CHAPTER 8

Ecology and Leadership

Pantitlan and Other Erratic Phenomena

BARBARA E. MUNDY

The environment of the Basin of Mexico (fig. 8.1) was as life giving as it was lethal. Situated in the temperate highlands of Mexico, the basin yielded bounties of maize, amaranth, chilies, and squash, but lacking a natural outlet for its abundant waters, its summer rains were both needed and dangerous. A great flood engulfed the island cities of Tenochtitlan-Tlatelolco in 1499; by the end of the 1530s, drought would grip the basin, followed by yet another flood in 1555. Bernardino de Sahagún and his collaborators in the creation of the Florentine Codex, island residents all, were keen observers of this environment, and as a result they left us a natural history of the world around them of unparalleled richness in Book 11. But the Nahua men who gathered around the Franciscan scholar were more than observers. They were elites and governors as well, and thus the Florentine Codex also registers Nahua ideas on the proper role of leaders.

Environment and rulership were not separate domains, as Nahua rulers not only were leaders of people but also were charged with keeping the relationship to the natural world in balance. Most famously reported in Book 12, when the *huei tlatoani* Moteuczoma learned of the surprising appearance of comets, lightning, and flood, he responded with the appropriate ritual action to set an unbalanced world back to rights. That his actions failed to prevent his own assassination and the invasion of the island by hostile (and largely indigenous) armies under the lead of Hernando Cortés did not mean that two generations later, as Nahua elites gathered to discuss Sahagún's queries, the special linkage between the ruler and the natural world had been severed. Instead the Florentine Codex presents us abundant evidence that its Nahua collaborators were still puzzling out the ceaseless and unfolding pattern of environmental threat and ritual reaction. In this chapter, I focus on two moments of environmental aberration recorded in the Florentine Codex that document cycles of threat and reaction, to argue that the Nahua fascination with the environmentally aberrant—an unsurprising interest given the temperamental environment—continued to be linked to ritual intervention and the need to appease potentially destructive forces. These moments are to be found in Books 1 and 11: the first, an account of the great whirlpool/drain of Pantitlan that lay in the eastern lake of Texcoco, and the second, the abnormal behavior of the *acuitlachtli* (water bear), a small furry animal with an aquatic habitat. These episodes are particularly notable for the images that accompanied them, images that are more than mere illustrations of the text, as is argued throughout this volume, and are equally rich sources of information provided by the book's creators.

Diving into the watery microenvironment in and around the island cities of Tenochtitlan-Tlatelolco allows a better purchase on the actual conditions of the book's genesis. More important, it accompanies a shift of our frame of interpretation to *emplacement*, by which I mean a focus on the immediate, physical context of the work's creation. This interpretative frame attempts to move beyond the polarities that structured an earlier body of scholarship, as seen in the next section. So obvious as to be largely

FIGURE 8.1. *Map of the Basin of Mexico. Olga Vanegas.*

unmentioned, Sahagún and his informants were all residents of the same place, the Basin of Mexico; by the time that they compiled the *Primeros memoriales*, Sahagún had spent more of his life in New Spain than anywhere else, and likely more time in the company of his Nahua collaborators than his Franciscan brothers. Ellen Baird captures some of the social dimensions of emplacement in describing their late-life intimacy—both intellectual and physical—as they found shelter from the plague, from old age, from threatened obscurity, within Tlatelolco's sturdy walls.[1] Certainly in creating the Florentine Codex they all were "navigating the terrain between cultural traditions" (in Peterson's phrase),[2] but that terrain was not a terra incognita. It was home.

INTELLECTUAL FRAMEWORK OF THE FLORENTINE CODEX

Authorial control of the text has been of major concern to past scholars.[3] How much of the book is the work of Sahagún? How much is the work of the Nahua informants? In the past, scholars have tended to argue along binaries, pitting ethnicity (Spanish/Nahua) or temporalities (pre-Hispanic/modern Europe) against each other, setting different parts of the text along a spectrum, one end deriving from the purely Nahua (meaning oral and/or pictorial and pre-Hispanic) and the other from the purely Spanish (meaning alphabetic and contemporary European). At one end are set relatively unmediated Nahua orations like the *huehuetlatolli* of Book 6. Thelma Sullivan, a major scholar of Nahuatl, claimed that no other part of the Florentine "is as rich in language or as revealing of the pre-Hispanic Indian mind and thought as [these] rhetorical orations."[4] Set at the middle of the spectrum are the texts "where the informants answered under pressure of a [written] questionnaire" that Sahagún used to elicit responses, whose formats Alfredo López Austin elucidated in a 1974 article.[5] At the other end of the spectrum are set the Spanish-only texts authored by Sahagún alone, which are often found as prologues or "*confutaciones*" in the text. Scholars pursuing the nature of the Florentine's sources have mapped them along complementary binaries: Do pre-Hispanic models predominate? Do imported European ones?

This volume offers abundant evidence that the Florentine is the result of a close collaboration between Sahagún and the Nahua men he gathered around him, rather than a product of one individual author, a category itself made considerably more capacious by poststructuralists. But polarities continue to color scholarship (Spanish Sahagún / European source / modern alphabetic text versus Nahua informants / indigenous source / pre-Hispanic pictorial manuscript or oral account). They have the danger of obscuring how much of the Florentine Codex was the product of mutual interests and shared habitus of the Nahuatl-speaking, Spanish-born intellectual and his Spanish-speaking Nahua counterparts; they also tend to constrict an understanding of the breadth of the currents that colored intellectual discourse on both sides of the Atlantic in the sixteenth century, currents in which those men sitting together in convent libraries were eager to participate. To parcel out the content of images along the same binaries also tends to obscure their innovative nature and the shared emplacement of the work's creators. Both innovation and emplacement are seen in the ways the authors (by which I mean Sahagún and his Nahua collaborators) registered responses to local and immediate phenomena.

Rather than tracing the ideas to either expressly "Nahua" or expressly "European" beliefs, heuristic categories in themselves, I see them as localized expressions of relevant ideas that were shaped by habitus. Sahagún and his collaborators all lived within the same city and were responding to the same changes in the local environment. They had access to the same libraries and would have shared in the same confessional practices. And the material that was included in the Florentine Codex had to have been of interest to all of them: while Nahua collaborators were directed by the standardized format of the questionnaire that Sahagún used, at many junctures they expounded freely, expositions that Sahagún included in the final text. The same is true of disruptions to the prescribed format of the page that dictated both the bilingual columns as well as the sizes of the images. Just as with the texts, a moment in which the otherwise even format of the page is ruptured by the image is where the unique and extraordinary phenomenon finds expression. These moments of rupture were ones particularly important to the text's creators, who saw fit to include them.[6]

There is no better place to explore emplacement than in the authors' collective preoccupation with the surrounding environment, evidenced in their decision to include a natural history and in the depth and complexity of the text and its images of Book 11. In doing so, they set "las cosas

de Nueva España" into a format suggested by the books of the ancients. (And who is to say that don Antonio Valeriano, fluent in Latin, steeped in classical texts, could not claim Pliny as a *tlamatini?*) An analysis centered on the images reveals which environmental phenomena preoccupied these elite authors at late century; the images' iconographic content and composition allows me to show the ways that elites underscored their roles as environmental custodians, key intermediaries between the populace and the fickle environmental conditions that the basin subjected them to. Nahua elites had played this intermediary role before the conquest, and the ones gathered within the great Franciscan monastery of Tlatelolco were actively reframing their roles to respond to new environmental challenges and to resonate within Christian parameters, the latter best seen in the artists' use of color.

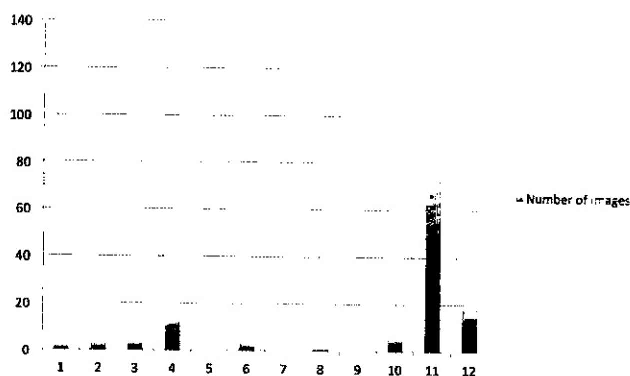


FIGURE 8.2. *Number of images showing water in each of the twelve books of the Florentine Codex.*

ELITES AND THE SHAPING OF THE LOCAL ENVIRONMENT

As can be seen in the map in figure 8.1, Tlatelolco and its sister city of Tenochtitlan sat on an island in the middle of a system of lakes, which through careful engineering projects carried out under Mexica rulers during the fifteenth century, and by other *altepetl* in the basin, had been transformed into a veritable paradise. On the map, which reconstructs the system as it existed from 1500 to 1519, one can see a dike and causeway stretching across the bottleneck formed by the skirt of the hill of Huixachtlan (known today as Cerro de la Estrella) near Culhuacan, which resulted in a careful corralling of fresh water in the southern lakes. This dike, as well as ones built to the north and south of the island of Mexico, where Tenochtitlan and Tlatelolco were situated, allowed for the buildup of a massive system of chinampa agriculture to provision the basin's burgeoning population, estimated at some quarter of a million people in 1500. The Nezahualcoyotl dike, to the east of the island, further protected the system from flooding coming from the salty Lake Texcoco. While the important sixteenth-century historical sources from the basin have always underscored the unpredictable, and sometimes violent, nature of the city's surrounding waters in the fifteenth century and onward, modern archeological data has further confirmed the extensive manipulation of the lacustrine environment, the engineering marvels of the basin's indigenous peoples. The Florentine Codex was clearly inflected by these local conditions: imagery recording water in some fashion accounts for 204 images, about a quarter of the book's total, and more than half of these appear within Book 11, as the table in figure 8.2 shows.

Through the fifteenth century, as histories of the basin underscore, pre-Hispanic Mexica rulers positioned themselves as custodians of the surrounding basin environment.[7] In particular, they made the island habitable and increased lands for cultivation by sponsoring two kinds of infrastructure projects to deal with the city's waters: huge dikes and causeways were constructed in the lake bed around the city, both to connect the city to neighboring communities and, more importantly, to control the ebb and flow of water during the rainy and dry seasons; in addition, aqueducts were built to provision city residents with fresh water, as scholars such as Ángel Palerm and Luis Gonzalez Aparicio have established.[8] During the rainy season, the waters flooding into Lake Xaltocan, Lake Zumpango, and the salty Lake Texcoco threatened to engulf the city in salt water; during the dry season, enough water needed to enter the system to keep open vital canal routes to provision the city. Solid causeways planked out across the lakes to the mainland to connect neighboring *altepetl*, parceling the lake up into smaller and more manageable sections, and openings in the causeways allowed regulation of the water flow between sections. Such massive infrastructure projects were often connected to ruling elites. Notably, two of the most important projects bore the names of sponsoring rulers: the great dike of Nezahualcoyotl, which was the main bulwark against saltwater flooding from Lake Texcoco, was named for ruler of the *altepetl* of Texcoco (r. 1431–1472); the dike of Ahuitzotl, which further protected the eastern flank of the island of

Tenochtitlan-Tlatelolco, took the name of its Mexica *huei tlatoani* (r. 1486–1502).

After the conquest, the crucial role of elites did not come to an end; they were the ones who possessed the technical know-how as well as the ability to manage the huge labor gangs necessary for water-management projects. Two examples will suffice to make the point. During the siege of the city in 1521, the conquistador Cortés broke the pipes from the springs at Chapultepec, starving the city into submission;[9] in the aftermath of the war, it was the Mexica nobility who stepped in to rebuild the city, including, in all likelihood, provisioning it with water.[10] In 1555, a catastrophic flood engulfed the city. Thousands of workers were marshaled to reinforce dikes that the Mexica had carefully engineered but that the Spanish-run government of the city had neglected. The viceroy, don Luis de Velasco, called in indigenous leaders to help him confront the crisis, and an indigenous account in the Codex Osuna underscores the crucial role that the indigenous labor force, organized by indigenous elites, played in rebuilding the dikes.[11] These are but two examples of the continuing role native elites played in maintaining the water infrastructure.

These roles were not only practical; they were also ideologically charged, in that human communities were conceived of as continuous with the environment. Such continuity is indicated by the Nahuatl term *altepetl*, combining words for "water" and "hill." Hills and mountains were conceived of as the containers of water, and water was crucial for agriculture and human survival. Mountains not only were biologically and socially essential but also were perceived of as animate embodiments of divine beings.[12] An *altepetl*'s *tlatoani*, including the Mexica *huei tlatoani*, was conceived of as the protector of his *altepetl*, charged with maintaining the balance between the human community and the forces of nature, such forces conceived of as deities. Thus the *tlatoani* was not only a political leader but also a head priest. Indeed, he was conceived of as a great tree sheltering his people. Such an idea was expressed by the Dominican Diego Durán, who recorded an oration that Nezahualcoyotl was believed to have delivered to Moteuczoma I, the Mexica ruler (r. 1440–1469): "You well know, great prince, that all your subjects, nobles as well as the common people, are under your shade for you have been planted here like a great juniper tree [*sabina*] under which men wish to rest in order to take pleasure in the freshness of your friendship and love."[13] By *sabina* (*Juniperus* sect. *Sabina*), Durán probably meant the native *ahuehuetl*, or cypress, which is an enormous, long-lived, water-loving tree that often grows near springs or other sources of fresh water.[14] It is described in the Florentine in terms similar to Durán's quoted oration: "It is large, high, thick, shady, shadowy. There is constant entering into its shade; under it one is shaded."[15] Metaphoric couplets in Book 6 where rulership is "*pochotl* [silk cotton], *ahuehuetl*," make a similar point, as does that book's comparison between forefathers and trees that provide shade and water.[16]

That the ruler should be thought of as a water-loving tree corresponds to his responsibility to supply the *altepetl* residents with fresh water, evidence of which is found in surviving remains of aqueducts and expansions of chinampa agriculture—all of them almost certainly public works projects—built around the basin to serve its peoples.[17] But to talk of "human community" and "nature," and to set these terms in opposition, is to rely on heuristic devices that reflect a Western idea of the cosmos: in all likelihood, the Nahua did not see the two as opposed entities, but rather as a more integrated whole. But the more salient point is this: when water supplies dried up during periods of drought, it was the Nahua ruler's responsibility to rebalance the relationships with the forces of the divine, and to restore the normal supply of life-giving water. Such responsibility of rulers did not end when the Spanish assumed political control of the basin. In 1539, when the basin was gripped by a major drought, the peoples of Huexotzinco made desperate appeals at mountaintop Tlaloc shrines for the rains to return, appeals that were condoned, if not led, by basin elites.[18] These appeals to the ancient god to end the drought came to light in Bishop Zumárraga's investigations of idolatry among the Texcocan elite, an investigation that quickly led to accusations against the Texcocan lord don Carlos Ometochtli, among them of idolatry, and he was burned at the stake in Mexico's main plaza in November of 1539. While it is usually the tragic figure of don Carlos that commands attention, as well as the interfamilial battles that caused him to fall, the case also underscores the traditional role of elites in maintaining relationships with the protective water deities who lived in surrounding mountains, as most recently argued by León García Garagarza.

Having established the ongoing role of Mexica elites in water management, both "practical" and "religious" (the distinction deriving from modern secular Western categories, not Nahua or Catholic ones), I turn to the Florentine Codex, and to the collaborator that Sahagún described

as "the leader, and wisest," don Antonio Valeriano, to further emphasize that the role of environmental custodian continued during the sixteenth century. Valeriano was also a member of the high Mexica elite, involved in a number of water infrastructure projects. Born around 1522 in Azcapotzalco, Valeriano was a great-grandson of Axayacatl, as María Castañeda de la Paz has demonstrated.[19] After the death of Mexico City's indigenous governor, don Luis Cipac, in 1565, and an interregnum of almost a decade, Valeriano was seated as *juez-gobernador* (judge and governor) of the indigenous city in 1573, a position of both judicial and executive authority. When Valeriano was in his fifties and serving as governor, he would spearhead a project to bring more potable water from Chapultepec to the city, particularly to its thousands of indigenous residents, whose own access to fresh water had been curtailed by the city's Spanish-led households.[20] This aqueduct-building project of 1575 to 1582 overlapped with the final drafting of the Florentine.

PANTITLAN

Valeriano's manipulations of the environment were echoed in the work of his fellow Nahua who helped create the Florentine, a work that reveals them to have been highly sensitive observers of their unique lacustrine local environment as well as its flora and fauna.[21] Despite the interest they expressed through texts, most of the illustrations that capture landscapes are fairly generic ones, hard to pin to unique places in the Basin of Mexico. A singular exception is the image of Pantitlan, a kind of whirlpool that existed in the eastern lake, about a mile off the dike that protected the eastern edge of Tenochtitlan and near Tepetzinco (see figure 8.1). The image breaks out of the neat formatting that guides most of the book: unlike other illustrations in the codex that are typically one column wide and about a quarter of a page high, this one occupies more than half the left-hand column of the page (fig. 8.3). In the upper two thirds of the image, the artist offers a bird's-eye view of a portion of the lake, the horizontal wavy lines and swirls conveying water. A brownish ring dominates this upper part, the stipples across its surface identifying it as earth that rises like a berm above the water level. Set into the earthen ring are white flags. In this context, these flags also function as a place-name. *Pamitl* (which combines as *pan-*) means "banner," *-ti-* is a ligature, and *-tlan* means "place of," so that Pantitlan means "Place of the Banners." Since the Florentine Codex shows similar white flags in the hands of victims to be sacrificed, Pantitlan can also be interpreted to mean "Place of Sacrifice." At the center of the earthen ring is a square construction with four sets of stairs on each flank ascending to a water-filled middle or cistern.

In the lower quarter of the image, the artist shifts perspective, and here we see three canoes as if viewed from the surface of the lake. Their three oarsmen all engage with the circular precinct. The one at left seems to have just thrown one of the green objects into the water in the center; the one at center holds up a box made of woven reeds; and the one at right holds a ceramic pitcher aloft, its form similar to the pitchers that are visible in the water, as if it, too, is destined to be an offering. At the top of the image, the lake fades into mudflats, and three waterbirds are visible, the one at the left foraging in the soft muck.

The colors are unusual: typically, in sixteenth-century maps from the basin, the artists opt for a standard palette of cochineal red, ochre yellow (for earth), and the brilliant turquoise we know as Maya blue (for water). In this image, the color register is shifted from red / yellow / turquoise blue to orange / green / blue violet; instead of Maya blue for the water, the artist uses a deep blue-violet pigment. It contrasts with the vivid green used for some of the offerings and on the large vessel in the canoe at right. The pigment used for both the men and their canoes is quite orange, more so than the flesh color used in other parts of the manuscript, and offers yet another dramatic contrast to the violet. In a manuscript where color was used sparingly, this blue violet, a transparent organic pigment almost certainly derived from indigo, has dramatic visual impact.[22]

The larger size of the image of Pantitlan is also dramatic but not especially called for by the accompanying text, a long chapter describing the worship of the *tlaloque*, a complex of water and related mountain deities.[23] The last sentence of the Spanish text simply states that at the end of the main festival in their honor, all the adornments and vessels used for that feast were taken up and pitched into the *sumidero*, or drain, of Pantitlan. The Nahuatl text pays more attention to the kind of stuff that was disposed of: "And when day broke, thereupon took place the disposal of the remains . . . all their adornment—the paper garlands worn over one shoulder . . . their staves of round thick reeds, and their flame sticks, their cloud-bundles; and the jade cups and their little sauce bowls with which [the celebrants] ate, the little wooden bowls and the clay

FIGURE 8.3. *Pantitlan. Florentine Codex, Bk. 1, fol. 23r. Florence, Biblioteca Medicea Laurenziana, Med. Palat. 218–220. Courtesy of* MIBACT.

bowls, all these they left at Tepetzinco, they threw them into the water, off shore, at a place called Pantitlan."[24]

But as we know from other studies of the images of the Florentine, the images are never merely illustrations to the text, and the large size of the Pantitlan image likely corresponds to its ritual importance, made clear in a number of other sections of the Florentine and in other sources. On the feast of Tlaloc, Atlcahualo, the Florentine Codex reports that child sacrifices were made at Tepetzinco and Pantitlan to the rain deity, Tlaloc, in return for abundant rains, stating, "There was the payment of the debt at Tepetzinco or there in the middle of the lake at a place called Pantitlan."[25] These annual child sacrifices had a commemorative function: the *Leyenda de los soles*, a cosmogony written in Nahuatl, perhaps by one of the members of the circle of indigenous intellectuals who helped make the Florentine, recounts the ancient sacrifice at Pantitlan of a young Mexica girl, Quetzalxochitzin, in order to bring the end to a drought, and which resulted in the gift of maize from the rain deities.[26] Recall that the name Pantitlan can be understood as "Place of the Banners," or "Place of Sacrifice." And as Anthony Aveni has demonstrated, Pantitlan was one of a circuit of sites around the basin, threaded together in pre-Hispanic rituals of child sacrifice on Atlcahualo.[27] Aveni has shown that the rituals were carried out at seven sacred sites around the basin, three of them clustering together to form a node on the eastern lake: Pantitlan, the small hill of Tepetzinco (known today as Peñol de los Baños), and Poyauhtlan (at Tepetzinco's foot).[28] Pantitlan was also the site of offerings during the feast of Etzalcualiztli, which was held a few months after Atlcahualo, during the rainy season, when captives in the likenesses of rain gods were sacrificed and their hearts offered at Pantitlan; "cloud vessels" (*mixcomitl*) containing the sacrificial hearts were tossed into the waters, as if to propitiate the water deities.[29] Thus, these sources show three kinds of rituals associated with Pantitlan: the interment of objects used in ritual, the commemorative child sacrifices to bring rain, and the offerings of sacrificial hearts to propitiate the rain deities.

The last two of the rituals taking place at Pantitlan centered on maintaining a steady supply of water, held during the anxious moments before the fall of the rain (Atlcahualo) and upon its arrival (Etzacualiztli), because Pantitlan itself was an environmental index to those changes, a bellwether to the larger conditions that obtained in the lake. The caching of the ritual objects seemed to occur at the beginning of the cycle when the lake levels were low: while the Florentine image of Pantitlan shows canoes approaching the site, the far side shows mudflats at the edge of the lake, corresponding to the conditions one would find in the dry season. In contrast, the written description of Pantitlan during the festival of Etzalcualiztli, which occurred when lake levels were higher, describes a quite different scenario, telling us that when the cloud vessels holding sacrificial hearts were cast into the water, "the water foamed, kept surging, roared, crackled continually, crackled as it surged. Bits of foam were formed."[30]

But any site on the lake could have been chosen if the Mexica were just interested in the rise and fall of water levels. Instead, Pantitlan was understood to be a conduit to a vast system of underground waters that originated in the mountains—these waters could either flow out from Pantitlan or be sucked into it. Like the Florentine's creators, the Dominican chronicler and Mexico City resident Diego Durán also shared a fascination with Pantitlan, and he called it a *sumidero*—that is, a great drain, which, if unplugged, would suck all the water out of the lake. At the same time, he also described it as a place where enormous waves could engulf a boat, even on a windless day.[31] This phenomenon suggests the opposite of a drain, that is, a spring, a place where water could surge upward.

To resolve the dueling natures of Pantitlan as drain/spring, the archeologists Margarita Carballal Staedtler and María Flores Hernández attempted to locate Pantitlan as well as to identify the precise geology that could create such variable effects.[32] While unable to pinpoint the spot, they were able to determine the general region and derive from core samples of the stratigraphy some explanations for the phenomena observed there.[33] Pantitlan sits on a highly seismically active site, at the juncture of plates, and some of the lake's erratic movements might have been produced by frequent seismic microquakes at the site. There also seems to have been underground springs lying beneath the lake bed; during the dry season, pressure from the water in the lake on the tightly packed clay strata beneath might have led to liquefaction of these layers, causing the "drain" effect; seismic activity could do the same. During the rainy season, underground flows of water from the surrounding mountains into the strata below the lake bed might have caused water to explode upward from the lake floor, causing dramatic waves on windless days, as well as the foaming and surging that the Florentine describes.

In the Florentine's image, the outer ring with its ban-

ners shows Pantitlan as protected by a man-made earthen barrier anchored with wooden pilings. This barrier appears similar to the way that the dikes were constructed, where archeologists have shown them to have had retaining walls created by driving tree trunks down into the lake bed for vertical support and then weaving them together with strong saplings to hold the inner fill.[34] Durán tells us that these were the remains of great tree trunks, again objects left over at the end of ceremonies, that were brought to the site at the close of a ritual and driven into the lake bed. He offered eyewitness testimony to these pilings when he reported seeing "great hoary trunks rising from the water" when he passed the site by boat.[35] He does not mention the inner construction, but in my reading, the Pantitlan image captures a dry moment, and the radial four-sided pyramid with a central cache at the center of Pantitlan would have likely been visible only when lake levels were low. When it *was* visible, the architecture served as a kind of alarm clock to signal that the time for ritual had arrived; and given the history of radial pyramids throughout Mesoamerica, it was an appropriate marker for period-ending rites.[36] Unfortunately, the slim opportunity of archeology in the current area (near Mexico City's international airport) has made further exploration of these features nearly impossible, and thus this image may offer a singular piece of evidence about the perceived relationship between Mexica ritual and the watery environment, beyond the more abundant information on mountain ceremonies.

While the image comes in a section of the book concerned with rituals of the pre-Hispanic past, Pantitlan and its waters still posed a very real threat to the Florentine's writers in the 1560s and 1570s. The reasons for the great flood of 1555 were many and various. Incessant Spanish campaigns to build the city using huge amounts of wood as pilings in the swampy lake bed and as roofing materials meant that the surrounding mountains had been denuded of trees; deprived of its natural anchors, the topsoil bled into the lake, and the naked hills became unable to absorb runoff. In addition, the Spanish leaders of the city neglected the elaborate system of dikes that the Mexica had constructed to maintain water levels in the basin, instead choosing to use native work gangs to build their houses and civic and religious buildings, such as the cathedral. Historical evidence suggests that the floodwaters of the 1555 inundation came from the east of the city, that is, from the area around Pantitlan, because in response to the flood, Viceroy Velasco ordered the reconstruction of a dike to protect the east littoral, which would have been the flank of the city closest to Pantitlan.[37] We do not know the role that Valeriano played in the reconstruction of this dike, but we do know that Velasco called on Nahua elites from basin cities to offer advice on how to deal with the catastrophe, and if Valeriano was not among them, members of his family were.[38]

Thus, both Valeriano and Sahagún were living in a moment of terrible aberrations in the normal patterns of the city's lacustrine environment—a sixteenth-century version of climate change, with documented droughts in the late 1530s and terrible flooding in the mid-1550s. These were not the only natural catastrophes. When the Florentine's authors hurriedly worked to finish the last books of the volume, they shut the monastery's doors against the plague that raged outside, a plague that might have killed a quarter of the city's indigenous population.

The image of Pantitlan shows that the Florentine's creators possessed keen awareness of the surrounding environs, as do other parts of the work, particularly Book 11. But it also includes human figures interacting with their environment, and it is important to pay close attention to what they are doing. As the three men bring their boats close to the defined precinct, they throw ceramic vessels, jade objects, including one in the form of a human, and things contained by a woven reed box into the cistern. The great vertical banners may be more of this refuse that remained at the end of a ceremony. The Mexica and other Nahuatl-speaking peoples typically engaged in breakage and cleansing rituals at the end of chronological cycles; in the New Fire ceremony that occurred every fifty-two years, households broke household objects and threw them out. As Byron E. Hamann has noted, "The destruction of household contents reenacted on a homely scale the cosmic devastations that destroyed previous ages of creation."[39] In the case of the festival to the rain deities depicted in the Florentine's image of Pantitlan, the dumping of used-up ritual costumes and vessels and the vertical caching of tree trunks at the site of a radial pyramid was the small-scale equivalent of the wide-scale cleansing of households at New Fire, "in which a new age could be symbolically brought into being."[40] The hillside adjacent to Pantitlan, Tepetzinco, served a similar function. The Codex Chimalpahin, a history of the Mexica written in Nahuatl at the beginning of the seventeenth century, tells us that upon the defeat of the evil sorcerer

Copil, "[Huitzilopochtli] cut off his head and cut open his breast. When he had cut open his breast he took his heart from him. And he placed his head on top of Tepetzintli [or Tepetzinco], a place now named Acopilco, [for] there Copil's head died."[41] Following this sacrifice, the city of Tenochtitlan was founded. Thus, Pantitlan and Tepetzinco are marked as sites where disruptive "refuse" (like the head of the enemy Copil) was interred. In the Florentine's image of Pantitlan, the foreground figures engage in actions that symbolically cleansed and renewed the world while simultaneously ensuring the orderly continuation of their universe.

THE *ACUITLACHTLI*

While Book 1 deals with the world of past ritual, Book 11 is set in the present. Not only does it discuss the sources of water in its chapter 12, but many of the texts and images also deal with plants and animals with aquatic habitats, and thus Book 11 has a great deal to say and show about water. More than half of the 204 images in the Florentine Codex that deal with water appear within Book 11, as the table in figure 8.2 shows. The water-associated animals included in Book 11 were certainly of interest because of their utilitarian value and were often divided into "edible" and "inedible" kinds. But more importantly, their normal behaviors were connected to the overall stability of the environment. This stability is thrown into relief by another aberrant or abnormal episode, in this case the behavior of an animal. Within chapter 2 of Book 11, a chapter devoted to waterbirds, on folios 33v–34v, we are treated to a much longer narrative about the *acuitlachtli*, a name that translates to "water bear." Many names of waterbirds in this section begin with *a*, the root stem of the word *atl*, or water, but in this case *a* is combined with *cuitlachi*, or bear, to describe an animal that is not a bird at all, but instead likely a type of nutria. The name captures the anomalous nature of the animal, a hybrid between a ferocious land mammal and a water creature. According to the text, the animal's normal behavior was to hide under the water, to remain invisible, and to cause the water to boil—a small-scale version of the behavior of Pantitlan.

The opening image to the section on this beast shows the *acuitlachtli* in his watery home of the lake, surrounded by fish and serpents (fig. 8.4). His profile pose, however, is noteworthy, as he sits on his haunches and holds out his clawed hands in front of his body, so they appear horizontal, thus striking the same pose that Mictlantecuhtli, the deity of the underworld, adopts in the Codex Magliabechiano (fig. 8.5). On this page of a manuscript picturing the "idolatrous" rituals of the pre-Hispanic period, Mictlantecuhtli sits atop the stepped temple platform at the right. He is identifiable by his skeletal lower jaw and five small banners composing his fan-shaped headdress. His clawed hands stretch out in front, toward the six penitents at left. In this pose, the *acuitlachtli* of the Florentine is thus visually associated not with the regenerative watery underworld of Tlaloc, the rain deity, but with the realm of the dead.

While it is the normal behavior of most animals that the Florentine's text describes, it is the abnormal behavior of the *acuitlachtli* that catches the authors' attention. Both the Spanish and the Nahuatl texts mention the recent appearance of an *acuitlachtli* in waters from Santa Cruz Cuauhcalco, "which is the spring that flows to Tlatelolco" (*in ompa catqui ameyalli, in huallaticac Sanctiago*).[42] Other sources tell us that water from a spring (known as Xancopinca), which was situated near Cuauhcalco, a site on the lakeshore, was carried by an aqueduct into the center of the urban nucleus of Tlatelolco.[43] The second image of the *acuitlachtli* appearing on relevant folios shows us this episode: the beast, seated with his forelegs on the ground like a dog, appears in a water fountain, defined by a low hexagonal base (fig. 8.6). By its shape and the description in the text, this is likely a freshwater fountain that the indigenous leaders of Tlatelolco had built in the 1550s to capture the Xancopinca waters and serve the urban populace. The construction of this elegant stone fountain was registered in the Codex Tlatelolco, a manuscript of uncertain date that records events of the 1550s and 1560s (fig. 8.7). In this indigenous codex, the fountain is shown with an octagonal base, filled with a blue pigment to signify fresh water; at its center rises the fountain's spigot in the shape of a bird, with streams of water coming out of pipes emerging from its mouth and its chest. This fountain would have been well known to the Florentine's creators, in that it was placed in Tlatelolco's main plaza, just steps from the monastery where the Florentine was being created.

Freshwater sources, like the fountain of Tlatelolco at the center of the island city, had both practical and symbolic importance. A freshwater source was essential for the health and survival of an urban population, and supplying the residents with fresh water was one of the key responsibilities of Nahua rulers both before and after the

FIGURE 8.4. *The* acuitlachtli *(water bear). Florentine Codex, Bk. 11, fol. 33v. Florence, Biblioteca Medicea Laurenziana, Med. Palat. 218–220. Courtesy of* MIBACT.

FIGURE 8.5. *Mictlantecuhtli, from the Codex Magliabechiano, fol. 79r (late sixteenth century). Ministerio dei beni e delle attività culturali e del turismo / Biblioteca Nazionale Centrale di Firenze, Banco Rari 232 (già Magl. XIII, 3).*

FIGURE 8.6. *The* acuitlachtli *in the fountain at Santiago Tlatelolco. Florentine Codex, Bk. 11, fol. 34r. Florence, Biblioteca Medicea Laurenziana, Med. Palat. 218–220. Courtesy of* MIBACT.

FIGURE 8.7. *Fountain at Tlatelolco from the Codex Tlatelolco, section 6 (ca. 1565). Biblioteca Nacional de Antropología e Historia. Reproduced with permission from the Instituto Nacional de Antropología e Historia, Mexico City.*

FIGURE 8.8. *Death of the* acuitlachtli. *Florentine Codex, Bk. 11, fol. 34v. Florence, Biblioteca Medicea Laurenziana, Med. Palat. 218–220. Courtesy of* MIBACT.

conquest, as discussed earlier, and connected to the native concept of *altepetl*.[44] Their interest was shared with that of the Franciscans who engineered water in and around their establishments, evoking the streams of Jerusalem.[45] The entry of such an animal into the city's freshwater source would have been quite threatening, as its dirty and disruptive habits would have fouled the precious liquid that sustained the urban community. The text does not tell us what caused the *acuitlachtli* to end up in the fountain, but contemporary science offers abundant evidence that animals often leave their normal habitats because of some environmental disruption, in the way that rising temperatures in Alaska and the northern Yukon are causing changes in the caribou migrations. Given what we know of the dramatic changes during the sixteenth century in the Basin of Mexico, which was whipsawed between drought and floods, the dramatic changes in lake levels is the most likely cause for the *acuitlachtli*'s aberrant behavior.

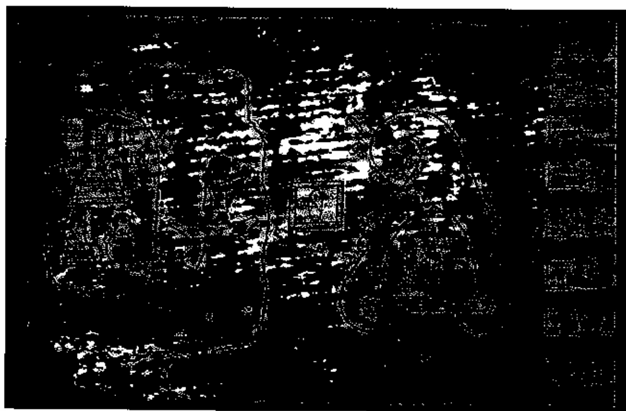
The fate of the aberrant *acuitlachtli* would be an unhappy one, but the role of human actors can be understood as an attempt to set the world back in balance. The third and final image of the animal that the Florentine offers shows us the *acuitlachtli* being hunted down by two men with spears, who stand with their feet in shallow water (fig. 8.8). Between them is the shaggy beast, who suffers a spear thrust to its proper right side, the mortal wound emitting a corona of blood. The wounded *acuitlachtli* thus resembles both the human sacrificial victims frequently depicted on the pages of the Florentine as well as the crucified Christ, with a lance piercing his right side. And the text also relates that when one was captured and brought to the ruler of Tlatelolco in the 1530s, "he was so terrified by it that he had it buried in Tepetzinco," that is, on the outcropping of land adjacent to Pantitlan. The burial of the *acuitlachtli*, an animal that strikes the pose of the underworld deity, at the same site as the head of the evil sorcerer Copil, who conspired against the Mexica, was hardly insignificant. The ruler's decision to bury the animal at this spot reasserts an initial ordering act that, at another moment in time, resulted in the foundation of the city in the aftermath of propitiatory sacrifice.

These two cases, then, present a landscape feature, Pantitlan, that was, by its nature, aberrant in its alternations between fountain and drain, and an animal that was also liminal, both furry mammal and aquatic creature (as was

another important transgressive animal, the feathered serpent), and on one notable occasion exhibited aberrant behavior. In both cases, the Florentine's creators make clear that human beings are not powerless, as the codex carefully registers responses as well as the initial phenomena. In the image of Pantitlan, the men in boats consign the refuse from the rain deity feast at the site, thereby paving the way for world renewal. In the image of the *acuitlachtli*, the beast is sacrificed by a thrust of the spear to the chest, as were human victims whose own deaths were necessary to keep the natural (and therefore divine) order of the world in balance. These images ultimately show us the importance of human action in keeping the world in balance, a key principle of Nahua belief.

The form of the spatial representation of Pantitlan is worth underscoring. While we know little of what Pantitlan looked like, the Florentine's artists show it following a recognizable template: a square construction, almost certainly a radial pyramid, surrounded by a ring of water, then by a ring of earth and another ring of water. This is an amplification of the basic template of Aztlan, the mythical place of origin of many of the *altepetl* of the basin. Consider the *Tira de la peregrinación*, page 1 (fig. 8.9). Here, the oval form at left is an island within which a temple, a seated male-female couple, and six small houses appear. The couple faces to the right, as if to watch a solitary oarsman cross the surrounding lake. This oval island, ringed by lake, is the idyllic homeland of Aztlan. The template found its fullest realization in Tenochtitlan itself, which was an island ringed by a lake, which was in turn surrounded by the land of central Mexico, which was then surrounded, or so it once seemed, by the vast seas that stretched out to the east and west forever. Thus Pantitlan, the most dangerous part of the lake, a threat to the order of the world, is here translated into an idealized model, itself a visual synecdoche for the larger achievement of the Mexica in taming the water that surrounded the city. In sum, in these responses to local environmental anomalies, the creators of the Florentine drew on a worldview within which environmental disorder could be set right by a human response, and they cared enough about it to devote pictures and pages of their magnum opus to underscore the point.

FIGURE 8.9. *Departure from Aztlan.* Tira de la peregrinación, *1 (mid-sixteenth century). Biblioteca Nacional de Antropología e Historia. Reproduced with permission from the Instituto Nacional de Antropología e Historia, Mexico City.*



COLOR

What can color add to our understanding of this work? Diana Magaloni Kerpel has argued that the application of colored pigment in the images of the deities in Book 1 was meant to emphasize their status as *teixiptla*, or localized embodiments of deities.[46] So now, any consideration of water in the Florentine would seem to be incomplete without discussion of its color.[47] The colors used for water in the Florentine Codex can be basically broken down to four, used in various concentrations—gray, tan, violet, and Maya blue. When one looks at patterns of color used across the manuscript, one pattern is striking—and that is the availability of color. Beginning around folio 179 in Book 11, color disappears almost entirely, likely because the trade networks that supplied urban markets were shut down by the plague that began in 1576. In addition, if we understand that the manuscript, from beginning to end, represents various temporal sequences (Jesús Bustamante García has shown that the trajectory from Book 1 to Book 12 was not an uninterrupted sequence),[48] we can see that in some of the sequences, like the time when artists were at work on Book 11 between folios 48 and 66, Maya blue was abundant. But interestingly, it is not Maya blue that is the favored color for water of the surrounding lakes, but rather a rich violet purple, found as both a concentrated pigment as well as a pale, almost gray wash.

In the case of colors used for water, the Florentine itself is aberrant. In cartographic manuscripts from the same time and place, artists uniformly use turquoise pigment, most likely derived from Maya blue, to show flowing water. As for the Florentine, it is not just that artists would have opted for Maya blue if they had been able to

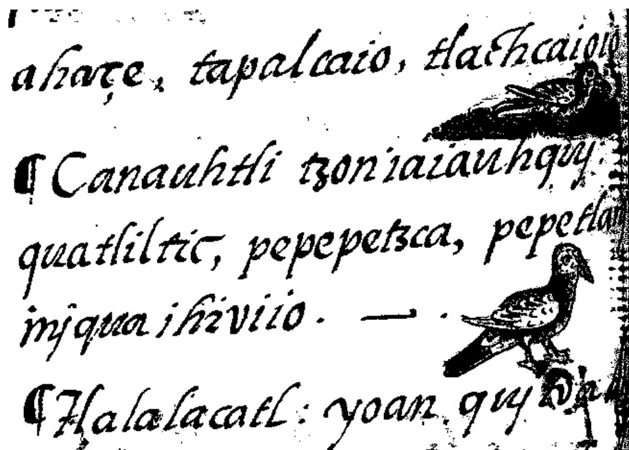


FIGURE 8.10. *Violet* (top) *and Maya blue* (bottom) *pigments were available and used on the same page. Florentine Codex, Bk. 11, fol. 26v. Florence, Biblioteca Medicea Laurenziana, Med. Palat. 218–220. Courtesy of* MIBACT.

acquire the pigment. In Book 11, chapter 2, folio 26v, the artist working on the page had access to both, but used violet for the water in the figure above and turquoise for the bird below (fig. 8.10). So why the anomalous use of this violet pigment for so much of the water in the Florentine Codex?

Turning to the way water appears in Book 2 offers an interpretive path. This part of the manuscript deals with pre-Hispanic rites, and water is frequently shown in rituals of the washing of infants. Ritual washing, also done during rites of royal consecration, was a way that the Nahua moved from one life state to another. In the case of infants, they moved from the ungendered and unordered neonatal state into a world of gender roles and fixed responsibilities, which were described to them in the orations of the elders. But for those gathered in Tlatelolco, these past ritual washings in water had their present-day correlation in baptism, the first Christian sacrament that brought to their souls the possibility of salvation. In a featherwork now in the Museo Nacional del Virreinato showing Christ as Salvator Mundi, which was perhaps produced in Mexico City, his resplendent cloak is made of purple-hued feathers, the work linking the extraordinary color to Christian salvation.

The water used to effect such passages in the Florentine is almost always violet or violet tinged. And the waters of Pantitlan are also violet tinged. Since this pigment almost never, that I can think of, appears on quotidian maps showing water, the use might be a convention particular to the Florentine. In the books dealing with pre-Hispanic rites, the painters show us water marked by a different level of animation and sacrality than ordinary water, like the waters that ushered the neonate into the local human community. When the Florentine was created, this community was a Christian one, and some of their present-day water, captured in Book 11, shared this color and perhaps its meaning as well.

CONCLUSION

The conquest unleashed terrible environmental changes in the Basin of Mexico, and sixteenth-century residents of the region were well aware that they lived in an era of ecological (particularly hydraulic) turmoil, a time of climate change not unlike our own. In writing about and picturing the surrounding lakes, the minds and imaginations of the intellectuals who worked on the Florentine Codex were snagged on the aberrant behavior of water and of animals. At least one of the scholars, don Antonio Valeriano, was also a ruler and thus, like the long line of rulers that preceded him, bore some responsibility for water management for the community he led. This chapter has barely mentioned the long Franciscan theological tradition dealing with the natural world,[49] but certainly Valeriano's sense of responsibility was deepened by the education he received at the Colegio de Santa Cruz, as was his conviction that propitiatory sacrifice can save the world. By shifting from a Nahua/European binary to *emplacement* as the site of analysis, and in focusing on certain environmental phenomena, I have hoped to show that the creators' innovative responses were not those of "pre-Hispanic" minds, but to suggest that all the Florentine Codex creators were grappling with inherited beliefs and Christian notions as they faced the ever new challenges that their surrounding environment posed. If one accepts that it is these intellectuals' responses that are registered in text and image, one can see how the Florentine underscores the human role in righting ecological disorder, whether it was the carefully tendered offerings at Pantitlan that were carried out before the conquest, or the sacrifice and interment of the *acuitlachtli* at the nearby site of Tepetzinco that was done in the 1530s. At the same time, the Florentine's creators sought ways to make these roles compatible within a Christian framework of baptism and salvation. Despite the tragic cast of their age, these intellectuals still had ac-

cess to a world where human action could set the cosmos right: in the violet waters that ushered the neonate into the human community came both a promise and a responsibility.

NOTES

1. See Baird, chapter 13 of this volume.
2. Peterson, chapter 11 of this volume.
3. Jiménez Moreno (1938) set the frame by crediting Sahagún with the conception, if not the actual execution, writing that "[l]a concepción—tan grandiose por sí sola—le pertenece a Sahagún de un modo exclusivo." For a summary of the authorship debate up to the early 1970s, see López Austin 1974a, 111–149, esp. p. 112. A more recent summary of this debate is encapsulated in Olivier 2007a.
4. Sullivan 1974, 79.
5. López Austin 1974a, 122.
6. "Sahagún realized the value of the spontaneous information he was receiving, so he let them expound freely, answering questions in the order they wished and narrating digressions that occupy whole chapters" (López Austin 1974a, 131).
7. Mundy 2015, 25–51.
8. González Aparicio 1973; Palerm 1973.
9. Cortés 1969, 111.
10. Mundy 2015, 77–84.
11. Mundy 2015, 199–200; Pérez-Rocha 1996; Rojas Rabiela 1981, 98–115; Cortés Alonso 1973.
12. See Bassett, chapter 9 of this volume.
13. Durán 1994, 125. The Spanish original reads: "Has de saber, señor, que todos aquellos tus vasallos, así principales como gente común, se someten debajo de tu sombra, pues estás puesto por árbol de gran sombra, como la sabina debajo del cual se quieren meter y amparar para gozar del frescor de tu amistad y de tu amor" (Durán 1990, 1:70).
14. While there are many types of juniper native to Mexico, none of them were well known enough to the creators of the Florentine Codex to be listed in Book 11.
15. Sahagún 1950–1982, Bk. 11, 108.
16. Thanks to Jeanette Peterson for this information in Book 6. Sahagún 1950–1982, Bk. 6, 58, 73, 137.
17. Sanders, Parsons, and Santley 1979, 260–281.
18. García Garagarza 2012, 193–214.
19. Castañeda de la Paz 2013, 167, 275–279, 461.
20. Mundy 2015, 190–208.
21. Espinosa Pineda 1996.
22. Diana Magaloni Kerpel, personal communication, 2015.
23. Broda 1971.
24. Sahagún 1950–1982, Bk. 1, 24. I have changed their translation of *chalchiuhxical* from "turquoise cup" to the more appropriate "jade cup."
25. Sahagún 1950–1982, Bk. 2, 42.
26. Tena 2002, 170, 197.
27. Aveni 1999, 58–73.
28. Sahagún 1950–1982, Bk. 2, 43. The Spanish text identifies Poyauhtlan as at the foot of Mt. Tepetzinco in Tlaxcala, but I suspect that this is an error and Poyauhtlan is at the foot of Tepetzinco in the basin.
29. Sahagún 1950–1982, Bk. 2, p. 89.
30. Sahagún 1950–1982, Bk. 2, p. 89.
31. Spanish: Durán 1990, 2:393–400; English: Durán 1971, 164–169.
32. Carballal Staedtler and Flores Hernández 1989a, 8–101.
33. Carballal Staedtler and Flores Hernández 1989a, 258–264.
34. Carballal Staedtler and Flores Hernández 1989b, 71–80.
35. Spanish: Durán 1990, 2:393–400; English: Durán 1971, 165.
36. Tozzer 1957. Thanks to Mary E. Miller for bringing Tozzer's comparison of Pantitlan to the cenote at Chichen Itza to my attention.
37. Pérez-Rocha 1996.
38. Pérez-Rocha 1996.
39. Hamann 2008, 806; Elson and Smith 2001, 157–174.
40. Hamann 2008, 806.
41. Chimalpahin Cuauhtlehuanitzin 1997, 1:87.
42. Sahagún 1950–1982, Bk. 11, 33. Spanish text: "que es la fuente que viene al Tlatelolco."
43. Castañeda de la Paz 2013, 87, including notes 138 and 139.
44. Mundy 2014.
45. Lara 2004.
46. Magaloni Kerpel 2014; and chapter 10 of this volume. The term "localized embodiments of deities" comes from Bassett 2015.
47. Wolf and Connors 2011; Magaloni Kerpel 2014.
48. Bustamante García 1990, 305–328.
49. Sorrell 1988.

THE

FLORENTINE CODEX

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EDITED BY

JEANETTE FAVROT PETERSON AND KEVIN TERRACIANO

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