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ARTICLE

Imperial Secrecy versus Scientific Exploration. Nicolas Thiéry de Menonville's Botanical Mission to Bring Cochineal from Colonial Mexico to Saint-Domingue

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Abstract

This article deals with the French botanist Nicolas Joseph Thiéry de Menonville who in 1777 went to Oaxaca (Mexico) in search of cochineal. Although cochineal was one of the Spanish Empire's best-kept secrets, he managed to go there, acquire knowledge about its cultivation from local planters, and smuggle the insects on cacti to Saint-Domingue, where he successfully raised them. His voyage is, thus, a paradigmatic case that illustrates how botanical knowledge and objects from local Indigenous farmers were transferred into the networks of European science. The analysis of how the botanist managed to gain access to a space and knowledge that was actually closed to him is embedded within a broader contextualization: starting with the examination of its main source, *Voyage à Guaxaca*, the article reconstructs the scientific and economic discourse that led Thiéry de Menonville to undertake his voyage. It concludes with contemporaries' evaluation of Thiéry de Menonville's transfer of knowledge about cochineal and its cultivation and the impact that his successful mission had on comparable endeavors.

Keywords: Colonial Spanish America; Scientific Exploration; European Expansion; History of Botany; Espionage

1. Introduction

In the eighteenth century, botany became a driving force for Europeans to explore what to them were little-known or unknown world regions. On the one hand was the scientific impulse: botanists wanted to discover new species and classify them according to Linnaeus' system. On the other hand were economic reasons: botany promised autarky for mercantilist interests. Botanists were expected to find plants from around the world that would be useful as foodstuffs, drugs, or dyes, and cultivate them for the benefit of state and society.[1] This created new opportunities for botanists, who

[1] On the relation between science and empire and the central role of botany in European expansion in the eighteenth century: David Philip Miller and Peter Hanns Reill, eds., *Visions of Empire. Voyages, Botany, and Representations of Nature* (Cambridge: Cambridge University Press, 1996); Richard Drayton, *Nature's Government. Science, Imperial Britain, and the "Improvement" of the World* (New Haven: Yale University Press, 2000); Roy MacLeod, ed., *Nature and Empire. Science and the Colonial Enterprise* (Chicago: University of Chicago Press, 2001); Londa Schiebinger, *Plants and Empire. Colonial Bioprospecting in the Atlantic World* (Cambridge, Mass.: Harvard

offered their services to empires which were competing in the botanical exploration of the world.[2]

The emerging botany found a favoured field of research in Spanish America with its abundant but poorly exploited flora. Thus, over the course of the eighteenth century, the eyes of the explorers turned from the coasts and seas where they hoped to discover new lands towards the American continent itself. However, the European explorers faced a problem:

> The Spaniards, who are naturally reserved, and who become particularly mysterious in any circumstance concerning their colonies, kept a secret, which everything induced them to believe was of importance to them.[3]

These words in Abbé Raynal's *Histoire des Deux Indes*, first published in 1770, describe the Spanish government's politics which considered the knowledge regarding its American domains – the coasts, harbours, and sea routes, as well as the population, landscape, resources and military defences – as a state secret, an *arcanum imperii*.[4]

This was especially the case for one of the most valuable natural products of colonial Spanish America: cochineal, the most important red-coloured dye until the development of chemical dyes in the nineteenth century. According to Raynal, a consequence of Spanish secrecy was that the nature of cochineal had "long been unknown, even to nations who made the most use of it."[5]

With regard to insect commodity production, Europeans found themselves on a "knowledge periphery."[6] Made from scale insects which were cultivated on the nopal cactus (a prickly pear cactus), cochineal use was known to pre-Columbian Indigenous people in the Aztec Empire. Geographically, the production had its centre in southern Mexico in the province of Oaxaca, where until the end of the colonial era, cochineal was cultivated by Indigenous producers.[7] Under Spanish rule, cochineal became one of the most important export products from Mexico, in high demand and with high remuneration in the European markets.[8] Due to the economic importance of cochineal, Spain maintained a

University Press, 2004); James Delbourgo and Nicholas Dew, eds., *Science and Empire in the Atlantic World* (New York, NY: Routledge, 2008); Daniela Bleichmar, *Visible Empire. Botanical Expeditions & Visual Culture in the Spanish Enlightenment* (Chicago: University of Chicago Press, 2012); Yota Batsaki, Sarah Burke Cahalan, and Anatole Tchikine, eds., *The Botany of Empire in the Long Eighteenth Century* (Washington, D.C.: Dumbarton Oaks, 2016).

[2] Daniela Bleichmar, "Atlantic Competitions. Botany in the Eighteenth-century Spanish Empire," in *Science and Empire in the Atlantic world*, eds. James Delbourgo and Nicholas Dew (New York: Routledge, 2008), 225–52, 226.

[3] I quote from the second English edition: Guillaume Thomas Raynal, *A Philosophical and Political History of the Settlements and Trade of the Europeans in the East and West Indies*, vol. 2 (London: T Cadell, 1776), 420.

[4] Jorge Cañizares-Esguerra, "Introduction," in *Science in the Spanish and Portuguese Empires, 1500–1800*, eds. Daniela Bleichmar et al. (Stanford, Calif.: Stanford University Press, 2009), 1–5, 3. See also María M. Portuondo, *Secret Science. Spanish Cosmography and the New World* (Chicago: University of Chicago Press, 2009), 6–8.

[5] Raynal, *A philosophical and political history*, 420 (own translation).

[6] Edward D. Melillo, "Global Entomologies. Insects, Empires, and the 'Synthetic Age' in World History," *Past & Present* 223 (2014), 233–70, 234.

[7] On cochineal production by Indigenous people in Oaxaca and colonial cochineal trade, see: R. A. Donkin, *Spanish Red. An Ethnogeographical Study of Cochineal and the Opuntia Cactus* (Philadelphia: American Philosophical Society, 1977), 21–30; Eufemio Lorenzo Sanz, *Comercio de España con América en la época de Felipe II. Vol. 1. Los mercaderes y el tráfico indiano* (Valladolid: Sever-Cuesta, 1979), 548–88; Alicia del Carmen Contreras Sánchez, *Capital comercial y colorantes en la Nueva España. Segunda mitad del siglo XVIII* (Zamora, Mexico: El Colegio de Michoacán, 1996); Jeremy Baskes, Indians, Merchants, and Markets. *A Reinterpretation of the "repartimiento" and Spanish-Indian Economic Relations in Colonial Oaxaca, 1750–1821* (Stanford, Calif: Stanford University Press, 2000), 9–15.

[8] On the importance of cochineal in early modern trade and the colour industry in general, see: Raymond L. Lee, "American Cochineal in European Commerce, 1526–1625," in *The Journal of Modern History* 23 (1951), 205–24; Carlos Marichal, "Mexican Cochineal and the European Demand for American Dyes, 1550–1850," in: *From silver to Cocaine. Latin American Commodity Chains and the Building of the World Economy, 1500–2000*, ed.

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monopoly on its trade, while the Spanish laws of the Indies explicitly forbade any foreigner from exporting cochineal.[9]

Nevertheless, the French botanist Nicolas Joseph Thiéry de Menonville succeeded in visiting Oaxaca in 1777 where he acquired the insects on nopal cactuses and brought them to Saint-Domingue. Using the knowledge he had gained from the local Indigenous planters in Oaxaca, he successfully raised cochineal in the French colony and compiled a handbook for its cultivation, published in 1787 by the Cercle des Philadelphes, a scientific academy founded in Cap-Français in 1784. Thus, his mission can be considered a transfer of Indigenous people's knowledge from the Spanish Empire to the epistemic community of European botanists.

The objective of this article is to use Thiéry de Menonville's mission to examine how European botanists acquired knowledge and species from distant and even closed regions. It analyses strategies for entering the Spanish Empire and discovering its secrets, as well as the colonial administration's attempts to control access and prevent espionage. By focusing on the botanist's interaction with Spanish officials and local residents during his voyage, it is possible to see how access to scientific knowledge was negotiated in a display of both polite social interaction and dissimulation to dispel suspicion, as well as distrust, caution, vigilance, and surveillance.[10]

Knowledge transfer was framed by practices of both openness and secrecy. Whereas the French botanist applied the enlightened ideal of scientific progress to gathering knowledge and the local planters of Oaxaca willingly informed him about the cultivation of cochineal, the role of secrecy was ambivalent. On the one hand, eighteenth-century imperial competition for resources and markets fostered a policy of state secrecy and thus hindered scientific exploration. On the other hand, Thiéry de Menonville had to conceal the real objectives of his travel. His mission thus shows that secrecy was also a condition that enabled knowledge transfers from those actors eager to preserve and not share their privileged knowledge.[11]

His strategy of dissimulating the real purpose of his voyage in order to achieve its scientific objectives exposed Thiéry de Menonville to the reproach of being an impostor. Since the trustworthiness of explorers was linked to their moral integrity, this reproach also questioned his scientific reliability. To defend his moral integrity and to create, as a result, epistemic trust in his observations, he not only justified his mission and strategy with the arguments of imperial competition as well as public utility, but in his travelogue

Steven Topik (Durham, NC: Duke Univ. Press, 2006), 76–92; Elena Phipps, "The Iberian Globe. Textile Traditions and Trade in Latin America", in *The Interwoven Globe. Worldwide Textile Trade 1500–1800*, ed. A. Peck (New York: Metropolitan Museum of Art, 2015), 120–35; Miruna Achim, "Cochineal," in *New World Objects of Knowledge. A Cabinet of Curiosities*, eds. Mark Thurner and Juan Pimentel (London: University of London Press, 2021), 177–82; Georges Roque, *La cochenille, de la teinture à la peinture. Une histoire matérielle de la couleur* (Paris, Editions Gallimard, 2021); Giorgio Riello, "The Colour of Empire. Cochineal and Indigo in the Pre-modern World," in *A Revolution in Colour. Natural Dyes and Dress in Late Medieval and Early Modern Europe*, eds. Maria Hayward, Giorgio Riello and Ulinka Rublack (London: Bloomsbury Academic, 2024), 64–84.

[9] *Libro* 8, *Título* 27, *Ley* 6 of the Recompilation of the Indian Laws from 1680 stated that "no foreigner extracts gold, silver, or cochineal." This law was originally issued by Philip II (own translation).

[10] Sarah Easterby-Smith highlights the importance of examining the scientific field work of explorers to contrast imperial scientific politics from the metropolises. Sarah Easterby-Smith, "Recalcitrant Seeds. Material Culture and the Global History of Science," in *Past & Present 242*, supplement 14 (2019), 215–42, 216.

[11] According to Paola Bertucci, openness and secrecy should not necessarily be understood as opposing concepts. Paola Bertucci, "Enlightened Secrets. Silk, Intelligent Travel, and Industrial Espionage in Eighteenth-Century France," in: *Technology and Culture* 54 (2013), 820–52, 847. The opposition between openness and secrecy is also questioned by Koen Vermeir, "Openness versus Secrecy? Historical and Historiographical Remarks," in: *The British Journal for the History of Science* 45 (2012), 165–88.

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also documents his conduct as morally right, disinterested, and focused only on the fulfilment of his objectives.

This analysis is embedded in a wider context: the article first examines its main source, Thiéry de Menonville's *Voyage à Guaxaca*, and, second, it reconstructs the scientific and economic discourse around cochineal that induced Thiéry de Menonville to undertake his mission. An analysis of Thiéry de Menonville's mission forms the main part of this article and shows the extent to which the eighteenth-century Spanish Empire was open to foreign exploration beyond the constraints of secrecy. This is followed by an approach to his contemporaries' ethical as well as scientifical evaluation of his mission. The article concludes with an outlook on the impact that his mission and plantation project had on similar endeavours. Whilst Thiéry de Menonville's attempt to cultivate cochineal outside Mexico found followers in many parts of the world, his assumption that wild cochineal from Saint-Domingue or Brazil could substitute true cochineal from Oaxaca was incorrect.

2. The Sources: *Traité de la Culture du Nopal* and *Voyage à Guaxaca*

Thiéry de Menonville's travelogue is the main source for this article. It was published posthumously in 1787 in two volumes as *Traité de la Culture du Nopal, et de L'Education de la Cochenille dans les Colonies Françaises de l'Amérique précédé d'un voyage à Guaxaca*. Volume one contains the travelogue of the voyage and volume two the botanical treatise.[12] Although both texts deal with cochineal, they had different objectives and addressed a different readership. The *Traité* is a botanical scientific treatise for the academic public (the scientific botanists) and for practitioners (the planters). With regard to its lettered readership, the *Traité* was published only in French and, apart from a partial Portuguese edition,[13] was not translated into other languages.

Voyage à Guaxaca belonged to the genre of travelogues which had become very popular in the eighteenth century. The text was commercially interesting for editors for two reasons: on the one hand, it covered the expectations of the European public in travel adventures, unknown landscapes, exotic plants, and foreign cultures, and, on the other, it provided information about the Spanish American continent, which was rare due to the restrictive Spanish policy.[14] In this way, because the text was perfectly suited to armchair adventurers' interests about a largely unknown but interesting region, it was soon translated into English and German.[15] Because of its dissemination the *Voyage à Guaxaca* also played a part in creating among its European readers an awareness of the possibilities of exploration and colonisation of the non-European parts of the world.[16]

[12] Cap-François, Paris, Bordeaux: Herbault, Delalain, Bergeret, 1787. I quote from the anonymous English translation of the travelogue, which was published as *Travels to Guaxaca, capital of the province of the same name, in the kingdom of Mexico* in John Pinkerton's *A General Collection of the Best and Most Interesting Voyages and Travels in All Parts of the World*, vol. 13 (London: Longman, Hurst, Rees, Orme, 1812), 753–876. For the analysis I have worked with both texts and checked the accuracy of the English against the French original.

[13] Claude-Louis Berthollet and José Mariano da Conceição Veloso, *Memoria sobre a cultura urumbeba e sobre a criação da Cochonilha* (Lisbon: Simão Thaddeo Ferreira, 1799).

[14] Like Nicolas Thiéry de Menonville's travelogue also Alexander von Humboldt's books fed the "hunger for first hand information on South America." Mary Louise Pratt, *Imperial Eyes. Travel Writing and Transculturation* (London: Routledge, 1992), 117.

[15] *Des Herrn Thiery de Menonville Reise nach Guaxaca in Neu-Spanien*, ed. and transl. Heinrich August Ottokar Reichard (Leipzig: Weygand, 1789); "Travels to Guaxaca ...," in *A General Collection ...*, ed. John Pinkerton, vol. 13 (London: Longman, Hurst, Rees, Orme, 1812), 753–876. A Spanish translation was published only in 2005: Joseph Thiéry de Menonville, *Tratado del cultivo del nopal y de la crianza de la cochinilla. Precedido de un viaje a Guaxaca*, ed. José Pérez Moreno Anaya (Mexico City: Consejo Nacional para la Cultura y las Artes, 2005).

[16] Pratt, *Imperial Eyes*, 4.

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In contrast to the public interest in Thiéry de Menonville's travelogue, the historiography has not paid it much attention. With the exception of Londa Schiebinger, who uses the voyage to analyse the relation between empire and botany,[17] there only exist several short descriptions of Thiéry de Menonville's voyage, addressed to a broader audience, but without analytical or contextual work.[18]

The limited historiographical interest is in contrast to the unique value of this document. Until the beginning of the eighteenth century, most of the foreign explorers were seamen or merchants who travelled along the coast and to port regions. The European public's knowledge of Spanish America was thus mainly limited to these travelogues and to translations of older Spanish chronicles about the conquest.[19] Exceptions which were disseminated in Europe during the second half of the eighteenth century – with editions in French, German and English – were the travelogues of Charles Marie de La Condamine, Antonio de Ulloa and Jorge Juan about their geodesic expedition to Peru and Ecuador,[20] La Condamine's crossing of the Amazonas region to travel from Quito to Cayenne,[21] John Byron's voyage from southern Patagonia to Santiago de Chile,[22] Pehr Löfling's expedition to the Orinoco,[23] Jean-Baptiste Chappe d'Auteroche's voyage to California,[24] and Pierre Marie François de Pagè's voyage from Louisiana through Texas and Mexico, published in 1782.[25] Nicolas Thiéry de Menonville's *Voyage* was not only among the first travelogues that provided the European public with insights into colonial

[17] Schiebinger *Plants and Empire*, 39–44.

[18] Angeles Sarabia Russell, "En busqueda de la grana cochinilla. Thiery de Menonville en Oaxaca, 1777," in *Acervos. Boletin de los archivos y bibliotecas de Oaxaca* 23 (2001), 13–26; Huemac Escalona Lüttig, "Viaje a la tierra del 'púrpura de los reyes.' Thiery de Menonville y su tratado sobre la grana cochinilla," in *Veinticinco años de la biblioteca Fray Francisco de Burgoa de la Ciudad de Oaxaca*, ed. Selene del Carmen García (Oaxaca: UABJO, 2001), 51–61; Amy Butler Greenfield, *A Perfect Red. Empire, Espionage, and the Quest for the Color of Desire* (New York: HarperCollins, 2005), 165–82; Edward D. Melillo, *The Butterfly Effect Insects and the Making of the Modern World* (New York: Alfred A. Knopf, 2020), 79–85.

[19] Colin Steele, *English Interpreters of the Iberian New World from Purchas to Stevens. A Bibliographical Study. 1603–1726* (Oxford: Dolphin Book, 1975), 166. For information about Latin America for English readers, see also: John Fisher, "British Publications on Latin America prior to 1900," in *Revista del CESLA* 2 (2001), 265–76. An overview of the travelogues and research reports by French explorers is provided by: Jean Paul Duviols, *Voyageurs francais en Amerique. Colonies espagnoles et portugaises* (Paris: Bordas, 1978), 147–79. Duviols also published a comprehensive "Catalogue bibliographique des récits des voyages des Européens en Amérique espagnole (1492–1768)," which only contains the travelogues of non-Spanish travellers: *L'Amérique espagnol vue et rêvée. Les livres de voyages de Christophe Colomb à Bougainville* (Paris: Promodis, 1985), 333–481.

[20] Pierre Bouguer, *La figure de la terre, déterminée par les observations de Messieurs Bouguer, & de La Condamine .... Avec une Relation abrégée de ce voyage qui contient la description du pays dans lequel les opérations ont été faites* (Paris: Charles-Antoine Jombert, 1749); Jorge Juan and Antonio de Ulloa, *Relación histórica del viage a la América Meridional* (Madrid: Antonio Marin, 1748); Charles-Marie de La Condamine, *Journal du voyage fait par ordre du roi, a l'Équateur, servant d'introduction historique a la Mesure des trois premiers degrés du méridien* (Paris: Imprimerie royale, 1751).

[21] Charles-Marie de La Condamine, *Relation abrégée d'un voyage fait dans l'intérieur de l'Amérique méridionale. Depuis la côte de la mer du Sud, jusqu'aux côtes du Brésil & de la Guiane, en descendant la riviere des Amazones, lûe à l'assemblée publique de l'Académie des sciences, le 28. avril 1745* (Paris: Veuve Pissot, 1745).

[22] John Bryon, *The Narrative of the Honourable John Byron Containing an Account of the Great Distresses Suffered by Himself and His Companions on the Coast of Patagonia from ... 1740, till ... 1746. With a Description of St. Jago de Chili* (London: S. Baker, G. Leigh, and T. Dawes, 1768).

[23] Petrus Loefling, *Iter Hispanicum eller resa til Spanska länderna uti Europa och America, förrattad ifrån år 1751 till år 1756* (Iter Hispanicum or journey to the Spanish countries in Europe and America, published from the year 1751 to the year 1756), ed. Carl Linnaeus (Stockholm: Salvius, 1758).

[24] Jean-Baptiste Chappe d'Auteroche, *Voyage en Californie pour l'observation du passage de Venus ...* (Paris: Jombert: 1772).

[25] Pierre Marie François de Pagès, *Voyages autour du monde et vers les deux poles par terre et par mer. Pendant les années 1767, 1768, 1769, 1770, 1771, 1773, 1774 et 1776* (Paris: Moutard, 1782).

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Mexico, he must also be considered the first foreign scientist who successfully evaded the control of the colonial administration to explore the interior of Spanish America on his own. His travelogue is thus a document of special interest.

With regard to the question of the travelogue's reliability, I have checked the many references to historical actors and circumstances, as well as the detailed descriptions of the travel route, all of which are indicators of the trustworthiness of the French botanist's narrative. In addition, I was able to contrast the travelogue with published letters from the Viceroy of New Spain and Antonio de Ulloa, who exchanged views about Thiéry de Menonville which also are consistent with the narrative of the *Voyage*.

3. Cochineal in Scientific and Economic Botany

In 1590, José de Acosta was probably the first European to mention the animal origins of cochineal – that it came from small "worms" which were cultivated and collected from cacti.[26] However, among European naturalists, the animal origin of cochineal was disputed until the beginning of the eighteenth century.[27] The reason behind this absence of knowledge was Spain's colonial policy to close America off to foreign, non-Spanish individuals, so that the botanists had no possibility of seeing cochineal in its natural habitat and environment.[28] Since they only had access to the red dye for investigation, cochineal became a perfect object for the new microscopic observations at the end of seventeenth century. However, Jordan Kellman has shown that the microscope did not have the epistemic authority to resolve the debate on whether cochineal was animal or plant.[29] Although an examination by Antony Van Leeuwenhoek concluded that cochineal was made by small insects, he received a letter from a merchant in Amsterdam who considered this impossible because

> in a Fleet that brings 200,000 pounds of this drug, what an infinite number of animals must there be? Besides, says he, where can you find man enough, who at the proper time of the year shall catch these insects ...?[30]

[26] José de Acosta, *Historia natural y moral de las Indias* (Sevilla: J. de Leon, 1590). Quoted by Sabine Anagnostou, *Jesuiten in Spanisch-Amerika als Übermittler von heilkundlichem Wissen* (Stuttgart: Wiss. Verl.-Ges., 2000), 154–5.

[27] See the overview on the dispute amongst European scholars about the nature of cochineal in: Caspar Neumann, *Chymiae medicae dogmatico-experimentalis, tomus tertius; das ist der gründlichen und mit Experimenten erwiesenen medicinischen Chymie dritter Band* (Züllichau: Christoph Heinrich Kessel, 1753), 16–29. See also the comprehensive survey of authors who dealt with cochineal in: Donkin, *Spanish Red*, 44–5; Jordan Kellman, "Nature, Networks, and Expert Testimony in the Colonial Atlantic. The Case of Cochineal," in: *Atlantic Studies* 7 (2010), 373–96.

[28] William Botting Hemsley's brief survey of the botanical exploration to Mexico and Central America demonstrates the effectiveness of Spain's secrecy policy. There are only five foreign botanists mentioned for the colonial period: William Houstoun who served as surgeon of the South Sea Company at Veracruz, the Bohemian botanist Thaddäus Haenke and the French botanist Luis Née who in 1789 joined the Malaspina expedition, as well as Humboldt and Bonpland. However, after the independence 38 foreign expeditions are listed. William Botting Hemsley, Botany, in Biologica Centrali-Americana; or Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America, eds. F. Ducane Godman and Osbert Salvin, vol. 4 (London: R. H. Porter, 1886), 117–137. Houstoun sent a brief account about the cochineal harvest to the Royal Society. *Dr Houston's account of some plants from la Vera Cruz, with details of the cochineal harvest in Mexico*, 1730, The Royal Society Archives (London), RBO/16/6. The *asiento* treatise after the Peace of Utrecht allowed the South Sea Company to establish dependencies to conduct trade with enslaved people in six major Spanish American ports. These dependencies gave British merchants, seamen, and surgeons access to Spanish American territory and, thus, became a channel for the transfer of botanical knowledge from America to Great Britain.

[29] Kellman, *Nature*, 377.

[30] "A letter from Mr. Antony Van Leeuwenhoek, F. R. S. concerning cochineal," in *Philosophical Transactions of the Royal Society of London* 24 (1704), 1614–28, 1614.

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Leeuwenhoek then repeated his observations and published them in a letter to the Royal Society of London in 1704.[31]

One year earlier the French botanist Charles Plumier had already published information obtained from the enslaved Alonso de Guaxaca about the cultivation of the cochineal insects in New Spain, which he then confirmed through microscopic observation.[32] Maybe the testimonial of an enslaved individual was seen as invalid, as neither this testimony nor the microscopic observations of Plumier and Leeuwenhoek resolved the question, and the dispute continued.

Decisive proof was finally provided by the Dutch merchant Melchior de Ruuscher, who, through the intermediation of a Spanish friend in Cádiz, obtained several testimonies from Spanish officials in Oaxaca. Like Plumier, Ruuscher also then confirmed their testimonies through microscopic observations and published a *Natuerlyke historie van de couchenille* in 1729 to verify the animal nature of cochineal.[33] Although Ruuscher's testimonies and observations were disseminated in Europe through William Rutty's *The Natural History of Cochineal*,[34] the decisive step of giving authority to them and ensuring that the animal nature of cochineal became commonly accepted knowledge among European scholars came in 1734, when Rene Antoine Ferchault de Réaumur, in his natural history of the insects, referred to Ruuscher to confirm that cochineal was, in fact, an insect.[35]

Two conclusions can be drawn from the debate around the nature of cochineal. The first is the importance of local knowledge from Oaxaca for establishing the epistemic truth about the nature of cochineal. This knowledge was validated in a two-step process: it was confirmed through microscopic observations and authorised by Réamur, the most important insect scholar of the day. Rather than microscopic observations and testimonies of local knowledge, it was the prestige of the scientist that transformed the scientific evidence into scientific truth. Second, with regard to the testimonies from Oaxaca, it becomes clear that in the eighteenth century the knowledge barrier between Europe and the Spanish Empire in America was not hermetic, and trade relations meant that both the dye and the information about the nature and cultivation of cochineal were brought from Oaxaca to Europe.

In addition to scientific interest in the nature of cochineal there was also the question of the application of this knowledge. A plantation experiment to grow the valuable dye seemed to be especially interesting for France, whose merchants spent large sums of money on importing cochineal via Spain from Oaxaca.[36] In terms of mercantilist autarky,

[31] Ibid. The first letter with the results of his observation to the Royal Society from 28th November 1687 was not published. See: Letter 105, in: *The collected letters of Antoni van Leeuwenhoek*, ed. J. J. Swart (Lisse: Swets & Zeitlinger, 1964), 134–73.

[32] The information provided by Alonso de Guaxaca was shared with Plumier by Monsieur Quesnot, an inhabitant of Saint-Domingue. "Response du R. P. Charles Plumier Minimé à Monsieur Frideric Richter, Docteur à Medicine à Lipzic, sur la Cochenille," in *Mémoires pour l'histoire des sciences et des beaux arts* 3 (1703) 1671–91.

[33] Melchior de Ruuscher, *Natuerlyke historie van de couchenille, beweezen met authentique documenten. Histoire naturelle de la cochenille, justifiée par des documens authentiques* (Amsterdam: Hermanus Uytwerf, 1729), 1–23. See also: Kellman, *Nature*, 383–385.

[34] William Rutty's, "The Natural History of Cochineal; Being an Account of a Book Entitled, Histoire naturelle de la cochinelle justifiée par des documens authentiques, Amsterdam 1729," in *Philosophical Transactions of the Royal Society of London* 36 (1730), 264–8.

[35] Kellman, "Nature," 386.

[36] On French involvement in the cochineal trade: Jutta Wimmler, *The Sun King's Atlantic. Drugs, Demons and Dyestuffs in the Atlantic World, 1640–1730* (Leiden: Brill, 2017), 42; Gilbert Buti, "Perception, construction et utilisation de l'espace. D'Oaxaca à Bassorah. Les négociants marseillais et la cochenille mexicaine au XVIIF siècle," in *Construire des mondes. Elites et espaces en Méditerranée, XVIe-XXe*, eds. Paul Aubert et al. (Aix-en-Provence: PUP, 2005), 251–68; Manuel Pérez-García, "Mercados globales de la América española. El comercio de lana vicuña y grana cochinilla en el siglo XVlll," in *América Latina en la historia económica* 49 (2016), 184–222.

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this meant a loss of money – which could be prevented if cochineal cultivation were possible in its own territory.

French botanists believed that cochineal could grow on the Caribbean islands because the climate seemed to be similar to that of Mexico, but they disagreed on where to find the insects. The dispute concerned whether it was necessary to use "true" or "fine" cochineal insects (*Dactylopius coccus*) from Mexico, or whether, as an alternative, it was also possible to cultivate wild cochineal that grew in other places. The latter opinion was suggested in 1722 in Jean-Baptiste Labat's *Nouveau voyage aux isles de l'Amérique*, in which the author claimed to have seen wild cochineal in Martinique.[37] Réaumur believed it was possible to find cochineal outside Mexico, but his objections were that, thus far, only wild cochineal had been found, which was of lower quality for dyeing. He therefore proposed to the regent of France, the Duc d'Orleans, that "true" cochineal should be brought by ship from Mexico to Saint-Domingue.[38]

By the mid-eighteenth century, the question of cultivating cochineal outside Mexico was still unresolved, and it thus became a major issue for European botanists. In 1748, Antonio de Ulloa, who had observed the cultivation of cochineal in Peru and Quito, informed the Spanish government

> that Andalusia in Spain, appears to me extremely well situated for breeding cochineal, both from the nature of the climate, and the plantation of fig-trees, which there attain so great perfection.[39]

The idea of cultivating cochineal found its way into the *Encyclopédie*. Venel Daubenton's article on cochineal finishes with the conclusion that

> this object of commerce is very important, and would well deserve attempts to be made to establish it in the American islands, or in other climates whose temperature would be suitable for cochineal and the plant from which it grows.[40]

Carl Linnaeus suggested cultivating cochineal in greenhouses in Europe. Since nopals were easy to cultivate and because the yield was very valuable, he believed that no plantation would be more worthwhile than cochineal. In 1756, Linnaeus was able to obtain live cochineal on cactus plants, which his disciple Daniel Rolander brought from Surinam to Sweden. However, when preparing the plants for Linnaeus' examination, a gardener cleaned away the cochineal scales so that they were lost.[41] In London, the Royal Society of Arts decided to foster the cultivation of cochineal by offering a prize of £100 in 1759 to anyone able to produce at least twenty-five pounds of cochineal in Jamaica, but it received no response.[42]

During a visit to Martinique between 1751 and 1756, Thibault de Chanvalon was unable to find cochineal, although he "looked on all the opuntia for the cochineal, which Father Labat affirms with his usual confidence to be found in our Isles." He therefore urged the

[37] Jean-Baptiste Labat, *Nouveau voyage aux isles de l'Amérique*, vol. 4 (Paris: Guillaume Cavelier, 1722), 41–5.

[38] René Antoine Ferchault de Réaumur, *Mémoires pour servir à l'histoire des insectes. Histoire des gallinsectes, des progallinsectes et des mouches à deux ailes*, vol. 4 (Paris: Impr. Royale, 1738), 107–9.

[39] Jorge Juan and Antonio de Ulloa, *Relación histórica del viaje a la América meridional* (Madrid: Marín, 1748). I quote the English edition: *A Voyage to South-America*, vol. 1 (London: L. Davis and C. Reymers, 1758), 346.

[40] *L'Encyclopédie*, 1° ed., vol. 3 (Paris: Le Breton et al. 1753), 559–60 (own translation).

[41] Carl Linnäus, "Schwedische Cochenille", in *Der Königlich Schwedischen Akademie der Wissenschaften Abhandlungen, aus der Naturlehre, Haushatungskunst und Mechanik, auf das Jahr 1759*, transl. Abraham Gotthelf Kästner (Hamburg, Leipzig: Grunds Witwe, Abraham Heinrich Holle, 1762), 28–31, 29.

[42] David Mackay, *In the Wake of Cook: Exploration, Science & Empire, 1780–1801* (London: Routledge, 1985), 182.

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French government to procure "this precious insect of which it makes a debit every year of about fifteen million for the benefit of a nation which does not outweigh ours in activity." He considered the means of obtaining cochineal to be simple and easy, but did not specify how this could be achieved.[43] The question of how to preserve and transport plants was crucial in eighteenth-century botany.[44] The answer for cochineal was finally provided by Abbé Raynal in 1770, when he adopted Réaumur's idea of procuring "fine" cochineal from Mexico for cultivation:

> Though cochineal is classed in the animal kingdom, the species of all others the most likely to corrupt, yet it never spoils. Without any other care than merely that of keeping it in a box, it has been preserved in all its virtue for ages. The high price it always bears should have excited the emulation of those nations which cultivated the American islands, and of other people who inhabit regions, whose temperature would be propitious to this insect, and to the plant on which it feeds.[45]

What Raynal describes in this short passage – transporting live "fine" cochineal in boxes to the Caribbean islands – was finally put into practice by Thierry de Menonville in 1777.[46]

Since the mid-eighteenth century, Spain had been participating in the imperial quest for plants. José de Carvajal, Secretary of State, and later Pedro Rodríguez de Campomanes wanted to make better use of America's green resources, thus creating an alternative to the exploitation of precious metals.[47] As mentioned above, Antonio de Ulloa had already suggested to the Spanish government in 1748 that cochineal should be cultivated in Andalucia. In Spain, as in Europe, the corresponding cultivation knowledge was lacking. However, the Spanish government had the possibility of employing its own path of acquiring this knowledge, which was disconnected from the debate among European scholars about the nature of cochineal and the possibility of its cultivation. In 1757 the Council requested information on how cochineal was cultivated from specialists in Oaxaca. This information was sent to Spain in 1761.[48]

The botanical interest of the Spanish government increased during the reign of Charles III, and botany assumed a key role in the reform policy for strengthening the Spanish Empire in its imperial competition with Great Britain, France, and Portugal. To gather and exploit botanical knowledge, the king sent several expeditions to Spanish America.[49] In addition, he also requested the collaboration of the colonial administration in America. On 22 January 1777, and thus just some ten weeks before Thiéry de Menonville

[43] Jean Baptiste Thibault de Chanvalon, *Voyage a la Martinique* (Paris: J. B. Bauche, 1763), 121 (own translation).

[44] See: Easterby-Smith, *Recalcitrant Seeds*, 216.

[45] Raynal, *A philosophical and political history*, vol. 2, 423–24. The original passage from the first edition in French can be found in: Guillaume Thomas Raynal, *Histoire philosophique et politique, des établissemens & du commerce des Européens dans les deux Indes* (Amsterdam: s.n., 1770), vol. 3, 63.

[46] That Thiéry de Menonville did read what Raynal wrote about cochineal can be confirmed by a direct reference on page 832 of the *Travels to Guaxaca*, which refers to the cultivation of the insects. See also below note 94.

[47] Bleichmar, *Visible Empire*, 30; Miguel Angel Puig-Samper Mulero; Sandra Rebok, *Sentir y medir. Alexander von Humboldt en España* (Aranjuez: Doce Calles, 2007), 19–36; Manuel Lucena Giraldo, *Laboratorio tropical. la expedición de límites al Orinoco, 1750–1767* (Caracas: Monteávila Editores Latinoamericana, 1993), 118–9.

[48] Informe del Corregidor de Antequera (Valle de Oaxaca) sobre la forma de cosechar la cochinilla o grana, Oaxaca, 27. 4. 1761, Real Academia de la Historia (Madrid), Colección Mata Linares, vol. 68, fols. 417r–418r.

[49] Fermín del Pino Díaz; Angel Guirao de Vierna, "Las expediciones ilustradas y el Estado español," in *Revista de Indias* 47 (1987), 379–429; Antonio González Bueno; Francisco Javier Puerto Sarmiento, "Política científica y expediciones botánicas en el programa colonial español ilustrado," in *Mundialización de la ciencia y la cultura nacional*, ed. Antonio Lafuente (Madrid: Doce Calles, 1993), 331–40; Paula S. De Vos, "Research, Development, and Empire: State Support of Science in the Later Spanish Empire," in *Colonial Latin American Review* 15 (2006), 55–79; Miguel Angel Puig-Samper, "Las expediciones científicas españolas en el siglo XVIII," in *Revista de la CECEL* 13 (2013), 7–28.

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arrived, Antonio Ulloa published a royal order in New Spain for gathering complete information concerning its geography, geology, antique monuments, animals and plants, which should then be sent to Spain. This order explicitly mentioned cochineal.[50] The famous Spanish scientist and naval officer, who had joined the French expedition to Quito and was now commander of the fleet of New Spain, had arrived at Veracruz in 1776.[51]

As an imminent response to the king's order, Viceroy Bucareli encouraged the Mexican scientist José Antonio de Alzate to send a memoire to the king to explain the benefits of cochineal, including advice – collected from instructed men – for its cultivation.[52] However, Alzate objected on the grounds that if this were to happen and the production of cochineal was extended, the dye would necessarily diminish in value and thus disadvantage the people of Oaxaca.[53] There was a clear clash of interests between imperial biopolitics that aimed to strengthen the Spanish Empire as a whole, and the American botanists who were focused on regional development.[54]

4. The Voyage of Thiéry de Menonville to New Spain, 1777

4.1 Negotiating Access to the Spanish Empire

By the time Thiéry de Menonville proposed his plan to the French minister of the navy, the example of indigo already existed. This example had demonstrated that it was possible to transfer a dye to Saint-Domingue and cultivate it successfully there.[55] In his plan he identified three requisites for obtaining the insects in Mexico: an agent – himself – was required to travel personally to Oaxaca, Txacala, or Honduras; he needed to have sufficient economic means for the mission; and, finally, the mission should be secret.[56]

Secrecy was necessary for a cultivation project that intended to break the monopoly of one of Spain's most valuable products. To divert the attention of the Spanish government, Thiéry de Menonville did not request official royal support – he did not receive a royal passport and nor was he appointed *botaniste du roi*, a title granted to those voyagers

[50] The order was printed in Mexico City at the Imprenta Nueva Madrileña. Archivo General de Indias (hereafter cited as AGI), Indiferente General, 1544, s.f. The aim of the order was to feed the recently established Royal Cabinet of Natural History in Madrid with American natural objects. For more context: Bleichmar, "Atlantic Competitions," 234. For the order: De Vos, "Research," 66.

[51] Alberto Orte Lledó, *El jefe de escuadra Antonio de Ulloa y la flota de nueva España, 1776–1778* (Gijón: Fundación Alvargonzález, 2006).

[52] *Memoria sobre la naturaleza, cultibo y beneficio de grana* (1777), Archivo del Palacio Real, Real Biblioteca, II/620, fol. 10r. The information provided by Alzate was not at all new in Madrid. One of the reports on which the scientist based his memoire came from Francisco Ibáñez de Córdoba, *Alcalde Mayor* de Zimatlan, which was also included in the 1761 information.

[53] Ibid., fol. 62r.

[54] Antonio Lafuente and Nuria Valverde, Linnaean Botany and Spanish Imperial Biopolitics, in: *Colonial Botany. Science, Commerce, and Politics in the Early Modern World*, eds. Londa Schiebinger and Claudia Swan (Philadelphia: University of Pennsylvania Press, 2004), 134–47, 135. The Creole perception that American interests were subordinated to the interests of peninsular Spain and that the Creoles were discriminated against in the Spanish Empire were widespread in late eighteenth-century Mexico and were to become a strong impulse for Creole aversion against European Spaniards and, ultimately, resistance and revolution against the metropolitan government. See, for example, the analysis in: Alexander von Humboldt, *Versuch über den politischen Zustand des Königreichs Neu-Spanien*, vol. 1 (Tübingen: Cotta, 1809), 161–2.

[55] In the eighteenth century indigo became one of the most valuable export products of Saint-Domingue. Dauril Alden, "The Growth and Decline of Indigo Production in Colonial Brazil. A Study in Comparative Economic History," in *The Journal of Economic History* 25 (1965), 35–60, 42.

[56] "Projet de culture du nopal, présenté par l'auteur au ministre de la marine," in *Traité de la Culture du Nopal*, vol. 1, CXLIV. The botanist does not mention the name of the minister. The office was held between 1774 and 1780 by Antoine de Sartine, comte d'Alby.

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who, since the end of the seventeenth century, had been sent on botanical expeditions to collect samples of useful plants.[57]

Nor could the Frenchman request an official Spanish passport to go to America. In two precedent cases in which the French government had intervened at the royal court in Madrid to pave the way for scientists to enter Spanish America, the expeditions were closely monitored by the Spaniards. In 1734, King Louis XV requested passports for a French geodesic expedition to Quito to measure the circumference of the earth. King Philipp V agreed, but in order to prevent espionage and smuggling, the Council of the Indies prescribed a travel route via Cartagena and Portobello to Quito and urged the port authorities in Spanish America to check the luggage of the French scientists. The Council also ordered two Spaniards, the young naval officers Antonio de Ulloa and Jorge Juan, to join – and observe – the expedition.[58]

In 1768, the French government requested a permit to send an expedition of the *Académie des Sciences* to lower California. From there, Abbé Jean-Baptiste Chappe d'Auteroche wanted to observe the transit of Venus, whose results served to calculate distances in the solar system. King Charles III responded with an invitation to the French astronomers to join a Spanish-led expedition. The assistance of the French was conditioned by an obligation to limit their activity to scientific observations and not to leave the vigilant company of the Spanish expedition members Vicente Doz und Salvador Medina.[59]

To maintain secrecy about the true purpose of his mission, Thiéry de Menonville's support from the government in Paris was unofficial and economic – the botanist received 4,000 livres when he arrived in Saint-Domingue, and he was also issued a passport by the governor of Port-au-Prince which attested that he was a botanist and physician. Thiéry de Menonville was later to ascertain the value of this paper because it identified him and he therefore became less suspicious. In Port-au-Prince, he finally boarded the French brigantine Dauphin bound for Havana, where he arrived after a thirteen-day voyage on the 3 February 1777.[60]

Although it had been easy to find a passage to a Spanish American harbour, it was difficult to disembark, because Spanish customs officials only allowed this with a royal Spanish passport. The French traveller thus addressed a letter to the port authorities. He stated that his presence as a scientist wanting to herborise was not dangerous, and that his state of health rendered confinement on board not only very irksome, but even dangerous. Under these circumstances – scientific interest and personal urgency – he expected the officials would act in accordance with their good reputation and allow him to disembark.[61]

In this regard, Thiéry de Menonville had luck, since the officials in charge – the intendent of the navy, Juan Ignacio de Urriza, the inspector of the army, Juan Andrés Dabán Busterino, and the governor of Cuba, Felipe de Fonsdeviela, Marqués de la Torre – were

[57] Marie-Noëlle Bourguet, "La Collecte du monde. Voyage et histoire naturelle (fin XVIIème siècle – début XIXème siècle)," in *Le Muséum au premier siècle de son histoire*, eds. C. Blanckaert et al. (Paris: Muséum national d'Histoire naturelle, 1997), 163–96.

[58] The discussion around surveillance measures and the issuing of passports can be found in: AGI, Indiferente, 446A, L. 42, fol. 197, Indiferente, 333, s.f. and Indiferente, 279, s.f. On the geodesic expedition (also known as La Condamine expedition), see: Neil Safier, *Measuring the New World. Enlightenment Science and South America* (Chicago, Ill.: University of Chicago Press, 2008), 1–92.

[59] Jean-Baptiste Chappe d'Auteroche, *Voyage en Californie pour l'observation du passage de Venus …* (Paris: Jombert: 1772) 9–11; AGI, Contratación, 5511B, n. 2, R. 69.

[60] *Travels to Guaxaca*, 753–6.

[61] Ibid., 757–8. The reference to their reputation as honourable men acted as a reminder from the botanist to the Spanish officials of how they were expected to behave. See: Steven Shapin, *A Social History of Truth. Civility and Science in Seventeenth-century England* (Chicago: Univ. of Chicago Press, 1994), 67.

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used to, and thus receptive to, French manners of civility.[62] They not only allowed him to enter Havana, but also gave him access to the highest sphere of colonial society, whose members invited him to dinners, promenades and receptions.[63]

There was a great display of the politest behaviour between the Spanish officials and Thiéry de Menonville, which was more than just appearance. On the one hand, the rules of civility obliged the Spaniards to be benevolent to Thiéry de Menonville's interests.[64] When he was received by the captain general, for example, he noted the "easy and noble manners" of the marquis, which "stamped him distinctly a finished courtier." The marquis pointed regretfully to the laws that forbade foreigners from going further into the country, but permitted him to stay in Havana for herborising.[65] On the other hand, the Spaniards used invitations and talks to observe and monitor Thiéry de Menonville's behaviour. In Havana, Thiéry de Menonville finally felt he was being observed "by a people naturally jealous and mistrustful, and whose eyes were constantly upon [him]."[66]

There was a link between polite behaviour and trust. It was the moral quality of a gentleman to tell the truth, and to withdraw trust from a gentleman was seen as an offence. Accordingly, since Thiéry de Menonville acted as a gentleman, the Spanish officials were obliged by the rules of civility to regard him as trustworthy, even if they had strong doubts.[67] Intriguing interrogatories and close surveillance would have been unpolite signs of distrust.

In order to dissipate any suspicions regarding the true objective of his voyage, Thiéry de Menonville had to herborise seriously in Havana, although he was eager to go to Mexico. To do this, he had the good luck of becoming acquainted with Manuel Félix Riesch,[68] the former secretary of Antonio de Ulloa. This gave the botanist occasion to reveal his wish to go to Mexico, a plan that Riesch supported, and that the captain general

[62] Thiéry de Menonville does not provide the correct names of these Spanish officials. Urriza is called "Dorrira" and Dabán "Davant." Juan Antonio de Urriza served at the Spanish embassy in France and in 1765 was appointed as consul in Bordeaux. In 1776 he became the intendant of Havana. See the biography by Didier Ozanam in Diccionario Biográfico Español, https://dbe.rah.es/biografias/53604/juan-antonio-de-urriza. Juan Andrés Dabán Busterino also held the important position of "teniente de gobernador," i.e., he represented the captain general during his absences. For his biography, see: Francisco José Ginorio Viscal, *Ancestors and Descendents of Dr Bernardo de Urrutia Matos*, vol. 2 (s.l.: Lulu.com, 2009), section 4. In 1769, Felipe de Fonsdeviela, Marqués de la Torre, met the expedition of Chappé d'Auteroche when he served as inspector of the army in Mexico City. Chappe d'Anteroche, *Voyage en Californie*, 27. Before this, during the Seven Years' War, he served as an observer in the French army. He was appointed captain general of Cuba in 1776 and left the island in June 1777. See his biography by Didier Ozanam in Diccionario Biográfico Español, https://dbe.rah.es/biografias/52537/felipe-de-fonsdeviela-y-ondeano.

[63] *Travels to Guaxaca*, 758–68.

[64] On the success of French literature on civility in eighteenth-century Spain, which created among the Spanish readers a more complicit model of civility than that of rigid Spanish courtly etiquette, see: Mónica Bolufer Peruga, "Poseer (¿y leer?) libros de civilidad en el siglo XVIII. Un análisis a través de las bibliotecas privadas," in Chronica Nova 46 (2020), 145–75.

[65] *Travels to Guaxaca*, 759.

[66] Ibid., 766.

[67] Shapin, *A Social History of Truth*. Steven Shapin analysed the relation between civility and science in seventeenth-century England. A comparable study about the relation between gentility and trust in early modern Spain is still missing. However, *Voyage à Guaxaca,* as well as other travelogues by foreign scientists, suggest that there was a comparable link between a gentleman's behaviour and the claim to trustworthiness in eighteenth-century Spain, as in seventeenth-century England.

[68] In *Travels to Guaxaca*, his name is written "Ruick." Riesch went with Ulloa first to Peru and later to Havana, where he became director of the slave-trading monopoly. Sherry Johnson, *Climate and Catastrophe in Cuba and the Atlantic World in the Age of Revolution* (Chapel Hill, NC: University of North Carolina Press, 2011), 96.

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accepted, issuing a passport for travel to Veracruz. On 11 March 1777, he finally boarded a Spanish ship bound for Mexico.[69]

He arrived in Veracruz on 25 March 1777. His passport was controlled on board and held by the naval official who allowed him to go on shore. Bearing a letter of recommendation from Riesch, the botanist introduced himself to Antonio de Ulloa and requested a passport for travel to Mexico City. Although Ulloa pointed out that only the viceroy, Antonio María Bucareli, could issue such a document, he promised to support the request. The French botanist then presented himself to the governor of Veracruz, Juan Fernando Palacios, who acted with reserve. He only permitted Thiéry de Menonville to botanise in Veracruz and its surroundings and retained his Cuban passport as a precaution to prevent him from making further use of this passport to travel deeper into Mexico without a permit.[70]

4.2 Botanical Role-Playing and Gallant Surveillance in Veracruz

As in Havana, Thiéry de Menonville played the role of the herborising botanist. When he found jalapa root in Veracruz, whose existence there was not known to the local residents, he gained the reputation of being an eminent botanist. To maintain and augment this favourable ascription, he employed what he called a "species of quackery":

> Whether in the fields or in the streets I constantly had plants in my hand, and either employed myself in observing them through a magnifying glass, or in dissecting them with nicest care. My room was overspread with papers, covered with plants, and my tables with phials and boxes containing seeds.[71]

This role-playing provided him with the justification to search for cochineal without suspicion of his curiosity. And it was convincing: on 16 April Ulloa wrote to Bucareli requesting a passport for Thiéry de Menonville to travel for one month to Mexico City in search of unknown plants. "I have not recognised any other occupation, nor care, since he has been here than running the fields with tireless tenacity to look for plants", he related to the viceroy. He also said that Thiéry de Menonville would accept to be accompanied by someone from the country, so that this person could later continue with the discoveries. Ulloa expressed the hope that this information would "dispel any scruples that he may have come for another purpose."[72]

In his answer, Bucareli considered "a lot of examination of the person" necessary to dissipate any doubts, "because surely there are unknown directives."[73] Ulloa also acted with caution: from the beginning he conducted close but well-dissimulated surveillance of the Frenchman. He politely and frequently invited the Frenchman to visit his table where he could observe him and question him on the objectives of his voyage.[74] Did Ulloa suspect the real objective of Thiéry de Menonville's voyage? On one occasion he questioned him directly and asked him whether he had seen cochineal. Thiéry de Menonville believed this question to be a trap. Although Ulloa feigned distraction, he realised that

[69] *Travels to Guaxaca*, 767–68.
[70] Ibid., 768–74.
[71] Ibid., 775.
[72] Letter from Ulloa to the viceroy, 16. 4. 1777, in *Antonio de Ulloa y Nueva España*, ed. Francisco de Solano (Mexico: Universidad Nacional Autónoma, 1979), n° 81 (own translation). Ulloa hoped to employ Thiéry de Menonville's services in an expedition that Spain was sending to California, but the French rejected this offer. Ibid., 783–4. For the 1778 expedition, see: Freeman M. Tovell, *At the Far Reaches of Empire. The Life of Juan Francisco de la Bodega y Quadra* (Vancouver: UBC Press, 2008), 49–68.
[73] Bucareli's answer to Ulloa, Mexico, 23. 4. 1777, in *Antonio de Ulloa y Nueva España*, n° 82 (own translation).
[74] *Travels to Guaxaca*, 773.

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during his answer he was being observed. The botanist tried to maintain his composure, but feared that the commander may have noticed his confusion. For him, it was clear now that the lunches and dinners were a means of control. Nevertheless, he continued to visit Ulloa's house and table frequently in order to give no reason for suspicion.[75]

Another means of control was direct but dissimulated observation. Soon after his arrival, Thiéry de Menonville was presented to two fellow countrymen – Francisco de Fersen, born in Paris, and Carlos Duparquet, born in Grenoble – who served as engineers in the Spanish army in Veracruz.[76] Both showed a lively interest in their compatriot and sought his friendship. Initially, Thiéry de Menonville was pleased by their company. However, at a dinner at Ulloa's house, he heard from a Spanish naval officer that, when the latter was a young lieutenant, he had been commissioned with one of his comrades to join the Chappé d'Auteroche's expedition from Veracruz to Mexico. The officer confessed that what had the appearance of a mark of distinction was in reality a means of surveillance of the French, preventing them from visiting the works of a new fortress which was being built at the time. This information left a deep impression on Thiéry de Menonville, who now began to understand the vigilance of his new friends. But he concealed this well and continued to see the "fancied spies" frequently.[77] Thiéry de Menonville's role-playing was convincing to Ulloa. In a second letter to the viceroy, although he admitted to difficulties in uncovering the true objectives of the Frenchman, because "the inside, we cannot judge," he saw no reason to doubt that the botanist was dealing with matters other than that of plants.[78]

The need to conceal the real objective of his voyage meant that Thiéry de Menonville could not make direct enquiries about cochineal, where to find it and how it was cultivated. But he had the chance to inquire further when, together with Fersen, he visited the house of a Spanish merchant called Lobo, where they saw packages of vanilla – another valuable colonial product – which gave rise to a conversation about cochineal. Here, Thiéry de Menonville finally learned that the best cochineal came from Oaxaca. Thus, he decided to travel there, not only to find the best quality cochineal, but also to gather knowledge on its cultivation.[79]

This would become a problem. Although Ulloa had sent two favourable letters to the viceroy supporting Thiéry de Menonville's three requests, the crown attorney (*fiscal*) of the *Audiencia* who answered the petition opined that "the secrets of the rich culture of the country" should not be opened to strangers.[80] Viceroy Bucareli followed this opinion and considered it beyond his competence to allow a foreigner to enter México without an explicit order from the king. Instead, the Frenchman was ordered to leave the country. Nonetheless, Governor Palacios did not accelerate the expulsion and still allowed Thiéry de Menonville to move freely in Veracruz and its province. He only wished to be informed when Thiéry de Menonville intended to take a ship so he could attend his departure.[81]

Thiéry de Menonville was surprised at the supposedly contradictory handling of his case by the Spanish officials, because the expulsion order of the viceroy was not enforced

[75] *Travels to Guaxaca*, 783–4.

[76] For the biography of Francisco Fersen, see the article by Juan Carrillo de Albornoz y Galbeño in Dicionario Biográfico Español, https://dbe.rah.es/biografias/136361/francisco-fersen. For the biography of Carlos Peison Duparquet, see: Horacio Capel Sáez, *Los ingenieros militares en España siglo XVIII. Repertorio biográfico e inventario de su labor científica y especial* (Barcelona: Cátedra de Geografía Humana, 1983), 368.

[77] *Travels to Guaxaca*, 784.

[78] Letter from Ulloa to Bucareli, Veracruz, 30. 4. 1777. Solano (ed.), *Antonio de Ulloa y Nueva España*, n° 85 (own translation).

[79] *Travels to Guaxaca*, 786.

[80] Ibid., 788.

[81] Ibid., 787.

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and did not change anything regarding his presence in Veracruz. Although the expulsion of foreigners from Spanish America was characteristically ordered with much rigor, the officials in charge of the expulsion largely dissimulated their presence.[82]

4.3 The Problem of Obtaining Cochineal and Getting It Out of Mexico

Thiéry de Menonville chose to ignore the expulsion order and use his freedom of movement in Veracruz to travel inland into Oaxaca, even though he expected serious difficulties:

> Nothing less than a miracle, on a road over which so many picket men were dispersed for the purpose of arresting deserters and strangers, could guard me from being asked by someone or other of them for my passport.[83]

Nevertheless, he reckoned that the worst that could happen was for him to be sent back to Veracruz in chains and confined there until his embarkation.[84]

For travelling to Oaxaca, the botanist changed his strategy. Whilst in Havana and Veracruz, he had gained respect and confidence through playing the role of a French nobleman and eminent scientist. In the countryside, this outward appearance could draw attention. Clothing expressed belonging and served as the most suitable visible marker to identify strangers, i.e., to distinguish them as members of a different local, national or ethnical community, as well as members of a certain profession or standing.[85] To avoid inquisitive glances, Thiéry de Menonville disguised himself as a Spaniard, wearing a broad-brimmed hat, a net for his hair, and – considered an indispensable item – a rosary. He also provided himself with a narrative explaining his foreign accent and his presence in the countryside. To explain why he spoke French well, but Spanish like a stranger, he declared himself a Catalan, and professed to be a physician resident in Veracruz who was in search of samples. His journey, accordingly, should resemble a promenade.[86]

After six weeks in Veracruz Thiéry de Menonville started his journey to Oaxaca.[87] His travelogue provides a description of his journey via Córdoba, Orizaba, and Tehuacán to Oaxaca. It is described as arduous, but hardly anyone showed any interest in the unknown traveller. He visited villages and towns on his way without any problems of being a stranger, and in the inns and at the gates of the towns the guards, hosts or officials never asked for a passport. Along the way, he first obtained a mule, and later a horse; his travel companions also changed and included a Franciscan monk and an enslaved person.[88]

[82] The early modern Spanish legal system called the practice of tolerating an infringement of the law by willingly overseeing it "disimulación." Its function was to exempt the infringement from the rule once without questioning its general validity. Víctor Tau Anzoátegui, "La disimulación en el Derecho Indiano," in *Derecho y administración pública en las Indias hispánicas. Actas del XII congreso internacional de historia del derecho indiano*, ed. Feliciano Barrios Pintado (Cuenca: Universidad de Castilla-La Mancha, 2002), 2, 1733–52. For the practice of expulsions and the tolerance of the Spanish colonial officials towards the presence of foreigners in America, see: Martin Biersack, *Geduldete Fremde. Spaniens Kolonialherrschaft und die Extranjeros in Amerika* (Frankfurt/M.: Campus Verlag, 2003), 269–303.

[83] *Travels to Guaxaca*, 790.

[84] Ibid., 789.

[85] On the identification of strangers in the Spanish Empire, see: Thomas Weller, "He knows them by their dress. Dress and Otherness in Early Modern Spain", in: *Dress and Cultural Difference in Early Modern Europe*, eds. Cornelia Aust, Denise Klein and Thomas Weller (Berlin: de Gruyter, 2019), 52–72, 62–3.

[86] *Travels to Guaxaca*, 790.

[87] The travelogue does not provide the exact dates for Thiéry de Menonville's departure from Veracruz, his arrival at Oaxaca and his return to Veracruz. It was after the refusal to give him a passport so it was probably between 5 – 10 May.

[88] Ibid., 791–822.

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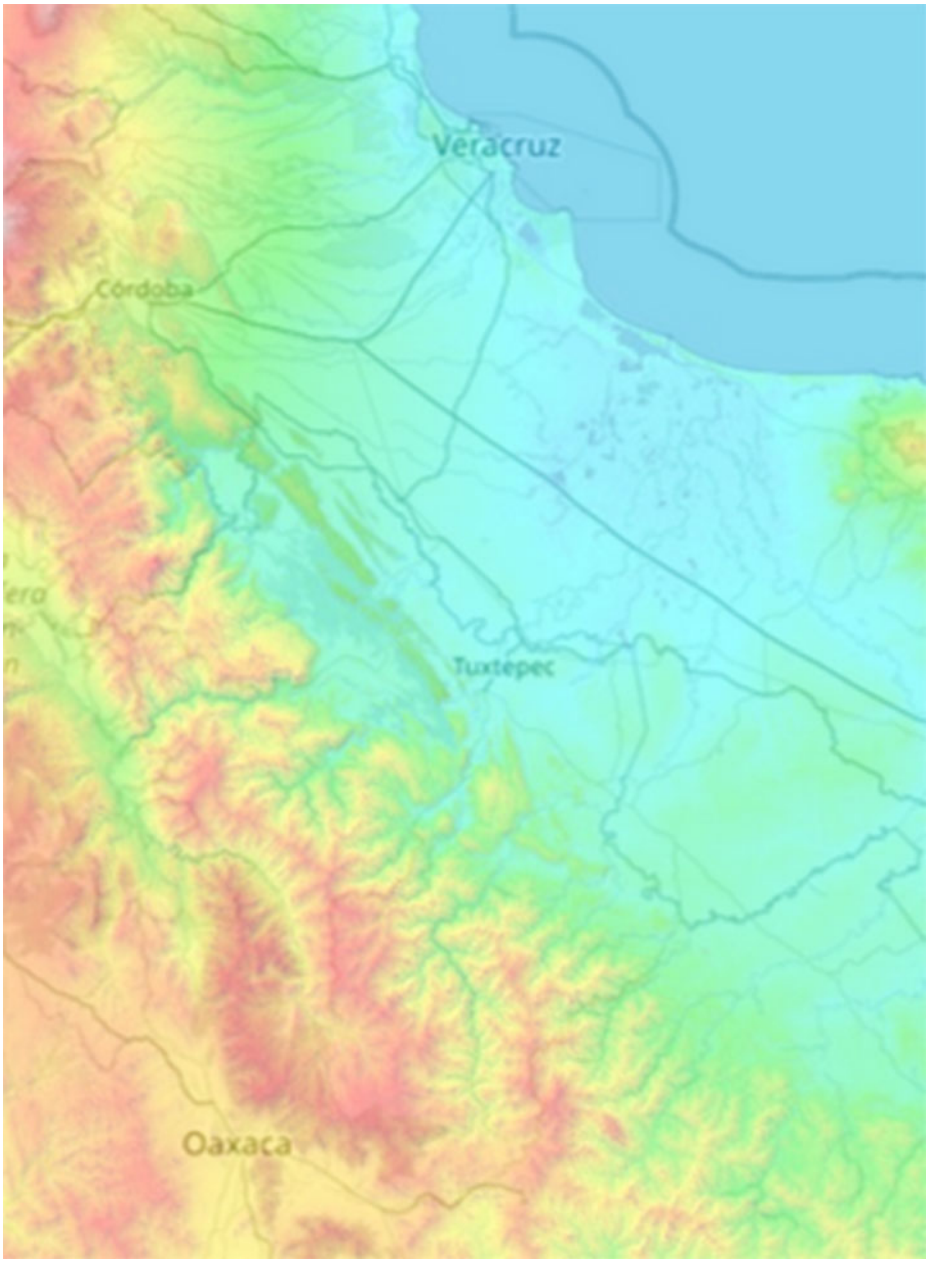

Figure 1. Veracruz, Tuxtepec and Oaxaca.
Source: https://topographic-map.com

After ten days Thiéry de Menonville arrived in Oaxaca, where he abandoned his Spanish guise to again play the role of a French botanist and physician. Well-trained doctors were rare in New Spain, and French doctors in particular were highly esteemed by the members of the local elite.[89] Thiéry de Menonville benefited from this. In a shop

[89] Luz María Hernández Sáenz, *Learning to Heal. The Medical Profession in Colonial Mexico, 1767–1831* (New York: Peter Lang, 1998), 57–60.

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where he was having his watch repaired, the watchmaker's wife urged him to establish himself in the city where, according to her, neither a surgeon nor a physician were practicing. She also promised the help of her husband, who was a *regidor* (city councillor).[90] It is remarkable that Thiéry de Menonville does not refer to any prejudices against the French and their culture, although these had spread throughout New Spain during the time of the French-born Viceroy François Charles de Croix (1766–1771), the predecessor of Bucareli.[91] On the contrary, residents like the pharmacist Antonio de Pisa showed him the "utmost civility" when they recognised by his dress that he was French. The presence of a French nobleman also provoked curiosity among the locals. When Thiéry de Menonville visited Pisa's garden, a lady, the wife of another *regidor*, came "for the purpose of seeing ... the face of a Frenchman."[92]

The friendly welcome at Oaxaca enabled Thiéry de Menonville to look around and visit gardens in search of cochineal. Although being an object of curiosity bothered him, the attention of the residents towards his foreign appearance did not restrict his plans to inform himself about the cultivation of cochineal. Finally, when he found the insects at a nopal plantation, he was able to buy eight pads (parts of the nopal plant) from the Indigenous planter, alleging that he was a physician and wanted to prepare an ointment for gout. For transport, he stored the nopals covered with towels in wooden boxes manufactured by a trunk maker in Oaxaca.[93]

After spending two nights in Oaxaca, Thiéry de Menonville began his return. Along the way he was able to buy more nopal pads with cochineal and also obtain more information about their cultivation. From an Indigenous cultivator, he learned, for example, that the fibrous nests of the scale insect were made of cocoa, that the scale insect's mothers were kept in the open air and on the plant itself for future breeding, and not, as Raynal had said, on cut pads which were stored inside. In the stormy season, the nopals were provided with shelter under leaves.[94]

The return journey was more difficult because Thiéry de Menonville, again dressed as a Spaniard, needed to rent horses to transport the boxes. He therefore took a different route across the lower part of the Mixteca mountains, where he expected to encounter less bandits. The customs officials there were more vigilant with travellers bound for Veracruz in order to prevent the smuggling of tobacco. Because of his boxes, the botanist faced several customs controls, but the customs officers acknowledged the nopals with cochineal with apparent indifference.[95]

Three weeks after his departure Thiéry de Menonville arrived in Veracruz. Again, the customs officials at the gates of the city found only what he declared to be transporting: herbs and plants.[96] He was fortunate to find a ship, bound officially for Havana, but whose port of call was actually Cape François.[97] But he still had one last problem: getting the boxes on board before the eyes of a crowd of spectators. One in particular seemed dangerous to him: Antonio de Ulloa – "this inquisitive gentleman, who would have examined everything, and infallibly have discovered what I wished to conceal." [98] However, Thiéry

[90] *Travels to Guaxaca*, 823–4.

[91] Gabriel Torres Puga, "Retóricas de la xenofobia. Franceses y gachupines en el discurso político y religioso de Nueva España (1760–1821)," in: *20/10 Memorias de las revoluciones de México* 2 (2008), 27–43, 28.

[92] *Travels to Guaxaca*, 825.

[93] Ibid., 824–6.

[94] Ibid., 827–32.

[95] For example, the customs control at Tehuacán. Ibid., 837–9.

[96] Ibid., 848.

[97] This port of call was kept secret because the colonial trade regulations meant that ships were not permitted to trade directly between Spanish America and the French territory.

[98] Ibid., 849.

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de Menonville was again fortunate and learnt that the commander of the fleet was absent and in Mexico City, so that he was able to bring the boxes on board without examination. To Fersen, who visited him once at home to find out more about his voyage, he recounted that he had been to the Pico of Orizaba (Citlaltépetl). He presented to him samples of many plants, professing that these had been collected by himself during his excursion. Fersen was not suspicious, neither of his long absence nor when he saw the nopals, because – according to Thiéry de Menonville – he was unable to recognise cochineal.[99]

Thiéry de Menonville finally bid his friends in Veracruz farewell and announced his departure to the governor. A final control took place on board. The governor asked the captain whether Thiéry de Menonville was actually on the ship and inquired whether he was in a melancholic state of mind – an indicator that he had not achieved the objectives of his journey. As the captain affirmed both questions, the governor left satisfied. The ship set sail with some delay on 8 June 1777.[100]

During the journey, Thiéry de Menonville needed to provide the nopals with fresh air, so the crew and captain saw what he was transporting. The captain thus asked him whether his intention was to cultivate them in his own country. Although Thiéry de Menonville confessed that this assumption was true, the captain had no objections to this. However, one crew member alleged that the transportation of cochineal was illegal. With the assistance of the captain, Thiéry de Menonville played his final role by presenting himself before the crew as a pharmacist transporting plants for medical purposes only. He explained a recipe for gout using nopals, cochineal, vanilla and jalap:

> a few Latin words I intermingled in my answers, rendered my [recipe] exceedingly respectable in the minds of my auditors. Never indeed was nonsense listened to with more attention, and the bamboozled sailors as well were convinced of the purity of my intentions, as of the efficaciousness of the prescription.[101]

This is another characteristic example of Thiéry de Menonville's arrogance in a world of developing science and medicine that can be observed throughout his travelogue: how he used his superiority as a cultivated French physician and botanist against popular ignorance to easily impose and advance his mission.

After one stop in Campeche, the ship sailed to Saint-Domingue, where it arrived in Cape François after three months, on 4 September.[102] Although many of the nopals perished during the journey, Nicolas Thiéry de Menonville was still able to cultivate the cochineal from Oaxaca on Saint-Domingue. In recognition of his achievements, the king of France honoured him with the title *botaniste du roi* and made him director of the *Jardin du Roi*, so that his plantation became Saint-Domingue's first royal botanical garden. However, he was able to enjoy this success only briefly, as he died of a fever in 1780 in Saint-Domingue. His cochineal cultivation was subsequently neglected, so that the "true" or "fine" cochineal which he had brought from Oaxaca was lost. His successor as royal botanist and director of the botanical garden, Joubert de la Motte, continued the cultivation using domesticated wild cochineal, which Thiéry de Menonville had only found after his return from Oaxaca. The plantation was ultimately abandoned during the Haitian revolution.[103]

[99] Ibid., 849–50.
[100] Ibid., 850–5.
[101] Ibid., 855.
[102] Ibid., 875.
[103] *Extrait des affices américaines*, n. 392 of 4 September 1785, published in: *Traité de la culture du nopal*, vol. 1, LIII–LVII. In 1765, the Chambre d'Agriculture of Cap Françoise in Saint-Domingue had already noted that wild cochineal grew on the island and suggested its cultivation since it had the same quality as Mexican cochineal.

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5. Evaluating Thiéry de Menonville's Mission

In the 1780 edition of *Histoire des deux Indes*, Raynal had already praised Thiéry de Menonville for his achievement in bringing cochineal successfully to Saint-Domingue and raising it there. Moreover, Raynal emphasised the importance of Thiéry de Menonville's example and gave voice to the hope that "this species of cultivation, as well as others, extend itself still further, and engage the attention of other nations."[104] The Spaniards had a different opinion. They viewed the botanical mission according not to utilitarian principles, but legal principles, and accused the Frenchman of being a thief.[105] Even today, Edward D. Melillo calls Thiéry Menonville's mission a "brazen act of biopiracy," while Londa Schiebinger labels him a "biopirate."[106]

The question of whether it was morally right to take cochineal from Oaxaca to Saint-Domingue points to the botanist's scientific reputation. Julia Carina Böttcher highlights how moral integrity was a predisposition of scientific explorers, who acted beyond the control of the scientific community. The ethical behaviour of scientists was directly linked to their credibility: to assert the truth of their travelogues and botanical findings they had to present themselves in consonance with the moral codex and expectations of their readers.[107]

Thiéry de Menonville also demonstrates his deference to the moral codes of his time when meeting attractive women. Ignoring temptation, he presents himself as an objective observer who describes his circumstances with a certain detachment. To defend himself from the accusation of being a trickster or thief, he pointed out that he had legally purchased the cochineal at four different places in Mexico. If it was forbidden by Spanish law to export cochineal, the ban referred only to the dye, but not to live insects. Nevertheless, he acknowledged the difficulty in considering his deeds in terms of either right or wrong. He was right to buy cochineal, but wrong only against the Spanish nation for taking it from Mexico. Since he had a different nationality, he had no moral obligation to respect Spanish interests. Moreover, he rejected the idea that one nation could exclusively lay claim to the benefits of nature. His mission was thus of benefit to "public utility" for a "nation, on whom nature has bestowed the same prerogatives, the same right to her favours."[108] Thiéry de Menonville also rejected the accusation that he – as an impostor assuming a false identity – had betrayed the trust of the Spaniards. Here, he follows Jean Henri Samuel Formey, whose article in the *Encyclopédie* about dissimulation rejects it from a moral perspective, but considers it necessary in cases that truly merit it, e.g., in defence against those aiming to obstruct the pursuit of a legitimate objective.[109]

The anonymous *Mémoire sur la cochenille* held on 3 June 1765 before the Chambre d'Agriculture of Cap Françoise is published in: Ibid., XL–LI. For cochineal cultivation on Saint-Domingue after Thiéry de Menonville's return from Oaxaca, see also: James Edward MacClellan, *Colonialism and Science. Saint Domingue in the Old Regime* (Baltimore: Johns Hopkins University Press, 1992), 152–6.

[104] Quoted from the English edition: Guillaume Thomas Raynal, *A Philosophical and Political History of the Settlements and Trade*, vol. 3 (London: W. Strahan; T. Cadell, 1783), 356. For the French edition, see: *Histoire des deux Indes*, vol. 2 (Geneve: Pellet, 1780) 78.

[105] According to Thiéry de Menonville, this idea was circulated by the captain to defend himself from having been his accomplice. *Travels to Guaxaca*, 875–6.

[106] Melillo, *Global Entomologies*, 256; Schiebinger, *Plants and Empire*, 39.

[107] Julia Carina Böttcher, *Beobachtung als Lebensart. Praktiken der Wissensproduktion bei Forschungsreisen im 18. Jahrhundert* (Stuttgart: Steiner, 2020), 96. For the link between the credibility of travel observations and the author's reputation and moral integrity, see also Harold J. Cook, "Risking Private Ventures. The Instructive Failure of a Well-Traveled Artist, Cornelis de Bruyn", in: *Regulating Knowledge in an Entangled World*, ed. Fokko Jan Dijksterhuis (London: Routledge, 2023), 169–92.

[108] *Travels to Guaxaca*, 875–76.

[109] Jon R. Snyder, *Dissimulation and the Culture of Secrecy in Early Modern Europe* (Berkeley: University of California Press, 2009), 177–8.

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However, Thiéry de Menonville attached less importance to the transfer of the live "true" cochineal to Saint-Domingue; he believed that the domestic wild cochineal which grew on the island could be cultivated and commercialised with success and could even replace the cochineal from Oaxaca.[110] Instead, for him, the real importance of his voyage was the transfer of knowledge; by circumventing Spanish secrecy policies relating to cochineal, he acquired practical knowledge of its cultivation from Indigenous planters.

Although the French botanist acknowledged his dept to the local planters, his opinion of the Indigenous people was ambivalent. In a lengthy passage about the character of Africans and Amerindians, he labels the Indigenous people as "phlegmatic, mild, and submissive, faithful and laborious." Thiéry de Menonville also appreciated that they still lived close to the "pristine state of nature."[111] Denigrating the colonised while simultaneously relying on their expertise was a common pattern among European scientists.[112] However, European travellers like Thiéry de Menonville had to explain why people who, on the one hand, were depreciated as wild, unlearned and immature had, on the other hand, superior knowledge about plants and their use compared to the educated scientists. The reason was found in the supposed closeness of Indigenous people to nature, which gave them privileged access to reveal its secrets. Accordingly, Stefanie Gänger describes an epistemic hierarchy in how European botanists regarded the status of the Indigenous knowledge: European scientists collected the primitive and unreliable local knowledge of Indigenous people and, by applying scientific methods, transformed it into universal, transferable scientific knowledge.[113] Thiéry de Menonville, in his own view, performed both roles: whereas he was a broker who had penetrated a region closed to non-Spanish European travellers to acquire Indigenous knowledge,[114] he was also a creator of scientific knowledge, who applied, tested and systematised what he had learned in Oaxaca and from the botanical literature at his plantation at Saint-Domingue.

The fact that Thiéry de Menonville had broken through Spanish secrecy and disseminated species and techniques to cultivate cochineal was met with anger from the Mexican perspective. In a short article published in 1791 in the *Gacetas de literatura de México*, José Antonio de Alzate echoed the reproaches against Thiéry de Menonville and blamed him for abusing the confidence of the locals in order to bring cochineal to Saint-Domingue. However, Alzate also pointed out the difficulties of cultivating cochineal. He substantiated this with the fate of the Saint-Domingue plantation and the fact that the efforts of the Spaniards to cultivate it outside Mexico had also failed.[115]

[110] *Traité de la Culture du Nopal*, vol. 2, 361.

[111] *Travels to Guaxaca*, 845.

[112] Contrary to Thiéry de Menonville, European scientists largely neglected their debt to Indigenous knowledge, and for a long time the historiography also showed little interest in the transfer of Amerindian knowledge to Europe. See: Laura Dierksmeier and Fabian Fechner, "Introduction," in *Indigenous Knowledge as a Resource. Transmission, Reception, and Interaction of Knowledge between the Americas and Europe, 1492–1800*, eds. Laura Dierksmeier, Fabian Fechner, and Kazuhisa Takeda, (Tübingen: Tübingen University Press, 2021), 15–25, 16–7 and Judith A. Carney, Black Rice. The African Origins of Rice Cultivation in the Americas (Cambridge, Mass.: Harvard Univ. Press, 2001), 5.

[113] Stefanie Gänger, *A Singular Remedy. Cinchona Across the Atlantic World, 1751–1820* (Cambridge: Cambridge University Press, 2020), 45–7.

[114] On the role of brokers in knowledge transfer, see: Simon Schaffer, Lisa Roberts, Kapil Raj and James Delbourgo, "Introduction," in: *The Brokered World. Go-betweens and Global Intelligence, 1770-1820*, eds. Simon Schaffer, Lissa Roberts, Kapil Raj and James Delbourgo (Sagamore Beach, MA: Science History Publications, 2009), IX–XXXVIII.

[115] *Gacetas de literatura de México* 4 and 18 October 1791, ed. José Antonio Alzate, vol. 2 (reprint Puebla: Hospital de San Pedro, 1831), 255–6.

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Alzate is likely referring to a project for cultivating cochineal in the districts of Tunja, Boza and Caqueza in the Viceroyalty of New Granada (now Colombia). According to a report that José Celestino Mutis drafted in 1783 for the Secretary of State for the Indies in Madrid, Jose de Galvez, the project faced "the biggest obstacle" due to "the lack of experience and management in the long-winded operations involved in the cultivation of cochineal." Mutis therefore suggested that the viceroy bring labourers from Oaxaca to New Granada who had experience in the cultivation of cochineal.[116] Mutis' plan to recruit skilled workers was a common path for technology transfer in eighteenth-century Europe.[117] For Spain's European rivals, this path was closed because they had no access to Oaxaca. But even Mutis' plan to improve the plantations in Peru was ultimately not implemented.

Alzate agreed with Mutis regarding the key role of skilled workers from Oaxaca in ensuring plantations were prosperous. In his article he concluded that the cultivation of cochineal outside Mexico, although possible, could not be commercially satisfactory for foreigners because raising the insects required patience that only the Indigenous planters possessed:

> Certain productions of nature seem to have been reserved by the Omnipotence for the character of the Indians .... Their sobriety and perseverance in what they undertake makes them dedicate themselves to the cultivation of grana .... The scarlet will subsist as long as the Indians take care of it; the other breeds do not possess the phlegmatic character so necessary in this continuous and daily occupation.[118]

In 1794, Alzate finally published his memoire from 1777 in his own newspaper, the *Gacetas literarias de México*, with the aim of improving local agricultural development.[119] To prevent further cultivation projects outside Mexico, he again cautioned that only Indigenous people could gainfully cultivate cochineal.[120]

The question of how to raise cochineal – both botanically as well as with economic success – had also concerned Thiéry de Menonville. His answer was the plantation economy linked to slave labour. In his *Traité de la Culture du Nopal*, he compares free Indigenous labour in Oaxaca with the enslaved African labour in Saint-Domingue using only the criteria of productivity and concludes that enslaved labour is cheaper in both the acquisition of enslaved people and their nutrition. Therefore, Saint-Domingue's planters could easily compete with Oaxaca's Indigenous producers in the world market.[121] Accordingly, and although he was highly critical of the treatment of the Indigenous people by the Spaniards, he did not position himself against the use of enslaved people of African

[116] Letter from Miguel de Villanueva to José Celestino Mutis (2 October 1783) and fragment of a report from Mutis for viceroy Caballero y Góngora (21 October 1783) to be sent to José Gálvez. Archivo del Jardín Botánico (Madrid), III, 1-1-462 and III; 1-1-199.

[117] France in particular tried to attract skilled workers from England's textile industry. John Harris, "Industrial espionage in the Eighteenth Century," in *Essays in Industry and Technology in the Eighteenth Century: England and France*, ed. John Harris (Hampshire: Ashgate, 1992), 164–75, 173. Judith A. Carney has shown how, with the introduction of rice and its culture to America by the enslaved Africans, an entire Indigenous knowledge system was transferred from Africa to America. Carney, *Black Rice*.

[118] *Gacetas de literatura de México*, 4 and 18 October 1791, 255–6.

[119] "Memoria en que se trata del insecto," in *Gacetas de literatura de México*, 5 February, 23 February, 12 April, 12 May, 21 June and 9 August 1794, ed. José Antonio Alzate, vol. 3 (reprint Puebla: Hospital de San Pedro, 1831), 245–314.

[120] Ibid., 247–8, fn. 1.

[121] *Traité de la Culture du Nopal*, vol. 2, 430–6.

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origin.[122] Moreover, he described Africans in very pejorative terms as "proud, passionate, vindictive, and effeminate, base, and intolerably idle."[123]

The Portuguese had been experimenting with the cultivation of wild domestic cochineal in Brazil since the 1780s in plantations run by enslaved workers. Although the cultivation was successful from a botanical point of view, the quality of the dye was too bad to be commercially interesting. To obtain better results, the Brazilian Portuguese botanist José Mariano da Conceição Vellozo translated Thiéry de Menonville`s *Memoire* into Portuguese and encouraged the Portuguese diplomatic representative in Philadelphia Hipólito da Costa to travel – as the French botanist had – to Mexico to obtain cochineal insects and knowledge how to raise them. However, although da Costa sent a report about his successful voyage to the Portuguese government, he had to admit that the insects did not survive in the Philadelphian climate, so that, ultimately, he was unable to send true cochineal to Brazil. In actual fact, it is likely that da Costa never went to Mexico.[124] For him, Thiéry de Menonville's travelogue was thus less inspiration on how to get to Mexico, and more about how to describe such a voyage.

Whereas true cochineal from Oaxaca was never brought to Brazil, Brazilian wild cochineal was transferred to India. In 1786, James Anderson, physician and botanist of the East India Company at Madras, found insects that he believed to be cochineal. He communicated his findings to Joseph Banks, and although his assumptions were ultimately false, Banks conceived a plan to establish a cactus plantation on the Coromandel coast and cultivate it with cochineal, which would be brought from America. In addition, all the existing literature on the subject, including the recently published *Traité de la Culture du Nopal*, was sent to Anderson. Finally, Anderson and Banks quarrelled about how to obtain the cochineal. Whilst Anderson believed in the benefits of open scientific exchange and communicated his plans to find support for his cultivation project within the scientific community, Banks considered him in this regard to be a fool. For Banks – as for Thiéry de Menonville – secrecy was an absolute requirement in order not to alarm the Spanish regarding any plans that would break their cochineal monopoly. Ultimately, "true" cochineal did not find its way to Anderson, and in 1794 only wild cochineal from Brazil arrived in India. As in Brazil, the cultivation itself was successful, but it was not a commercial success. Since it could not generate the same profits that "true" cochineal from Oaxaca could, and because all attempts to obtain "true" cochineal failed, the plantation project was eventually abandoned.[125]

In addition to the failure of the Dominican, Brazilian, and Indian cultivation projects, Alzate was wrong in his opinion that the cultivation of cochineal could not succeed outside Mexico. Although the projects for cultivating wild cochineal failed, with Mexican independence, the Spanish monopoly on the cochineal trade broke up and "true"

[122] For the discourse on slavery and the question of abolition during the French Enlightenment, see: Jean Ehrard, "Slavery before the Moral Conscience of the French Enlightenment. Indifference, Unease, Revolt," in *The Abolitions of Slavery. From Léger Félicité Sonthonax to Victor Schoelcher, 1793, 1794, 1848*, ed. Marcel Dorigny (Paris: UNESCO, 2003), 111–20.

[123] *Travels to Guaxaca*, 845.

[124] For the attempts to cultivate wild cochineal in Brazil at the end of the eighteenth century, see: Nelson Papavero, "Alguns dados históricos sobre as cochonilhas do carmim (Hemiptera, Homoptera, Dactylopiidae). Notas sobre etimologia, seu cultivo no Brasil no século XVIII e na primeira metade do século XIX," in *Arquivos do NEHiLP* 4 (2014), 1–126, 63–85. On the supposed mission of Hipólito da Costa to Mexico, see: Neil Safier, "Spies, Dyes, and Leaves. Agro-Intermediaries, Luso-Brazilian Couriers, and the Worlds They Sowed," in: *The Brokered* World, 239–69.

[125] For the transfer of wild cochineal to Madras, see: Alexander Engel, *Farben der Globalisierung. Die Entstehung moderner Märkte für Farbstoffe 1500–1900* (Frankfurt am M.: Campus-Verlag, 2009), 72–7. For the final failure of the Madras plantation project, see: Mackay, *In the Wake of Cook*, 181–6; James W. Frey, "Prickly Pears and Pagodas. The East India Company's Failure to Establish a Cochineal Industry in Early Colonial India," in *The Historian* 74 (2002), 241–66.

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cochineal from Oaxaca became available, with cultivation experiments following in France, Algeria, Senegal, southern Africa, Madeira, the Bourbon islands and Java. Spain, which had lost its cochineal supply from Mexico, now began its own plantation projects on the Iberian Peninsula and on the Canary Islands. The Canary Islands project was especially successful, surpassing cochineal production from Oaxaca by the early 1870s.[126] However, Mexico's most important rival in the export of cochineal became Guatemala, where its cultivation had been fostered since the beginning of nineteenth century.[127]

With regard to cochineal the effects that Spanish trade monopolies and barriers to enter America had on the regional economies were ambivalent. On the one hand, Spain kept them in colonial dependence, subordinated them to its imperial goals and hindered economic development as well as scientific exploration. On the other hand, the colonial order also – to a certain degree – protected them from direct European competition and exploitation. European and also American competition only affected the planters of Oaxaca after the fall of the Spanish Empire in America.

6. Conclusion

Nicolas Thiéry de Menonville's mission to Oaxaca is paradigmatic of how eighteenth-century scientific progress in many cases did not result from the creation of new knowledge and the finding of unknown species, but rather from existing knowledge and known species crossing social and spatial borders.[128] In the case of Thiéry de Menonville, it was Indigenous knowledge from local planters in Oaxaca that formed the basis of his own plantation experiments on Saint-Domingue. The fruit of the knowledge that Thiéry de Menonville had gathered was his *Memoire*, which ultimately transformed oral Indigenous knowledge into a scientific handbook, thus transferring it to the community of European botanists who used it for their plantation projects in different parts of the world.

The knowledge transfer from Oaxaca was possible, first of all, because the Indigenous planters did not regard their skills as secret.[129] The cultivation of cochineal in the best way was common knowledge for them, and they willingly shared this with the French botanist, as they did their plants and insects.[130] In addition, the majority of the Creole

[126] Donkin, *Spanish Red*, 46–52.

[127] Marichal, "Mexican Cochineal," 89–90. For cochineal cultivation in Guatemala since the beginnings of the nineteenth century, see: Manuel Rubio Sánchez, *Historia del cultivo de la grana o cochinilla en Guatemala* (Guatemala, C.A: Tip. Nacional, 1994).

[128] Patrick Manning, "Introduction," in: *Global Scientific Practice in an Age of Revolutions, 1750-1850*, eds. Patrick Manning and Daniel Rood (Pittsburgh: University of Pittsburgh Press, 2016), 1–18, 17. Case studies on the question of how the mobility of people, practices and things impacted epistemic systems of knowledge are discussed in the collective volume *Mobilities of Knowledge*, eds. Heike Jöns, Peter Meusburger and Michael Heffernan (Cham: Springer Nature, 2017).

[129] Other than, for example, the Indigenous healers in the Amazonas region. Alexander von Humboldt and Aimé Bonpland felt very lucky when, in 1804, they were invited by an Indigenous priest-doctor to assist and watch as he prepared *curare*. This was exceptional, because Humboldt knew that there was a "veil of secrecy" surrounding this knowledge, as it was restricted to the *piaches*. Alexander von Humboldt, *Reise in die Äquinoktial-Gegenden des Neuen Kontinents*, ed. Ottmar Ette, 2[ed], vol. 2 (Frankfurt: Insel Verlag, 1999), 1190–1. On the secrecy of Indigenous healers, see also: Gänger, *A Singular Remedy*, 41–2.

[130] For the strategies employed by European scientists to obtain information by their Indigenous informants, see:

Londa Schiebinger, "Prospecting for Drugs. European Naturalists in the West Indies," in *The Postcolonial Science and Technology Studies Reader*, ed. Sandra Harding (Durham: Duke University Press, 2011), 110–26. Also true for Thiéry de Menonville's travelogue is what Mary Louise Pratt describes as the representation of the Americans in the *Personal Narrative* of European travellers where "they appear overwhelmingly in instrumental capacities." Pratt, *Imperial Eyes*, 130.

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Mexicans had no objection to Thiéry de Menonville's interest in live cochineal. For them, cochineal was a trading good which was monopolised by the Spanish state. The export of cochineal as a dye was forbidden, but not live cochineal for scientific interest.

Thiéry de Menonville's foremost problem was how to enter the territory of the Spanish Empire. Colonial officials were very cautious of a Frenchman wanting to explore Spanish territory without a royal passport. Whilst the juridical status of foreigner and the distrust of strangers meant exclusion, Thiéry de Menonville played a convincing role of a French aristocrat, physician, and scientist in search of medical plants. This status and his role-playing differentiated him from other travellers who came to Spanish America as seamen, merchants, craftsmen, or deserters, and linked him to the highest spheres of colonial society.

Although Thiéry de Menonville was never officially allowed to stay, either in Havana or Veracruz, the Spanish officials dissimulated his presence and even provided him with the opportunity to move around with a great deal of freedom. They felt less obliged to the royal laws that excluded foreigners than to the rules of civility and hospitality, as well as learned curiosity and scientific openness towards an aristocratic scholar.

A commitment to the rules of civility and the habits of scientific scholarship were ambivalent enablers of knowledge transfer. On the one hand, this meant the ability to overcome the frontier between Spaniards and foreigners, as well as between residents and strangers, creating a community of trust among those who belonged to the same social sphere, tied together by common values, scientific interests and modes of behaviour. On the other hand, being subject to the rules of civility and the habit of scholarship also constricted the freedom of action of the travellers. First, they were bound by certain expectations of behaviour that the hosts and scholars had, and second, their behaviour was able to be controlled through their obligation to participate in social and scientific activities.

Colonial officials applied these instruments of observation because – according to the obligations of the rules of civility – they were unable to refute their suspicion of the French traveller through direct interrogatories and surveillance. For this reason, not only in the *Voyage à Guaxaca*, but also in many of the eighteenth-century travelogues of voyages to Spanish America, considerable space is given to the description of social activities. These were a means of interrogating and surveying the travellers in a polite way that dissimulated distrust.

Both Thiéry de Menonville and the Spanish officials were well acquainted with the art of dissimulation so characteristic of early modern courtly society.[131] The Frenchman dissimulated the real interest of his voyage behind a mask of honest scientific curiosity that was supposedly harmless to Spanish interests.[132] The Spanish officials dissimulated their suspicion that this may not have been the case behind polite interaction.

Thiéry de Menonville's travelogue provides many examples of close surveillance and constant vigilance over his actions by the Spanish government and people, so that there was always a danger of crossing the narrow line between trust and suspicion, and between polite hospitality and strict exclusion. Readers, therefore, might understand the success of Thiéry de Menonville with ambivalence. Although it was encouraging that it was possible to circumvent the Spanish ban on foreign travellers, it was also a warning to all those who wished to travel to Spanish America without a Spanish passport.

[131] The culture of dissimulation as a requirement for the courtier was intensively discussed in early modern Spain: Fernando Rodríguez de la Flor Adánez, *Pasiones frías: secreto y disimulación en el barroco hispano* (Madrid: Marcial Pons, 2005); Shifra Armon, "Gracián Dantisco and the Culture of Secrecy in Hapsburg Spain," *Ingenium* 5 (2011), 55–75; In eighteenth-century France, the art of dissimulation and civility were criticised against the ideal of transparency and sincerity. Jean-Pierre Cavaillé, "De la construction des apparences au culte de la transparence. Simulation et dissimulation entre le XVIIe et le XVIIIe siècle," in: *Littératures classiques* 34 (1998), 73–102.

[132] On honest curiosity as a code of conduct that also limited investigations, see: Harris, *Industrial Espionage*, 165.

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Alexander von Humboldt was a reader of Thiéry de Menonville.[133] He was well aware of the importance of a royal passport for exploring Spanish America. In Cuba he became acquainted with the Scottish botanist John Fraser, who had previously explored northern America, and intended entering Cuba without a passport – a nearly impossible endeavour according to Humboldt:

> He did not know the difficulties of entering the colonies without the permission of the King of Spain, otherwise he would hardly have followed his intention of collecting plants here.[134]

It was a blessing in disguise for Fraser that he was shipwrecked shortly before reaching Cuba. After spending three days on a sandbank, he was rescued and brought to shore in Matanzas, so that – like Thiéry de Menonville and his illness – a misfortune acted as the door-opener. In Cuba, he was helped by Humboldt, who intervened before the Spanish government in his favour, so that Fraser finally obtained "permission to travel through the island of Cuba, which he would hardly have obtained without the accident of the shipwreck."[135] Humboldt needed no happy accident. His way to America was via the Spanish Court in Madrid, where he gained the famous passport that opened every door to and within the Spanish Indies for him.[136]

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[133] Humboldt quotes Thiéry de Menonville when he writes about cochineal in New Spain: *Essai politique sur le Royaume de la Nouvelle Espagne*, vol. 3 (Paris: Schoell, 1811), Livre 4, Cap. 10, 244–63.

[134] Letter to Carl Ludwig Willdenow, in *Berlinische Nachrichten von Staats- und gelehrten Sachen* 86 (18 July 1801), in Alexander von Humboldt, *Sämtliche Schriften*, vol. 2, 1800–1809, eds. Sarah Bärtschi and Rex Clark (Munich: dtv, 2019), doc. 13, 4–5 (own translation).

[135] Ibid.

[136] For Humboldt's passport, see: Miguel Ángel Puig-Samper Mulero and Sandra Rebok, *Sentir y medir. Alexander von Humboldt en España* (Aranjuez: Doce Calles, 2007), 201–7.

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