anxious mood. He was hoping to make charts of the country's principal islands. While in the Philippines, the corvettes would be refitted and the crew, exhausted from illness, suffering from fevers and "very severe attacks of bilious colic" and fearful of pirate attacks, would rest. The corvettes themselves were infested with cockroaches, so severe that cabins had to be dismantled to completely rid them of insects.⁴⁰

Malaspina noted his first impressions of the country: "The scenes that meet the eye are so many and varied," he wrote, and, scanning the landscape of Sorsogon, observed, "a uniformly luxuriant vegetation, the terrain... gently rounded or steeply rising to volcanoes and other higher mountains, the watchtowers of each of the towns." Throughout the visit, the expedition was welcomed by Spanish officials who were attentive, provided them with food, horses, and armed escorts.⁴¹ Upon landing, Malaspina sought the aid of missionaries while the crew collected seashells and bought provisions from Filipinos, making a point to buy cockerels which were used both as food and as amusement in cockfights. Indeed, Malaspina was particularly grateful that cockfights were frequent throughout the country because they served to distract his crew away from sexual temptations or "worse pastimes."⁴² It was noticed that in some of the crew of both corvettes, the "dreadful symptoms of venereal disease" had appeared and had to be treated with mercury.⁴³ To prevent further infections, Malaspina imposed several disciplinary measures and enforced routines to keep behavior in check: "The marines were ordered to perform firearms drill twice a week and to have a clothing inspection once a week. Any seamen who missed roll call without leave for three days was to be considered a deserter... Anyone who transgressed these very moderate regulations... would be condemned to the Cavite galley."⁴⁴ What proved to be more effective however, were other distractions especially cockfights:

A sailor's cravings are inexhaustible... there was an abundance of domestic fowls, and the cockerels, which are the object of the natives' constant attention... It had to be considered an advantage, therefore, that the useful diversion of the cock-fights continued throughout our

stay in this port, distracting the men from other vices and providing a quantity of healthy food for the cooking pot.⁴⁵

The plan was for the corvettes to separate, the *Atrevida* to sail onto Macau, while the *Descubierta* would remain. Malaspina was to send parties by land and sea to undertake soundings, chart harbors and survey coastlines covering eastern Luzon, the passage around the north-east extremity of the island of Samar and the various ports scattered from east to west at the southern end of Luzon. In Manila, Malaspina sought out local officials to gain information on the country's political conditions and natural history; artists sketched and painted ethnological portraits, vistas, and buildings. Antonio Pineda, Luis Neé, and Tadeo Haenke set out on inland excursions around the country to make observations and collect specimens.⁴⁶

Output from the visit to the Philippines was substantial. Malaspina produced the first accurate charts of Luzon, Mindanao, Mindoro, and Negros; Felipe Bauza, the expedition's cartographer, drew coastline views and various maps of ports; documents in Filipino archives were copied and, in the field of botany, Neé discovered a variety of unknown plants and wrote a comparative study of plants found in Luzon and Mindanao.⁴⁷ Pineda's writings included his meteorological observations, research on volcanoes, minerals, commerce, and agriculture, and his observations of the Philippine peoples.⁴⁸

In Pursuit of Scientific Accuracy

The corvettes were supplied with a library of predominantly British and French works on navigation, astronomical observations, and hydrographic charts ordered from London and Paris. It was equipped with the latest surveying and navigational instruments recommended by Sir Joseph Banks and purchased from the most important instrument-makers in London, with the help of Alexander Dalrymple.⁴⁹ Sixty-eight pieces of equipment were issued, of which sixty-one had been purchased from London.⁵⁰ Included in Malaspina's cache of precision instruments were a quantity of pocket chronometers (because they tended to break); the Ramsden astronomical quadrant, so famed because it was made by one of the most skilled instrument-makers in eighteenth-century England; a variety of telescopes and compasses; a eudiometer for measuring air quality on board the ship; at least two longitude chronometers; and, interestingly, a microscope that could have been the first microscope to arrive in the Philippines. This may well have been a solar microscope, invented in the 1750s, a useful

apparatus for naturalists, which operated in a dark room much like a magic lantern, producing highly magnified images of very small objects with the aid of the sun's rays falling on a plane mirror outside the room, and reflecting toward a condensing lens.⁵¹

Malaspina's emphasis on accuracy was revealed by his habit of methodically comparing his data, and checking differences in mathematical calculations, with those obtained by previous expeditions. He regularly referred to Cook's writings, copies of which he kept on board the *Descubierta*, and Dalrymple's engraved charts, which he depended upon during storms and high winds.⁵² In addition, he regularly compared his astronomical and hydrographic Philippine data with calculations taken by the Göttingen astronomer Johann Tobias Mayer (1723–62) (Mayer's star catalogue), and findings from at least two other expeditions. In the Philippines he consulted Le Gentil's longitudinal measurements obtained from the unfortunate Frenchman's hapless voyages to record the 1761 and 1768 transits of Venus, and astronomical data gathered by Jean-François de La Pérouse on his expedition to the Pacific from 1785 to 1788.⁵³

Pineda's list of books carried by the expedition show a reliance on British and French secular accounts of Pacific voyages, and included the most authoritative works of the period on zoology, mineralogy, astronomy, and botany—from Linnaeus and Buffon to Plumier. He sought out titles from Paris and London, and works that detailed the latest methods in calculating distances and charting coastlines.⁵⁴ Works by local clerics, on the other hand, were conspicuous by their absence within the expedition's library.⁵⁵ At the time of Malaspina's arrival, much of what was already known about the Philippines was through works by the religious orders. Priests were well placed within a community, resided in the country for lengthy periods, and were at the vanguard of botanical and natural history writing in the Philippines. From the sixteenth century to the end of the eighteenth century, *Historias* and *Relaciones*, written by friar and Jesuit scholars, offered the most detailed sources of information on the archipelago. Works such as Pedro Murillo Velarde's *Historia de la provincial de Philipinas de la Compania de Jesus* (1749), and the multivolume *Historia General de Philipinas* by the Augustinian Juan de la Concepción published in 1788, one year before Malaspina's departure, described local customs, flora, and fauna, and the geography and climate of the archipelago, with the aim of bringing science into the service of God.⁵⁶ The botanical drawings, detailed annotations, and collections of plant and animal specimens by the Czech Jesuit lay brother Georg Josef Camel, for example, were the first serious inquiry into the botanic and zoologic

life found in the Philippine archipelago; and the two-volume *Historia* of the Visayan peoples, written in 1668 by the Jesuit Ignacio Alcina, was a richly detailed ethnography, the result of a 42-year residency in the Philippines and a strong grasp of local languages.⁵⁷

Although Malaspina may not have consulted these clerical writings, he certainly did seek out Spanish missionary friars for information and practical support in his travels around the archipelago. Frequently, they were his first port of call, as when he immediately went to see the resident Franciscan friar when he arrived in Port Palapag.⁵⁸ While surveying the coasts of Pangasinan, Francisco Viana, an ensign on the voyage, drew on the hospitality of Dominican and Augustinian friars. Writing flatteringly of the religious orders, whom he says showed “the extent of their influence over the natives, undoubtedly won by gentleness, love and kindness,” Viana compared the work of Spanish missionaries to Filipino secular priests. The former had brought civilization and order, as shown in clean and orderly towns, well-dressed and hardworking natives; the latter, he perceived, were just the same as the “mass of people” because they shared the customs of their fellow Filipinos; he charged them with idleness, bearing little influence over people, and administered towns where idleness, neglect, and laxity were widespread.⁵⁹

The Art of Empirical Research

Mary Louise Pratt has argued that the exploration and documentation of continental interiors, from about 1750 to 1800, presented a new orientation in travel writing and a “major object of expansionist energies and imaginings.”⁶⁰ Expedition writings relating to the interior exploration of the Philippines reflect an eclecticism of interests and give a forceful impression of industrious Europeans moving about the country in all directions, searching, observing, and collecting. Tadeo Haenke botanized (*herborizando*) his way across dense forests and sandy plains⁶¹; Luis Neé wrote with enthusiasm and curiosity toward all that he encountered—whether the subject was the plants he collected (in Acapulco, during one month alone, Neé had collected and described 30 new specimens of plants), or ethnography, “Indian” societies he came across, particularly the Negrito peoples with whom he stayed simply out of curiosity, or the physical terrain of the places he visited. Neé was also interested in zoology and conchology; he scaled the Albay volcano, noting the surrounding landscape of gypsum rocks, fissures, and gullies; he looked into the production of commercial crops and surveyed the cultivation and plantations of cocoa,

mulberries, indigo, pepper, sugar, and cotton.⁶² Antonio Pineda's account, written by Neé from notes and journals saved after his death, appears as a narrative of physical suffering, dogged perseverance, and industriousness under intolerable conditions. Juan Ravenet sketched Negrito peoples. Witnessing a demonstration of their dances and exchanging adornments, Ravenet saw them as innocents, showing him no distrust or ill will⁶³. Commenting on the work of the naturalists in Sorsogon, Malaspina noted the return of Pineda and Haenke who had been away for several weeks collecting, bringing back "a vast number of acquisitions and much useful information." Impressed by their diligence under the difficult circumstances, he wrote:

These industrious naturalists had, in the short space of eight days travelled through a considerable part of the province . . . made a close study of the volcano . . . and the molten rock . . . After this, botany and zoology had been the principal object of their observations, and although the rain, the rough tracks and the short time available were obstacles to the success of their excursion, their survey could nonetheless be considered complete, particularly as Don Luis Neé had explored the area surrounding the harbour with his usual zeal.⁶⁴

Neé was collecting in the Bicol region, in Sorsogon, the southernmost province of southern Luzon, through the provinces of Albay and Camarines before returning to Manila and the environs. He was careful to take note of useful plants such as *abaca*, fibers obtained from a species of banana that could be used for rope and cordage; forests "full of excellent timber for construction," planting of *bongva* palms, indigo, and cocoa; and indigenous uses of plants especially in relation to medicines and textiles.⁶⁵

Meanwhile, Haenke made his way from Manila to Ilocos Norte, the northernmost region of Luzon. En route he was aided by many priests, one of whom, Father Fray Manuel del Barrio, a poet, Haenke praised for his "vast erudition and love of science."⁶⁶ Like his colleagues, Haenke kept an eye out for the profitable, taking note of gold mines worked by the *igorots*, a term given by the Spaniard to the indigenous peoples of the Cordillera region, and their cultivation of various cottons. He remarked on the fertility of the area, relentlessly collecting all plants that he considered important, new, and precious. Over a period of two weeks he had amassed a "large collection of well-dried plants of about 2000 species" taking care that the collections were well protected from damage and humidity. On his return journey to Manila, he collected the flowers of plants

that had come into season and, despite a brief bout of illness, was able to write his observations “on the little known fruition of [the] palms.”⁶⁷

Antonio Pineda set out on 11th April, a few days ahead of Haenke. He tarried awhile in the rural environs of Manila, examining first the cinnamon plantations and the thermal waters of Laguna, the latter accomplished by following the methods of the renowned Swedish scientist Torbern Olof Bergmann (1735–83).⁶⁸ He observed how the springs of Laguna were used to irrigate over 5,000 cinnamon trees and 500,000 trees of various species, and tested the waters for their purity.⁶⁹ Accompanied on the early leg of his journey by Juan de Cuellár, a naturalist who had been commissioned to collect plants by the Real Compañía,⁷⁰ Pineda intended, eventually, to travel north, by way of Pampanga, in central Luzon, and follow the entire length of the Cagayan river that flowed through northeastern Luzon, passing through settlements established by the Dominicans. He carried with him a barometer, a hydrometer, several other boxes, a few provisions, and a single blanket. The hostilities of the *igorots* toward Spaniards had compelled him to travel with 20 Filipinos armed with spears and arrows; he, his European servant, and the painter, possibly Ravenet, carried muskets. In northern Luzon, the party’s progress was slow due to the difficult terrain—steep, slippery mountain slopes, tortuous tracks, and thickly forested areas impassable by horseback.⁷¹ Throughout the journey, Pineda made the acquaintance of priests who sheltered and shared with him their knowledge. In Cagayan, for instance, a learned Dominican friar Fray Antonio Lobato shared his observations on the Kalingas, the rice farmers of the Cordilleras; in Badoc he was tended to by Augustinians.⁷² Pineda himself was attentive: he noted the fine quality of the cocoa that grew on the rocky soils of mountain ridges; he observed how the Spanish tobacco monopoly had impoverished villages and diminished original trades such as the collection of wax; and he praised the industriousness of women weavers.⁷³

Neé’s retelling of Pineda’s journey was inclined to emphasize the arduousness and peril Pineda encountered, thus deterministically presenting the journey, and Pineda’s death, as most importantly distinguished by heroism. Pineda, Neé recounted, suffered innumerable deprivations and hardships that took a toll on his health. Already beleaguered by fevers, most likely malaria, his condition took a turn for the worse after drinking from the waters of the Cagayan river, though he knew the water to be impure. He died on 23rd June at the age of 38.

Conclusion

The Malaspina expedition was driven by a host of purposes that were to directly benefit the Spanish Crown—from the making of hydrographic charts to assist in mercantile navigation within even the remotest regions of Spain's Empire, to the execution of a systematic and comprehensive survey of American politics, commerce, natural resources, manufacturing, and defense, in relation to Spain. But Malaspina also infused the undertaking with an expansive enlightened thinking that sought to gather information and collect all manner of exotica, flora and fauna, for the Royal Museum and Botanical Garden, where everything could be studied and exhibited for the benefit of science and humanity. The careful and internationally diverse choice of officers on the Malaspina expedition, men chosen for their scientific breadth, depth, eclecticism, and experience, appears to have been a case of obtaining the best men to carry out the expedition's special scientific aims. State support for Malaspina's international choices seems to indicate a distinct lack of fear of espionage, a confidence though difficult to explain was rewarded by Malaspina and others. The Czech naturalist Tadeo Haenke, for instance, had been appointed on the recommendation of the Austrian ambassador to Spain, and continued to serve the Spanish Crown as a naturalist until his death in Alto Perú, what is today Bolivia, on November 4, 1816.⁷⁴

"Science," as Jorge Cañizares-Esguerra has written and other scholars have also observed, "was the handmaiden of the Iberian empires."⁷⁵ The eighteenth century was a favorable moment for Spanish science. The period saw the establishment of a number of important scientific institutions in Madrid (the Royal College of Medicine, the Astronomical Observatory, for instance); and Spanish scientific exploration excelled most notably in the field of botany. Naturalist-botanists on board expeditions sponsored by the Crown sent innumerable floral and faunal specimens to Spain; completed thousands upon thousands of folio botanical illustrations; and wrote detailed descriptions of new specimens, valuable woods, precious resins and gums, medicinals, curiosities, and fish and other marine life. Yet, conspiracies at court and imprudence were able to consign the considerable achievements of one of the most extensive and far-ranging expeditions launched by Spain to obscurity until the late twentieth century. Two volumes of hydrographic and astronomical information were published in 1809, but this was only a small fraction of the expedition's work.⁷⁶ Why had the expedition's findings been permitted to languish for so long? Scholars have pointed to the enduring "bureaucratic culture

of secrecy,” *arcane imperii*, long upheld by the Spanish monarchy.⁷⁷ Knowledge, it was thought, could only be circulated in manuscript form among the trusted, a strategy that would effectively obstruct the ambitions of imperial rivals, or so it was reasoned. Perhaps combined with this culture of secrecy, there might also have been a general distrust of print and print culture, though knowledge was allowed to circulate in the form of images—masses and masses of drawings that might have served as mnemonic aids so that plants and knowledge of distant places were experienced visually.⁷⁸ What is certain is that the failure to publish information from the Malaspina expedition greatly deprived Spain of national prestige. In the Philippine case, the information gathered by the botanists Pineda, Haenke, and Neé would have substantially added to the knowledge already gathered by priests. Had their findings been published, the authority of clerical writings would surely have been challenged long before the late nineteenth century.

Notes

1. The Malaspina expedition and the life and political thought of Alejandro Malaspina are well documented. A few important works are Maria Dolores Higuera Rodríguez, *Catálogo Crítico de los Documentos de la Expedición Malaspina en el Museo Naval*, 3 vols. (Madrid: Museo Naval, 1989–1994); Andrew David, Felipe Fernández-Armesto, Carlos Novi, and Glyndwr Williams, with an introduction by Donald C. Cutter. *The Malaspina Expedition 1789–1794: Journal of the Voyage by Alejandro Malaspina*, trans. Sylvia Jamieson, 3 vols. (London and Madrid: The Hakluyt Society and the Museo Naval, Madrid, 2004); Iris H. W. Engstrand, *Spanish Scientists in the New World: The Eighteenth Century Expeditions* (Seattle: University of Washington Press, 1981); Juan Pimentel, *La Física de la Monarquía: Ciencia y Política en el Pensamiento Colonial de Alejandro Malaspina (1754–1810)*, Colección de Historia Natural *Theatrum Naturae* (Aranjuez: Doce Calles, 1998); Juan Pimentel, *Testigos del Mundo: Ciencia, Literatura y Viajes en la Ilustración* (Madrid: Marcial Pons Historia, 2003).
2. Alexander von Humboldt, *Political Essay on the Kingdom of New Spain*, vol. II, trans. John Black (London: Longman, Hurst, Rees, Orme and Brown, 1811), 376.
3. Juan Pimentel, *Viajeros Científicos: Tres Grandes Expediciones al Nuevo Mundo; Jorge Juan, José Celestino Mutis y Alejandro Malaspina* (Madrid: Nivola, 2001); Virginia González Claverán, *La Expedición Científica de Malaspina en Nueva España, 1789–1794* (Mexico: El Colegio de México, 1988).
4. Felipe Fernández-Armesto, *Pathfinders: A Global History of Exploration* (Oxford: Oxford University Press, 2006), 306.

5. Exceptionally, for a chronological survey of the expedition including the Philippines, see Emilio Soler Pascual, *La Aventura de Malaspina: la Gran Expedición Científica del Siglo XVIII por las Costas de América, las Filipinas y las Islas del Pacífico* (Barcelona: Ediciones B, 1999); José María A. Cariño and Sonia Pinto Ner, *Álbum: Islas Filipinas 1663–1888* (Hong Kong; Ars Mundi Philippinae, 2004), esp. 42–72.
6. William Lytle Schurz, *The Manila Galleon: The History of the Spanish Galleons Trading between Acapulco and Manila* (New York: Dutton, 1959).
7. Engstrand, *Spanish Scientists in the New World*, 45.
8. Work on European collecting and collecting practices is vast. Some prominent examples are: Thomas DaCosta Kaufmann, *The Mastery of Nature: Aspects of Art, Science, and Humanism in the Renaissance* (Princeton, NJ: Princeton University Press, 1993); John Elsner and Roger Cardinal, eds., *The Cultures of Collecting* (Cambridge, MA: Harvard University Press, 1994); Lorraine Daston and Katherine Park, *Wonders and the Order of Nature 1150–1750* (New York: Zone Books, 1998); Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley: University of California Press, 1994); Nicholas Jardine, Emma Spary, and J. A. Secord, eds., *Cultures of Natural History* (Cambridge: Cambridge University Press, 1996); Anthony Grafton and Nancy Siraisi, *Natural Particulars: Nature and the Disciplines in Europe* (Cambridge, MA: MIT Press, 1999); Pamela H. Smith and Paula Findlen, eds., *Merchants and Marvels: Commerce, Science and Art in Early Modern Europe* (London: Routledge, 2002); Eddy Stols, Werner Thomas, and Johan Verberckmoes, eds., *Naturalia, Mirabilia e Monstrosa en los Imperios Ibéricos* (Leuven: Leuven University Press, 2007); also Part 3, chapters 9, 10, and 11 in Claire Farago, ed., *Reframing the Renaissance: Visual Culture in Europe and Latin America 1450–1650* (New Haven and London: Yale University Press, 1995). I thank Thomas DaCosta Kaufmann for bringing this book to my attention.
9. David Arnold, *Science, Technology and Medicine in Colonial India* (Cambridge: Cambridge University Press, 2000); several art historical studies on the Mughal empire, for instance, Som Prakash Verma, *Flora and Fauna in Mughal Art* (Bombay: Marg Publications, 1999); Harold J. Cook, *Matters of Exchange: Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven and London: Yale University Press, 2007); Londa Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World* (Cambridge, MA: Harvard University Press, 2004); Londa Schiebinger and Claudia Swan, eds., *Colonial Botany: Science, Commerce, and Politics in the Early Modern World* (Philadelphia: University of Pennsylvania Press, 2007); Londa Schiebinger, “Forum Introduction: The European Colonial Science Complex,” *Isis* [Special Issue] 96 (2005): 52–55; Jorge Cañizares-Esguerra, *Nature, Empire and Nation: Explorations of the History*

- of Science in the Iberian World* (Stanford: Stanford University Press, 2006); Roy MacLeod, ed., "Nature and Empire: Science and the Colonial Enterprise," *Osiris* [Special Issue] (2000). See also selected essays in the Variorum volumes: Ursula Lamb, ed., *The Globe Encircled and the World Revealed*, vol. 3 (Ashgate: Variorum, 1995); Felipe Fernández-Armesto, ed., *The Global Opportunity*, vol. 1 (Ashgate: Variorum, 1995); and Sanjay Subrahmanyam, ed., *Merchant Networks in the Early Modern World, 1450–1800*, vol. 8 (Ashgate: Variorum, 1996).
10. Scholarly work is scattered and fragmentary. For recent treatments on Jesuit botanizing with mention of the Philippines, see Sabine Anagnostou, "Jesuits in Spanish America and Their Contribution to the Exploration of the American Materia Medica," *Pharmacy in History* 47 (2005): 3–17; Sabine Anagnostou, "International Transfer of Medicinal Drugs by the Society of Jesus (Sixteenth to Eighteenth Centuries) and Connections with the Work of Carolus Clusius," in *Carolus Clusius in a New Context: Cultural Histories of Renaissance Natural Science*, ed. Florike Egmond, Paul Hoftijzer, and Rob Visser (Amsterdam: Edita Pubs. Royal Dutch Academy, 2006), 293–312; and Raquel A. G. Reyes, "Botany and Zoology in the Late Seventeenth-Century Philippines: The Work of Georg Josef Camel, SJ (1661–1706)," *Archives of Natural History* 36 (2009): 262–76. On the early-seventeenth-century Franciscan botanist Father Blas de la Madre de Dios, see Francisco Guerra and María Carmen Sánchez Tellez, *El Libro de Medicinas Caseras de Fr. Blas de la Madre de Dios: Manila, 1611* (Madrid: Editorial Cultura Hispánica, Fac de Medicina Alcalá de Henares, 1986); Evelyn Ansay-Miranda, "Positive Contributions of Spanish Religious Scientists in Philippine Society," in *Imperios y Naciones en el Pacífico*, vol. 1, ed. María Dolores Elizalde, Josep M. Fradera, and Luis Alonso (Madrid: Biblioteca de Historia, CSIC, 2001), 585–95; Mercedes Planta, "Traditional Medicine and Pharmacopoeia in the Philippines, 16th and 17th Centuries," *Historical Perspectives on East Asian Science, Technology and Medicine* (Singapore: Singapore University Press, 1999). For a brief mention of the role of Juan de Cuéllar and the cultivation of pepper, coffee, cacao, cinnamon, indigo, and mulberry trees for silkworms in the Philippines, see Daniela Bleichmar, *Visible Empire: Botanical Expeditions and Visual Culture in the Hispanic Enlightenment* (Chicago and London: University of Chicago Press, 2012), 135–37.
 11. For a recent survey of early modern European commercial and imperial rivalry, see Ronald Findlay and Kevin H. O'Rourke, *Power and Plenty: Trade, War, and the World Economy in the Second Millennium* (Princeton, NJ: Princeton University Press, 2007).
 12. Antonio Barrera-Osorio, *Experiencing Nature: The Spanish American Empire and the Early Scientific Revolution* (Austin: University of Texas Press, 2006); Daniela Bleichmar et al. eds., *Science in the Spanish and*

- Portuguese Empires 1500–1800* (Stanford: Stanford University Press, 2009).
13. Chiyo Ishikawa ed., *Spain in the Age of Exploration 1492–1819* (Seattle: University of Nebraska Press, 2004), 171–72.
 14. Ibid.
 15. Daniela Bleichmar, “A Visible and Useful Empire: Visual Culture and Colonial Natural History in the Eighteenth-Century Spanish World,” *Science in the Spanish and Portuguese Empires*, 290–309.
 16. Bleichmar, *Visible Empire*, 10. On the application of “visuality” to the study of cultural interaction in the early modern period see Claire Farago, “Understanding Visuality,” in *Seeing Across Cultures in the Early Modern World*, ed. Dana Leibsohn and Jeanette Favrot Peterson (Farnham: Ashgate, 2012), 239–57.
 17. Paula De Vos, “The Rare, the Singular, and the Extraordinary: Natural History and the Collection of Curiosities in the Spanish Empire,” *Science in the Spanish and Portuguese Empires*, 271–90.
 18. Ibid. On botanical collecting and the culture of gift exchange and patronage during the Hispanic Enlightenment see Daniela Bleichmar, “Visible Empire: Scientific Expeditions and Visual Culture in the Hispanic Enlightenment,” *Journal of Postcolonial Studies*, 12 (2009): 441–66. On the origins of the Royal Natural History Cabinet, see María Angeles Calatayud, *Pedro Franco Dávila y el Real Gabinete de H.a Natural* (Madrid: CSIC, 1988).
 19. Engstrand, *Spanish Scientists in the New World*, 46.
 20. Ibid., 47; John Kendrick, *Alejandro Malaspina: Portrait of a Visionary* (McGill: Queen’s University Press, 1999), 41.
 21. Engstrand, *Spanish Scientists in the New World*, 48.
 22. Ibid., 52; Iris H. Wilson Engstrand, “Of Fish and Men: Spanish Marine Science during the Late Eighteenth Century,” *Pacific Historical Review* 69 (2000): 3–30.
 23. For a comprehensive catalogue of the expedition’s artists, see Carmen Sotos Serrano, *Los Pintores de la Expedición de Alejandro Malaspina* (Madrid: Real Academia de la Historia, 1982). Also, José Torre Revello, *Los Artistas Pintores de la Expedición Malaspina*, vol. 2 (Buenos Aires: Estudios y Documentos para la Historia del Arte Colonial Universidad de Buenos Aires, 1944).
 24. Scholarship on early modern Spanish colonial science in the Philippines is extremely limited. While tentative research on science in nineteenth-century Philippines has begun, literature is slight on earlier periods and is frequently found in the form of translations, annotations, and reprints of manuscripts. Exceptionally, some work has been done in the fields of cartography, navigation, and astronomy in the mid to late sixteenth century, most notably on the charts, maps, and sketches of Southeast Asia made by the Portuguese cartographer Francisco Rodrigues in 1515 and the Augustinian friar Andrés de Urdaneta, well known for discovering a fast route to Acapulco from

- Manila. See Felipe-Fernandez Armesto, *Pathfinders*; the Filipino historian Horacio de la Costa closely examined Jesuit activities in the Philippines, including some of their scientific contributions: Horacio de la Costa, *The Jesuits in the Philippines, 1581–1768* (Cambridge, MA; Harvard University Press, 1961); in the history of botany, see Maria Belen Bañas Llanos, *Una Historia Natural de Filipinas: Juan de Cuéllar* (Madrid: Ediciones del Serbal, S.A., 2000).
25. Maria Higuera, “The Sources; The Malaspina and Bustamante Expedition: A Spanish State enterprise,” appendix 6 to *The Malaspina Expedition 1789–1794: Manila to Cadiz*, vol. 3 (London: Hakluyt Society, 2004), 372.
 26. Ishikawa, ed., *Spain in the Age of Exploration, 1492–1819*, 185–86.
 27. J. H. Elliot, *Spain, Europe and the Wider World 1500–1800* (New Haven and London: Yale University Press, 2009).
 28. Daniel Baugh, “Seapower and Science: The Motives for Pacific Exploration,” in *Scientific Aspects of European Expansion*, ed. William K. Storey (London: Ashgate Variorum, 1996), 85–139.
 29. See Alan Frost, *The Global Reach of Empire: Britain’s Maritime Expansion in the Indian and Pacific Oceans 1764–1815* (Carlton, VIC: Miegunyah Press, 2003); Alan Frost and Jane Samson, eds., *Pacific Empires: Essays in Honour of Glyndwr Williams* (Vancouver: University of British Columbia Press, 1999).
 30. Alan Frost, “Science for Political Purposes: European Explorations of the Pacific Ocean, 1764–1806,” *Scientific Aspects of European Expansion*, 37.
 31. Jorge Canizares-Esguerra, *Nature, Empire, and Nation: Explorations of the History of Science in the Iberian World* (California: Stanford University Press, 2006), 96.
 32. Scholars have portrayed the Malaspina expedition as particularly representative of a “new phase” in Spain’s relationship with the New World. Richard L. Kagan and Benjamin Schmidt have emphasized the exploratory drive, and the scientific objectives underpinning the expedition.
 33. Ishikawa, ed., *Spain in the Age of Exploration, 1492–1819*.
 34. Frost, “Science for Political Purposes,” 38.
 35. The questionnaires that circulated in the 1570s and 1580s came to be known as the *Relaciones de Indias*. Antonio Barrera-Osorio has carefully elucidated Spain’s information-gathering strategies in relation to the Spanish administration and domination of the Americas, and the management of natural resources: Barrera-Osorio, *Experiencing Nature*, 82–83.
 36. Frost, “Science for Political Purposes,” 39.
 37. Higuera, “The Sources,” 371.
 38. Baugh, “Sea Power and Science,” 40.
 39. Juan Pimentel, “Alessandro Malaspina (1754–1810): In Search of the Nature of Empire” (lecture, Malaspina University College).

40. *The Malaspina Expedition 1789–1794 Panama to the Philippines*, vol. 2, 319.
41. See for instance the treatment the crew received in Zamboanga, described in *The Malaspina Expedition 1789–1794, Manila to Cadiz*, vol. 3, 16.
42. *Ibid.*, 276.
43. *The Malaspina Expedition 1789–1794, Panama to the Philippines*, vol. 2, 324.
44. *Ibid.*, 322.
45. *Ibid.*, 289.
46. *Ibid.*, 273–74.
47. Luis Neé, “Observaciones Botánicas Islas Philipinas 1792,” unpublished manuscript, Archivo de Real Jardín Botánico, Madrid.
48. Cariño and Ner, *Album*, 47.
49. Andrew David, “Surveying and Navigational Instruments and Related Books Supplied to the *Descubierta* and *Atrevida*,” appendix 5 to *The Malaspina Expedition 1789–1794, Panama to the Philippines*, vol. 3, 361.
50. *Ibid.*
51. Gerard L’Estrange Turner, *Scientific Instruments, 1500–1900: An Introduction* (Berkeley: University of California Press, 1998), 96; Robert S. Whipple, “Scientific Instruments in the Eighteenth Century,” *The Philosophical Magazine* (1948), 113–21.
52. *The Malaspina Expedition 1789–1794, Panama to the Philippines*, vol. 3, 4.
53. *Ibid.*, 302–3.
54. Engstrand, *Spanish Scientists in the New World*, 48.
55. David, “Surveying and Navigational Instruments,” 365–70.
56. Others include Juan de Plasencia, *Relación de las Costumbres los Tagalos* (1589); Francisco Colin, *Labor Evangelica* (1604), Pedro Chirino, *Relación de las Islas Filipinas* (1663); and Francisco Combes *Historia de las Islas de Mindanao, Jolo y sus Adyacentes* (1667).
57. Ignacio Francisco Alcina, *History of the Bisayan People in the Philippine Islands (1668)*, ed. Cantius J. Kobak and Lucio Gutierrez (Manila: University of Santo Tomas Publishing House, 2005), 19.
58. *The Malaspina Expedition 1789–1794, Panama to the Philippines* vol. 2, 275.
59. *Ibid.*, 361.
60. Mary Louise Pratt, *Imperial Eyes*, 23.
61. *The Malaspina Expedition 1789–1794, Panama to the Philippines* vol. 2, ff.7, 399. Notes by Tadeo Haenke on Philippine plants are in Div. VI Serie, Tadeo Haenke, Leg.2–3, Archivo de Real Jardín Botánico, Madrid.
62. *The Malaspina Expedition 1789–1794, Panama to the Philippines*, vol. 2, 389.

63. Ibid., 324.
64. Ibid., 290.
65. Ibid., 390.
66. Ibid., 400.
67. Ibid., 402.
68. Ibid., 404.
69. Ibid. The cinnamon from the Philippines was not the true cinnamon, *Cinnamomum Zeylanicum*, which was then found only in Sri Lanka.
70. Lourdes Díaz-Trechuelo, Susana Pinar, Ma. Belén Bañas Llanos, Juana Molia Nortés, and Domingo A. Madulid eds., *La Expedición de Juan de Cuéllar a Filipinas* (Madrid: Caja Madrid Real Jardín Botánico, 1997); María Belén Bañas Llanos, *Una Historia Natural de Filipinas: Juan de Cuéllar, 1739?-1801* (Barcelona: Ediciones del Serbal, 2000); María Pilar de San Pío Aladrén, ed., *La Expedición de Juan de Cuéllar a Filipinas* (Madrid: Lunweg, 1997).
71. *The Malaspina Expedition 1789-1794, Panama to the Philippines*, vol. 2, 404.
72. Ibid., 409-11. For a detailed analysis of the expedition's ethnographic interests see David J. Weber, *Bárbaros: Spaniards and Their Savages in the Age of Enlightenment* (New Haven and London: Yale University Press, 2005).
73. *The Malaspina Expedition 1789-1794, Panama to the Philippines*, vol. 2, 408-10.
74. José Ignacio González-Aller Hierro, "Officers and Supernumeraries on the Malaspina Expedition," appendix 3 to *The Malaspina Expedition 1789-1794, Panama to the Philippines*, vol. 2, 345.
75. Jorge Cañizares-Esguerra, "Introduction," *Science in the Spanish and Portuguese Empire*, 1.
76. Carlos Novi, "The Road to San Antón: Malaspina and Godoy," appendix 2 to *The Malaspina Expedition 1789-1794, Panama to the Philippines*, vol. 3, 330-31.
77. Jorge Cañizares-Esguerra, "Introduction," 3.
78. Ibid., 4-5.

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