

Chapter 2

Making Natural History in New Spain, 1525–1590

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Introduction



Figure 2.1: “Paradise Garden,” mural in the Augustine convent at Malinalco, Mexico (Mexico). Photographed by the author.

Ever since the discovery of the murals of the Augustinian convent of Malinalco in the middle of the 1960s, it has been clear that the convent walls speak to us about the “invention of New Spain” by the native communities who had survived the demographic catastrophe and by the friars who were trying to convert them (Estrada de Gerlero 1989, 63–112).

Malinalco is not the only Augustinian convent in New Spain with such impressive murals. In an illuminating article by Antonio Rubial (2008, 85–105) published a synthesis of the analysis of a dozen murals that have been preserved today in the Augustinian convents of New Spain.¹ All of them date back to the 1570s and 1580s. Rubial explained that they are idealized representations of the Thebaid, the name given to the desert region in the south of Egypt, which formed a spiritual retreat for St. Anthony the Abbot and countless Christian hermits from the third century onwards. It was frequently represented in Europe during the Middle Ages and Renaissance. This motif was particularly favored by the Augustinian order, though it was not without its internal tensions (Gutiérrez 1978; Rubial 1995, 355–383).

The wall paintings of the Thebaid in New Spain reconciled an apparent paradox within the marks of identity of the Augustinian order: the enclosed cloisters, location of community life and the garden as *locus amoenus*, were filled with representations of the open and solitary desert of the hermits, seen as a *sacred wood* (a medieval *topos* explored some time ago by Goff (1985, 59–75)). The idea of a closed garden as an earthly paradise that is so prevalent in the Spanish metaphysics of the Counter-Reformation, as Fernando R. de la Flor has pointed out,² here undergoes its colonial translation. It even became a commonplace in the colonization of the New World by both Catholics and Puritans, as Jorge Cañizares has emphasized (Cañizares-Esguerra 2006, 141–175). In spite of the constant elements in these representations—animals, plants, crags, friars, angels and demons—there is great diversity in the compositional schemes and in the styles of execution of the murals. This was due to the lack of a clear model of inspiration such as European engraving supplied by the friars to the groups of *tlacuiloque* (native painters) who executed the murals.

Malinalco undoubtedly represents an artistic pinnacle within this panorama, but it also forms an exceptional example as regards the process of cultural hybridization involving the first generations of *Indios*, Spaniards and Creoles in Mexico.³ The paradise of Malinalco was intended to convey the promise of salvation for the native population and for its converters to Christianity, the Augustinians. This paradisiacal setting is covered with representations of emblems, which are inspired by European-Christian culture, filled with references to the Greco-Roman world, and by Mesoamerican myths connected with virtue, strength or the identifying mythology of the *altepletl* (region) of Malinalco. On the other hand, dozens of species of plants and animals have been identified in the murals of Mali-

¹ See also Rubial (2010).

² Quoted by Chaparro Gómez (2002, 127). See also de la Flor (1999).

³ For a discussion on the concept of hybridism in the field of artistic colonial works in Latin America, see Dean and Leibsohn (2003, 5–35).

nalco, first by Favrot-Peterson (1987, 25–38; 1993), and later by Carmen Zepeda and Laura White (2005 and 2008, 173–199). More than half of these were native to the Mexican highlands, and ninety percent of them had some useful properties for the native population and for the colonists.

So this Garden of Eden in the middle of the Mexican highlands was constructed by means of an exuberant representation of the local flora and fauna. It was the work of painters trained both in the traditions of their families and communities of origin and in the vocational school that the Augustinians ran in Tiripetío, which was a rival of the one the Franciscans had maintained right from the start in the middle of the conquered Tenochtitlan: the Colegio de San José de los Naturales (Kobayashi 1974; Osorio Romero 1990; Zepeda Rincón 1999, 51–62). So in a certain sense the walls of Malinalco contain a “natural history” of the Mexican highlands. They are the visual representation of that natural history, but one indissolubly linked with a textual representation arising from the exchanges between friars and *indios*—an oral circulation that has been lost for ever.

This obliges us to consider what it meant to practice natural history in Mexico by writing, on paper or on walls, during the first sixty or seventy years of the colony. By which channels, by which authors and in which styles was it done? To that end it is necessary to consider as sources not only texts, but also images and even objects, when it is possible to relate them to those practices. This strategy enables us to go beyond writing, traditionally subject as it is to certain descriptive and taxonomic techniques—what Giuseppe Olmi⁴ has called *nominare, figurare e descrivere*—which were applied to each specimen of the three realms of nature observed, collected or selected by the writer. It was a question of fitting the experience of contact with nature to that mental grid, as Michel Foucault (1996, 137–176) called it.

It also enables us to take the emphasis off the *Historia natural de la Nueva España* of Francisco Hernández compiled between 1570 and 1577. At this point, Hernández’s work seems to have finally caught the attention of a historiography that elaborated on the story of the history of science from a radically Eurocentric perspective. However, apart from other considerations, this focus has hidden a large part of the panorama of what we would like to present.

Although it can be dealt with only briefly here, it is more of a proposal for future investigations than a concluded project with precise and specific results. For present purposes we shall concentrate only on what was to become the first phase of the natural histories of New Spain, extending from the conquest to the last decade of the century, until the publication of the *Historia natural y moral* of José de Acosta in 1590 (Acosta 1590).

⁴Olmi (1980/1981, 99–120). See also Ogilvie (2006).

We have therefore proposed to locate and classify clues, allusions and documentation that will help us to understand the forms of practicing natural history in Mexico. After that material was collected, the following step was to put forward a classification of the material for analytical purposes. We have found it useful and illuminating to distinguish three paths or programs in the praxis of a natural history of New Spain *in situ*.

1. Practices instigated by the Crown, from the epistemic setting of the court, as Arndt Brendecke has called it.⁵
2. Local, more or less spontaneous practices, from an epistemic setting in New Spain which has the city of Mexico and its hinterland as its epicenter;
3. Practices relating to the spiritual conquest, in the hands of religious orders.

Practices Instigated by the Crown

These practices form part of the continued attempt by Charles I and Philip II to collect information about the vast new territories under their control. This involves the innovative and diverse development of empirical methods of obtaining and managing information to which Antonio Barrera has insistently returned and which has been exhaustively theorized by Arndt Brendecke in his *Imperium und Empirie* (Barrera-Osorio 2010, 129–148; 2006).⁶ There can be no doubt that the development of this process started a long time before Hernández's expedition took clear form during the period of Hernández's stay in New Spain (1571–1576), and continued after his departure.

We mention here only three examples produced before the conception of the Hernández expedition. The first is the so-called *Comisión para la información, que ha de aver el Licenciado Ponce de León: para saber el grandor de la nueva España y Provincias della, y de sus pueblos y del grandor y calidad de cada uno dellos* given to Juan Ponce de León in 1525 and again on 5 April 1528.⁷ The proposed method of collecting information is important for its novelty. The joint responsibility for the information rested with a team consisting of the *Audiencia*, the bishop and the generals of the religious orders, who were to consult with the people who had the most experience and training; the information had to be based on documentary material and the testimony of trustworthy Spanish and native witnesses who made their statements under oath; and the framework was provided

⁵Brendecke (2009); Spanish translation, Brendecke (2012, 123–154).

⁶See also Brendecke (2009).

⁷Ponce de León, "La comission para la informacion, que ha de auer el Licenciado Ponce de Leon: para saber el grandor de la nueva España; y Prouincias della, y de sus pueblos y del grandor y calidad de cada vno dellos. M.d.xxv. Años," published by Puga (1945, II, 15r–15v).

by a questionnaire intended to obtain a cosmographic and topographic description of the territory and an approximate census of its population and resources, in particular its mineral resources. The *Descripción de la Nueva España* was completed and dispatched to Madrid on 5 July 1532. It is regrettable that this very first general description of New Spain is known to us only through excerpts that Antonio de Herrera incorporated in the following century in his work published in Madrid in 1601 (Herrera y Tordesillas 1601–1615).

The second example prior to the Hernández expedition is the *Instrucción para hacer las descripciones* contained in the *cédula real* of 1533:

Our aim is to obtain full notice of things of this land and their qualities. Therefore I instruct you to establish a very long and particular report on the size of this land, be it in its length and its width; also of its limits that should be specified by its proper names and how they are confined and landmarked by them; also of the qualities and particularities you find in it, enumerating each village separately; furthermore, the settlements of people, which exist in it of the naturals, pointing out their rites and customs in particular [...] and which harbors and rivers they have, which buildings are constructed, and the animals and birds that are bred there, their quality; once this task is fulfilled and your names are signed, send it back to Us to Our *Consejo de las Indias*. And together with this named report you will send paintings, as close to reality as you can of all things mentioned and of everything that can be painted.⁸

The revealing excerpt contains an unusual feature: the request to accompany the responses with the graphic representation of all “that could be painted.”

The third example prior to Hernández’s expedition is the questionnaire of 1553. Arising from another royal edict, it contained seventeen questions and gave rise among other documents to the famous reply from the judge Alonso de Zorita, who named and described the flora and fauna of New Spain in chapters fifty-two to seventy of the first part of his *Memoriales* and in chapters nineteen to twenty-

⁸Cited in Bustamante (2000, 44). The Spanish original: “Porque queremos tener entera noticia de las cosas de essa tierra y calidades della, vos mando que [...] hagays hazer vna muy larga y particular relación de la grandeza de essa tierra, así de ancho como de largo; y de sus límites, poniéndolos muy especificadamente por sus nombres propios y cómo se confina y amojona por ellos; y así mismo de las calidades y estrañezas que en ella ay, particularizando las de cada pueblo por sí; y qué poblaciones de gentes ay en ella de los naturales, poniendo sus ritos y costumbres particularmente [...] y qué puertos y ríos tienen, y qué edificios ay hechos, y qué animales y aves se crían en ella, y de qué calidad son, y así hecha y firmada de vuestros nombres, la embiad ante nos al nuestro Consejo de las Indias. Y juntamente con la dicha relación nos lo embiareys pintado lo más acertadamente que ser pudiere de todo lo susodicho, lo que se pudiere pintar.”

four of the second part of the same work.⁹ The mobilization of information put into circulation on the basis of the 1553 questionnaire is inseparable from the report by the royal cosmographer Alonso de Santa Cruz, compiled in 1556.¹⁰

We cannot ignore the close initial link between the description or enumeration of the natural world of New Spain and the continuous attempt to rationalize the extraction of royal tribute from the colonial producers, nor the connection between this and the transformation of painting in the pre-Hispanic cultures into tributary codices already in the colonial era. The Hernández expedition marks the moment when an agent sent directly from the epistemic setting of the court elaborates his own program for the collection of information in situ. The support of the court for this elaboration assumed various forms during the six years that the Protomédico spent in the Indies.

A single example will suffice to show how the Spanish court continued to stimulate this task of systematically recording information even during Hernández's stay in New Spain: the instructions sent by Philip II to the Viceroy Martín Enríquez, dated 17 August 1572:

[...] afterwards, you will inform any person, be it secular or religious, who might have written or recompiled or who possesses any kind of histories, commentaries or reports of one of the discoveries, conquests, [...] and as well of religion, government, rites and customs that the Indians had and have; furthermore, of the description of the land, naturals and qualities of the things there; ordering to search for those or something similar in archives, offices and bureaus of the scribes and in other parts where they might be; and those that can be found originally, or as a copy, you issue an order to send it to Us at the first occasion of departure of the float or boats to these kingdom.¹¹

This implies, among other things, that Madrid was aware of the existence of individuals who had elaborated and processed this type of material.

⁹Reference to Alonso de Zorita and the 1553 cuestionario in Bustamante (2000, 55). See also Zorita (1999–2001).

¹⁰On the report of Alonso de Santa Cruz, see Portuondo (2009, 210–212).

¹¹Philip II's Instrucción to Viceroy Martín Enríquez was published by Nicolás León in Ximénez (1888, XXIX–XXX). The Spanish original: “[...] hagáis luego informar de cualquier persona, así legas como religiosas, que hubieren escrito o recopilado o tuvieren en su poder alguna historia, comentarios o relaciones de alguno de los descubrimientos, conquistas, [...] y asimismo de la religión, gobierno, ritos y costumbres que los indios han tenido y tienen, y de la descripción de la tierra, naturales y calidades de las cosas dél, haciendo asimismo buscar lo susodicho o algo del en los archivos, oficios y escritorios de los escribanos y otras partes a donde pueda estar, y lo que se hallase originalmente, si ser pudiere, y si no la copia dél, daréis orden como se nos envíe en la primera ocasión de flota o navíos que para estos reinos vengan.”

After the return of Hernández to Spain in 1577, several examples could be cited. We shall mention only two clear signs of the efforts on the part of the Crown to provide continuity to the project that Hernández had conducted for several years.

The first is represented by the tasks carried out by the cosmographer Francisco Domínguez, who arrived with Hernández but remained in Mexico after the departure of the Protomédico.¹² In response to a letter sent by him to Philip II dated 30 December 1581, the following proposal was made: “that His Majesty should charge the Viceroy Enríquez with sending back the description of New Spain that [Domínguez] has improved from Doctor Francisco Hernández.”¹³

The second example refers to Juan de Vides, who was appointed Protomédico by the council of the city of Mexico in 1581 and 1582, and proposed continuing the natural history of Hernández. His patron, the Viceroy Lorenzo Suárez de Mendoza, advocated this in a letter to Philip II of October 1581:

[...] in continuation, rendering service to Your Majesty, of the Historia that the protomedico Francisco Hernández has started following an order by Your Majesty of the qualities and characteristics of the plants of this land.¹⁴

The end of Suárez de Mendoza’s reign as viceroy in 1583 raises serious doubts as to whether this proposal was ever implemented, but its very existence clearly indicates a desire for continuity in the royal ambition of compiling a natural history of New Spain.

The most striking evidence of that desire for continuity, however, can be seen in the circulation of a questionnaire with fifty questions printed in 1577 and created by the *Cosmógrafo Mayor* Juan López de Velasco for the Council of the Indies. It derived from the program of reforms undertaken by Juan de Ovando and aimed at obtaining an *entera noticia* on the American territories. The replies from almost two-hundred localities in New Spain have been preserved. The collection is known under the name of *Relaciones Geográficas de Indias*. What interests us here is the enormous plurality of voices reflected in these documents and the existence of cases in which one of those voices went further in replying to certain questions with the clear ambition of producing a natural history.¹⁵

¹²On Francisco Domínguez, see Somolinos (1960, 252–258).

¹³Fernández Navarrete (1842, 379). The Spanish original: “que SM mande al Virrey Enríquez remita la descripción de Nueva España que [Domínguez] trabajó mejorando lo hecho por el Doctor Francisco Hernández.”

¹⁴Martínez Hernández (2011, 113–114). The Spanish original: “[...] proseguir, siendo vuestra Magestad servido, la Historia que el Prothomédico Francisco Hernández comenzó por mandado de vuestra Magestad de las virtudes y propiedades de las yerbas desta tierra.”

¹⁵On the *Relaciones*, see Pardo-Tomás (2014) and the bibliography mentioned there.

“Local” Practices

Here we must limit our remarks to a couple of examples to convey an idea of the variety of forms in which the authors of the *Relaciones* complied with the request for complete information about the animals, plants and minerals, as well as the climatological conditions, the quality of the air, water, soil and inhabitants of the locality themselves. This second way of practicing natural history is located in the (relative) margins of the colonial program imposed by the metropolis. These are practices that emerged in situ, often aimed at local audiences and in pursuit of certain objectives that can be understood only if one considers the existence of a colonial, basically Mexican epistemic setting right from the first decades of colonization. In spite of the lack of a systematic collection of material, which is still pending, a couple of individual cases will serve to document the existence of these practices in the city of Mexico and its environs.

The transposition of the manner of conducting Plinian natural history to the Indies and resulting in *mestizo* knowledge is revealed very clearly in the production of the so-called *mestizo* or *ladino* chroniclers. Rolena Adorno and, more recently, Aguilar Moreno have drawn attention to them as “dual ethnographers,” without forgetting the idea that “the texts produced by those who wrote the history of their ethnic groups are revealing both for what they say and for what they suppress” (Adorno 1994, 383; Moreno 2002, 149–184). While they consider that “for these ladino historians, the re-evaluation of the past has a present-oriented objective” (Adorno 1994, 400), we should ask ourselves in the present case whether the natural histories inserted in their chronicles are, in that sense, a *re-evaluation* of the nature that belonged to them, or whether they were pursuing the maintenance of that possession as members of the *mestizo* elite in charge of their respective communities (Adorno 1994, 400).

In the heat of the mobilization produced by the 1577 questionnaire, these *mestizo* chroniclers produced two works that I would like to briefly present here. The first is the so-called *Relación de Tlaxcala* edited around 1584 by Diego Muñoz Camargo, son of a conquistador and a native noblewoman from Tlaxcala, who divided his time between Mexico City and Tlaxcala. In assuming the responsibility of replying to the questionnaire, he ended up editing a natural history of the region as a résumé of his extensive *Historia de Tlaxcala*, in which he defended the history of the Tlaxcaltecs, a loyal native group allied with the Spaniards against the Mexica during the conquest. Muñoz Camargo writes, among other things:

We will not treat on herbs and its medical roots, nor of other plants and flowers and its varieties and different colors, neither of plants that are called tuna de grana cochinilla nor of the ways the Indians

take advantage of them; I will not touch the quality and characteristic of birds and its colors, not of aromatic trees, because the doctor Juan Alonso de la Mota, dean of the Bishop-Cathedral of Michoacán, has a very comprehensive book of these things, astonishing and elegant, with the title *Floresta de virtudes* to which we refer.¹⁶

We know nothing more about this doctor Juan Alonso de la Mota, dean of the cathedral of the bishopric of Mechoacán, nor about his *Floresta de virtudes*. It may have been a work in an allegorical style, like so many others that were the fruit of the idea of colonization as spiritual gardening, as Jorge Cañizares has called it (Cañizares-Esguerra 2006, 178 and *passim*).

Once Muñoz Camargo had ruled out the possibility of repeating what Hernández and his friend the dean had written, he could not resist the temptation to venture on a natural history of his own, with aspects that were not to be found in Hernández or in the other contemporary Spanish sources. This is clear from the following excerpt on resins and aromatic herbs:

We will regard some astonishing things that we have seen [...] and of some trees that dribble odoriferous smells; that is the case of the tree called xochiocotzotl quahuil that in English [for Spanish] means the tree that is called “tree of odoriferous resin, smelling like the odor of a flower.” This is a very tall tree, similar to a pine and very straight; in its very height he forms a very curious crown, also its leaves are sparse like those of a laurel; wherever you find this tree it has a very fine odor. In order to extract the liquor you have to carve with a knife or an axe and [...] the tree is very appreciated and the old Indians estimated it a lot, because it was used by the lords [...].¹⁷

While Muñoz Camargo justified how he intended to deal with the information about the animals of the Tlaxcala region, this is what Juan Bautista Pomar wrote in

¹⁶Acuña (1985, 269–270). The Spanish original: “Menos trataremos de las yerbas y de sus raíces medicinales, ni de otras plantas y flores y de sus variedades y diversas colores, ni de la planta que llaman tuna de grana cochinilla y de la manera que benefician los naturales; ni menos, tocaré en la virtud y propiedad de las aves y sus colores, ni de los árboles aromáticos, porque el doctor Juan Alonso de la Mota, Deán de la catedral del obispado de Mechoacán, hace un libro muy copioso de estas cosas, curioso y elegantísimo, intitulado Floresta de virtudes, al cual nos remitimos.”

¹⁷Acuña (1985, 271). The Spanish original: “pasaremos sucintamente por algunas cosas curiosas que se nos ofrecieron [...] y de algunos árboles que destilan olores odoríferos, como es el árbol que llaman xochiocotzotl quahuil, que en nuestro romance quiere decir el árbol que llaman ‘árbol de resina odorífera, olorosa, como de olor de flor.’ Éste es un árbol muy alto, de hechura de pino muy derecho y, en lo más alto, hace una copa de sus hojas muy graciosa, aunque las hojas son menudas a manera de hojas de laurel, que adondequiera que está da muy suave olor. Y para sacar dél licor, le dan algunas cuchilladas con un cuchillo o hacha y [...] es árbol muypreciado, y los naturales antiguos lo estimaron mucho, porque usaban dello los señores [...].”

1582 about the medicinal herbs used by the people of Texcoco, the town situated on the northeastern shore of the swampy basin of Mexico:

The herbs used by the Indians for medical purposes, roots and plants, grains and seeds, are many; they are coming from this town and its surrounding, as well as they come from abroad; it was the doctor Francisco Hernández, *Protomedico* of his Majesty who has given a long and comprehensive report, written and painted in his books, relating its qualities and characteristics. There you can see its properties and effects properly of each thing; and therefore, this chapter treats of the most often used and of the effects they mostly have when applied in cures and as medicine, because to treat all of them needs necessarily a lot of time and a lot of writing.¹⁸

Pomar, who was a grandson of Nezahualcōyotl, the king of pre-Hispanic Texcoco, is a good representative of the *mestizo* nobility who, while allied with the Spaniards, tried to maintain its privileges and its power over the communities of native origin at all times. The examples of both Pomar and Muñoz Camargo serve to draw our attention to the uses and appropriations of these forms of doing natural history by members of the native population. The phenomenon has been studied accurately, though for a different context and period, by Kapil Raj (2007).

Let us now move on to the third form of implementing the praxis of a natural history of New Spain in situ.

¹⁸Acuña (1986, 109–111). The “Relación de Tezcoco” was dated to March 1582 by Juan Bautista de Pomar, but the original text was lost; we know the copy made by Fernando de Alva Ixtlilxóchitl around 1609. The Spanish original: “Las yerbas con que se curan los indios, raíces y plantas, granos y semillas, son muchas, así de las que se dan en esta ciudad y su comarca, como de las que de fuera della se traen, de las cuales el doctor Francisco Hernández Protomédico de su Majestad tomó muy larga y entera razón, que escribió y pintó en unos libros que de sus calidades y naturalezas hizo, en donde se verán sus propiedades y efectos muy en particular de cada cosa; y así se satisfará en este capítulo de lo que más generalmente usan y que más conocidos efectos hacen en sus curas y medicamentos, porque tratar de todas era menester hacer un proceso y escritura de mucho volumen.”

Practices in the Hands of the Religious Orders



Figure 2.2: “Dance of Death” mural in the Augustine convent at Huatlatlauca, Puebla (Mexico). Photographed by the author.

In their continuous attempts to convert the population to Christianity, the religious orders deployed the practice of natural history as an instrument for that conversion, but also for the training and development of the missionaries in the territory. We saw how the Augustinians put into practice a visual program of representing the natural world of New Spain, both in Malinalco and in the many other Thebaidas painted on the walls of their convents. In so doing, they attempted to articulate the struggle for the conversion of the *indios* with the promise of the salvation of their souls in a paradise on a par with the exuberant nature of the New World. That nature also included a description and a moral and social taxonomy of the heterogeneous population of New Spain. This can be seen very clearly, for example, in the mural of Huatlatlauca with the social groups portrayed in the “Dance of Death.”¹⁹ This seems an obvious and convincing demonstration of the nuclear *mestizaje* characterizing that “invention of New Spain” which under-

¹⁹On Huatlatlauca and the “Dance of Death,” see Rosquillas (2006, 12–24).

lies many visual and textual documents of the first generations. The Huatlatlauca mural shows the representation of the Spanish authorities and of the religious hierarchies, but also a strange assembly of male and female elite members of the community. As for natural history, the Thebaid and the Garden of Eden reappear in the other murals of the Huatlatlauca convent. So in a certain sense the walls of the Augustinian convents were already the site where a “natural and moral history of the Indies” was being written years before the appearance of the book of this title by the Jesuit José de Acosta in 1590.

As for the Franciscan order, it was the first to arrive in New Spain and the most active in deploying those resources in the course of the first sixty or seventy years of “the spiritual conquest of Mexico,” as Robert Ricard aptly called it.²⁰ There are probably many examples of this. This is not the place to dwell on the extremely interesting natural history that Fray Diego de Landa includes in his *Relación de las cosas de Yucatán*, written around 1566 during his stay in Spain, for the geographical and cultural distance of Mayan Yucatán would take us too far from the central Mexican area with which we are concerned here.²¹ In a previous article I focused on Fray Bernardino de Sahagún and the setting that is essential for an understanding of his *Historia general*, namely, Tlatelolco. All the same, I would like to say something about the style and forms of practicing natural history in Tlatelolco and to comment on some of its architecture that I only mentioned in passing in that article (Pardo-Tomás 2013, 40 note 3).

I am referring to the decoration with murals of the *Caja de Agua* created at a very early date by the *tlacuiloque* of Tlatelolco under the supervision of the Franciscans of the monastery of Santiago. Guilliem Arroyo, the archaeologist who studied these paintings, discovered in 2002, has identified ten representations of human beings with almost thirty hunting, fishing and collecting implements, some thirty animals and an equal number of plants, as well as the nine sections of the aquatic littoral with their corresponding watermills (Arroyo 2009, 15–32; Guilliem Arroyo 2013, 19–38). In a certain sense, the reservoir of Tlatelolco is another painted natural history, in particular an eloquent representation of the lakeside world surrounding the twin cities Mexico-Tenochtitlan and Mexico-Tlatelolco.

²⁰Ricard (1986), French original edition, 1933. See also Prodi (1979); more recently, Prospero (1999, 267–293); Cantú (2007); Broggio (2013, 441–447).

²¹Landa (2002), edited by Miguel Rivera Dorado.



Figure 2.3: “Box of water” [reservoir], in the Franciscan convent at Tlatelolco, DF (Mexico). Photographed by the author.



Figure 2.4: *Libellus de medicinalibus Indorum herbis*, ff. 8v–9r, manuscript made in 1552, published in Mexico by the Instituto Mexicano del Seguro Social, 1992. Author’s copy.

de las arañas



tote curijque mochi que coa,
 mochi pan vete: vel mota tla
 mota, momamaavi in tva
 qualo, vel mōchi tiva mī
 kacaco, in jopan vete in tva
 tenqualalāli. vel tlatā in jol
 lo, vel tveoa. In jomopale
 va: quj papachoa, ipan mo
 tlatālia: voan icuica quj
 tchichinilia, voan quj terna,
 voan in jec in quj octli: in cā
 ca hio cilizitl, no vilitziltl
 in: quj caoaz, in achi ceviz. In
 in tveat: vel tchilotē in jto
 qualac, iece in naravati: ca
 vna cōtā tlatālia, in canj
 ca nānāo aul, icpatē, ie
 ce canpanj: njman iciehoatl
 in coacivizāi, axio, tēllo,
 ic mon: atēloa: caquj cevia.
 In in tveat: vmpā nemy in
 tlatōtētia, iuh quj nī tva
 tā. lo mītl: in aquj quj mī
 naz, aul can tētia va ca tla
 mīz, can ixicatōz in vna
 quj mīna: aul cenca tlatāz
 in jolō, in jnacaco: vel tva

Figure 2.5: “On the Spiders,” in Bernardino de Sahagún, *Florentine Codex*, manuscript made c. 1577, published in Mexico by Secretaría de Gobernación, 1979. Author’s copy.

The process of hybridization of the *indios* who studied, wrote, read and painted in Tlatelolco reflects their dynamic nature and the richness and plurality of their practices. In this respect, María José Afanador (2011, 36) has emphasized their ability to “name nature in Nahuatl while complying with European standards.” That is what the painters of the reservoir achieved in 1530s, and Juan Badiano and Martín de la Cruz in the *Libellus* in 1552,²² or the informants and painters of Sahagún’s *Historia general de las cosas de Nueva España* in the 1560s and 1570s.²³

James Lockhart (1992) has pointed out how the adaptation of the *indios* to the writing techniques brought by the Spaniards enabled them to ensure the survival of Nahua culture and the persistence of their social and cultural organization. Gruzinski (1988, 86), in turn, has declared that “the *indios* of the Colegio de Santa Cruz in Tlatelolco gave the impression of being privileged witnesses who tried to master both cultural spaces between 1550 and 1580.”

What we would like to stress here is that this whole process of hybridization was compatible—albeit not without tensions or contradictions—with the missionary task of the Franciscans during the first half century of the conversion campaign. The natural histories that emerged from the action of various agents, with all the ambiguities they implied, were a contribution of the first order to the nascent culture of New Spain.

Perhaps the picture changes when it comes to translating—translating and transferring—the natural histories of New Spain to European audiences. To illustrate some of the problems involved, without departing from the world of the Franciscans, I would like to touch briefly on the *Rhetorica christiana* by Fray Diego Valadés, published in Perugia in 1579 (Valadés 1579).

Valadés was a Franciscan who had lived in New Spain since childhood and devoted twenty years of his life to missionary activities among the native population, returned to Spain in 1571 at practically the same moment when Francisco Hernández was disembarking in Veracruz. Valadés traveled on from Madrid to Rome in 1575. With this distance from the policy of Philip II, he placed himself at the service of the Pope and of the Roman strategy to secure a larger share of the missionary activities in America. This context of tensions between the policies of Rome and Madrid with regard to the organization of the Catholic mission in the Indies is essential for understanding the ultimate intentions of a work of the complexity of *Rhetorica christiana*.²⁴ This is not the place to go into this in more detail, but it is relevant to mention the work of Valadés here to show how

²²I used the edition Cruz (1991). On the *Libellus*, see Pardo-Tomás (2013, 28–32); see also Gimmel (2008, 169–182) and José Afanador (2011).

²³On Sahagún, see Pardo-Tomás (2013, 32–37) and the bibliography cited there.

²⁴On Valadés and his *Rhetorica*, see Bolzoni (2008, 147–141); Báez (2005); and Chaparro Gómez (1996–2003, 403–419).

the relation between non-European natural history and the missionary program assumes plural forms of expression among the Franciscans, depending on a variety of factors including the complex intricacies of the relations within the triangle Madrid-Rome-Mexico.



Figure 2.6: “God the creator, redeemer and rewarder,” in Valadés (1579, 222).
Reproduced courtesy of Biblioteca de Catalunya, Barcelona (Spain).

Divergences of this type—as well as convergences, for they, too, exist—between the works of Sahagún and Valadés are evidence of this. Valadés’s work was in fact a manual of Christian rhetoric, but it was intended to give the missionaries in America a series of theoretical and practical skills that would help them in their mission. To illustrate the role of natural history in Valadés’s proposal, I shall present only two images and the accompanying texts. The first is the engraving entitled *God the creator, redeemer and rewarder* (Valadés 1579, 222).

In this interesting and original composition, the various stages of the creation of the universe as recounted in the Bible are expounded, from the angels, humans and various animals to the vegetable world. Here Valadés included animals and plants endemic to Mexico, such as maize, the opuntia cactus, the pineapple and cacao. The upper part is dominated by the representation of the Holy Trinity, inspired, apparently, by Dürer. In the lower part Lucifer with his retinue of demons are in hell. And this is one of the passages where Valadés commented on the image:

In eorum exploratorum numero per Dei gratiam ego quoque fui nec possum quidquam de ea regione prædicare nisi videri mihi omnium quas solvidet maximam, quæ nec propter æstum nec frigus inhabitabilis sit multis camporum patientium æquoribus, fluminibus, et fontibus plena, quæ parvo labore et sumptu ad irriganda prata et agros deduci possunt atque ita melius triticum et mahiz ibi colligitur quam vel in Hispania vel in cæteris partibus novis orbis hactenus devictis. Quod videre est in hortis ab Hispanis conditis in ijs partibus apud Sacathecos, ubi ego in civitate Nominis Dei in valle Huadiana, quam excoluit bonus ille frater Petrus de Spinareda, et sanctus ille Frater Cindos tantæ magnitudinis cydonia, granata, persica, et cotonea, ut nisi hic adessent qui conspexerunt ipse vererer dicere. Sunt cydonia paria capitibus puerorum. Persica magnis aurentijs aequalia sunt, cæpæ amplitudine patellarum aliæ magnitudine aurantiorum. (Valadés 1579, 202–203)

The second engraving is entitled *Description of the sacrifices that the indios inhumanly perpetrated in the New World of the Indies, principally in Mexico* (Valadés 1579, 172).



Figure 2.7: “Description of the sacrifices that the indios inhumanly perpetrated in the New World of the Indies, principally in Mexico,” in Valadés, (1579, 172). Reproduced courtesy of Biblioteca de Catalunya, Barcelona (Spain).

It aims to visually facilitate the description of the pre-Hispanic world of Mexico. Among other things, Valadés includes various endemic trees and plants, each labeled with a more or less Latinized name, such as Maguei, Tuna, Pinna, Cacao, Cocusi, Guaiaba, etc.²⁵ The engraving is connected to a passage in which Valadés discusses the sacrifices and temples of the *indios*, describing the building materials, form and surroundings of those *cues* and adding:

Exornabantur eadem templa viridarijs, fontibus amenissimis, balneis calidis, aquis stagnatibus, et hortis viridissimis, flosculis et arboribus amœnis. Habent autem flores eximios odoratos et varios Semper autem in illis plantabant magno studio arbores vaide patulas et umbrosas, usque adeo, ut in unius umbra mille homines agere possint, eo modo, quo Indi sedent. Quamvis autem sterilis, et infrugifera sit ea arbor, est nihilominus in tanto pretio, ut in comparationibus a maiori plerunque ab ipsa collationem ducant. Vocant autem illam Indi ahuehuetl, Hispani arbor de parayso, mihi autem non eiusdem generis esse videtur. Toto anno virides manent, sunt platano persimiles, nec tamen plane eiusdem naturæ, ut in catalogo variarum rerum novi orbis explicaturi sumus. (Valadés 1579, 168)

Unfortunately, no trace appears to remain of that *catalogo variarum rerum novi orbis*, whose mention here at least serves to show once again how much this form of practicing natural history was connected with the missionary program of the Franciscans.

Conclusion

Our final consideration proposes an integration of the three forms of praxis of natural history in situ that we have presented here. Such an integration is only possible from two complementary perspectives.

On the one hand, starting from the space of elaboration of these natural histories—Mexico, the city and its hinterland—some questions still call for better answers than what have been offered so far. When did this practice of doing, painting or writing natural histories commence? Everything seems to indicate that the answer is from the start and in different ways, but there is a need to examine the material we have unearthed so far in greater depth. In which spaces in the city or valley of Mexico were those natural histories written, painted or collected? There is an urgent need to chart the details of such production. Who

²⁵This part of Valadés' iconography is clearly inspired by illustrations from Gerolamo Benzoni's. *La Historia del Mondo Nuovo* (Venice, 1572). I thank Peter Mason, who pointed out this connection.

were the informants, what were the sources of inspiration for the paintings, how were the animals, plants and minerals obtained for stockbreeding, cultivation, consumption and exchange?

On the other hand, there is a second perspective that is similarly geographically focused: we should not ignore the fact that the sights of an important part of the actors in Mexico are fixed on Madrid and Rome as well, and that vice versa Madrid and Rome are looking towards Mexico. It is essential to chart the circulation of these natural histories among the three corners of this triangle. For example, there is an evident connection in the group of natural histories produced through direct instigation of the Crown, but it is (or should be) also evident that the three corners are connected via the circulation of natural histories carried out by the friars. As for the natural histories that emerged in a more or less spontaneous way in situ in New Spain, we should explore their transatlantic circulation, even before the period in which some of them were taken up again by European authors as an “archaeological remnant” and sources of information for the natural histories of the Enlightenment, although they are distinct and distant from those that concern us here. It is necessary to evaluate the reality and scope of a certain autonomy of the colonial periphery, which could even generate “independent attitudes” prior to those that Daniela Bleichmar (2008, 228) has highlighted for the eighteenth century.

What seems clear as a starting point is that, behind the various ways of practicing natural history in the final decades of the sixteenth and the first decades of the seventeenth centuries, there exists a plurality of intellectual projects, convergent and connected.

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