

The Tira of Don Martín

A Living Nahua Chronicle

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DON MARTÍN'S LEGACY

In the late sixteenth century, a man named Martín looked toward the future. Among a council of nobles, he dictated a testament: “I, don Martín . . . give this inheritance to my children and my grandchildren.”¹ His legalistic language was a familiar feature of the documentary penumbra around land disputes in central Mexico at the end of the sixteenth century. Don Martín wrote of “my grandchildren,” *noxhuihuan* in Nahuatl, highlighting his relationship to his descendants in phrasing common to colonial wills explaining what land ought to be passed on and to whom.² The *tlabcuiloh* (scribe) wrote in alphabetic script that is now faded, but the reader can make out “it will belong to all of them . . .” followed by a series of place names. Perhaps the children had stayed near don Martín’s home, or his kin may have moved further afield. Regardless, his prose tied them all to the past they shared with their ancestors who had migrated to and founded this *altepetl* (polity) more than a century before.

Don Martín’s *tlabcuiloh* wrote Nahuatl words in European characters in the Spanish style. However, rather than using a blank piece of parchment or paper, he inscribed this will on top of a much older history alongside pictographic writing long used in the older Mesoamerican

documentary tradition (fig. 1). By the 1540s, Nahuatl-speaking officials had adopted European characters to write to one another, and by the 1570s many *tlabcuilohqueh* (scribes, in plural) integrated these new styles of writing and European legality into the Mesoamerican record-making tradition.³ Given the intimate relationship between the pictographic system and the placement of the alphabetic glosses, don Martín likely recorded his property claim between 1550 and 1600, when alphabetic writing gained favor but *tlabcuilohqueh* still retained fluency in reading older pictorial treatments.

We employ cultural biography to trace this document’s journey from a Mexican *altepetl* to American collections through modern scientific and humanistic study. This is fitting, for the document is itself a biography of a community.⁴ In a conscious effort to recenter the study of this document on the Indigenous history it relates, we have given it a new designation as the Tira of don Martín after its format as a *tira* (literally, strip) and the subject of the glossed testament. We prefer this over its previous designation as the Codex Saville, which problematically highlights the fact that the document was purchased in Mexico in 1925 by Marshall H. Saville.⁵ This collector

1. *Tira of don Martín* (Codex Tetlapalco/Codex Saville), National Museum of the American Indian, Smithsonian Institution, 13/6913. High-resolution color images of the Tira are available online at https://americanindian.si.edu/collections-search/objects/NMAI_147424. See appendix A for complete transcription and translation.

2. For the spelling of Nahuatl words, we use an *h* to denote the *saltillo* or glottal stop, following the conventions of normalized orthography found in D. Babout, D. Dehouve, A. Franconi, and A. Hémond, *Note sur l’orthographe en nahuatl* (Paris: Groupe d’Études Mésoaméricaines [GEMSO], École Pratique des Hautes Études, 2011); Alexis Wimmer, *Dictionnaire de la langue nahuatl classique*, <http://sites.estvideo.net/malinal/>; Frances Karttunen, *An Analytical Dictionary of Nahuatl*, 2nd ed. (Norman: University of Oklahoma Press, 1992); James Lockhart, “Wills and Related Documents” in *Beyond the Codices: The Nahua View of Colonial Mexico*, ed. Arthur J. O. Anderson, Frances Berdan, and James Lockhart (Los Angeles: UCLA Press, 1976), 47n17.

3. Justyna Olko and Agnieszka Brylak, “Defending Local Autonomy and Facing Cultural Trauma: A Nahua Order against Idolatry, Tlaxcala, 1543,” *Hispanic American Historical Review* 98, no. 4 (2018): 573–604; James Lockhart, *The Nahuas after the Conquest: A Social and Cultural History of the Indians of Central Mexico, Sixteenth through Eighteenth Centuries* (Stanford, CA: Stanford University Press, 1992), 331.

4. This chronological conceit has been inspired by Davide Domenici, “The Wandering ‘Leg of an Indian King’: The Cultural Biography of a Friction Idiophone now in the Pigorini Museum in Rome, Italy,” *Journal de la Société des Américanistes* 102, no. 1 (2016): 79–104, which applies a reversed timeline. On the origin of cultural biography, see Igor Kopytoff, “The Cultural Biography of Things: Commoditization as Process,” in *The Social Life of Things: Commodities in Cultural Perspective*, ed. Arjun Appadurai (Cambridge: University of Cambridge Press, 1986), 64–91.

5. Recent provenance research at NMAI clarifies a long-standing misunderstanding that the document was acquired in Lima, an error persisting through the several published interpretations noted here.



FIGURE 1. Overall visible light composite image of the *tira*, unidentified Nahua artist(s), *Tira of don Martín* (Codex Tetlapalco/Codex Saville), sixteenth century, *amatl* (fig bark paper), $57\frac{1}{2} \times 5\frac{1}{2} \times \frac{1}{8}$ in. (146.2 x 14 x 0.3 cm). National Museum of the American Indian (NMAI), Smithsonian Institution, Washington, DC, 13/6913, collected by Marshall Saville, purchased with funds from Thea Heye, 1925 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

acquired the *tira* for the Museum of the American Indian/Heye Foundation (MAI/HF), the predecessor to the Smithsonian's National Museum of the American Indian (NMAI), where it is presently held. It has also been known as the *Anales de la Fundación Heye*, and various scholars have referred to it as the *Codex* or *Códice Proto-Histórico*, *Protohistórico Guadalupano*, *Texplalco*, *Tetlapalco*, or *Telapalco*, following interpretations focused on the final portion of the *tira*'s pictographic text related to a battle and its Christian imagery, as well as the later glosses added to those images.

In contrast to this previous scholarship that focused predominantly on the last portion of the *tira* in order to emphasize a story of Christianity in Mesoamerica, our reading of this document centers on the Nahua creators' history making, made visible by the combination of imaging, ethnohistorical analysis, and a renewed focus on Nahuatl language and pictographic communication. Nahuatl is descended from a family of Uto-Aztec languages spoken throughout a wide region as far south as Nicaragua, across Central America into the heart of Mexico, and up into the southwestern United States. In the fifteenth and sixteenth centuries, Nahuatl was the primary language of Mesoamerica, spoken across the many regional polities of central Mexico as well as in Tenochtitlan at the head of the Triple Alliance. Long before Europeans' arrival in the region, an extensive writing tradition recorded histories, genealogies, land ownership, and mythology in a range of document types including *tiras* (strips), *lienzos* (sheets), and screenfold books. As such, this document is part of this *longue durée* of Indigenous intellectual tradition. Our analysis provides new iconographic-linguistic findings, particularly the transformation of the *tira* into a will in the mid-sixteenth century. By centering our study on the Nahuatl-language portions of the *tira* we provide new, fuller access to its history and the possibility of reconnecting the document to modern Nahua communities. For this reason we prioritize Nahuatl terms when available over their equivalents in English or Spanish.

The result is a vision of an Indigenous conception of time at the turn of the sixteenth century, and a sense of a polity's endurance that was negotiated among place, family, and overarching systems of control. Multiple hands of *tlahcuilohqueh*, writing first in images and later with European characters, returned to this time line to negotiate a local chronology. The *tlahcuilohqueh* devoted

most of their space to local history, which in turn they related to distant Tenochtitlan. Taking a cue from these Nahua authors, our analysis follows the chronology of the tira from creation to its present condition in the following phases: original migration and foundation of the *altepetl*, edits to the chronology to fit imperial time lines, the tira's transformation into a will, modern collection and study during the apex of US expansionism, restoration and exhibition, and recent conservation and scientific analysis.

For the purposes of this cultural biography, we employ the terms *empire* and *imperial* loosely to refer to many different overarching systems of control with collecting regimes: the "Aztec Empire" or Triple Alliance, the Spanish Empire, the Catholic Church, and the expansionism of the United States.⁶ The original authors of the tira already addressed issues of land and political control to tell a story of local governance in the context of the Triple Alliance.⁷ Soon, the arrival of Europeans brought a novel power system in the form of the Catholic religion, recorded by the *tlabcuilohqueh* as the community established their own church paid for with imperial Spanish reales. Later, don Martín's contemporaries knew that their land might in turn be appropriated by the growing Spanish and mestizo populations; glosses were added to advocate for local property in a colonial court of New Spain. Finally, the tira became part of a US collection, a result of the flurry of American collecting of Mesoamerican antiquities in the early twentieth century.⁸ Given this context, it should be unsurprising that in his foundational 1929 article on this document, Reverend Mariano Cuevas claimed it was "America's Oldest Book," lumping this Nahua account into a pan-American history.⁹ Finally, scholars committed to the Virgin of Guadalupe and the canonization of Juan Diego Cuauhtlatotzin in turn deployed the tira as evidence of the miraculous appearance of Guadalupe, using only the uppermost portion of the document to buttress their analyses. Collected as

curiosities and alienated from their origins, it is little wonder that documents with profoundly local meaning are frequently studied outside of their original context. In short, regardless of their specific political machinations, overarching empires each collected the tira anew. What makes this local history exciting is not that it is exceptional in nature, but rather that it was a part of an expansive network of *altepemeh* that persisted, negotiating their histories between mythic origins and the ongoing political shifts of imperial rule.

By combining technical analysis and humanistic methods, this study emerges from a collaboration among conservators, conservation scientists, imaging specialists, curators, and humanists. We question the nineteenth- and early twentieth-century insistence on dividing the pre-conquest past from the colonial period. The tira analyzed here participates in that "decidedly global visual economy" in which worlds combine, with naming traditions, natural resources, Mesoamerican tribute, and European coins. There are no explicit divisions between people and periods here.¹⁰ Rather, what we find is the persistence of generations past linking themselves to generations future. With renewed focus on the layered nature of making history, we aim to participate in a diachronic analysis that dialogs between modern conservation interventions, scribal additions for property disputes in a European-style legal context, and Nahua visual norms.¹¹ We are certain that new conversations will emerge about this document as other experts of material analysis, museums, and Mesoamerican cultures engage with this living Nahua history.

TIME IN THE TIRA

This document is a *tira*, a type of Mesoamerican document in *res gestae* format, which begins with the founding of an *altepetl*, followed by an account of its ruling lineage.¹² The term *tira* ("strip" in Spanish), refers to the document's long, thin shape, though in this case it does seem to have been accordion folded for storage if not to facilitate reading. It is generally read from bottom to top,

6. For an introduction to related literature, see *Collecting and Empires: An Historical and Global Perspective*, ed. Maia W. Gahtan and Eva-Maria Troelenberg (Turnhout, Belgium: Brepols, 2019).

7. For a similar analysis, see Lori Boornazian Diel, *The Tira de Tepechpan: Negotiating Place under Aztec Spanish Rule* (Austin: University of Texas Press, 2008).

8. Elizabeth Hill Boone, ed., *Collecting the Pre-Columbian Past. A Symposium at Dumbarton Oaks*, October 6–7, 1990 (Washington, DC: Dumbarton Oaks Research Library and Collection, 1993).

9. Mariano Cuevas, "The Codex Saville: America's Oldest Book," *Historical Records and Studies* 19 (New York: United States Catholic Historical Society, 1929): 7–20 and folding plate facing page 4.

10. On the concept of hybridity, see Carolyn Dean and Dana Leibsohn, "Hybridity and Its Discontents: Considering Visual Culture in Colonial Spanish America," *Colonial Latin American Review* 12, no. 1 (2003): 5–35; Peter Burke, *Hybrid Renaissance: Culture, Language, Architecture* (Budapest: Central European University Press, 2016).

11. Lisa Trever, "Pre-Columbian History in the Age of the Wall," *Latin American and Latinx Visual Culture* 1, no. 1 (January 2019): 100–104.

12. Elizabeth Hill Boone, *Stories in Red and Black: Pictorial Histories of the Aztecs and Mixtecs* (Austin: University of Texas Press, 2000), 126.

TABLE 1. Lineage of Local *Tlahtohqueh* in the Tira of don Martín

Tira of don Martín <i>tlahtohqueh</i>	Translation of name glyph	Approximate length of rule	Overlap with listed <i>tlahtohqueh</i> at Tenochtitlan
Ocelotl	jaguar warrior	30/31 years	Chimalpopoca, Itzcoatl, Moteuczoma Ilhuicamina
Cihuacoatl	advisor to the <i>tlahtoani</i>	18 years	Moteuczoma Ilhuicamina, Axayacatl
“oztotl-tlacatl”	“cave-person”	13 years	Axayacatl, Tizoc
“cuetzpalin-tetl”	“lizard-rock”	46 years	Tizoc, Ahuizotl, Moteuczoma Xocoyotzin
fifth <i>tlahtoani</i>	-	at least 10 years	n/a

although the later alphabetic glosses read top to bottom. Written with multiple layers of time and emendations by at least five different hands, it chronicles a complete local history with a migration, founding, successive rulers, tribute, and finally, inheritance. The local events of the *altepetl* were later set alongside an imperial time line of the Triple Alliance centered in Tenochtitlan. Time in the *altepetl*, however, marched onward with each passing year, just as it had before, even as rulership shifted from a hereditary line and Europeans arrived with their swords and Madonnas.

Time is ordered by a column of turquoise-colored disks that spans the entire surviving manuscript on its right-hand side. The multivalent word *xihuitl* refers to the solar year of 365 days as well as the color and material of turquoise.¹³ As such, these disks indicate the passage of time in solar years relying on a visual-linguistic metaphor.¹⁴ There are 118 whole disks and 24 partial or implied disks on the surviving portion of the document, totaling at least 142 years of the *altepetl*'s history. These are marked at intervals of thirteen years with glyphs indicating corresponding *xihuitl* names (*Ce Tecpatl* [1 Flint], *Ce Calli* [1 House], *Ce Tochtli* [1 Rabbit], *Ce Acatl* [1 Reed]). The final portion of the document at the top appears to have been painted by a new *tlahcuilob* whose *xihuitl* disks are not as precise in size and spacing as the previous disks: they begin to veer off toward the left. Correlating the named years to the Christian calendar appears to show that this change occurred after 1530 but before the next thirteen-year cycle would have been recorded in 1533.

Two different dynastic chronicles appear to the left and right of the column of *xihuitl*. The first deals with the

13. See Mutsumi Izeki, *Conceptualization of 'Xihuitl': History, Environment and Cultural Dynamics in Postclassic Mexica Cognition* (British Archaeological Reports, 2008); Danièle Dehouve, “La polisemia de xihuitl. Un ejercicio de análisis cognitivo,” *Estudios de cultura náhuatl* 55 (January–June 2018), 9–52.

14. The Tira de Tepechpan uses the same metaphor with a series of turquoise disks representing years.

history of the place where the manuscript was painted, starting with a line of footprints indicating a migration, followed by a series of five *tlahtohqueh* (rulers) that we will refer to as follows: Ocelotl, the founding *tlahtoani*; Cihuacoatl; “oztotl-tlacatl”; “cuetzpalin-tetl”; and a fifth *tlahtoani* whose name-glyph is almost entirely lost (table 1). While the first founding *tlahtoani*, Ocelotl, is rendered at the largest scale of any figure in the document, his two successors are slightly smaller, and the final two are rendered at the smallest size. Although the first three are clearly tethered together by a red line indicating their shared bloodline, it is difficult to discern whether or not the final two are also linked in this way. While none of the local rulers are tied explicitly to the time line, the final *tlahtoani* appears more than forty years after the last ruler, and at least ten years after the arrival of Europeans was recorded with a conquistador on a horse battling an Indigenous warrior with a richly feathered *chimalli* (shield) and *huitzoctli* (pointed war club). Soon thereafter, the *altepetl* purchased a large outdoor crucifix, both a statue and a painting of the Virgin Mary, and a large church bell, each rendered in detail alongside coins indicating their purchase price in the space to the left of the column of dates, which shows that these were part of the local narrative.

The second dynastic line appears to the right of the line of *xihuitl* disks, indicated in a slightly different format showing the seating and death of each ruler of Tenochtitlan from Huitzilhuicatl to Moteuczoma Xocoyotzin (table 2). These small drawings appear to have been added by a later *tlahcuilob* explicitly tying each ruler to the dates of their seating and death with strong, black lines in one of several campaigns of adjustments and modifications made to the document. We surmise that this addition was used to calibrate the long history of the local *altepetl* to that of the imperial capital.

There are glyphs naming the beginning of each thirteen-year cycle rendered in two different ways. This difference is

TABLE 2. Concordance of *Tlahtohqueh* at Tenochtitlan with Dates in the Tira of don Martín

Tlahtohqueh of Tenochtitlan	Accepted	Dates in the Tira of don Martín
	Gregorian Dates	
Acamapichtli	r. 1376-95	-
Huitzilihuitl	r. 1396-1417	dies in 8 <i>Tochtli</i> (1422)
Chimalpopoca	r. 1417-27	8 <i>Tochtli</i> (1422) - 5 <i>Tecpatl</i> (1432)
Itzcoatl	r. 1428-40	5 <i>Tecpatl</i> (1432) - 5 <i>Calli</i> (1445)
Moteuczoma	r. 1440 to 1455	5 <i>Calli</i> (1445) - 1 <i>Acatl</i> (1467)
Ilhuicamina		
Axayacatl	r. 1469- 81	1 <i>Acatl</i> (1467) - 2 Calli (1481)
Tizoc	r. 1481-86	2 Calli (1481) - 7 Tochtli (1486)
Ahuizotl	r. 1486-1502	7 Tochtli (1486) - 10 Tochtli (1502)
Moteuczoma	r. 1502-20	seated in 10 Tochtli (1502)
Xocoyotzin		
Cuitlahuac	r. 1520	-
Cuauhtemoc	r. 1520-21	-

Note: Bold text indicates dates in the tira that correspond with accepted Gregorian dates of rule.

a remnant of one of the later modifications made to the document. Just three years after the *tlahtoani* Ocelotl was seated, one of the *xihuitl* disks shows a hint of the previous system with a *vesica piscis*-shaped flint knife or *tecpatl* inside the black outline of the circle. Two years after this modification, the date *Ce Tecpatl* is rendered to the left of the *xihuitl* disk, indicating that the date-glyphs on the left of the disks are a new adjusted set of dates. This pattern is repeated eleven *xihuitl* later, where a *calli* (house) glyph inside the disk is painted over with blue pigment and repainted as *Ce Calli* (1 House) two years later. Two dates are modified in other ways: one is pasted over with a small piece of *amatl* (fig bark paper); in another case, the new modified date to the left of the *xihuitl* disk has been blotted out. Only one date is given with a coefficient larger than 1. This is the year *Ome Calli* (2 House or 1481) painted inside the *xihuitl* disk where the document records the death of Axayacatl and the seating of the short-reigning Tizoc.

It seems most likely that the document started in *Ce Tochtli* (1 Rabbit or 1402). The surviving manuscript is 146.2 cm (57½ in.) in length, with some damage on all edges, especially at top and bottom, where information is lost. From the size of two intact central portions of the *amatl*, we estimate that the original document would have had approximately eighteen more *xihuitl* disks at its end

and just enough room at its beginning at the bottom to start a full thirteen-year cycle before the first named date with *Ce Tochtli* (1402).¹⁵ This means the document would begin from the last new fire ceremony or “bundling of the years,” making the migration to the new *altepctl* one-half the full cycle of fifty-two years. The founding moment is placed in relationship to the year *Ce Tecpatl* (1 Flint), which is a date that serves as a cosmological signal of *altepctl* foundation in other period documents.¹⁶ By beginning the history with these significant cyclical markers, the *tlahcuilob* sets the document in mythological time in order to ground more recent political history to a cosmic past.

RULERSHIP IN THE ALTEPETL

The founding of the *altepctl* is represented by a diagrammatic image of a *tlahtoani* seated on a large woven *tepotz-obicipalli* (woven reed-mat seat with a backrest) (fig. 2).¹⁷ He wears a *tilmachtli* (cloak) with a *tenixyob* (eyes on the edge) border¹⁸ and a *xiuhhuitzollli* (turquoise mosaic diadem); both of these are Mexica emblems of rulership.¹⁹ A name glyph in the form of the face emerging from a jaguar-shaped head enclosing *ocelotl* (jaguar [warrior]) *tlahuiztli* (insignia) appears just behind the *tlahtoani*'s head above to the left. We refer to this *tlahtoani* as Ocelot, although the glyph is as likely to have referenced

15. From the two intact central portions of *amatl* (each roughly 45 cm in length), we estimate that the top section of the document is missing approximately 14–15 cm of length, while the bottom of the document (where the migration begins) is only missing 4–5 cm of length. There are seven or eight *xihuitl* disks for every 10 cm of *amatl*, so with the existing eight or nine *xihuitl* before the first adjusted *Ce Acatl* (1 Reed) date, with an extra 4–5 cm there would be just enough room to start from *Ce Tochtli*. More material has been lost from the top of the document, and there the disks are slightly smaller with about nine disks per 10 cm, although another approximate 7 cm of *xihuitl* disks were already lost in the damage to the top layer of the *amatl*, totalling about eighteen *xihuitl* beyond the last complete disk.

16. Boone, *Stories in Red and Black*, 42 notes that *Ce Tecpatl* appears in other documents such as the Codex Xolotl as the date both the first and third Mexica *tlahtohqueh* (Acamapichtli and Itzcoatl) were seated, establishing the date as one of founding.

17. Justyna Olko, *Insignia of Rank in the Nahuatl World: From the Fifteenth to the Seventeenth Century* (Louisville: University of Colorado Press, 2014), 150.

18. Patricia Rieff Anawalt, “A Comparative Analysis of the Costumes and Accoutrements of the *Codex Mendoza*,” chap. 8 in *The Codex Mendoza*, vol. 1, ed. Frances F. Berdan and Patricia Rieff Anawalt (Berkeley: University of California Press, 1992), 142–45.

19. Olko, *Insignia of Rank*, 37–54.; Justyna Olko, *Turquoise Diadems and Staffs of Office: Elite Costume and Insignia of Power in Aztec and Early Colonial Mexico* (Warsaw: Polish Society for Latin American Studies and Centre for Studies on the Classical Tradition, University of Warsaw Press, 2005), 113, 114.



FIGURE 2. Detail of the founding Ocelotl *tlahtoani* and the place glyph showing a tree in a pond surrounded by a wall with a standing figure, unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

a prominent part of his name.²⁰ To the right of the *tlahtoani* is a compound image that likely represents a place glyph or toponym naming the *altepetl* itself. The glyph shows a loosely drawn tree growing out of a pool of water within an enclosure, possibly the walls of a courtyard. An indistinct figure stands beside the tree. The sketchy rendering of the tree and figure seem to indicate a different hand, and the whole image was likely added at a later date than the *tlahtoani*. While the pool of water represents an established Mesoamerican design for the depiction of water, the tree is rendered in a European style.²¹

So what is the name of the *altepetl* described in the tira? The provenience of the manuscript has been an ongoing debate since it was first described by Cuevas. Exactly where the document originated is unclear, as it was purchased by Saville on the art market without further provenance. As a result, various authors have ascribed it to other locations based on the later alphabetic Nahuatl glosses or on the supposed apparition of the Virgin of Guadalupe. However, based on the structure of the

20. For a recent example from the extensive scholarship on central Mexican writing, see Gordon Whittaker, *Deciphering Aztec Hieroglyphs: A Guide to Nahuatl Writing* (Oakland: University of California Press, 2021).

21. Note the graphic similarity of this tree to the sketchy rendering of the *abuehuetl* (cypress) on folio 112v in Book XI of the Florentine Codex.



FIGURE 3. Digital drawing of Alhuexoyocan place glyph, unidentified artist(s), *Codex Mendoza*, folio 26r, mid-sixteenth century. Bodleian Libraries, University of Oxford, MS. Arch. Selden. A. 1 (artwork in the public domain; drawing provided by Alanna Radlo-Dzur)

document as a tira, the pictographic text indicates that this is the history of this “tree-in-a-pond-in-a-courtyard” place. Comparison of this toponym to existing sources has so far not settled this question, but we found a distinct graphic similarity to the glyph for Alhuexoyocan as listed in the *Codex Mendoza* (folio 26r) with a large tree emerging from a round source of water, although without the surrounding walls or standing figure (fig. 3). Located in present day Hidalgo, Alhuexoyocan, which Berdan and Anawalt translate as “Place Full of Water Willows,” was part of the imperial province of Cuauhtitlan, paying tribute to both Tlacopan as well as Tenochtitlan.²² One of the regular tribute items was the high-backed *tepotzohicpalli* depicted notably in the tira. Cuauhtitlan was the only province that produced the high-backed seat, which Berdan and Anawalt suggest was due to the province’s location on the reed-filled lakeshore.

22. Alhuexoyocan is also rendered as Albaxuyuca (adjacent to Chilguautia) and is known today as Alfajayucan or Nxamti in Otomí. David Carrasco, *City of Sacrifice: The Aztec Empire and the Role of Violence in Civilization* (Boston: Beacon Press, 1999), 124, 127; Berdan and Anawalt, *Codex Mendoza*, 1:164, 1:170, 2:47–49.



FIGURE 4. Digital drawing of Axocopan place glyph, unidentified artist(s), *Codex Mendoza*, folio 27r. Bodleian Libraries (artwork in the public domain; drawing provided by Alanna Radlo-Dzur)

Another possibility is Axocopan, also listed in the *Codex Mendoza* (folio 27r), whose glyph consists of a tree emerging out of a basin of water representing a river (fig. 4). Berdan and Anawalt translate the place name as “On the Bitter Water” or alternatively “On the Creeping Wintergreen” and note that it was one of the twenty provinces that paid tribute in the form of the *cuexyoh* (Huastec) design *chimalli* (shield).²³ Axocopan, as referenced in the *Codex Mendoza*, is in Hidalgo, but a second location with the same name may also be found in Veracruz.²⁴ We are not the first to make a connection between these two place glyphs in the *Codex Mendoza*. Indeed, the two northern Otomí-speaking places may have been occasionally conflated. David Wright-Carr, for example, contests the typical identification of Axocopan on the Stone of Tizoc and suggests that it is actually Alhuexoyocan, based in part on the depiction of the glyph (fig. 5).²⁵ Despite these many intriguing possibilities, the

23. Berdan and Anawalt, *Codex Mendoza*, 1:164, 1:173, 2:50–51.

24. Axocopan, Hidalgo, is also spelled Axacuba or Ajacuba. See Peter Gerhard, *A Guide to the Historical Geography of New Spain*, Cambridge Latin American Studies, vol. 14 (Cambridge: Cambridge University Press, 1972), 155, 295; Carrasco, *City of Sacrifice*, 46, 67, 72, 75, 79, 81–82, 84–88, 120–21, 124–27, 189, 191–92, 194, 209, 248v50, 429, 434. Axocopan, Veracruz, is also spelled Axocapan or Axocuapan. See Carrasco, *City of Sacrifice*, 314, 352.

25. David C. Wright-Carr, *Los otomís: cultura, lengua y escritura*, vol. 1 (PhD diss., Universidad de Guanajuato, 2005), 340n415.

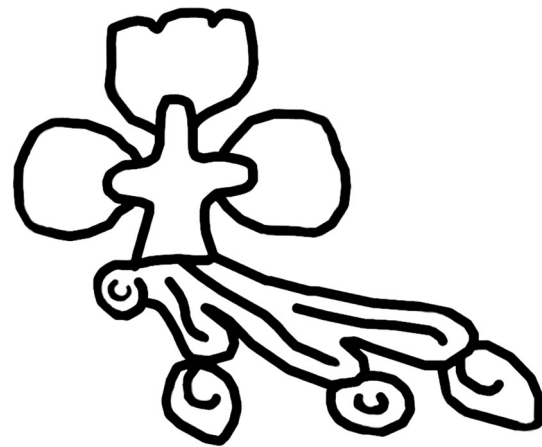


FIGURE 5. Digital drawing of Axocopan/Alhuexoyocan place glyph, unidentified Mexica artist(s), *Piedra de Tizoc* (Tizoc Stone), late Postclassic, stone, 37 x 104³/₈ in. (94 x 265 cm). Museo Nacional de Antropología, Mexico City (artwork in the public domain; drawing provided by Alanna Radlo-Dzur)

ease with which these place glyphs are confused is likely due to the cosmological and mythological significance of the iconography.

Another similar image of a tree growing out of an enclosure occurs in the *Codex Mexicanus* 22–23, where the seven tribes emerge from Chicomoztoc in the Mexica migration story.²⁶ There, Chicomoztoc is represented as a stony cave with a primordial tree at its center. Taking this example as a model, the toponym in the tira may represent an ideograph showing the fundamental elements (tree, water, architecture, people) required for founding an *altepetl* rather than a combination of glyphs representing the conceptual or phonetic equivalent of its name.

More easily followed, the ruling lineage of the *altepetl* is indicated by a dotted red line that connects the founding Ocelotl *tlabtoani* to his successors. These lines mark *tlacamecayotl* (lineage) like umbilical cords linking past and future through heredity.²⁷ His first descendant is also

26. Boone, *Stories in Red and Black*, 218n143 tells the story as “The Aztecs are journeying to Chicomoztoc, where seven tribes emerge in 1 Rabbit (1194).”

27. Justyna Olko, who translates *tlacamecayotl* as “human cordage,” explores pictorial conventions for Indigenous genealogies. See “Native Pictorial Genealogies of Central Mexico: Tracing Pre-Hispanic Roots in a Colonial Genre,” *The Mapas Project*, Wired Humanities, University of Oregon, December 2018, <http://mapas.uoregon.edu>. For the relationship between heredity and kinship terms, see Julia Madajczak, “Nahuatl Kinship Terminology as Reflected in Colonial Written Sources from Central Mexico: A System of Classification” (PhD diss., University of Warsaw, 2014). Cords linked generations through the process of engenderment, or



FIGURE 6. Detail of *tlabtoani* Cihuacoatl, unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

seated on a large woven *tepotzoicpalli*, again wearing a *tilmahitli* with a *tenixyoh* border just like his ancestor below (fig. 6). Although he does not wear a *xiuhhuitzollli*, his name glyph does. Marked directly above his head and emphasized by a line connected to his hairline, it shows the head and shoulders of a woman wearing a *quechquemitl* (women's garment) and *axtlacuilli* (proper female coiffure).²⁸ The woman in the name glyph is crowned with a *xiuhhuitzollli* distinguished from all the others in the document by a pair of horizontal lines at its apex.²⁹ This image likely indicates his name was Cihuacoatl. This was not a reference to the deity of that name but rather a political title, second in command to the *tlabtoani* and a plausible successor to the ruler who could also have been his blood relative.³⁰ A famous example was the Mexica lord Tlacaellé, who served as Cihuacoatl under Itzcoatl and retained the position through his brother

becoming, to indicate hereditary linkage. See Cecelia F. Klein, "Woven Heaven, Tangled Earth: A Weaver's Paradigm of the Mesoamerican Cosmos," in *Ethnoastronomy and Archaeoastronomy in the American Tropics*, ed. Anthony F. Aveni and Gary Urton, *Annals of the New York Academy of Sciences* 385 (1982): 1–35.

28. Olko, *Turquoise Diadems*, 107.

29. This double horizontal line appears in many renderings of the *xiuhhuitzollli* in the Florentine Codex. See particularly the depiction of rulers in Book VIII, folios 11–10r.

30. Olko, *Insignia of Rank*, 21.

Moteuczoma Ilhuicamina's reign as *tlabtoani* and into that of his successor Axayacatl. About twenty years later, a third *tlabtoani* was seated, still connected to the others by *tlacamecayotl* now painted solid red, although it is heavily faded and difficult to discern.

This lord was rendered in the same fashion as the previous two, seated on a large woven *tepotzoicpalli* but with a less luxurious *tilmahitli*, despite the *xiuhhuitzollli* he wears (fig. 7). His name glyph, which appears as a cave with a recumbent figure inside, is explicitly tied to his head with a black tether like Cihuacoatl. As such, the image cannot be interpreted as a narrative sequence, although many migration stories feature people emerging from caves. One possible interpretation of this "oztotl-tlacatl" name could be related to the profession of an *oztomecatl* (merchant), which is a word literally meaning "a person from an *oztotl* (cave)."³¹ A more metaphorical interpretation of this name is suggested by a passage in a chapter describing different qualities of nobles in Book X of the Florentine Codex: a humble noble is a *tlallanca-laquini* (one who enters into caves).³² Another possibility could be that it is a reference to the *tlabtoani*'s primordial Chichimeca ancestry, as the Chichimeca were described as residing in caves.³³ Whatever his actual name, the last *tlabtoani*'s relatively short reign is contrasted sharply by his long-reigning successor, "cuetzpalin-tetl," who may or may not have been a part of the lineage.³⁴

31. Karttunen, *Analytical Dictionary*, 181.

32. Bernardino de Sahagún, *Historia general de las cosas de nueva España*, 3 vols. (Florence: Biblioteca Medicea Laurenziana, MS Palat. 218-220, 1577), vol. 3, fol. 12v; Bernardino de Sahagún, *Florentine Codex: General History of the Things of New Spain – Book 10 The People, Part XI*, trans. Arthur J. O. Anderson and Charles E. Dibble (Salt Lake City: University of Utah Press, 1981), 21. The entry for *tetzicuehualló* (literally, "one's chip" metaphorically used as a reference to a child or grandchild of a noble lineage) is described as a person of noble lineage who "wishes no praise." Indeed, this is a person so humble that they conceal, hide, and cover themselves—a *tlallancalaquini* (one who enters into caves)—who is depicted in the accompanying illumination on folio 12v showing just such a nobleman lying prone in a cave. Our gratitude to Jeanette Peterson for calling attention to this image.

33. Not simply a reference to a personality type, this description also implies that the noble lineage stretches back to the ancestral Chichimeca, the progenitors of many central Mexican peoples including the Nahuas. A cognate image of a recumbent figure inside a cave appears further on in Book X on folio 121r, in a chapter describing the Teochichimeca who made their homes in caves. See Sahagún, *Historia general*, vol. 3, fol. 121r; Sahagún, *Florentine Codex*, Book 10, 171–72.

34. There is a possibility that an indistinct curving red line connects the Cihuacoatl to "cuetzpalin-tetl." However, if present, it was rendered in a very different meandering style than the previous three generations, which follow a more strictly linear path.



FIGURE 7. Detail of *tlahtoani* “*oztotl-tlacatl*,” unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

The *tlahtoani* with the longest reign in the tira’s *altepetl* was its fourth ruler, named with an image of a *cuetzpalin* (lizard) seated upon a glyph depicting a *tetl* (rock) (fig. 8).³⁵ “Cuetzpalin-tetl” was drawn at a smaller scale than the previous *tlahtoahqueh*, possibly an indication of his perceived lesser status. Still, he retains the same set of insignia of his rulership: the *tepotzoicpalli*, the *xiuhhuitzolli*, and a decorated, if simple, *tilmahitli*. Over more than a century, this *altepetl* represented itself in alignment with the ruling structure of Tenochtitlan, not least through its consistent use of the Mexica markers of rulership: each *tlahtoani* seated on *tepotzoicpalli* and wearing *xiuhhuitzolli*. Justyna Olko has shown that both the *tepotzoicpalli* and *xiuhhuitzolli* appear as iconographic representations of Mexica affiliation in local documents created across the many regions that paid tribute to the Triple Alliance, even

35. We thank Barbara E. Mundy for the observation of the similarity of this *tlahtoani*’s name glyph with that of Tilcuetzpal, named in Codex Aubin 37v as “of the house of Xiquilpilo,” seated at about the same time in *Macuilli Tecpatl* (5 Flint or 1484), who previously fought with the Tenochtitlan *tlahtoani* Axayacatl, wounding him in *Mahltactli omome Tochli* (12 Rabbit or 1478). She notes that the greatest similarity with his name appears in the Codex Veinte Mazorcas.



FIGURE 8. Detail of the *tlahtoani* “*cuetzpalin-tetl*,” unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

those outside the Nahua cultural sphere. Indeed, she also documents a distinct lack of these objects in manuscripts created in Tlaxcala, a polity that emphasized its distinction from Tenochtitlan.³⁶ In short, this document relies on a shared vocabulary of rulership to iconographically link itself to the imperial center. During the approximately forty-five years “*cuetzpalin-tetl*” was in power, he would have witnessed, at least at a distance, the arrival of Europeans on the coast and the ensuing war against the Triple Alliance.

Indeed, the war is depicted in a large scene with a representative Indigenous warrior fighting a conquistador (fig. 9).³⁷ The Indigenous warrior wears *ichcahuipilli* (quilted cotton armor) and decorated sandals, holding a *cuexyoh* (Huastec) design *chimalli* for protection and a simple *huitzoctli* weapon.³⁸ Despite the design’s name, the *cuexyoh chimalli* was not directly associated with the

36. Olko specifically identifies “Xilotepec, Axocopan, Atotonilco de Pedraza, Chiapan, Malinalco, Huaxtepec, Tlapan, Tepeyacac, Acatlan, and Cempoala; spanning wide portions of the present states of Hidalgo, Guerrero, Morelos, and Puebla; and bordering parts of Oaxaca and Veracruz,” *Insignia of Rank*, 282, 285–86. See also Diel, *Tira de Tepechpan*, 126–27, for a similar use of the *xiuhhuitzolli* as a signal of affiliation with Tenochtitlan.

37. On the weapons and armor used during this period by both Natives and Europeans, see John M. D. Pohl and Charles M. Robinson III, *Aztecs and Conquistadores: The Spanish Invasion and the Collapse of the Aztec Empire* (Oxford: Osprey Publishing, 2005), 40–41, 48–49.

38. Olko, *Turquoise Diadems*, 103.



FIGURE 9. Approximately top fourth of *amatl* showing the battle, final *tlabtoani*, and establishment of the Christian church, unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

Huastec culture, but as Anawalt notes, they were manufactured in “twenty culturally and geographically diverse provinces but, strangely, not from the Huastec region.”³⁹ Indeed, the shield design was one of at least five different designs referred to by this designation, all of which formed part of an entry-level set of warrior’s *tlabuiztli* (insignia). These were given, in Tenochtitlan at least, to those who had taken a second captive in battle. They were the most commonly depicted type of *chimalli* design in all of the imperial tribute rolls, and the version drawn in the *tira*—Anawalt’s *cuexyoh chimalli* design no. 3, with horizontal “hawk scratches” on either side of a vertical triangular shape—appears frequently in the late sixteenth-century drawings of Diego Muñoz Camargo in use by

39. Anawalt, “Comparative Analysis,” 113–22. Olko, *Insignia of Rank*, 133, connects other *cuexyoh chimalli* designs to a pan-Mesoamerican tradition found at Chichén Itzá, Uxmal, and Tula that is conceptually rather than culturally linked to a Huastec origin.

warriors of many different *altepetl* affiliations beyond that of Tenochtitlan, including the Tlaxcalan enemies of the Mexica.⁴⁰ As such, the design, like the insignia of rulership worn by the *tlabtoaqueb*, cannot be used as evidence of a particular political affiliation. Instead, it represents a less prestigious rank ubiquitous in many widespread Nahua communities.

An unusual detail of the Indigenous warrior’s shield design in the *tira* is the inverted V-shape of its triangular field, a feature not commonly seen on the *cuexyoh chimalli*. Instead, the design seems to be making a connection to the Greek lambda (Λ) found on shields used by the Spartans, who famously defended their homeland against an invading force during the battle of Thermopylae. The *tira* is not unique in making this allusion to patriotic courage against overwhelming odds in the corpus of early colonial Nahua documents. Indeed, images of lambda shields are repeated three times in the hands of nameless Tlateloca and Tenochca warriors defending their island cities after the Toxcatl massacre in Book XII of the Florentine Codex.⁴¹ As with the *cuexyoh chimalli*, the lambda design reiterates that the Indigenous warrior of the *tira* is not a specific individual, but a representation of collective effort defending against an invasion.

Likewise, the *tlabcuilob* depicts a generic conquistador wearing a doublet over a chain mail shirt. These elements were later emphasized with turquoise pigment, as are the other metal components of his sword and horse, such as

40. On the specific *cuexyoh chimalli* design no. 3, see Anawalt, “Comparative Analysis,” 113–16, and depictions in the Codex Mendoza on folios 20v, 25r, 34r, 37r, 64r; the *Matricula de Tributos*, folios 4r, 7v, 9r; Diego Muñoz Camargo, *Descripción de la ciudad y Provincia de Tlaxcala de la nueva España y Indias del Mar Océano para El buen gobierno e Ennoblecimiento de las [1580-1585]* (Ms Hunter 242 [U.3.15], Special Collections Department, University of Glasgow, Scotland), folios 257v, 258v, 262v, 264r, 264v, 274v, 307r, 307v, 308v, 316r.

41. The three appearances of the lambda shield are on folios 34r, 36v, and 39r in Book XII of the Florentine Codex. See also James Lockhart, *We People Here: Nahuatl Accounts of the Conquest of Mexico, Repertorium Columbianum*, vol. 1 (Los Angeles: UCLA Center for Medieval and Renaissance Studies, 1993), 132–49. On the lambda shield design in the Florentine Codex, see Alessia Frassani, “Color y monocromo en las ilustraciones del Códice florentino,” *Estudios de cultura náhuatl* 52 (July–December 2016), 210. Our thanks to Barbara Mundy for a fruitful discussion on this point and to Felipe A. Rojas Silva for confirming the graphic similarity of the shields in the *tira* and the Florentine Codex to the lambda design of the Spartans. See also Rojas Silva’s forthcoming article, “Babylonians in Sixteenth Century Mexico: Comparative Antiquarianism in the Work of Sahagún,” in *The Allure of the Ancient: Early Modern Receptions of the Ancient Near East*, ed. John Steele and Margaret Geoga (Leiden: Brill, Intersections: Interdisciplinary Studies in Early Modern Culture, forthcoming).

the stirrups and horseshoes. With chainmail rather than full armor, and a cap rather than helmet, the power of this image is the common nature of its subjects: this could be *any* conquistador facing *any* low-ranking Indigenous warrior. The conquistador's sword, complete with a curving handguard akin to the blades that would anticipate the rapier, is depicted as long as nearly the full height of his enemy, emphasizing the fierceness of the weapon. Furthermore, the conquistador's anonymous quality is akin to the "Ironman," a heuristic term that Kevin Terraciano has coined in reference to a conquistador completely encased in armor (which was actually made of steel), who represents an otherworldly menace in Book XII of the Florentine Codex.⁴² This individual has become his armor and weaponry such that his humanity is neither visible nor important in contrast with the violence he inflicts.

The European rides not a horse but a deer-horse fusion, which combined a cervid's petite rostrum, short neck, tufted ears, dew claws above the hoof, and slim frame with an equine flowing mane and tail. Given the detailed observation from life reflected in this latter portion of the document, the emphasis on deerness must be read as an intentional pictographic-writing choice, as the Nahuatl word *mazatl* (deer) was applied to horses in the first generation of the colonial encounter, which was distinguished by little linguistic change and the hesitant adoption of Spanish loanwords such as *caballo* for horse.⁴³ Thus, the horse is called deer to readers and is depicted as a quasi-deer in the tira.

About ten years after the battle scene, a new *tlahtoani* is seated in the tira's *altepetl*. He is depicted at an even smaller scale than the long-lived "cuetzpalin-tetl" but still retaining all of the Indigenous markers of rulership: the *tepotzoicpalli*, the *xiuhhuitzollī*, and the *tenixyoh tilmahli* worn by the first two *tlahtohqueh*. His name glyph is almost entirely lost by abrasion to the amatl, but what little image remains could be the nose and chin of a human face emerging from the mouth of a head-enclosing zoomorphic *tlahuiztli*. This similarity to the name glyph of Ocelot could represent a family name,

42. Kevin Terraciano, "Reading between the Lines of Book 12," in *The Florentine Codex: An Encyclopedia of the Nahuatl World in Sixteenth-Century Mexico*, ed. Jeanette Favrot Peterson and Kevin Terraciano (Austin: University of Texas Press, 2019), 55–59.

43. Lockhart, *Nahuas after the Conquest*, table 7.14 on 283, 408, 428–30; Lockhart, *We People Here*, 8, 33, 80, 110. See also Cuevas, "Codex Saville," 16.

passed down to the next generation. Significantly, somewhere between the battle scene and the seating of this Indigenous lord the *xibhuītl* markers start to change, moving progressively leftward into the page and shrinking in size. This change marks the arrival of a new *tlahcuīloh*.

This new hand paints the establishment of a Christian church, which is first represented by the purchase of a large, outdoor T-shaped cross labeled "INRI"—*Iēsus Nazārēnus, Rēx Iūdaēorum* or Jesus the Nazarene, King of the Jews—at the top and mounted in a base of three round stones.⁴⁴ The price paid by the *altepetl* to erect the cross is marked out by six four-real coins, likely Mexico City shield and pillar coins made from 1536 to 1542, drawn to its right in pairs and linked to it by a dotted black line.⁴⁵ Over the following fifteen to twenty years, the *altepetl* purchased further accoutrements for their new church, including a painting of the Virgin Mary crowned as Queen of Heaven, a statue of the Virgin holding the infant Christ in her arms, and a large bell. Each of these items is rendered in careful detail that notes the three-dimensionality of the statue's robes and sculpted base as well as the bell's interior and exterior surfaces. This shift in representation is a deployment of a European rendering style that emphasizes figures in the round, even though the *tlahcuīloh* continued to use indigenous pigments and formatting throughout this later section. The raising of money for bells was a general obsession among Native communities and appears in many early colonial Indigenous documents.⁴⁶

44. More work remains to be done to identify the local church discussed in this document. See, for example, John F. Schwaller, *The History of the Catholic Church in Latin America: From Conquest to Revolution and Beyond* (New York: New York University Press, 2011); Robert Ricard, *The Spiritual Conquest of Mexico: An Essay on the Apostolate and the Evangelizing Methods of the Mendicant Orders in New Spain, 1523–1572*, trans. Lesley Byrd Simpson (Berkeley: University of California Press, 1966).

45. The *reales* are rendered as circles with a second, thinner interior line and marked in the center with a cross resembling the Arabic numeral 4. In some colonial-period documents, reales appear with a mark in the form of a Greek cross. An excellent example of both the Greek cross and 4 mark used to indicate reales can be found in the Codex Osuna. Compare plates 29r and 31r in *Pintura del gobernador, alcaldes y regidores de México: "Códice Osuna,"* ed. Vicenta Cortés Alonso, 2 vols. (Madrid: Ministerio de Educación y Ciencia, Dirección General de Archivos y Bibliotecas, 1973). See Alberto Francisco Pradeau, *Numismatic History of Mexico from the Pre-Columbian Epoch to 1823* (Los Angeles: Western Printing Company, 1938).

46. For examples, see the Codex Tlatelolco, Códice Sierra (Sta. Catarina Texúpan) or the Codex Osuna. For a nuanced analysis of the linguistic and cultural shifts resulting from Nahuatl-Christian relations, see Louise M. Burkhart, *The Slippery Earth: Nahuatl-Christian Moral Dialogue in Sixteenth-Century Mexico* (Tucson: University of Arizona Press, 1989).

MAKING TIME MUDDY: STRATEGIC EDITING

Editing and repainting is a common feature of Mesoamerican manuscripts. In her 1994 essay, Mary Elizabeth Smith discusses why the repainting of the Codex Selden makes no reference to the arrival of foreigners even though the modification occurred sometime around 1556 to 1560 and was likely generated as evidence for use in a Spanish courtroom. The very illegibility of these texts to Spanish colonial readers might have worked to their advantage; their archaic style, resistance to including contemporary events featuring Europeans, and focus on local genealogical subject matter should itself be seen as a political act.⁴⁷ Indeed, parallel strategic forgetting and remembering can be seen in other regions that have suffered heavy settler colonialism.⁴⁸ Most importantly, the tira's chroniclers did not see Europeans as time-makers. Rather, the continuity of the *xibuitl* list them as just another addition to the local story, passing over them without further comment. This tactic of exclusion ought to be taken seriously, and the local focus of this document provides in its own logic a riposte to the sacred European chronology that is too often preserved unintentionally in historical time lines.⁴⁹ In the words of Olivia Harris, "the 'naturalness' by which we assume that events which were of momentous significance for European historiography and the construction of the European identity have the same status in the historical imagination of those unconquered and subjugated by these same Europeans needs to be unpicked."⁵⁰ While Harris focuses on the lack of attention the Codex Selden paid to the arrival of Spaniards despite a detailed chronological sequence of related years, this tira both cites their arrival and suggests continuity as the very format of local time continued marching forward.

The tira likewise exhibits repainting and editing that did not center Europeans. The first two *tlahcuilohqueh*

47. Mary Elizabeth Smith, "Why the Second Codex Selden Was Painted," in *Caciques and Their People: A Volume in Honor of Ronald Spores*, ed. Joyce Marcus and Judith Zeitlin (Ann Arbor: Anthropological Papers, Museum of Anthropology, University of Michigan, No. 89, 1994), 111–42. See also Byron Hamann, "Introduction to the Codex Selden: Pictures in Colonial Courts," *Mesolore*, accessed June 6, 2020, <http://mesolore.org/viewer/view/4/Codex-Selden>.

48. For an example in twentieth-century Madagascar, see Jennifer Cole, *Forget Colonialism? Sacrifice and the Art of Memory in Madagascar* (Berkeley: University of California Press, 2001).

49. Daniel Smail, "In the Grip of Sacred History," *American Historical Review* 110 (2005): 1337–61.

50. Olivia Harris, "'The Coming of the White People': Reflections on the Mythologisation of History in Latin America," *Bulletin of Latin American Research* 14, no. 1 (1995): 18.

completed the *altepetl*'s history through the establishment of the local church. To clarify, the first *tlahcuiloh* painted the *altepetl*'s history from the beginning of time up to the last *tlahtoani* who was seated just a few years after the start of the war with Europeans for Tenochtitlan. The second *tlahcuiloh* painted the artifacts that established the local church. A third campaign of modifications to the tira may have been undertaken by several people at different times. There are three main categories of changes made during this period: the adjusting of dates, the removal or modification of information, and the addition of color.

The time line of dates appears to have been back-calculated from the later portion of the document, where the Nahua calendrical system lines up directly with other colonial period sources. The addition of year bearers on the left-hand side of the *xibuitl* markers, which are tied to specific years with a connecting line, appear as adjustments made after the first *tlahcuiloh*'s year bearers inside the circle of the *xibuitl* were painted out. The ordering of *tlahcuilohqueh* is most apparent in the early portion of the document, where the interior year bearers are erased by overpainting of a later color, leaving only the tethered year bearers visible (fig. 10).

In order to substantiate these corrections, another parallel history was also added: the succession of rulers in the imperial capital of Tenochtitlan were squeezed into the small remaining space to the right of the *xibuitl* disks.⁵¹ This history of succession is handled in a different format than the lineage of *tlahtoqueh* in the tira's *altepetl*. Where the tira simply names each of the *altepetl*'s rulers beside the portrait of his seating, for Tenochtitlan the deaths of each ruler are also shown with an image of their mummy-bundle. These mummy-bundles are tethered to the *xibuitl* on their left and accompanied by a name glyph above the dead *tlahtoani*'s head. A second tether then ties to an image of the succeeding *tlahtoani* above, each seated on a *tepotzoicpalli*, wearing the *xiubhuitzolli*, and identified by a name glyph above the head. As a result, this system gives the history of rulership at Tenochtitlan in a series of pairs—a dead *tlahtoani* followed by his living successor—at dated intervals from the moment of the local *altepetl*'s founding up to the final third of the manuscript. The last *tlahtoqueh* of Tenochtitlan are lost due to damage to the final portion of the manuscript, so that

51. For the visual and historical culture of the transition between Aztec and Spanish rule, see Barbara E. Mundy, *The Death of Aztec Tenochtitlan, The Life of Mexico City* (Austin: University of Texas Press, 2015).

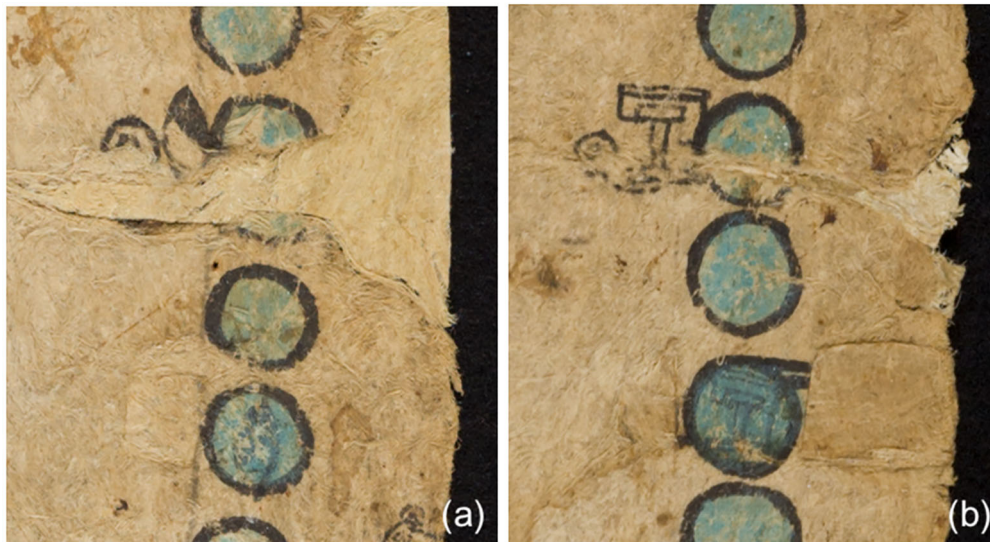


FIGURE 10. Details showing painted-over year bearers: a. *Tecpatl* (Flint) inside the circle of the *xibuitl*, with tethered *Ce Tecpatl* (1 Flint) year bearer two years above. b. A second example of painted-over year bearer at *Calli* (House) moved two years up and marked with tethered *Ce Calli* (1 House). Unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

what remains is an account of the rulers from the death of Huitziluhuitl to the seating of Moteuczoma Xocoyotzin.⁵² The dates marked for the reigns of the last four rulers in Tenochtitlan match those listed in other sources exactly, while the previous rulers are within five to six years of their accepted dates (see table 2).⁵³ These early discrepancies are likely due to the purge of Itzcoatl, who famously burned all the histories during the tumult of his reign after the

assassination of Chimalpopoca.⁵⁴ Whatever the reason, the edits back-date events in the local *altepetl* to match the established imperial time line that would have been recognized in the new colonial legal system.

Further modifications were made with additions and removals by pasting over existing content and painting in colors (fig. 11). As mentioned above, year bearers marked inside of *xibuitl* circles were painted over with blue

52. This imperial history develops to the right side of the column of *xibuitl* with the death of the *tlabtoani* of Tenochtitlan in the year *Chicueyi Tochli* (8 Rabbit or 1423) indicated by a mummy-bundle seated on a *tepotzoicpalli*. In the same year, his replacement was seated. Although the dead man's name glyph is lost, the next *tlabtoani* has the remains of a name glyph showing a circular element as large as the figure's head with small circular marks inside and a simple rounded scroll emerging from its top. Based on this image, we can compare this with Chimalpopoca's name glyph ("Smoking shield," r. 1417–28) whose name is frequently represented by an image of a round *chimalli* (shield) with rows of eagle feathers that emanate curls of smoke. Given the later identifiable imperial *tlabtoaqueh* (rulers) it is confirmed that this is the Chimalpopoca who succeeded the *tlabtoani* Huitziluhuitl (r. 1397–1417), although the date in the *tira* is off by six years. The next marked *xibuitl* that appears is *Ce Tecpatl* (1 Flint or 1427). Just five years later in *Macuilli Tecpatl* (5 Flint or 1432), Chimalpopoca is depicted as a mummy-bundle with his name glyph just visible as the curve of its *chimalli*. In the same year, the next *tlabtoani* of Tenochtitlan, Itzcoatl (r. 1428–40) was seated. His name glyph is partially obscured by another sewn repair to the *amatl*, but a zigzag line at the back of his head shows that the *tlabcuiloh* rendered his name as a *coatl* (serpent) studded with jagged *itzzli* (obsidian) blades. More details could be mentioned here, but Cuevas correctly identified this portion of the *tira*'s historical content.

53. Axayacatl died in 1481, Tizoc ruled from 1481 to 1486, Ahuizotl from 1486 to 1502, and Moteuczoma Xocoyotzin was seated in 1502.

54. See Diego Durán, mentioned in Mundy, *Death of Tenochtitlan*, 61. The original is in Sahagún, *Historia general*, vol. 3, book 10, fol. 142r: "ca iquac tlatlac in tlatocat Itzcoatl, in mexico: innenonotzal mochiuh in mexica tlatoque, quitoque: amo monequi mochi tlatcat quimatiz, in tlilli, in tlapalli, in tlatconi, in tlamamaloní, avilquiçaz: auh inin, çan naoalmaniz in tlalli, ic miec mopic in iztlacaiutl," which Arthur J. O. Anderson and Charles E. Dibble translate as: "The history of it was saved, but it was burned when Itzcoatl ruled in Mexico. A council of rulers of Mexico took place. They said: 'It is not necessary for all the common people to know of the writings; government will be defamed, and this will only spread sorcery in the land; for it contain[s] many falsehoods.'" Bernardino de Sahagún, *Florentine Codex: General History of the Things of New Spain, Book 10 – The People, Part XI*, trans. Arthur J. O. Anderson and Charles E. Dibble (Salt Lake City: University of Utah Press, 1961), 191. Anthony Aveni, "Circling the Square: How the Conquest Altered the Shape of Time in Mesoamerica," *Transactions of the American Philosophical Society, New Series* 102, no. 5 (2012): i, iii–v, vii, ix, xi–xiii, 1, 3–9, 11–17, 19–55, 57, 59–69, 71, 73–85, 87–89, 91, 93–101, 103–109, 111, 113–16. For the complexities in modern Western time, see Byron Ellsworth Hamann, "How to Chronologize with a Hammer, Or, The Myth of Homogenous, Empty Time," *HAU: Journal of Ethnographic Theory* 6, no. 1 (2016): 261–92; "Chronological Pollution: Potsherds, Mosques, and Broken Gods before and after the Conquest of Mexico," *Current Anthropology* 49, no. 5 (2008): 803–36.

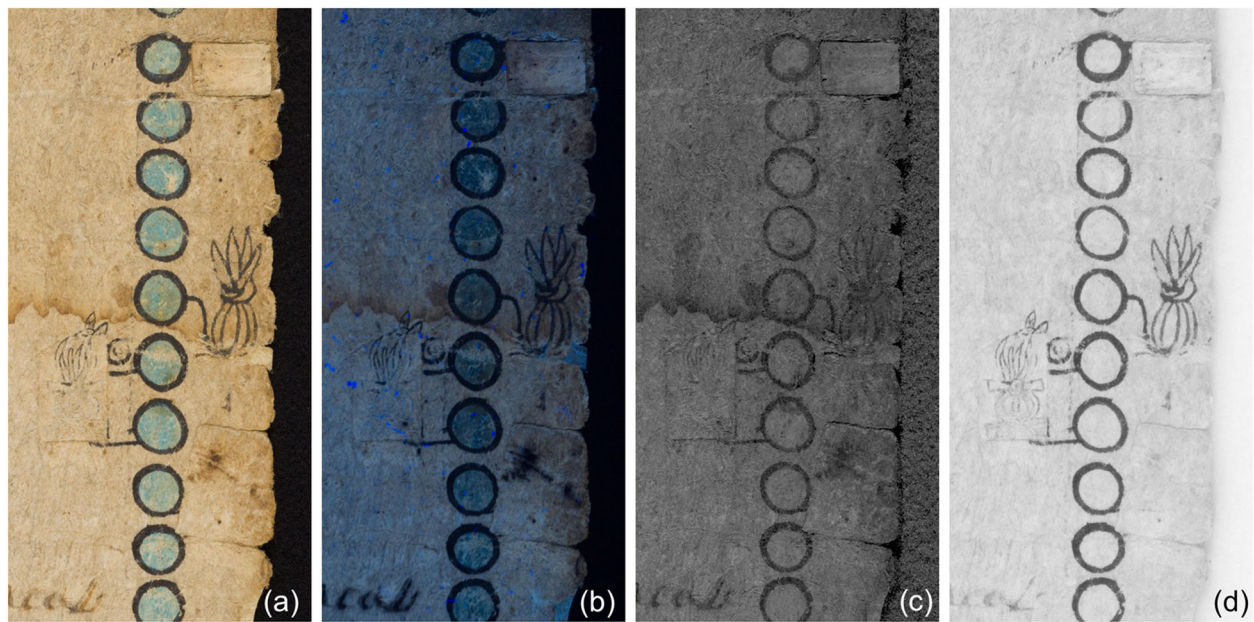


FIGURE 11. Four areas of edited, pasted-over year bearers using different imaging modes, with pasted-over *Ce Tochtli* (1 Rabbit) at center in (a) visible light; (b) ultraviolet-induced visible luminescence (UVL); (c) reflected ultraviolet (RUV); (d) reflected infrared (RIR), where the *Ce Tochtli* year bearer is most visible. Unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

colorant in *Ce Tecpatl* and *Ce Calli*. Bundles marking *tox-iuhmolpia* (the New Fire ceremony, literally, “to bundle our years”) were added in two years, both called *Ome Acatl* (2 Reed or 1455 and 1507). The latter was corrected to reflect the shift in celebrating the ceremony from *Ce Tochtli* to *Ome Acatl* after the famine in the *Ce Tochtli* of 1507. The editors who back-dated the calendrical information from the *Ce Acatl* of 1519 overstepped by also moving the *tox-iuhmolpia* bundle of *Ce Tochtli* in 1454, even though the change did not actually occur until the next cycle (fig. 12).⁵⁵ The establishment of the local church’s history is likewise tied to this reformed calendar. Counting forward from the last marked *xihuitl* of *Ce Acatl* (1 Reed, 1519) alongside the battle, we surmise that the cross was purchased in about 1531. By this late date, however, the logic of the manuscript started to erode away from the calendar round that dictated its earlier structure, and no further *xihuitl* were marked after *Ce Acatl* (1 Reed, 1519).

In another addition that is out of place in time, a group of four *pipiltin* (lords) are painted in a slightly darker carbon black ink and with a looser hand (fig. 13b). They

appear thirteen years after the founding Ocelotl *tlahtoani* was seated in line with the *xihuitl* marked *Ce Calli* (1 House, 1441). These *pipiltin* sit on low *icpalli* (woven reed seats), facing to the left. The first man seated at the front of the line is distinguished from the others by his *temillotl* (stone-pillar) hairstyle and a decorated *tilmahitli* indicating his higher rank. These figures, along with the group of four diagrammatic *tilmahitli* found just above (fig. 13a), as well as one of the tethered *Ce Acatl* dates, all feature smudged or blotted ink stains that obscure parts of the images. The appearance of the four lords seems to be either a later *tlahcuilob*’s campaign—adding in the four lords and the tribute of four *tilmahitli* (mantas)—or they could be connected to the additions of the Tenochtitlan *tlahtohqueh*. While Cuevas argues that the four lords are from Tenochtitlan, this explanation does not fit within the structure of the document that marks the imperial history only to the right of the *xihuitl* while the history of the *altepetl* fills the larger portion of the amatl on the left.⁵⁶ Therefore, these four lords, whoever they may be, must have been part of the history of the *altepetl* and not part of the imperial history overlaid onto

55. Emily Umberger, “Antiques, Revivals, and References to the Past in Aztec Art,” *Res: Anthropology and Aesthetics* 13 (1987): 92.

56. Cuevas, “Codex Saville,” 15.



FIGURE 12. Details showing addition of *toxiuhmolpia* bundles, unidentified Nahuatl artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)



FIGURE 13a. Detail of the four mantas. **b.** Detail of the four lords. Unidentified Nahuatl artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

the document.⁵⁷ It is unclear exactly who they represent, but the most likely explanation is that they are the

57. The uneven blotting that appears over the images of the four lords, as well as a mislabeled *Acatl* (Reed) year bearer, may be a result of adhesive residue used to attach an *amatl* patch in order to edit out this content entirely, which could also account for the slightly darker ink used on these figures.

subordinate council of leaders under the reigning *tlahtoani*. By the mid-sixteenth century, *altepemeht* were most commonly structured into four subdivisions known as *tlaxilacalli* (often translated as *barrio*), but its meaning carried a more specific connotation: the district or constituent part of an *altepetl*.⁵⁸ Each *tlaxilacalli* had its own leadership and was subject to regular tribute payments of items such as the pictured *tilmabtli*. Likewise, these lords could also represent other members of the ruling family with claims to don Martín's inheritance. Therefore, it seems likely that these additions were made as the document was prepared for use in a colonial court.

The final substantial addition of information in the form of two pairs of vertical rectangles placed beside the last two *tlahtohqueh* of the *altepetl* likely occurred at the same time. One can contrast the polish of the rest of the document with these rectangular additions, which are rendered in a thicker, almost sloppy hand. Alfonso Lacadena calls this glyph the *wa₁* or "double-stroke sign" indicating the phoneme *wa* or *hua*.⁵⁹

58. Alonso de Molina, *Vocabulario en lengua castellana y mexicana* (Mexico City: Juan Pablos, 1571), 146r; James Lockhart, *Nahuatl as Written: Lessons in Older Written Nahuatl, with Copious Examples and Texts* (Stanford, CA: Stanford University Press, 2001), 104.

59. Alfonso Lacadena, "The *wa₁* and *wa₂* Phonetic Signs and the Logogram for *WA* in Nahuatl Writing," *PARI Journal* 8, no. 4, (2008):38–39, fig 1.

He cites Manrique Casteñeda, who identified this logogram as a phoneme translated as “owner” or “possessor.”⁶⁰ Lacadena gives an origin in *huahuan(a)*, which Karttunen gives as “to scratch, scrape something, to incise lines on something.”⁶¹ The same glyph also appears on *cuextecatl* (Huastec) warrior costumes and *cuexyoh chimalli*, which are identified in the Florentine Codex as “hawk scratches.”⁶² Like the *chimalli* held by the Nahuatl warrior, these were entry-level rewards for those who had taken their first prisoners in war and therefore become “possessors of captives.” Why then are only these last two *tlahtohqueh* marked as “possessors?” What are they possessors of? Is it possible that the two men were not part of the lineage of the earlier *tlahtohqueh* but instead were considered later “owners” of the *altepetl*? If so, then there is a reason that the alphabetic glosses do not appear in the ample blank space alongside the long reign of “cuetzpalin-tetl,” nor do they speak to the tumult of the Christian arrival.⁶³ Rather, the Nahuatl text speaks about inheritance and is placed alongside the ancestors of don Martín and his descendants, emphasized by the blood red *tlacamecayotl* that connects them.

THE TIRA IN COURT

The document’s next layer came from the addition of a fifth *tlahcuiloh* writing in alphabetic glosses. This *tlahcuiloh* wrote the discussion of inheritance in the middle portion of the amatl where the rulers were linked by a distinct red line of heredity. It is here that don Martín’s petition to pass the land on to his children gains voice (see appendix A). In the second half of the sixteenth century, the Spanish sociojuridical system of courts, wills, and paper documents reshaped the paper trail of death in Latin America. As preexisting structures governing the transfer of wealth and influence crumbled and were reformed in the new colonial system, inheritance became an increasingly contentious matter. Indigenous nobles brought suit against one another and against European colonists who increasingly encroached on their territories both in terms of land and governance. In these court proceedings, Indigenous tribute lists, genealogies,

histories, and maps were frequently used in support of litigants’ claims.⁶⁴ The pictorial nature of these documents registered their ancientness and therefore authenticity to Spanish authorities such as the Viceroy Antonio de Mendoza, who officially ruled in favor of their use as evidence in lawsuits.⁶⁵ Don Martín—who likely was the child of Indigenous lords and bestowed with a Spanish name in the first decades following the installation of the Viceroyalty of New Spain in 1535—maintained an honorific title reserved for elites. Along with his will, thousands of similar wills and property records that are written in Nahuatl remain. However, these documents often integrated Christian language into their requests for what officials and relatives ought to do following their death. Many requested church bells to toll, the grace of the “eternal Virgin,” and the honor of the Christian god.⁶⁶ By contrast, don Martín’s bequest resisted the Christian references that infused Spanish bureaucracy in favor of language that highlighted Mesoamerican conceptions of heredity that were tied into the pictographic representational norms formalized in the region long before.

The content of don Martín’s testament is understandable even if some of the words are not entirely legible. In it, don Martín speaks in the first person, a noble among a group of nobles, making a formal statement at a place called Amacozac. He identifies himself and states clearly, “I, don Martín, [. . .] give it [the inheritance] to my children and my grandchildren, it will belong to them all in these *tlaxilacalli*,” followed by a list of place names. As mentioned above, although commonly translated as barrio, *tlaxilacalli* specifically refers to a constituent subdivision of an *altepetl*.⁶⁷ The implication is that don Martín’s children and grandchildren were inhabitants of the following list of *tlaxilacalli* presumably subordinate to the *altepetl* of the tira, which may or may not be Amacozac. Indeed, it is not yet possible to nail down precisely where the listed communities are today or where they were located in the sixteenth century. Some of the place names

60. Leonardo Manrique Casteñeda, “Ubicación de los documentos pictográficos de tradición náhuatl en una tipología de sistemas de registro y de escritura,” in *I Coloquio de documentos pictográficos de tradición náhuatl* (Mexico City: Universidad Nacional Autónoma de México [UNAM], 1989), 159–70, esp. 166, figure 7b.

61. Karttunen, *Analytical Dictionary*, 80.

62. Anawalt, “Comparative Analysis,” 122; Olko, *Insignia of Rank*, 133.

63. Olko discusses the ambiguity in representations of dynastic rulers as distinguished from appointed municipal governors or other functionaries (*alcaldes* or *regidores*, for example) in colonial period documents. See Olko, *Insignia of Rank*, 289.

64. Angélica Jimena Afanador-Pujol, *The “Relación de Michoacán” (1539–1541) and the Politics of Representation in Colonial Mexico* (Austin: University of Texas Press, 2015), 4; Eduardo de Jesús Douglas, *In the Palace of Nezahualcoyotl: Painting Manuscripts, Writing the Pre-Hispanic Past in Early Colonial Period Tetzaco, Mexico* (Austin: University of Texas Press, 2010), 12.

65. Boone, *Stories in Red and Black*, 248. On Viceroy Mendoza’s recognition of Indigenous documents, see Ethelia Ruiz Medrano, *Mexico’s Indigenous Communities: Their Lands and Histories, 1500–2010* (Boulder: University Press of Colorado, 2011), 33–36.

66. Lockhart, *Nahuas after the Conquest*, 243, 342.

67. Lockhart, 15–27.

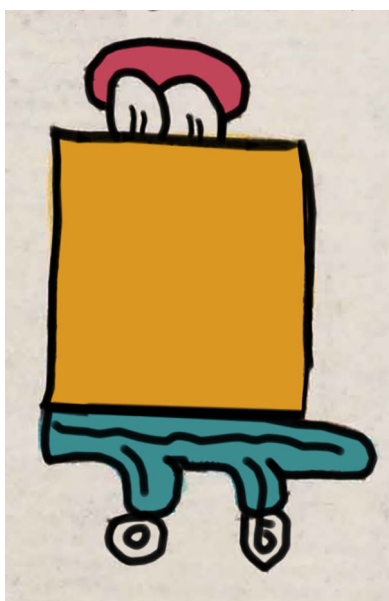


FIGURE 14. Digital drawing of Amacuzac (Amacoztitlan) place glyph, unidentified artist(s), *Codex Mendoza*, folio 23r. Bodleian Libraries (artwork in the public domain; drawing provided by Alanna Radlo-Dzur)

are too abraded or faded to identify clearly. In other cases, it is difficult to clarify exactly how to standardize their orthography based on the spelling used in the document. While Amacozac could easily be connected to Amacuzac in present-day Morelos based solely on the name, for the time being there is no corroborating evidence to support this identification except for two intriguing connections found in the *Codex Mendoza*.⁶⁸ On folio 23r, the phonetic toponym (fig. 14) is rendered with a square of amatl painted *coztic* (yellow) to indicate the *Amacoztic* trees (*Ficus petiolaris*) for which the town is named, suggesting at least that the raw materials of amatl were available there. Although it is unclear if amatl was made in Amacozac itself, the imperial province of Cuauhnahuac that is described on folio 23r of the *Codex Mendoza* specialized in paper production and paid tribute in the form of eight thousand bundles of paper either semi-annually or every eighty days, depending on the source.⁶⁹ Likewise, Cuauhnahuac was also one of the twenty provinces that produced the *cuextecat* warrior costume that frequently included the *cuexyoh chimalli* held by the Indigenous warrior in the battle depicted on the tira. Beyond Amacuzac, several

68. "Amacuzac," *Colección enciclopedia de los municipios de México* (Mexico City: Secretaría de Gobernación y Gobierno del Estado de Morelos, 1988), 22–24; Berdan and Anawalt, *Codex Mendoza*, 1:171, 2:41–43.

69. Berdan and Anawalt note differences in the amounts and periods between the Spanish and Nahuatl glosses in both the *Codex Mendoza* and the cognate pages of the *Matrícula de Tributos*, *Codex Mendoza*, 2:42.

of the *tlaxilacalli* can be matched to similar place names in the surrounding areas of the Puebla-Tlaxcala valley bordering on the present state of Veracruz, as well as in the Mixteca Alta, but no substantiating evidence connects any of these presumably independent polities with each other or to a central, governing *altepetl*.

The same *tlabcuiloh* also made other changes to the tira: he labeled two events with place names. The first, appearing beside the Christian cross, is not fully legible, but the second labels the battle between conquistador and Indigenous warrior or, more likely, the location where such a conflict took place. While others have identified this gloss as Texlapalco, Tetlapalco or Telapalco, we read this gloss as Tenampolco, the "Place of the Big Walls" (from *tenamitl*, meaning "parapet" or "wall," with *-pol* an augmentative suffix, in this case meaning "very," along with the locative *-co* "place of"). In Nahuatl, the letters *n* and *m* often erode into one another, as well as the adjacent vowels *o* and *u*. Therefore, this name may have been known as Tenanpolco or Tenampulco. For example, Tenanpulco-Matlactonatico, subordinate to Tlaxcala in the sixteenth century, is known today as Tenampulco, Puebla. Tenanpulco-Matlactonatico features on a map in the *Relaciones geográficas* by which imperial administrators described their colonial towns to the Spanish king.⁷⁰ In the map alongside a logographic place name in the form of a hill surrounded by large walls, a looming steer towers over the village, indicating the widespread growth of European-style cattle ranches.⁷¹ A second Tenanpulco recorded in another *Relación* map was a tributary of a larger town called Tzicapulzalco described in Ichcateupan.⁷² Yet another Tenampulco is found in the Sierra de Puebla region, where an eighteenth-century hamlet grew on the foundations of an *altepetl* that had been abandoned at the end of the sixteenth century.⁷³ Despite these tantalizing leads, the exact location identified by the gloss remains unclear.

70. See the *Relación geográfica* map of Tenanpulco and Matlactonatico, 1581, Benson Latin American Collection, University of Texas Libraries, Austin.

71. Barbara Mundy, *Mapping of New Spain: Indigenous Cartography and the Maps of the Relaciones Geográficas* (Chicago: University of Chicago Press, 1996), 153–55, fig. 73, 223.

72. Described by Lucas Pinto, Alonso Velázquez, Gonzalo de Rojas, and a Nahuatlato from Tzicapulzalco on October 20, 1579. René Acuña, *Relaciones geográficas novohispanas del siglo XVI*, vol. 6 México, tomo primero (Mexico City: UNAM – Instituto de Investigaciones Antropológicas, 1982–88), 257, 270.

73. Emilio Kouri, "The Practices of Communal Landholding: Indian Pueblo Property Relations in Colonial Mexico," in *Beyond Alterity: Destabilizing the Indigenous Other in Mexico*, ed. Paula López Caballero and Ariadna Acevedo-Rodrigo (Tucson: University of Arizona Press, 2018), 37–38. See also

The original alphabetic text was enhanced with European iron gall ink for clarification, perhaps when the document was presented at court. This represents the hand of a sixth and final *tlabcuilob*. Even in visible light, it is apparent that two inks were used to write the glosses: one grey-black ink and another browner in color that seems to have been written over the first text, likely to redefine the letters. While the first alphabetic black ink records the words don Martín spoke before the assembled group of nobles at Amacozac, the second clarifying ink may have been the result of a New Spanish court official making the original words more legible when the document was introduced as evidence during a property dispute. After the document played its role in a colonial court, its history becomes less clear.

DON MARTÍN'S TIRA AS A COLLECTED AND STUDIED OBJECT

The next phase in the life history of the tira is made visible through records of provenance, display, and conservation. Where the document went after the land dispute is unknown, but it was likely preserved in a court archive in the region of the dispute itself. If we take Amacuzac in Morelos to be the site named as Amacozac, then in all likelihood that regional court would have been located at Cuernavaca, and documents such as the tira would have been preserved there. If those archives were not looted in the instability of Mexican independence from Spain (1821), then colonial archives were continually at risk during the successive conflicts centered on Cuernavaca during the Mexican Revolution (c. 1910–20). Incentivized by the influx of foreign capital, visually exotic documents often found their way out of private and state collections.

One way or another, the document fell into the hands of a contact of Marshall H. Saville, an American archaeologist and collector for museums. Saville's long-standing interest in Mexican history and codices has been documented in extensive correspondence, notes, and chronicles

Bernardo García Martínez, *Los pueblos de la sierra: el poder y el espacio entre los indios del norte de Puebla hasta 1700* (Mexico City: Colegio de México, 1987); Bernardo García Martínez, "Pueblos de Indios, Pueblos de Castas: New Settlements and Traditional Corporate Organization in Eighteenth-Century New Spain," in *The Indian Community of Colonial Mexico: Fifteen Essays on Land Tenure, Corporate Organizations, Ideology, and Village Politics*, ed. Arij Ouweneel and Simon Miller (Amsterdam: Centrum voor Studie en Documentatie van Latijns Amerika, 1990), 103–16. See also *Colección enciclopedia de los municipios de México: Puebla*, vol. 20 (Mexico City: Secretaría de Gobernación, 1988), 863–66, 1131, 1151; G. F. Elkholtm and I. Bernal, *Handbook of Middle American Indians: Archaeology of Northern Mesoamerica* (Austin: University of Texas Press, 1976), 532–37.

principally in the American Museum of Natural History archives. In 1901, he published an article, "Mexican Codices: A List of Recent Reproductions," which advocated the collection of Mexican books, writing "as is well known, several of the tribes of Mexico had attained a degree of culture at the time of the Spanish conquest that led to the recording of events of national importance and much that related to their religion, not only on stone bas-reliefs and sculptures, but on material of a more perishable nature."⁷⁴

Not long thereafter, Saville purchased the Tira of don Martín from an unknown source in Mexico in 1925. Sponsored by Thea Heye, wife of Museum of the American Indian (MAI) founder George Gustav Heye, Saville travelled to Peru and Mexico from December 1924 through February 1925 as one of the official delegates of the United States government to the Third Pan American Scientific Congress, which convened in Lima from December 20, 1924, to January 6, 1925. While in Mexico for this trip, Saville collected specimens and visited various sites in the Valley of Mexico that had been recently explored by Dr. Manuel Gamio.⁷⁵ MAI accession records from this trip include a single document listing Saville's purchases and field expenses, but only Peru is noted.⁷⁶ The record lists "a tribute roll on amate paper. Executed about 1530. Texcoco."⁷⁷ Likely this was the first mention of the tira in its MAI collecting history. Saville listed the cost of this "Mexican Codex" as three hundred US dollars, approximately four thousand dollars in today's currency.⁷⁸

74. Marshall H. Saville, "Mexican Codices: A List of Recent Reproductions." *American Anthropologist* 3, no. 3 (1901): 532–41, esp. 532.

75. Further evidence that Saville was in Mexico: "Dr. Manuel Gamio, who while a student at Columbia University accompanied Professor Saville as an assistant on the Marie Antoinette Heye Expedition to Ecuador in 1910, has been appointed Subsecretary of Public Education in the cabinet of President Calles of Mexico. Dr. Gamio has been Director of Anthropology and Inspector of Ancient Monuments in Mexico for some time. The Department of Anthropology has been given control of the National Museum, a consolidation that will be the means of advancing research in American archeology to a considerable degree. Plans are in progress for conducting extensive field work in ethnology and archeology in Oaxaca, similar to that prosecuted under Dr. Gamio's direction in the Valley of Mexico at Teotihuacan." *Indian Notes*, Heye Foundation, Museum of the American Indian, New York, vol. 2, no. 2 (April 1925): 135–36.

76. *Indian Notes*, 135–36.

77. Gift roster titled "Purchased in Peru by M. H. Saville," February 1925, Museum of American Indian Heye Foundation Record, box 296A, folder 5. The items in this group were designated NMAI accession lot 1925.0029 in 2016 by NMAI staff as part of a provenance project to digitize MAI/Heye Foundation Records (1890–1989) donor/source documents and implement a retroactive accession lot system.

78. Fieldwork expense report titled "Specimens purchased Lima and Mexico," Marshall Saville Papers, Anthropology Archives, box 5, folder 16,

The American Museum of Natural History (AMNH) archives holds a version of the same list of purchases and fieldwork expenses from the 1925 trip, amended to include Mexico. Research over the last several years by NMAI staff in the MAI-Heye Foundation (HF) and AMNH archives has enabled clarification of accession records for the 9,750 items from Latin America excavated or purchased by Saville, including this tira. Saville's purchases contributed to the tradition of American collectors in the growing antiquities market, adding the wonders of the ancient Americas to both private and public collections in the United States.

Reverend Cuevas may be credited with bestowing the name "Codex Saville" on the tira in a triumphalist article published in the 1929 *Catholic Historical Records and Studies*. A member of the Royal Historical Academy of Spain and the American Antiquarian Society, he described how the document was "recently secured in Lima, Peru by the Heye Foundation." MAI/HF records note that "during the early spring, Dr. Mariano Cuevas, S.J., the well-known historian of Mexico, made a critical study of an original Mexican codex on native paper which was presented to the Museum several years ago by Mrs. Thea Heye. It is expected that the results of Dr. Cuevas' investigation will ultimately be published by the Museum." At this time the museum was in financial straits and stopped publishing *Indian Notes*, resuming in 1972, so it is not surprising that the museum did not end up publishing the work.

Cuevas began his commentary on the tira's size and materials, making a preliminary pass at what it meant for the "race Nahuatl." A product of his time, Cuevas applauds the "brilliant successes" of Marshall Saville in collecting objects related to Latin American history, emphasizes the "Mexican" chronological cycle, and highlights the political history of rulership leading up to Moteuczoma. He divides the tira in two halves—pre-Cortesian and post-Cortesian—despite the fact that spatially only one-fifth of the document describes history after Hernán Cortés's 1519 invasion of the Valley of Mexico. Cuevas ends by saying, "If it is the oldest Mexican historical Codex, we might

American Museum of Natural History (AMNH). Saville served as curator at AMNH from 1894 to 1910, during which time he conducted extensive fieldwork principally in Oaxaca. He joined the MAI/HF in 1916, although his relationship with Heye began in 1906, and he collected for Heye (even when he was still affiliated with AMNH) from that point until his departure in 1933. He resigned due in part to financial reversals suffered by Heye and the institution following the 1929 stock market crash. He later returned to AMNH and stayed until his death in 1935. Saville's papers and field photographs, including those from his tenure at the MAI/HF, were donated by his son Randolph Saville to the AMNH archives in 1951.

easily conclude that it is the oldest book in America and nothing of the kind was ever painted by any of the native Indians of either North or South America."⁷⁹ In this era of American exceptionalism, Cuevas provided the United States with an antique history captured from south of the border.

Cuevas's article has taken on a life of its own in literature on the Virgin of Guadalupe. Looking at the images of two female figures bedecked in blue garments at the very end of the tira, he saw something more than the Madonna. He reads the "virgin with her hands folded near her heart, her head bent toward her right shoulder, dressed in a salmon colored tunic and a greenish blue mantilla" as the Virgin of Guadalupe. The story of the Virgin's apparition holds that she appeared to an Indigenous believer named Juan Diego Cuauhtlatotzin in 1531.⁸⁰ Counting the years on the tira from after the battle to the appearance of Christian imagery also gives a date of 1531, so Cuevas argued that the document must reveal the Virgin of Guadalupe, as she is "venerated in Tepeyac, four miles north of the City of Mexico, and some six miles south of San Marcos."⁸¹ Through this assertion of iconographic likeness, Cuevas uses the Virgin to locate the document and buttress his argument for the document's date. Subsequent scholars such as Edwin Edward Sylvest and José Bravo Ugarte have cited this same manuscript as proof of the Virgin's first apparition without questioning Cuevas's analysis.⁸² Bravo Ugarte claimed that this manuscript was "one of the seven authentic Indian Guadalupan documents originating in the Valley of Mexico."⁸³ We, by contrast, see that the statue does indeed depict the Holy Virgin but note that she is also holding the Christ Child in her arms—something Guadalupe is never depicted doing. Likewise, the painting shows

79. Cuevas, "Codex Saville," 20.

80. Stafford Poole, *Our Lady of Guadalupe: The Origins and Sources of a Mexican National Symbol, 1531-1797* (Tucson: University of Arizona Press, 2017), 26-33. Poole critiques the cult of Guadalupe for turning to specious evidence.

81. Cuevas, "Codex Saville," 17.

82. Edwin Edward Sylvest, *Nuestra Señora de Guadalupe: Mother of God, Mother of the Americas* (Dallas: Bridwell Library, 1992). Published in conjunction with an exhibition held at the Elizabeth Perkins Prothro Galleries, Bridwell Library, Southern Methodist University, July 25-September 19, 1992.

83. José Bravo Ugarte, S. J., *Cuestiones históricas guadalupanas* (Mexico City, 1946) lists the Codex Tetlapalco in *Anales de la Fundación Heye de Nueva York* as one of the seven authentic Indian Guadalupan documents originating in the Valley of Mexico and notes it as one of the six important documents unknown to Icazbalceta, a nineteenth-century skeptic. See also Nancy Rosoff, "Codex Tetlapalco," in *Creation's Journey: Native American Identity and Belief*, ed. Tom Hill and Richard W. Hill (Washington, DC: Smithsonian Institution Press, 1994), 212-13.

Mary as the Queen of Heaven with a crown floating above her head; although Guadalupe was indeed depicted with a crown in early images based on the graphics of the Virgin Immaculate, the feature of a crown was not exclusive to her cult.⁸⁴ Instead, it should not be surprising that an early colonial church would feature images of Mary. Likewise, the coincidence of a 1531 date does little to attach the tira to the specific cult of Guadalupe. Many colonial churches were established across Central Mexico from 1524, especially in greater density around the population centers in Hidalgo, Morelos, Puebla, and the central valley.⁸⁵ Thus, we conclude that there is no connection manifest here to the apparition of the Virgin of Guadalupe.

Museum records do not indicate exactly when the tira first went on display, and it received little attention during the middle of the twentieth century. In a 1944 book, a photograph of the top section of the tira was published with the title “Codex Telapalco” along with a short description.⁸⁶ Later, it was documented with the title “Codex Texcoco” in a drawing of an exhibit case housed in the Williams Hall of Middle American Archeology in the West Hall, third-floor galleries of the MAI/HF, which were remodeled and reopened in May of 1961. Coley Taylor also noted the tira in a 1956 publication, saying: “On the west wall of the third floor gallery, in the Mexican section of the Heye Foundation, Museum of the American Indian, Broadway at 155th Street, New York, hangs a strip of cactus paper, approximately six feet long by seven or eight inches wide. It is irregular in shape and width, and is obviously torn off at the top, where a sketch of a church bell ends.”⁸⁷

84. Our thanks to Jeanette F. Peterson for clarifying this point. On the image of Guadalupe, see Jeanette Favrot Peterson, *Visualizing Guadalupe: from Black Madonna to Queen of the Americas* (Austin: University of Texas Press, 2014); Jeanette Favrot Peterson, “Creating the Virgin of Guadalupe: The Cloth, the Artist, and Sources in Sixteenth-Century New Spain,” *The Americas* 61, no. 4 (April 2005): 571–610; and Jeanette Favrot Peterson, “The Virgin of Guadalupe: Symbol of Conquest or Liberation?” *Art Journal* 51, no. 4 (Winter 1992): 39–47.

85. Robert Ricard, *The Spiritual Conquest of Mexico: An Essay on the Apostolate and the Evangelizing Methods of the Mendicant Orders in New Spain, 1523–1572*, trans. Lesley Byrd Simpson (Berkeley: University of California Press, 1966), 61–64. Ricard notes the difficulty of pinning down specific dates when particular orders were established because of the imprecise or general terminology and often impossible chronologies contained in correspondence, chronicles, and administrative documents.

86. Victor Wolfgang Von Hagen, *The Aztec and Maya Papermakers* (New York: Augustin, 1944), plate 5.

87. See Donald Demarest and Coley Taylor, eds., *The Dark Virgin: The Book of Our Lady of Guadalupe; A Documentary Anthology* (Freeport, ME: Coley Taylor, 1956), 175.

In contrast, scholars began to highlight new aspects of the tira’s composition. In his 1975 compilation of Mesoamerican manuscripts, John Glass consolidated the common names for the document and mentioned its contested history.⁸⁸ Glass noted that the Nahuatl alphabetic glosses had yet to be studied, a feature only now remedied in this article. Other authors, such as Manuel Aguilar-Moreno, treat the vertical tira in a similar fashion, describing it as pictorial annals from 1407 to 1535, with emphasis on the succession of rulers in Tenochtitlan and the Spanish conquest.⁸⁹ These later descriptions often only cite Glass and Cuevas, perpetuating the latter’s interest in imperial events of Tenochtitlan and the encounter with Europeans over the aspects of local history centered in our reading. Elizabeth Boone, who likewise cited Cuevas and Glass, diverged in her description of the tira’s orientation (running bottom to top) and emphasized its combination of local and Tenochtitlan history. She connected the tira to others that likewise represent time in an unbroken ribbon (often rectangles rather than this tira’s disks) that runs the length of the document, and argued that unbroken annals are prototypical as they take “advantage of the spatial features of the preconquest *tira* [while] all other forms begin with the strip of year and either bend or break it.” This tira’s long orientation incorporates that older tradition but depicts it with plain turquoise disks to represent the Nahuatl word *xihuitl* as both “turquoise” and “year,” as described previously. Boone notes the tira’s role in a wider tradition of history making in a dialectic between the local and imperial, and she points out that the tira is “incompletely studied and remains poorly understood.”⁹⁰ This article aims to expand on the problems both Boone and Glass identified.

CONSERVATION OF THE TIRA

In 1989, with federal legislation, the MAI/HF became the National Museum of the American Indian (NMAI) as part of the Smithsonian, and the tira entered the next phase of its collection history. This section follows the conservation, imaging, and scientific analysis that have taken place since this shift. Even before its arrival at MAI/HF, tears and weakened areas of the amatl had been reinforced by sewing

88. John B. Glass and Donald Robertson, “A Census of Native Middle American Pictorial Manuscripts,” in *Handbook of Middle American Indians*, vol. 14, ed. Robert Wauchope and Howard F. Cline (Austin: University of Texas Press, 1975), 81–252.

89. Manuel Aguilar-Moreno, *Handbook to Life in the Aztec World* (Oxford: Oxford University Press, 2006), 272.

90. Boone, *Stories in Red and Black*, 61, 198, 199–200, 201, 214, 223, 263n9.

with cotton thread in eight areas. The stitching is visible in the earliest known photographs of the tira taken by MAI staff in 1925, indicating they were added before the tira entered the collection.⁹¹ The first documented conservation treatment was carried out in 1993 at the NMAI in preparation for its loan to the J. S. Bridwell Library, Southern Methodist University, for an exhibition called *Nuestra Señora de Guadalupe: Mother of God, Mother of the Americas*. The aim of the exhibit was to mark the quincentenary of 1492 and illustrate the history of the Virgin of Guadalupe in Mexico. Daria Keynan, a paper conservator contracted for the loan, described the document's condition: it was poorly framed and pinned to a low-quality, acidic, painted board.⁹² Upon unframing, Keynan noted that the paper support was brittle with numerous folds, creases, losses, tears, areas of abrasion, and insect damage, and the lower half of the work was dominated by a water stain. Her treatment included local humidification to flatten creases and local areas of distortion, as well as to realign tears. Notably, several small areas of drawing were uncovered during this process. Weak or torn areas were mended with wheat starch paste and Japanese paper along the edges of the tira. Some small losses were filled with inserts of modern Mexican *amate* distressed to aesthetically approximate the appearance of the original amatl. To retain evidence of the life history of the tira, the water stain was not reduced and the cotton stitches were not removed.⁹³ The tira was displayed again from August 1994 to June 1996 in *Creation's Journey: Masterworks of Native American Identity and Belief*, one of the inaugural exhibitions at the George Gustav Heye Center (now NMAI-NY) at the Alexander Hamilton U.S. Custom House in lower Manhattan, and the tira was published in an accompanying volume. With no additional conservation treatment or framing undertaken, the document was displayed horizontally in the same frame used for the Bridwell Library exhibit.

As recently as 2008, the tira exemplified the imposition of European time and power onto the Nahuas of Central Mexico. For the Field Museum exhibition *The Aztec World*, curated by Elizabeth Brumfiel in collaboration with Felipe Solís, Juan Alberto Román, Leonardo

López Luján, and Gary Feinman,⁹⁴ the loan request to the NMAI described the tira:

the exhibition will close with a section on the Conquest, focusing on the melding of the Aztec and Spanish cultures. The *amate* document features a depiction of a Spanish soldier made by an Aztec artist. The conquistador is on a horse, wielding a sword, and engaging an Aztec warrior in battle. A Christian cross is also present, referencing the new religion imposed on the indigenous people.⁹⁵

Later the same year, the Field Museum requested that the tira be displayed vertically instead of horizontally, so the manuscript was remounted with an additional hinge at the top for stability. At this point, the conservator noted some minor delamination of amatl layers and consolidated these areas with wheat starch paste. The tira was then placed in a new frame, in which the conquest history would be prominently visible. This change in orientation shows a new interest in the document's own legibility, even if the conquest history was still the central focus.

In the course of its two conservation treatments, the preservation of the document revealed new information about the object's materiality. These treatments revealed the extent of overpastings and erasures in the colonial period in which past editors had tweaked the tira's chronology. Finally, the aging and deterioration—its tears, water stains, and insect damage—provide a window onto its long history as it was stored in archives kept with varying degrees of care in the distant past as well as the twentieth century. Following the collapse of its legal value after its use in court, a new American empire's collecting conserved the document. Recently, conservators and scientists have worked to increase the document's longevity and legibility by improving its preservation and display.

VISUAL AND MATERIAL ANALYSIS AT THE SMITHSONIAN

In late 2017, as part of the visual examination of the tira for this project, several coauthors disassembled the previous framing package and sliced the hinges to free the document

91. Such stitching is a repair method typically used for historic parchment records. Further research into these stitched repairs and comparative studies with other documents could illuminate more about the life history of the tira.

92. Daria Keynan, internal NMAI conservation report, National Museum of the American Indian, Smithsonian Institution, 1993.

93. Keynan, internal NMAI conservation report.

94. Elizabeth M. Brumfiel, *The Aztec World* (New York: Abrams, 2008), a catalog of an exhibition held at the Field Museum, Chicago, from October 31, 2008, to April 19, 2009.

95. Franck Mercurio (senior exhibition developer, Field Museum), loan request in correspondence to W. Richard West (director, Smithsonian National Museum of the American Indian), September 28, 2007, Registration Department of the National Museum of the American Indian, Smithsonian Institution.

from its mat. Other than documentation and examination, no further treatment was executed for this project. The material analysis component of this study prioritized non-invasive methods to characterize the colorants, substrate, and condition.⁹⁶ Colorants identified in technical imaging were confirmed by analysis with portable X-ray fluorescence spectroscopy (XRF), fiber optic reflectance spectroscopy (FORS), and Fourier-transform infrared spectroscopy (FTIR) (See appendix C). These techniques highlighted events in the biography of the tira such as the use of colorants to edit the content of the document and the addition of iron gall ink glosses (fig. 15).⁹⁷ Imaging enhanced faded and obscured text in addition to characterizing the materials. The components of the tira can now be compared with the results of other studies of Mesoamerican documents, such as those by David Buti, Diana Magaloni, and Élodie Dupey García, who have used similar techniques to understand colorants and materials of the known corpus of Nahua manuscripts.⁹⁸ These studies exemplify the importance of

96. The technical imaging carried out over three days in February 2019 at NMAI's Cultural Resources Center by E. Keats Webb, imaging scientist at the Smithsonian's Museum Conservation Institute, and Leah Bright, NMAI Andrew W. Mellon Conservation Fellow, included visible light, transmitted light, reflected infrared (RIR), ultraviolet-induced visible luminescence (UUVL), reflected ultraviolet (RUV), false color infrared (FCIR) image processing, and multiband image subtraction. Tana Villafana and Amanda Satorius conducted spectroscopic analysis at the Library of Congress.

97. For an overview of similar technical imaging methods, see Joanne Dyer, Diego Tamburini, Elisabeth R. O'Connell, and Anna Harrison, "A Multispectral Imaging Approach Integrated into the Study of Late Antique Textiles from Egypt," *PLoS ONE* 13, no. 10 (2018): e0204699; David Buti, Davide Domenici, Costanza Miliani, C. García Sáiz, T. Gómez Espinoza, F. Jiménez Villalba, A. Verde Casanova et al., "Non-invasive Investigation of a Pre-Hispanic Maya Screenfold Book: The Madrid Codex." *Journal of Archaeological Science* 42 (2014): 166–78; Jansen Maarten, Virginia M. Lladó-Buisán, and Ludo Snijders, eds., *Mesoamerican Manuscripts: New Scientific Approaches and Interpretations* (Leiden: Brill, 2019), and especially chapter 6, Chiara Grazia, David Buti, Laura Cartechini, Francesca Rosi, Francesca Gabrieli, Virginia M. Lladó-Buisán, Davide Domenici, Antonio Sgamellotti, Aldo Romani, and Costanza Miliani, "Exploring the Materiality of Mesoamerican Manuscripts by Non-invasive Spectroscopic Methods: Codex Laud, Bodley, Selden, Mendoza and Selden Roll at the Bodleian Library," 134–59.

98. Buti and his colleagues outline their findings by color and discuss the results of their noninvasive analysis using XRF, mid-IR FTIR, Raman, UV-Vis reflection, and emission spectroscopy. David Buti, Davide Domenici, C. Grazia, Joanna Ostapkowicz, S. Watts, A. Romani, Federica Presciutti, Bruno Brunetti, A. Sgamellotti, and Costanza Miliani, "Further Insight into Mesoamerican Paint Technology: Unveiling the Colour Palette of the Pre-Columbian Codex Fejérváry-Mayer by Means of Non-invasive Analysis," *Archaeometry* 60, no. 4 (2018), doi: 10.1111/arc.12341; Diana Magaloni, "The Traces of the Creative Process: Pictorial Materials and Techniques in the Beinecke Map," in *Painting a Map of Sixteenth-Century Mexico City: Land, Writing, and Native Rule* (New Haven, CT: Yale University, 2012), 75–90. See also Chiara Grazia, David Buti, Anna Amat, Francesca Rosi, Aldo Romani, Davide Domenici,

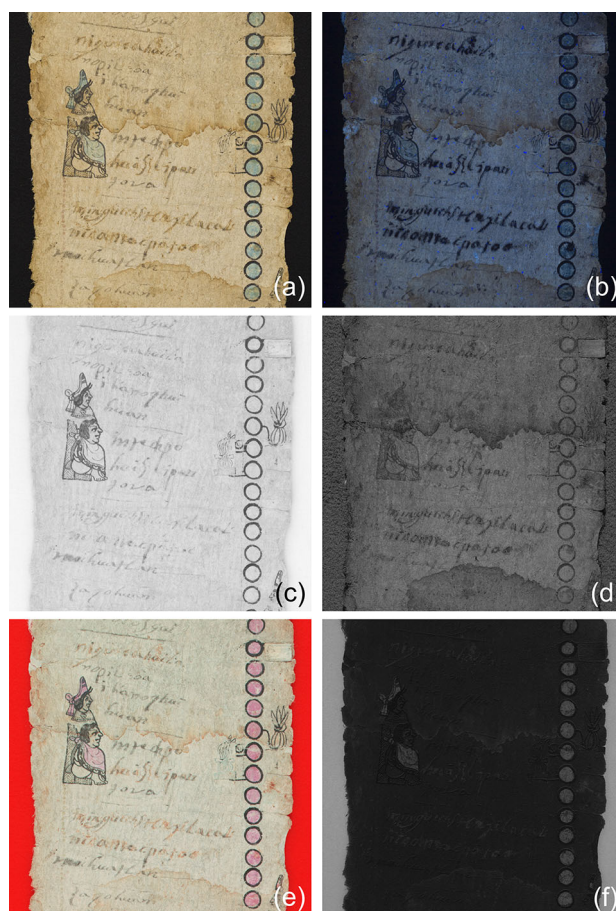


FIGURE 15. A section of the amatl from different imaging modes, illustrating various material characteristics in (a) visible light image; (b) UUVL image, showing dark, highly absorbent areas that suggest presence of iron gall ink; (c) RUV image that highlights surface issues like water staining; (d) multiband image subtraction showing areas that have a difference in reflectance between 660 nm and 735 nm as a bright grey-silver color, which is characteristic of indigo; (e) false color infrared (FCIR) image processing, showing indigo-containing areas as bright pink; and (f) RIR image illustrating absorbance of carbon-containing inks. Unidentified Nahua artist(s), *Tira of don Martin*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photographs by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

Antonio Sgamellotti, and Costanza Miliani, "Shades of Blue: Non-invasive Spectroscopic Investigations of Maya Blue Pigments. From Laboratory Mock-Ups to Mesoamerican Codices," *Heritage Science* 8, no. 1 (2020): 1. Dupey García summarizes existing scientific analyses of the codices Cospi, Fejérváry-Mayer, Colombino, Zouche-Nuttal, and Borbonicus, explaining that central Mexican palettes are mostly organic in origin, while Maya documents can include inorganic and mineral pigments. Élodie Dupey García, "The Materiality of Color in Pre-Columbian Codices: Insights from Cultural History," *Ancient Mesoamerica* 28, no. 1 (2017): 21–40.



FIGURE 16. Overall transmitted light composite image showing the striations and seams in the amatl, unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb, provided by NMAI Photo Services)

interdisciplinary research, combining the skills and knowledge of scientists, historians, and conservators to provide a more holistic understanding of a document's history.

The basic materials used to create the initial content of the tira were, simply, plain amatl and *tlilli* (lampblack ink). The substrate of the tira is amatl, a type of paper made from the fibers of the inner bark of *Ficus* (fig trees), pounded into sheets using specially shaped stone beaters called *xicaltētl*.⁹⁹ The corduroy-like striations made by ridged *xicaltētl* are characteristic of amatl, emphasized in transmitted light imaging. Transmitted light also shows six seams where individual sheets of double-ply amatl were joined together (fig. 16). There are at least two layers of amatl in each sheet, but the precise number of layers and means of joining could not be identified during this phase of research. It is interesting to note that there is no ground or preparatory layer: the *tlahcuilohqueh* painted directly onto the amatl. All black outlines on the tira absorb infrared radiation in a manner consistent with a carbon-based colorant like *tlilli*, and this is apparent in the reflected infrared images.

Edits made to the document in successive campaigns used color. All of the blue areas were painted with an indigo-containing colorant, which was mapped with multiband image subtraction and false color infrared (FCIR) imaging.¹⁰⁰ Some areas in which blue and black were mixed—

such as along select *tilmahltli*—are visible in the FCIR images as a lighter pink color, suggesting the presence of indigo, but at a lower concentration. This mixing also represents a shift in technique; later *tlahcuilohqueh* added European-style three-dimensional shading to the diagrammatic line drawings that are more typical of earlier Mesoamerican documents. Red areas, such as the *tlacamecayotl* (lineage) depicting the bloodline, were made using cochineal, suggested by the FCIR image where the colorant appears as a bright yellow.¹⁰¹ There are also areas of what seem to be faded yellow and green organic colorants, but we could not characterize these with the analytical techniques employed in this study. The brown ink has a characteristic absorbance of ultraviolet radiation indicative of iron gall ink, which is visible in the ultraviolet-induced visible luminescence (UVL) images. The grey-black ink seems consistent with a carbon-containing ink like *tlilli*, although it does not absorb as strongly as other black areas in the RIR images (fig. 17). Thus, it may be a mixture of inks, a dilution, or another ink entirely. XRF confirmed that organic colorants were used throughout the colored areas of the document: no inorganic elements such as copper, iron, or mercury were detected. High levels of iron relative to the blank substrate were detected with XRF, thereby confirming that these portions were written, as suspected, with the iron gall ink brought by Europeans.

Imaging helped clarify areas of damage and repair to the tira. Water damage resulted in staining of the amatl from the movement of acidic degradation products and iron-containing components of the iron gall ink. These stains are most clearly apparent in the FCIR images. The eight rows of stitches used to repair breaks in the amatl were found to be made using a white, two-ply cotton thread.

99. Hans Lenz, *El papel indígena mexicano* (Mexico City: Secretaría de Educación Pública, 1973); Citlalli López Binnqüist, Alejandra Quintanar-Isaías, and Marie Vander Meeren, "Mexican Bark Paper: Evidence of History of Tree Species Used and Their Fiber Characteristics," *Economic Botany* 66, no. 2 (2012): 138–48; M. Schwanninger et. al., "A Review of Band Assignments in Near Infrared Spectra of Wood and Wood Components," *Journal of Infrared Spectroscopy* 19, no. 5 (2011): 287–308.

100. Multiband image subtraction exploits the known absorbance/reflectance characteristics of indigo between 660 and 735 nm, so the image produced shows areas with this reflectance as bright grey, while the rest of the tira remains dark. FCIR is an image processing method using a visible light image and a reflected infrared image of the same view of an object to characterize and differentiate materials, effectively mapping their distribution across the codex. In this instance, the areas painted with an indigo-based colorant appear bright pink; areas painted with cochineal appear a bright yellow in the FCIR images. See E. K. Webb, R. Summerour, and J. Giaccari, "A Case Study Using Multiband and Hyperspectral Imaging for the Identification and

Characterization of Materials on Archaeological Andean Painted Textiles," *Textile Group Postprint* 24 (2014): 23–35; Buti et al., "Further Insight."

101. For an introduction to the extensive literature on cochineal, see Carmella Padilla and Barbara Anderson, eds., *A Red like No Other: How Cochineal Colored the World* (New York: Skira Rizzoli, 2015); Stephen Houston, ed., *Veiled Brightness: A History of Ancient Maya Color* (Austin: University of Texas Press, 2009).



FIGURE 17. Details showing distinct layering of inks in visible light, iron gall ink written over a likely carbon-based ink, unidentified Nahuatl artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photographs by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

These alterations changed the content of the tira; for instance, the Ocelotl name glyph is partially obscured by one of these sewn repairs. However, the sheer fact that this thread is made of cotton does not help identify when the stitches were made to the document. Perhaps, in the vein of Mary Elizabeth Smith's analysis of the Codex Selden, the roughness of the sewing lent the tira an antique quality just as its pictographic aesthetic signified the authenticity of a deep past in a New Spanish court. In short, the damage and repairs leave behind a beguiling history of preserving the document as a whole. These preservation efforts may date to the colonial period, and damage likely continued in the years following the land dispute, but a detailed chronology of the repairs remains challenging to discern.

THE FUTURE OF THE TIRA'S CULTURAL BIOGRAPHY

Cultural biography focuses on the lives of objects that outlast human generations. As they move from one collection and context to another, objects have the potential to take on new meanings in divergent systems of value. The Tira of don Martín is just such a storied object that acquired new meanings as it moved from one hand to the next. The tira depicts the foundation of an *altepetl* from the beginning of cosmological time through the migration and establishment of the community at a place and with a founding *tlahtoani* (fig. 18). Although the *altepetl* is difficult to locate geographically, we are able to follow the succeeding generations of the ruling lineage through their *tlacamecayotl* up to the reign of "cuetzpalin-tetl" and into the new regime of Spanish-Catholic empire in the sixteenth century. Through successive changes, additions, and deletions, the document was molded to fit the needs of subsequent guardians,

collectors, and institutions. Our focus on chronology, from this object's creation to its current residence in the NMAI collections, aims to preserve and reflect the document's own emphasis on continuity despite the Spanish invasion, edits, and subsequent relocations.¹⁰²

Our study of this single document is part of a longer history of textual interpretation of Mesoamerican manuscripts that takes seriously Nahuatl communicative strategies and their ontologies beyond teleological linkages to European history. Throughout the late 1970s and early 1980s, Dennis Tedlock pushed scholars to think beyond Western concepts of hermeneutics and poetics when interpreting the spoken works of other cultures. Scholars understood Nahuatl communication as largely oral, where written or visual texts had meaning in part because of the narrations they were supposed to provoke. Documents such as the tira are verbal texts referencing a *longue durée* of literate Nahuatl-speaking culture, even if this "writing without words" does not replicate speech in exactly the same manner as alphabetic texts do.¹⁰³ These documents are not merely a set of cues referencing a memorized text, and their use went far beyond that of an *aide mémoire*. Instead, these objects are legible as a unique form of expression tied directly to language. As Eduardo de Jesús

102. While the Tira of don Martín is by no means unique in this emphasis on continuity (which is likewise reflected in other codices from the same period), such transtemporal links across the sixteenth century are still relatively rare in a field of Latin American history defined by departments and expertise according to the siloed pre-Columbian, colonial, and modern eras. While scholars such as Camilla Townsend, Justyna Olko, and Louise Burkhart, as well as other successors of the Lockhart school of Nahuatl studies, promote this idea of continuity, it is still surprisingly liminal in the wider field.

103. Elizabeth Hill Boone and Walter D. Mignolo, eds., *Writing without Words: Alternative Literacies in Mesoamerica and the Andes* (Durham, NC: Duke University Press, 1994).

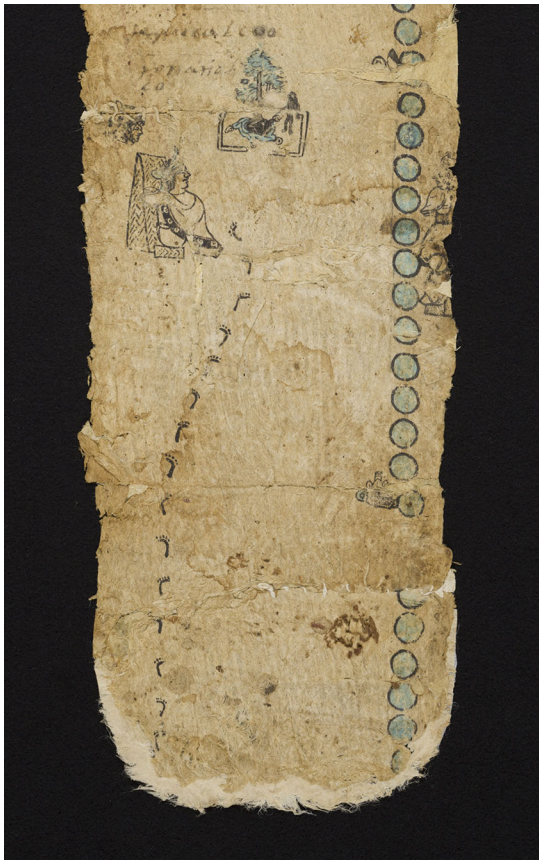


FIGURE 18. The beginning of the tira, approximately lower fourth of the *amatl*, showing footprints leading to the founding Ocelotl *tlabtoani*, unidentified Nahua artist(s), *Tira of don Martín*. National Museum of the American Indian, Smithsonian Institution, 13/6913 (artwork in the public domain; photograph by Leah Bright and E. Keats Webb provided by NMAI Photo Services)

Douglas writes, “these documents can articulate and communicate meaning themselves rather than recall another and preexisting text, and they did so more and more after 1521 in response to new challenges and influences,” continuing, “the texts, like their authors, if not all their intended audiences, are finely attuned to metaphor, parataxis, parallelism, and substitutions; and in order to read them, we must be too.”¹⁰⁴ Just as Tedlock read the Quiché Popol Vuh over the shoulder of a diviner, one can imagine how readers were supposed to engage with the tira. Perhaps they would stand encircled around it while history was narrated to a crowd. They may have commented on the rulers, folding and unfolding the *amatl* to compare the extent of their

104. Douglas, *In the Palace of Nezahualcoyotl*, 14.

respective reigns or the meaning of each political transition. Later, when hung in the Heye Foundation gallery, modern observers would stand before the tira, speaking of its materiality, depiction of the human form, artistic technique, or the distant history it mysteriously depicted. As digitized collections lower the barrier of entry for accessing Mesoamerican texts, we have seen an expansion in readership and scholarship derived from both formal and informal methodological schools of analysis, fueling new conversations.¹⁰⁵

Most of all, we hope that the tira finds new Indigenous audiences. While foreign interpretive traditions create ever more elaborate toolkits by which to draw meaning from Mesoamerican texts and artifacts, Indigenous scholars like Luis Reyes García have resisted the segregation between the collection and interpretation of such documents.¹⁰⁶ Indeed, these local histories should be available to and interpreted by Nahuatl speakers across present-day North America. This article aims to show how Nahua communities maintained and survived successive imperial regimes—a process that continues today. By focusing on the Nahuatl language and the structures of Indigenous time and history making, we are attempting as nonnative scholars to view this document from an Indigenous perspective in a long and convoluted cultural biography. This investigation of the materiality, life history, and provenance of the document contributes to its recontextualization. Scholarship that engages with Nahuatl in this way contributes to language revitalization projects, which open the archives to descendant communities, allowing the process of reclamation to continue in order to take back the narration of their own history. The tira was meant to be read by locals to whom it had meaning, used as proof in negotiating a heritage that was, in turn, deeply linked to place. May a new generation of readers find the “tree-in-a-pond-in-a-courtyard” place.

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105. For formal traditions including the Dutch School, Mexican, American, Spanish Traditions, and the Galazar School, see Michel R. Oudijk, “De tradiciones y métodos: investigaciones pictográficas,” *Desacatos* 27 (2008): 123–38.

106. Luis Reyes García, “Introducción: los Nawas actuales de México,” in *Der Ring aus Tlalocan*, ed. Luis Reyes García and Dieter Christensen, vol. 12 (Berlin: Gebr. Mann Verlag, 1976); Juan Julián Caballero, “Recordando al maestro Luis Reyes García,” *Desacatos* 17 (2005): 171–76.

initiating the germ of this project when she, along with Diana Magaloni Kerpel and the Dumbarton Oaks Pre-Columbian Studies Program under the direction of Colin McEwan, included NMAI and the tira in the 2019 Pre-Columbian Studies Colloquium “Mesoamerican Codices: New Discoveries and New Directions.” For their assistance with Nahuatl, we give thanks to John Sullivan, Jessica Stair, Bérénice Gaillemín, and the participants of the 2019 Summer Nahuatl Intensive at the University of Utah as well as gratitude for the ongoing support of the entire Instituto de Docencia e Investigación Etnológica de Zacatecas (IDIEZ) community, particularly Eduardo de la Cruz, Sabina Cruz, Abelardo de la Cruz, Alberta Martínez Cruz, Carlos Cerecedo, Rosa de la Cruz, and Alma de la Cruz. Our thanks are also due to Maria Galban, NMAI Collections Information and Documentation, for her invaluable MAI/NMAI provenance research and assistance with archival materials, and to Manuel Gancedo, NMAI Director’s Office, and Marian Kaminitz and the NMAI Conservation Department for research support. We are grateful to Kristen Mable, Registrar for Archives and Loans, Anthropology Division Archives, American Museum of Natural History, for access and assistance. Leah Bright’s NMAI fellowship was supported by the Andrew W. Mellon Foundation. Research funding was also made possible by Hamilton College, as well as the Department of the History of Art Aida Cannarsa Snow Travel Grant and the College of Arts and Sciences Arts and Humanities Graduate Research Grant from The Ohio State University. Finally, we are grateful for the thoughtful comments we received from Byron E. Hamann, Jeanette Favrot Peterson, the anonymous readers, and the editorial team at *Latin American and Latinx Visual Culture*.

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Mary Elizabeth Haude is a paper conservator at the Library of Congress. She performs treatments and materials research on the collections, specializing in sixteenth-century Mexican manuscripts. She holds an MLIS with an advanced certificate in conservation from the University of Texas at Austin.

Tana Villafana is a chemist at the Library of Congress working mainly with conservators to study collection items using a variety of noninvasive spectroscopy techniques and to further develop methodologies for pigment identification. Tana holds a PhD from Duke University, specializing in nonlinear laser spectroscopy and spectroscopic imaging.

Amanda K. Satorius is a preservation science specialist at the Library of Congress, where she performs material science research to identify paper composition and historical pigments using portable, nondestructive instrumentation. Amanda holds an MSc in conservation practice from Cardiff University, Wales, and bachelor’s degrees in chemistry and art history.

APPENDIX A. COMPILED TRANSCRIPTION AND TRANSLATION

The following is a transcription and translation of the Nahuatl language glosses. They are inscribed running top to bottom, while the rest of the document reads bottom to top. Transcription line numbers are provided for

two sections, where: (a) a pair of glosses appears beside the cross and the battle, and (b) a continuous text regarding inheritance begins under the feet of the *tlabtoani* “oztotl-acatl.”

Transcription	Standardization	Translation
<i>Glosses on battle and cross</i>		
[01] pe[?]-ña-	pe [?] ña-xico	[-co is locative, this is a place-name]
[02] -xico		
[03] tenāpolco	Tenanpolco	Tenanpolco ¹⁰⁸
<i>Glosses on inheritance</i>		
[04] nicā i ihuā-	nican in ihuan	here together with him (at)
[05] -ca ---- amaco-	cah ---- Amacozac	Amacozac
[06] -çac		
[07] tehuantin tipipil-	tehuantin tipipiltin	we nobles
[08] -tin --- nica amaco	nican Amacozac	here (at) Amacozac
[09] -çac ----- neol	---- nehuatl	I,
[10] don martin	don Martín	don Martín
[11] [?] yao [?]	[?] yao [?]	[line cut off by reattachment of document]
[12] tec[?]sos[?]xal	tech[?]sos[?]xal	[?]
[13] niqincahuilia	niqincahuilia	I give it to them
[14] nopiloa	nopilhuan	my children
[15] ihua noxhui-	ihuan noxhuihuan	and my grandchildren
[16] -huan		
[17] intechpo-	intechpohuiz ipan	it will belong to them
[18] -huis ipan		
[19] tova	toda	all
[20] in ixquich [§] tlaxilacali	in ixquich § tlaxilacalli	in these § tlaxilacalli
[21] nican tecpantoc	nican tecpantoc	here in this order [the document will now list the names of tlaxilacalli:]
[22] [?] cihuatlan	[?] cihuatlan	[?] cihuatlan ¹⁰⁹
[23] zaxohuan	Zaxohuan	Zaxohuan
[24] [?]coauh qomolco	[?]coauhcomolco	[?]coauhcomolco
[25] tlatacolco	Tlatacolco	Tlatacolco
[26] cacahuaxochitlā	Cacahuaxochitlan	Cacahuaxochitlan ¹¹⁰
[27] [?]apalco	[?]apalco	[?]apalco
[28] tesquis	Tensquiz	Tensquiz ¹¹¹
[29] calalpan	Callalpan	Callalpan ¹¹²
[30] [?]np[?]ollo	[?]np[?]ollo	[?]
[31] tequicalco	Tequicalco	Tequicalco ¹¹³
[32] tonatiuh-	Tonatiuhco	Tonatiuhco ¹¹⁴
[33] -co		

107. “Place of the Large Walls,” from *tenamiltl*, meaning “parapet” or “wall,” with *-pol* an augmentative suffix in this case meaning “very,” followed by the locative *-co* “place of.”

108. The first part of this toponym is obscured, but likely would describe the remainder further: [?] + *cibua(tl)* woman, women + *-tlan* place of, *Place of [?]-women*.

109. Below the *Flor de Cacao*, from *cacahuaxochi(tl)* Flor de Cacao + *ti* + *-tlan* below, at the foot of, between, see Berenice Alcántara Rojas, “In Nepapan Xochitl: The Power of Flowers in the Works of Sahagún,” in *Colors Between Two Worlds: The Florentine Codex of Bernardino de Sahagún*, ed. Gerhard Wolf, Joseph Connors, and Louis Alexander Waldman (Cambridge: Harvard University Press, 2011), 112.

110. Similar to Tezquizapan near Chicontepec, Veracruz; see Carrasco, *City of Sacrifice*, 375–76.

111. “In the House-Garden,” from *callal(li)* “a household’s agricultural plot” + *-pan* “in, at, on.” See Lockhart, *Nabuas after the Conquest*, 607.

112. “Tribute House,” from *tequical(li)* + *-co*.

113. There are two towns with the name Tonatiuhco (*Place of the Sun*), one in Ocuillan and the other in Puebla, see Carrasco, *City of Sacrifice*, 255, 259, 263, 380, 384, 293–94.

APPENDIX B: NAHUATL GLOSSARY

Note: (s) = singular, (pl) = plural, (pos) = possessed, (pos-e) = possessive

<i>altepemeh</i> See <i>altepetl</i>	<i>mazatl</i> (s) deer; also used to refer to horses during the first generation of the colonial period
<i>altepetl</i> (s) <i>altepemeh</i> (pl) polity	
<i>amatl</i> (s) paper made from <i>Ficus</i> (fig tree) bark; commonly known as <i>amate</i> in Spanish	<i>mecayotl</i> (s) cord, rope; a related term, in reference to lineage, <i>tlacamecayotl</i> (adding <i>tlaca(tl)</i> "person" as an adjectival prefix to the concept of <i>mecayotl</i> "cord, rope," literally a "cord of people")
<i>axtlacuilli</i> (s) proper coiffure of a mature Nahuatl woman with the long hair parted at the nape of the neck and wrapped up around the head to form two horn-like tufts at the temples on either side of the forehead	<i>noxhuihuan</i> See <i>ixhuihtli</i>
<i>calli</i> (s) house	<i>ocelotl</i> (s) jaguar; also the designation for a class of warrior as well as the <i>tlahuiztli</i> worn by these warriors
<i>chimalli</i> (s) shield	<i>oztomecatl</i> (s) merchant; also an inhabitant of Oztoman
<i>cuetzpalin</i> (s) lizard	<i>oztotl</i> (s) cave
<i>cuextecatl</i> (s) <i>cuexyoh</i> (pos) Huastec; frequently refers to a group of Nahuatl warrior <i>tlahuiztli</i> consisting of a feathered bodysuit, conical hat, and shield, each with specific designs associated with the Huastec region	<i>pilli</i> (s) <i>pipiltin</i> (pl) lord, noble
<i>cuexyoh</i> See <i>cuextecatl</i>	<i>pipiltin</i> See <i>pilli</i>
<i>huitzoctli</i> (s) a pointed stick, usually of oak and used for loosening soil; also refers to a simple war club	<i>quechquemiltl</i> (s) a Mesoamerican garment worn by women, triangular with open sides, worn on the upper body and usually formed from two rectangular strips of cloth draped over either shoulder and attached at their ends at the chest and middle of the back
<i>icpalli</i> (s) seat, throne; usually made from woven reeds	<i>tecpatl</i> (s) flint, used for knives
<i>ixhuihtli</i> (s) grandchild; <i>noxhuihuan</i> (pos-e pl) my grandchildren	<i>tenixyoh</i> (pos) bordered with eyes
<i>tetl</i> (s) stone, rock	<i>tepotzohicpalli</i> (s) seat with back, usually made from woven reeds
<i>tilmahtli</i> (s) square cloak	<i>tequicalli</i> (s) [often <i>tequicalco</i>] tribute clearing house
<i>tlahcuiloh</i> (s) <i>tlahcuilohqueh</i> (pl) scribe, in this context; more generally referring to a maker of marks including a writer as well as a painter	<i>tlaxilacalli</i> (s) district, constituent part of an <i>altepetl</i>
<i>tlahtoani</i> (s) <i>tlahtoqueh</i> (pl) [also <i>tlahtoanimih</i> , <i>tlahtoanih</i>] literally, a speaker, i.e., ruler	<i>tlilli</i> (s) lampblack
<i>tlahuiztli</i> (s) insignia, often referring to feathered bodysuits worn by warriors, as well as other accoutrements identifying rank and affiliation, including back-devices worn with a frame	<i>toxiuhmolpia</i> the New Fire ceremony, literally, "to bundle our years"
<i>tlacamecayotl</i> See <i>mecayotl</i>	<i>xicaltetl</i> (s) a bark beater used in the manufacture of <i>amatl</i>
	<i>xihuitl</i> (s) year, designating the year of 365 days; blue-green precious stone, usually jadeite or turquoise; color, usually referring to blue
	<i>xiuhhuitzollil</i> (s) turquoise-mosaic diadem
Dates	
Ce <i>Acatl</i> - 1 Reed	Ome <i>Acatl</i> - 2 Reed
Ce <i>Calli</i> - 1 House	Ome <i>Calli</i> - 2 House
Ce <i>Tecpatl</i> - 1 Flint	Macuilli <i>Tecpatl</i> - 5 Flint
Ce <i>Tochtli</i> - 1 Rabbit	Mahtlactli <i>omome Tochtli</i> - 12 Rabbit

APPENDIX C: ANALYTICAL METHODS

Tana Villafana and Amanda Satorius

X-ray fluorescence spectroscopy

X-ray fluorescence spectroscopy (XRF) was performed with a Bruker Tracer. The spectrometer has a 4-W Rh tube, 8 μm Beryllium detector window, and a proprietary silicon drift detector. Each spectrum was collected with a 700- μA current at 40 kV in air with a beam diameter of 3 mm and an integration time of 30 s. The instrument is controlled through Bruker software.

Fiber optic reflectance spectroscopy

Fiber optic reflectance spectroscopy (FORS) was performed using an ASD FieldSpec 4 Hi-Res spectroradiometer (Malvern Analytical). The spectral resolution is 3 nm at 700 nm and 8 nm at 1400 and 2100 nm. Light from a halogen bulb (ASD Contact Probe) was used to illuminate the areas of interest at a height of roughly 20 cm from the surface, set at a 45-degree angle to avoid specular reflectance. The fiber was held roughly 1 cm away from the surface, giving a 3 mm sampling size. Ten spectra were averaged with a total acquisition time of <5 s. Spectra were normalized to a Spectralon white reference standard. The system is controlled via ASD proprietary software, RS³. Reflectance spectra were viewed and otherwise processed using ViewSpec Pro; first derivatives were calculated using a built-in ViewSpec Pro software function with a derivative gap of 9 to highlight the rate of change of the reflectance with respect to the wavelength.

Fourier-transform infrared spectroscopy

A Bruker ALPHA portable FTIR spectrometer with an external reflectance attachment (ER-FTIR) was used for analysis. Spectra of the substrate are always taken when looking at painted coatings, to verify which spectral features are coating related and which are interference from the environment and substrate, due to the nature of the technique. Prior to collecting spectra, a background scan is taken using a gold reference standard. The method used for both the background and sample analysis was sixty-four scans taken from 4000–400 cm^{-1} with a resolution of 4 cm^{-1} . When sampling each spot, a 4 mm round aperture was used.

Results and Discussion

Noninvasive spectroscopic measurements were performed on the Tira of don Martín on plain, unpainted amatl paper (as a baseline reference), a blue circle, and red clothing. Each measurement technique was applied to the same area of interest as closely as possible.

XRF

XRF analysis of the bark paper shows it has trace amounts of silicon (Si), sulfur (S), titanium (Ti), manganese (Mn), and zinc (Zn). Elemental peaks contributing most to the signal of the paper are chlorine (Cl), calcium (Ca), and iron (Fe),

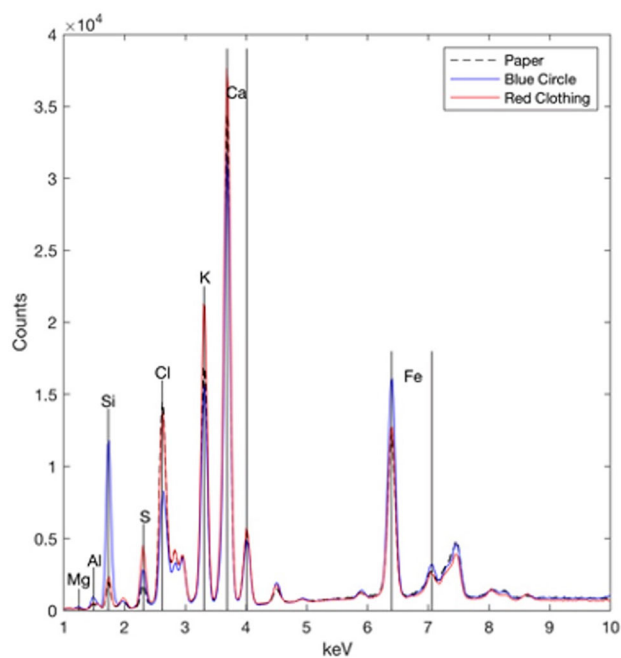


FIGURE C-1. XRF spectra of plain amatl paper, a red, and a blue pigment area. The plain paper has elements that would be expected from bark paper that has been boiled in basic water. The red area has elevated counts of sulfur (S) and potassium (K), indicating an alum-laked dye. The blue area has trace amounts of magnesium (Mg) and aluminum (Al), as well as more silicon (Si) and iron (Fe) than the paper. The presence of palygorskite (the clay associated with Maya blue) could be inferred from this because it is a magnesium aluminum silicate clay.

elements in line with *amate* preparation techniques employed in López Binnqüist et al. (2012).¹¹⁴ Elemental peaks in the red and blue pigmented area are only considered relevant if the peaks are more intense than what is seen in the paper baseline. As seen in the figure below, the red pigmented area is characterized by S and potassium (K), while the blue pigmented area contains magnesium (Mg), aluminum (Al), Si, and Fe. Together with the reflectance spectroscopy analysis, these results indicate that the cochineal is an alum-based lake.¹¹⁵ Maya blue can be inferred from the higher amounts of Si as compared to the paper, as well as the increased levels of Fe. Further, the XRF shows trace peaks of Mg and Al in the blue area that are completely absent in the paper, also supporting the finding of palygorskite, which is a magnesium aluminum silicate clay.¹¹⁶

114. Citlalli López Binnqüist, Alejandra Quintanar-Isaías, and Marie Vander Meeren, “Mexican Bark Paper: Evidence of History of Tree Species Used and Their Fiber Characteristics,” *Economic Botany* 66, no. 2 (2012): 138–48.

115. Dupuy García, “Materiality of Color,” 21–40.

116. This is in line with results shown by Grazia et al., “Shades of Blue,” 134–59.

FORS

Reflectance spectroscopy of the tira paper as a baseline found peaks typical of a cellulose-based paper, as expected for paper created from the bark of a tree. The spectral features in the range from 1000 to 2500 nm originate from vibrations in carbon (C), hydrogen (H), and oxygen (O) bonds absorbing particular wavelengths of light. These vibrational energies associated with wood components have been previously assigned; however, the spectrum for paper also contains a small shoulder at 2170 nm that is due to the presence of a protein. Akin to results described elsewhere,¹¹⁷ this protein-related peak is most likely due to an animal glue in the paper, probably used as a sizing. The reflectance spectra from the red and blue pigment areas will also contain peaks from the paper substrate (fig. C-2).

The reflectance spectrum from the blue circle has increased reflectance at 430 and 555 nm, with an absorption at 654 and 2220 nm. According to recent research by Grazia et al. (2020), these visible-range spectral features identify the blue pigment as an indigo-palygorskite hybrid Maya blue obtained either by using a low indigo content or by heating the mixture at very high temperatures. The absorption feature at 2220 nm is found in the infrared region of the spectrum typically associated with metal-hydroxide vibrations. According to Clark et al. (1990),¹¹⁸ features in this region could be due to either an Al-OH or Mg-OH vibration, further confirming the presence of palygorskite.

Although weak, the red pigmented area has two small absorptions at 525 and 565 nm that would associate it with an anthraquinone-based dye.¹¹⁹ Small changes in the spectrum are often easier to visualize by taking the first derivative of the reflectance. Cochineal has been found to have a very distinctive first derivative that allows for discrimination among various types of mordants used to create cochineal lake.¹²⁰ According to the absorption features and first derivative features (peaks at 495 and 535 nm, fig. C-3), the cochineal in the

117. K. A. Dooley, S. Lomax, J. G. Zeibel, C. Miliani, P. Ricciardi, A. Hoeningwald, M. Loew, and J. K. Delaney, "Mapping of Egg Yolk and Animal Skin Glue Paint Binders in Early Renaissance Paintings Using Near Infrared Reflectance Imaging Spectroscopy," *The Analyst* 138, no. 17 (2013): 4838.

118. Grazia et al., "Shades of Blue"; R. N. Clark, T. V. V. King, M. Klejwa, G. A. Swayze, and N. Vergo, "High Spectral Resolution Reflectance Spectroscopy of Minerals," *Journal of Geophysical Research* 95, no. B8 (1990): 12653.

119. See C. Clementi, B. Doherty, P. L. Gentili, C. Miliani, A. Romani, B. G. Brunetti, and A. Sgamellotti, "Vibrational and Electronic Properties of Painting Lakes," *Applied Physics A* 92, no. 1 (2008): 25–33; M. Aceto, A. Agostino, G. Fenoglio, A. Idone, M. Gulmini, M. Picollo, P. Ricciardi, and J. K. Delaney, "Characterisation of Colourants on Illuminated Manuscripts by Portable Fibre Optic UV-Visible-NIR Reflectance Spectrophotometry," *Analytical Methods* 6, no. 5 (2014): 1488.

120. Beatriz Fonseca, Catherine Schmidt Patterson, Monica Ganio, Douglas MacLennan, and Karen Trentelman, "Seeing Red: Towards an Improved Protocol for the Identification of Madder- and Cochineal-based Pigments by Fiber Optics Reflectance Spectroscopy (FORS)," *Heritage Science* 7 (2019), <https://doi.org/10.1186/s40494-019-0335-1>.

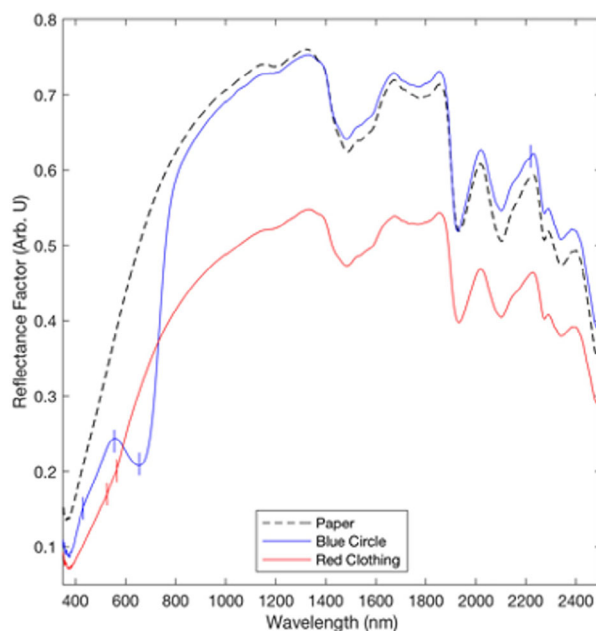


FIGURE C-2. Reflectance spectroscopy of the Tira of don Martín on plain amatl paper, a blue circle, and red clothing. Features used for aid in identification are marked; red lines at 525 and 565 nm to identify cochineal; blue lines at 430, 555, 654, and 2220 nm to identify Maya blue.

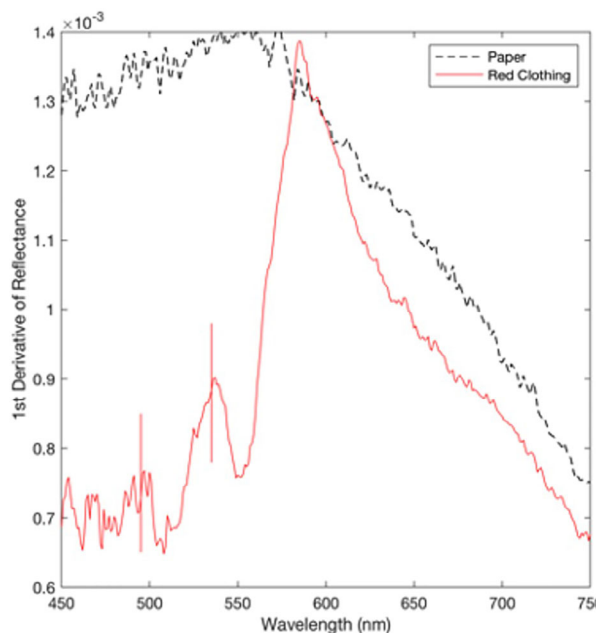


FIGURE C-3. First derivative of the reflectance spectra of amatl paper baseline and red clothing. Peaks labeled with red lines (495 and 535 nm) were used to aid in identifying the red clothing as an alum-based cochineal lake.

tira is likely an alum-based cochineal lake. This is also in agreement with the XRF results that found elevated levels of S and K in the red area.

FTIR

FTIR analysis from the Tira of don Martín only showed identifiable spectral features from the blue circle. No unique features were found in the substrate or the red clothing spectra different from a pure cellulose reference, likely indicative of an organic red pigment (fig. C-4). The spectrum from the blue circle had unique features at ~ 3695 (shoulder) and 3616 cm^{-1} attributed to O-H stretching, as well as

inverted peaks,¹²¹ at 1028 , 980 , 508 , and 467 cm^{-1} , attributed to Si-O vibrations that have been found to be from a palygorskite based pigment, in this case, Maya blue.¹²² This is in agreement with both FORS and XRF. Additionally, FTIR picked up shifted peaks at 2923 and 1678 cm^{-1} and a shoulder around 1555 cm^{-1} different than the paper substrate, likely indicative of a protein binder, also correlating findings from FORS.

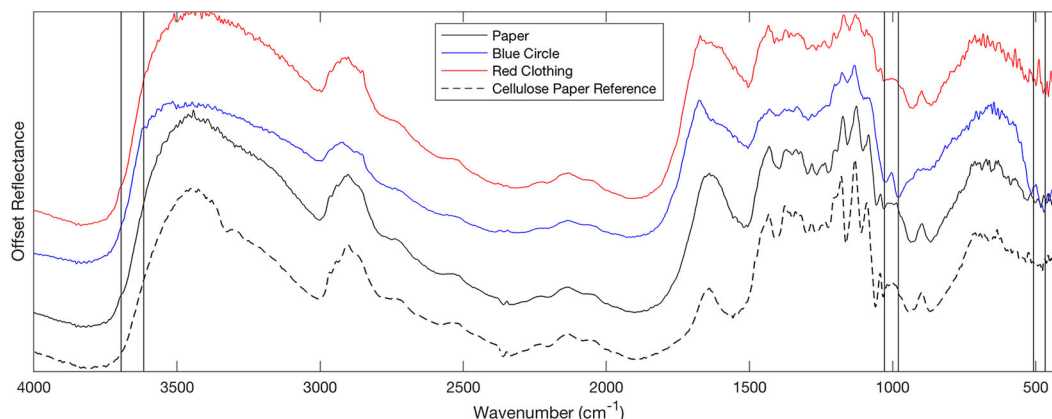


FIGURE C-4. ER-FTIR spectra of the Tira of don Martín on the amatl substrate, blue circle, red clothing, and an unsized 100% cotton rag paper used as a standard cellulose reference. Features used to aid in identification are marked; ~ 3695 (sh), 3616 cm^{-1} , as well as inverted peaks at 1028 , 980 , 508 , and 467 cm^{-1} to identify palygorskite.

121. C. Miliani, F. Rosi, A. Daveri, and B. G. Brunetti, "Reflection Infrared Spectroscopy for the Non-Invasive In Situ Study of Artists' Pigments." *Applied Physics A* 106 (2012), 295–307.

122. Grazia et al., "Shades of Blue"; M. Sánchez del Río, A. Doménech, M. T. Doménech-Carbó, M. L. Vázquez de Ágredos Pascual, M. Suárez, and E. García-Romero, "The Maya Blue Pigment," in *Developments in Clay Science*, ed. Emilio Galán and Arich Singer (Amsterdam: Elsevier, 2011), 453–81.