Media: The Case of Spain and New Spain

John Durham Peters and Adam Wickberg

One of the beneficial intellectual side effects of the explosion of digital media has been a reformulation of the media concept beyond its twentieth-century center of gravity in the print and audiovisual culture industries. Ubiquitous computing and handheld access to the datasphere have brought to the fore the fundamental logistical role of media as agencies that arrange, catalog, organize, network, and index people, places, and things. During much of the twentieth century, research on media was biased toward questions of (1) ideological or attitudinal influence caused by (2) modern or emergent technologies. Questions of content and effect were front and center. This article takes advantage of this shift in thinking toward structure and ambiance to expand the temporal frame beyond the past century and the geographical frame beyond the North Atlantic. Media can be profitably understood as environing and residual, not only semiotic and emergent. Media can certainly be the bright and shiny gadgets produced by Silicon Valley or the vast information and entertainment empires of radio, TV, and film but also, more fundamentally, the means of organizing our cultural and natural worlds. They not only work upon hearts and minds but shape societal habits and ecological habitats. Media are agencies of civilizational and environmental order. They have more than modern relevance. The tools of media theory that have been developed for news, moving images, or the internet

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can be productively applied to the pyramids of Giza and the biblical book of Esther, the Greek classics, the Persian postal office and Roman roads, Venetian counting houses, and medieval cathedrals.[1] All of these process data, connect across space and time, manage people and properties, and alter, to one degree or another, their cultural and natural environments.

Our understanding of media as fundamental constituents of environmental organization joins the flourishing interest in infrastructures, understood as "large, force-amplifying systems that connect people and institutions across large scales of space and time"[2] or "big, durable, well-functioning systems and services."[3] Thus, nature can be viewed as the ultimate infrastructure. Calendars, clocks, towers, names, addresses, maps, registers, arms, money, and ships are all infrastructural media. Such media become second nature, morphing biorhythms and altering ecosystems. Today's planetary digital infrastructure builds upon the long legacy of resource management via databases. The deep sea, the global yield of corn, and planetary public health—a fact made only more visible by the SARS-CoV-2 pandemic—depend for their very existence upon the circulation of data.[4] In rural China today, AI affects pig farming, and blockchain shapes chicken farming.[5] We argue for

1. Two recent examples of such temporal expansion can be found in Menahem Blondheim and Elihu Katz, "Communications in an Ancient Empire: An Innisian Reading of the *Book of Esther*," in *Traffic: Media as Infrastructures and Cultural Practices*, ed. Marion Näser-Lather and Christoph Neubert (Boston, 2015), pp. 183–204, and *Classics and Media Theory*, ed. Pantelis Michelakis (New York, 2020).

2. Paul N. Edwards, "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Sociotechnical Systems," in *Modernity and Technology*, ed. Thomas J. Misa, Philip Brey, and Andrew Feenberg (Cambridge, Mass., 2003), p. 221.

3. Edwards, "Introduction: An Agenda for Infrastructure Studies," *Journal of the Association for Information Systems* 10 (May 2009): 365.

4. For four recent collections in this spirit, see *Traffic*, ed. Näser-Lather and Neubert; *Signal Traffic: Critical Studies of Media Infrastructures*, ed. Lisa Parks and Nicole Starosielski (Champaign, Ill., 2015); *Assembly Codes: The Logistics of Media*, ed. Matthew Hockenberry, Starosielski, and Susan Zieger (Durham, N.C., 2021); and *Saturation: An Elemental Politics*, ed. Melody Jue and Rafico Ruiz (Durham, N.C., 2021).

5. See Xiaowei Wang, *Blockchain Chicken Farm: And Other Stories of Tech in China's Countryside* (New York, 2020).

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a longer genealogy of the nature-shaping logistical role of media that is so evident today. The technosphere has a long prehistory: humans are a technically enhanced niche-constructing species.[6]

In this article, we refine and exemplify these claims via a case study of some environing media in Mexico. This is intended as a suggestive entry or invitation, not as a thorough historical study. The country has a deep and rich media history. The past century has many examples. One is the fascinating history of Mexican broadcasting as told by Joy Elizabeth Hayes in *Radio Nation.*[7] Rubén Gallo's *Mexican Modernity* also illuminates the central role played by even more elemental media in both avant-garde artistic and architectural developments in the period immediately following the Mexican Revolution.[8] By way of cameras, typewriters, radio, cement, and stadiums in the 1920s, Gallo shows how the energies released by the revolution took up these new media as things to think with and to design a new society with. They not only were topics for art or literature but were material shapers of art-making itself. This article follows Gallo's underlying assumption that media are not only channels for transmitting ideologies; they are modes that shape what it means to exist in a given time and place. Media have ontological force; they define what is and who we are. Mexican history has seen diverse media of control, surveillance, and spectacle.

Studies of Mexican media history tend to focus on the mass media of press, radio, and television and begin only in the middle of the nineteenth century.[9] But in this article, our examples will mostly be drawn from the sixteenth century, especially the momentous clash of Spanish paper power and indigenous culture during and following *la conquista.* In choosing Mexico, our aim is not a kind of intellectual carpetbagging nor to proclaim an open-and-shut case; it is to open comparative possibilities. It is typical in anglophone scholarship to think of the US and the UK as each having a rich media history, often with Canada and Germany serving as key comparative cases. Mexico—along with many other nations—is typically (perhaps absurdly) left out. Geoffrey Winthrop-Young quips that Canada and Germany are the promised and cursed lands of media theory; whatever the case may be,

6. For the concept of the technosphere, see Peter Haff, "Humans and Technology in the Anthropocene: Six Rules," *Anthropocene Review* 1, no. 2 (2014). For humans as niche-constructing species, see Jürgen Renn, *The Evolution of Knowledge: Rethinking Science for the Anthropocene* (Princeton, N.J., 2020), pp. 328–31.

7. See Joy Elizabeth Hayes, *Radio Nation: Communication, Popular Culture, and Nationalism in Mexico, 1920-1950* (Tucson, Ariz., 2000).

8. See Rubén Gallo, *Mexican Modernity: The Avant-Garde and the Technological Revolution* (Cambridge, Mass., 2005).

9. See the classic work of Fátima Fernández Christlieb, *Los medios de difusión masiva en México* (Mexico, 1982).

they are two of the most generative sources for comparative theory on environing media.[10] We start with a Canadian and German to arrive in Mexico in hopes of coming to terms with the special conditions of colonial media in the New World.

Innis and Siegert

In speaking of media as central constituents of civilization, we draw on the work of Harold Adams Innis, who remains one of the most suggestive sources for understanding media in a deep historical and environing way. Like his younger and more famous Canadian colleague Marshall McLuhan, Innis held an expansive definition of media, a fact that has raised the stock of their work in recent decades. Trained as an economic historian, Innis came to media through the study of staples—basic economic goods such as timber, fur, and fish that were so important for the historical development of Canada. The Canadian fur trade, the topic of a book by Innis, was not just an obscure bit of economic history. Rather, the fur trade was the embryo for much of Canada's later history and foreshadowed lasting dilemmas: the clash of native peoples and European settlers, ecological relations between fauna such as the beaver and world markets, the rise of a center periphery system (a few families in Montreal more or less controlling much of Canada's territory via trading networks), and international relations with Europe and the US (where the furs were typically sold as hats before falling out of fashion). Canadian history for Innis was a story of control of space across mountains, prairies, lakes, rivers, and oceans. But the control of time was also always important for him, both in integrating the country (standardized time and time zones were invented in part by a Canadian, Sandford Fleming) and remembering the richness of the past (what Innis called the oral tradition).

From the analysis of staples, it was a short step to studies of media. In Innis's last, cancer-shortened years, he worked on a treatise that reinterpreted the history of civilization in terms of various media of communication.[11] He was especially interested in the long span of history, in particular, in stone, clay, papyrus, paper, and electricity (to a lesser extent) as key media in civilizations such as ancient Egypt, India, China, Greece, Rome, medieval and modern Europe, and modern North America. (With his long-range perspective, Innis never would have dreamed of calling newspapers, cinema,

10. See Geoffrey Winthrop-Young, "Von gelobten und verfluchten Medienländern. Kanadischer Gesprächsvorschlag zu einem deutschen Theoriephänomen," *Zeitschrift für Kulturwissenschaften* 2 (2008): 113–28.

11. See Harold Innis, *Harold Innis's History of Communications: Paper and Printing—Antiquity to Early Modernity*, ed. William J. Buxton, Michael R. Cheney, and Paul Heyer (Lanham, Md., 2015).

radio, or television old media as they sometimes are in comparison to digital media.) He read widely in English and French, and his massive, dense, and difficult texts are crammed with facts, events, and interpretations. He faced critics who found his roving eye for historical facts too structural and too abstract, a critique that expansive media history (including this article) has risked ever since. Though this is not the place to explicate his work, one focus of his media theory was the relative weight that civilizations gave to space and time and the bias that media imposed on those two dimensions. Monuments and statuary—as heavy, durable media—are time biased and transmit along the time axis. Thus ancient Egypt, with its pyramids and death cult, was a time-biased society. Documents and newspapers—as light, ephemeral media—are space biased and transmit along the space axis. The Roman Empire, with its roads, postal service, and military spread, or the US, with its love of territorial expansion along various frontiers and disregard for the past, were space-biased societies.[12] So was Canada, to a lesser degree, whose geography was shaped by lightweight and easily transportable beaver pelts.

In Innis's view, media were fundamentally about power. For him the question was not so much how new media change our sensory perception or proprioception (as it was for McLuhan) but how they give advantages to new classes of experts. Each new medium grants some new occupational group a monopoly of knowledge, special insider control, and leverage that gives them advantage over others. As papyrus and the brush appeared as means of calendrical calculation in ancient Egypt, to take one of Innis's examples, scribes were able to wrest power from the royal class whose power was invested in the old media of stone and hieroglyphics. In the same way, the rise of silicon gave moguls like Bill Gates the opening to create a monopoly of knowledge on operating systems or Jeff Bezos one for online retail. Such figures who get hold of technical innovations at their most strategic choke point are found throughout history. (Of course, explicating how these innovations arise is itself half the problem.) For Innis the large political and ethical task of media theory was to fight monopolies and counter the massive space bias of modern civilization, especially the US. Canada, a nation formed by various media of space and time, was precariously perched between past and future among the empires of England, France, and the US and its indigenous past.

Strangely enough, Innis never paid much attention to Mexico or to Latin America, and he hasn't received much attention there either. This is unfortunate, as he was a scholar of empire and communication and an outspoken political critic of the way his nation was dependent on the ambitions of

12. See Innis, *The Bias of Communication* (Toronto, 1991).

conflicting empires. As a Canadian nationalist, he would have appreciated a saying often attributed to Porfirio Díaz: "Pobre México. Tan lejos de Dios, tan cerca de Estados Unidos [Poor Mexico. So far from God, so close to the US]."[13] He felt the same way about Canada. Innis is productively read as a dependency theorist from a northern cold rich country instead of a southern warm poor one.[14] To Innis's way of thinking, Canada and Mexico would be siblings in several ways: their shared borders with the same colossus, their long *mestizaje* of native and European stock, their heritage of being the plaything of battling empires, their internal center-periphery system that gives so much power to one or two urban centers, their long histories of resource extraction, and time- and space-controlling media. Innis was deeply concerned with the political, ethical, and cognitive imbalances that great power brings and thought that US-style modernity had a dangerous space bias. (He would no doubt see the internet, despite rare valiant efforts to record its history, as grotesquely space biased.) His insistence on the creativity of the periphery is a potential rendezvous with what Latin American liberation theologians call "the epistemological privilege" of the oppressed.[15] Innis believed that his marginal, Canadian point of view yielded special insight. His research on the circulation of staples could apply richly to Mexico's economic and cultural history with its gold, silver, feathers, maize, and slaves all the way through the recent tragic and lucrative staple of narcotics, presided over by the cult of Santa Muerte. An Innis-style analysis of any one of these staples could reveal much about Mexico's complex and contradictory history.

Unlike Innis, recent German-language work in media history has much to say about Latin America and Mexico. Bernhard Siegert in particular has taken an intense interest in the Spanish empire and the media it used to invent and colonize Latin America.[16] Two of his books, not yet translated, provide an analysis of Spain and New Spain. The first, *Passage des Digitalen*, is a

13. Quoted in Mélany Barragan, "Pobre México, tan lejos de Dios y tan cerca de Estados Unidos," *La Opinión de*, 2 Feb. 2022, laopinion.de/2019/06/13/pobre-mexico-tan-lejos-de-dios-y-tan-cerca-de-estados-unidos/

14. See *Culture, Communication, and Dependency: The Tradition of H. A. Innis*, ed. William Melody, Liora Salter, and Heyer (Norwood, N.J., 1981).

15. Robert McAfee Brown, *Gustavo Gutiérrez: An Introduction to Liberation Theology* (Maryknoll, N.Y., 1990), p. 107.

16. For other German media theorists interested in the Hispanic world, see, for example, Hans Ulrich Gumbrecht, *Eine Geschichte der spanischen Literatur*, 2 vols. (Frankfurt, 1990). See also Wolfgang Schäffner, "Telematische Representation im 16. und 17 Jahrhundert," in *Theatralität und die Krisen der Representation*, ed. Erika Fischer-Lichte (Stuttgart, 2001), and "Die Verwaltung der Endlichkeit Zur Geburt des neuzeitlichen Romans in Spanien," in *Die Endlichkeit der Literatur*, ed. Eckart Goebel and Martin Koppenfels (Berlin, 2002). See also Silvia Fehrmann, Irina Podgorny, and Schäffner, "Un Colón para los datos: Humboldt y el diseño del saber," *Redes* 14 (Nov. 2008): 77–80.

deep history of computation, electricity, and much more. The digital computer, in Siegert's argument, trails a long history of data processing that goes back as far as medieval Europe. An *inquisition*, for instance, was originally a census or inventory of a kingdom, an effort to count people and property. In England, for example, the famous *Domesday Boke* (book of reckoning) in 1086 listed men of standing and their holdings. The Norman conquerors wanted to know who they could tax. Such practices of assessing, however clumsy by modern norms, were widespread in feudal Europe.

Siegert focuses his second chapter on sixteenth-century Spain, which took such data-gathering enterprises to new extremes.[17] He shows that the spectacular, torture-filled side of inquisition in the Spanish empire was just the more memorable part of its insatiable desire for information about its ever-increasing dominion, a dominion whose unoverseeability by traditional means required innovations in accounting. This information took three main forms: pictures (especially maps), numbers (especially lists, registers, and accounts), and words (narrative descriptions). Various institutions and actors, such as the Council of the Indies and the Casa de Contratación (the House of Trade), were charged with the job of representing the Spanish empire. New professions defined by writing proliferated: scribes, accountants, cosmographers, notaries, and chroniclers. Philip II, the most important king of Spain in the sixteenth century, liked to say something that media theorists such as Siegert are fond of quoting: *Quod non est in actis, non est in mundo* (if it is not on file, it doesn't exist). Philip was also known as *el rey papelero* (the paper king)—thanks to his love of governing through documents.[18]

Siegert's key point of transformation was the 1570s, though there was a longer prelude. The Casa de Contratación in Seville was first founded in 1503 as a storehouse for managing trade with the New World but soon became a clearinghouse for managing data about ships, cargo, people, and places. The record and the reality were theoretically supposed to match one-to-one. Under the initial leadership of Amerigo Vespucci, who was appointed to lead the Casa in 1508 and gave his name to the Americas thanks to a 1507 map, the Casa housed the *padrón real* (royal register), a constantly updated record of Spanish possessions. Siegert calls the *padrón real* a *metamedium*—the standard against which all other inquiries into the New World were measured. All returning ships' captains were required by oath to supply updates from their logs, something they seem to have done without enthusiasm.

17. See Bernhard Siegert, *Passage des Digitalen: Zeichenpraktiken der neuzeitlichen Wissenschaften, 1500–1900* (Berlin, 2003), pp. 65–120.

18. Wickberg, *Pellucid Paper: Poetry and Bureaucratic Media in Early Modern Spain* (London, 2018), pp. 15, 16, 17.

The position of royal cosmographer, nautical map- and instrument maker was created in 1523 and was occupied by a number of important scholar-bureaucrats over the following few decades. The most important cosmographer for Siegert was Juan de Ovando, who assessed the inefficiency of the Council of the Indies in the 1560s and then introduced sweeping administrative reforms in 1571. Ovando's aim was a total natural history of the Indies, involving, yet again, three kinds of data: pictorial, tabular, and textual. Section 3 of his *Ordenanzas* called for nothing less than a complete and certified description and investigation of all things in the state of the Indies.[19] According to Ovando, if the crown's data were incorrect or out of date, the empire itself would be threatened with ruin. He dreamed of a permanent inquisition in the New World. In a sense, the aim was to create a simulation of the Spanish empire as a manageable totality. Of course, the Council of the Indies never achieved anything like this, but the ambition was a paper machine filtering massive amounts of data. For Siegert, Spanish bureaucracy was a gigantic computer *avant la lettre* that processed documents instead of bits. As he remarks of this early Google, drawing an explicit line between digital and logistical media: "The colonial heterotopia in Latin America achieves for the first time a model of storage that we recognize today in the processing units [*Arbeitsspeichern*] of our computers."[20]

Siegert's next book, *Passagiere und Papiere*, directly concerns the transatlantic passage between Spain and New Spain. It examines how acts of writing helped to create new kinds of identities in the sixteenth century.[21] Like Innis, Siegert is interested in bottlenecks. He sees sea and ship as essential media in the history of the world, uniquely able to reveal both techniques and anthropogenesis.[22] The House of Trade in Seville had a royal monopoly overseeing all passengers and cargo to and from Spain. Seville was better suited for this task than a seaport such as Cádiz because it was more tightly controlled: everything coming or going had to pass through the Guadalquivir River.

Paper served as a similar kind of choke point. Writing, not the auto-da-fé, was the great instrument of *inquisición*: the legalistic inspection of identity, using the tools of documentation and legal hearings, oversaw the borders of

19. See Siegert, *Passage des Digitalen*, p. 86.

20. Siegert, *Passagiere und Papiere: Schreibakte auf der Schwelle zwischen Spanien und Amerika* (Munich, 2006), p. 150.

21. See Siegert, *Passagiere und Papiere*.

22. See Siegert, "Der Nomos des Meeres: Zur Imagination des Politischen und ihren Grenzen," in *Politiken der Medien*, ed. Daniel Gethmann and Markus Stauff (Zurich, 2005), pp. 39–56. See also Siegert, *Cultural Techniques: Grids, Filters, Doors and Other Articulations of the Real*, trans. Winthrop-Young (New York, 2015), pp. 68–147.

the Spanish domain. Inquisition's procedures made it impossible for anyone to pass to the New World without going through an ordeal of testifying, writing, and counting in an *interrogatorio*. Each person had to attest to—and in many cases thus create—their identity. Penal institutions, as is well-known, do not impose only a blackout of information; they produce mountains of documents and identities in their wake. As a by-product of all this bureaucracy, new ways of thinking about the self emerged. A person's identity was legitimate only when their oral account matched the written account on file. One motive for the paperwork was to prevent frauds and impostors and to discover crypto-Jews and Muslims. The invention of the *pasajero* went together with the invention of the *picaro*: the sneaky, identity-defying rogue that populates Spanish literature. Official records came to define personal identity. "Spanish America is a special world: a world in which everything is counted – commodities, people, ships, books."[23] To be a passenger was not only to sail across the sea; it was to have your data transferred from one register to another. The Spanish empire, for Siegert, was an empire of documents. Its task was to assemble an exhaustive view of things. This ambition was reflected even in urban design, as cities such as Santo Domingo, Lima, and Buenos Aires were laid out on grids—every point, in the spirit of Renaissance perspective, lying on a X-Y coordinate system, and thus readily overseeable from a single point of view. The spirit of registration bound people to places. The legal culture of inspection and documentation forever saturated Latin American culture with letters, in every sense of that word.[24]

Clashing Media in the Conquest

Logistical and environing media were central to the conquest of New Spain and thus to the history of Mexico. Maps and names, calendars and compasses, horses and gunpowder, the biological agents of disease and *mestizaje*, and *cruz y campana* (cross and bell)—many media mixed in the sixteenth-century cauldron of New Spain. But above all, the medium *primus inter pares* was writing. As Hernán Cortés lamented: "'Oh, if one were only illiterate, so as not to have to sign so many death certificates.'"[25] He knew all too well the connection between writing and death. Though no man of letters, Cortés was a diligent Spanish bureaucrat, scrupulously following procedures of documentation, sometimes to an almost absurd degree. The chronicler

23. Siegert, *Passagiere und Papiere*, p. 53.

24. See ibid., pp. 53, 62, 135. Siegert notes his debt to the work of Roberto González Echeverría. The influence of Gumbrecht, *Eine Geschichte der spanischen Literatur*, is also clear.

25. Bernal Diaz del Castillo, *Historia verdadera de la conquista de la Nueva España* (Mexico City, 2004), p. 97; hereafter abbreviated *H*.

Bernal Diaz del Castillo, who like Cortés was an adventurer rather than a man of letters, reports of one encounter with hostile natives: "And as always, Cortés wanted to attend to documentation and made a demand in front of a Royal scribe" (*H*, p. 51). The natives were not impressed and responded with "a great shower of arrows" (*H*, p. 51). According to Diaz, Cortés conducted a formal ceremony, making three slashes into a tree to take possession of the land for the king and defend his right with the sword. "And in front of a Royal scribe they did this declaration," duly notes Diaz (*H*, p. 52). The legalistic scrupulousness with which the conquistadores warned the native peoples and documented everything before notaries and witnesses is almost quixotic—to mention a later figure in the Spanish culture of documentary simulation in which fact and fiction blended together for both kings and knights errant.

Diaz's *Historia verdadera* may be profitably read for media history. Its story is logistical in the clearest military sense: the conquistadores sail, seek, map, name, build fortifications, seek food, fight enemies, tend wounds, forge battle plans, and have relationships with native women. The Aztecs soon adopted the Spanish paper fetish even if they didn't understand how it worked. "And the three chiefs understood our language very well and demanded a letter from Cortés, this not because they could read it but because they understood clearly that when we sent messengers or orders, there was a paper called *amal*, a sign as an order" (*H*, p. 360). Thus, messengers to Cuauhtémoc ask for the authenticating mark of an official message. (Indigenous puzzlement at alphabetic writing in the Americas is a venerable topos stretching from Inca Garcilaso de la Vega to Claude Lévi-Strauss.)[26] Note how nicely the phrase "a sign as an order" unites communication and command, symbol and military, semiotics and tactics. In love as in war, the sign is the thing itself.

Clearly the Aztecs also had cultural techniques for controlling space, time, and people. Every state formation produces a media system. Let us mention just two among many. First, their calendar was clearly a data processor, a logistical organizer of days and years into larger recurring systems. As is well-known, the Aztec calendar (derived from the Mayans) featured a nested system of two cycles, a 365-day agricultural-political calendar and a 260-day religious sacred calendar (perhaps related to the period of human gestation). The two cycles coincided every fifty-two of the long years or seventy-three short years. The calendar was the central computer of the Aztec social order, a kind of massive algorithm that directed agriculture, war, reproduction, labor, and religious ritual. It was sort of like the television schedule of the

26. See Max Hernández, *Memoria del Bien Perdido: Conflicto, Identidad y Nostalgia en el Inca Garcilaso de la Vega* (Lima, 1993), pp. 149–57.

1950s through 1970s on steroids, which partly guided the household flow of leisure and activity, except that the Aztec calendar oversaw the flow of festivals, sacrifices, and days honoring gods.[27] It was run by priests who had a monopoly of knowledge in how to reckon dates and declare auspicious and inauspicious times. The calendar was a device of abstract calculation (a cognitive tool), but it also took form in concrete works of sculptural art in stone. It was not only a model of cosmic cycles; it was an instrument of power.

Aztec temples were, among other things, broadcasting towers. The mark of towers as communicative devices is optical and acoustic leverage; they can be seen and heard from great distances, and they can also see and sound at great distances.[28] In their battles with the Spanish, the Aztecs used their temples to great military advantage. The temples afforded vista points and strategic lookouts to survey the Spaniards' movements and were command posts that were very hard to capture. In the brief period before all-out conflict, Montezuma showed Cortés and his men the amazing sight of Tenochtitlan from the Templo Mayor, a panoramic 360-degree view. The Spanish, in turn, were very eager once the fighting began to occupy the temples and to replace the deities there with their own banners. The Aztec elites used the temples as agents of spectacle and intimidation for their own people and for neighbors as well. Temples amplified the visibility of human sacrifices. As the mutilated bodies were cast down the steps, the elevated position of the altar afforded a cinematic view. The priests also used the temples as a center point for broadcasting sound. Diaz reports that the Aztec drum—which he found exceedingly large—could be heard for two leagues from the temple. He thought "the sound of it was so horrible that they called it the instrument of hell" (*H*, p. 174). It could be accompanied by conch shells, horns, and trumpets. (His dislike for the sound may come from its heralding the sacrifice of his captured comrades.) For the Aztecs, temples were not only places of religious sacrifice but centers of political control and social organization. The Spaniards recognized their importance at once, installing *cruz* and *campana* as if they were taking over the television network, which was long the first item of business for any revolutionary.[29]

After the violent overthrow of the Aztecs, other kinds of media came to the fore. Some of them were for winning hearts and minds, specifically

27. For a discussion of the calendar at length, see Bernardino de Sahagún, *Historia General De Las Cosas De Nueva España*, 3 vols. (Mexico City, 1999), 2:65–183. On the TV schedule, see John Ellis, "Scheduling: The Last Creative Act in Television?" *Media, Culture & Society* 22, no. 1 (2000): 25–38.

28. See Peters, *The Marvelous Clouds: Toward a Philosophy of Elemental Media* (Chicago, 2015), pp. 35–37, 175–77, 225–41.

29. See Edward N. Luttwak, *Coup d'Etat: A Practical Handbook* (Cambridge, Mass., 2016).

Christianizing the indigenous population. Churches were famously built where Aztec temples once stood and out of the same stones. Religious orders such as the Franciscans created pictorial catechisms and religious theater for the indoctrination of an illiterate and subaltern public. Logistical media can often take a religious tone, and religious media almost always have a logistical tone. New calendars and temporalities, featuring the day of judgment, were introduced. The process of religious *mestizaje*, so famous in Mexican history, had medial elements.[30]

Perhaps nowhere were mestizo media more obvious than in the projects of classification and collection done to enable local and remote governance during Spanish colonization. The period between 1570–1590 saw several projects with the common goal of achieving a description of the territories. One of the most significant were Ovando and López de Velasco's questionnaires that were sent out to every local governor several times during this period. The questionnaire consisted of fifty key questions, according to the art of geography, with data on provinces, seas, islands, rivers, mountains, and other places in relation to longitude, latitude, and size. This corpus of data survives as the *Relaciones geográficas de indias* and comprises thousands of pages, as well as a large number of maps and illustrations. It came to be the first statistical study performed by any nation and constitutes one of the primary sources of information about the early colonial period and the pre-Columbian era.

Francisco Hernández, a doctor of medicine and Philip II's personal physician, shows just how intense data-collecting zeal could be. He was named chief medical officer of the Indies in 1570 and sent on a five-year expedition to map all the natural resources of New Spain, as part of the ambition to achieve a description of the territories. The position meant that Hernández would do something similar to the cosmographers' work on geography in mapping the biodiversity of the Americas, for the purpose of advancing trade and exports from the region. At the same time, the cosmographer and navigator Andrés de Urdaneta had been the first ever to perform a cross-Pacific return voyage between Mexico and Southeast Asia, where the empire had just colonized the Philippines. Where the cosmographers of the Casa de Contratación like Ovando and López de Velasco scaled up using the environing paper media of censuses, registers, questionnaires, astronomical observations, and maps, Hernández scaled down to the most minute detail of each plant, mineral, and animal that could be found in the American territories.

Hernández mediated New World nature by paper and specimen alike. He sent back several shiploads of cargo with large quantities of plants and instructions for their domestication and cultivation in European soil. Philip II

30. We thank Mariano Navarro for suggestions incorporated in this paragraph.

impatiently wrote him several letters urging him to complete and send back the natural history of New Spain that he was compiling aided by local knowledge and painters. In the end, Hernández sent back sixteen volumes containing around three thousand plants and four hundred animals on 893 pages of text and 2,071 illustrations in 1576.[31] These books were sent in locked wooden cases with the keys sent separately along with written orders from the King that they could under no circumstance be opened. As he arrived from Mexico to Seville the following year, he brought a cargo of an additional twenty-two books. In an unpublished letter to Philip II dated 30 August 1577, Hernández writes that he has just returned from New Spain with a fleet a week earlier in very bad physical shape and with a valuable cargo that he wishes to present to the King. "I will go [to Madrid] as soon as I can and bring with me the books that had already been sent, as well as translations of them into Mexican language, our commentaries of the things of the Indies and description of New Spain. I have also sent several boxes of medicinal herbs from this land that I have discovered and described, as well as wonderful plants to be planted here in Spain."[32] Among the books were herbaria with plants directly attached to pages, as well as translations of his work in Nahuatl, of which Philip II could not have understood much, but perhaps the purpose of including these was to impress the king with his linguistic skills. Thus, even the medium of knowledge transfer regarding New World botany was itself a material hybrid of both hemispheres.

Media of documentation thus played a crucial role for the Spanish not only with churches, schools, and offices but also in the environing process of new knowledge about the natural and cultural world. The Franciscan priest and missionary Sahagún spent most of his life in New Spain based at a Franciscan *colegio* at Tlatelolco. He and his native and mestizo Aztec colleagues spent around thirty years on an encyclopedic project of gathering and showing the things of New Spain. America, of course, was a colossal mistake, and European misunderstanding still shapes our vocabulary ("indio," Indian). They described the people, their religion, history, agriculture, political structure, and natural world, often assimilating novel conditions by way of analogies to Europe. Thus, in the prologue to the book, written in 1576 during an epidemic outbreak, the city of Tenochtitlan was *another Venice*. Here he also compares the Aztecs to the Old Testament prophecy in which Jeremiah cursed Judea and Jerusalem, promising the arrival of a violent and

31. See Wickberg, "Plus Ultra: Coloniality and the Mapping of American Natureculture in the Empire of Philip II," *Necsus* 6 (Autumn 2018): 217.

32. Francisco Hernández, "Contratación, 5197," 1560–1638, Minutas de Cartas del Tribunal de la Contratación, Archivo General de Indias, Spain.

aggressive people who would destroy them and their societies. According to Sahagún, this was exactly what had happened to the Aztecs, and the fear of their extinction and loss of their culture was a motivation for compiling the encyclopedia. Sahagún notes that "in this land which is now called New Spain, these people have lived for at least two thousand years, and that their knowledge and political structure far exceeds those of many European nations."[33] The book was completed in New Spain around the same time that Hernández was finalizing his work, and the authors were familiar with each other's work. Both also employed collectives of indigenous scholars in the elaboration of their multivolume descriptions of New Spain.

In 1575 Rodrigo de Sequera arrived in New Spain with orders from Ovando to produce an illustrated bilingual edition of Sahagún's encyclopedia. The result was the collection of twelve richly illustrated books with 2,468 hand-colored illustrations now known as The Florentine Codex because of its 1580 arrival in Florence as a diplomatic gift for Cardinal Ferdinando I de Medici.[34] If the Renaissance excelled in worldmaking, as Ayesha Ramachandran shows, rarely was there such a rich achievement as this encyclopedia.[35]

Spanish and indigenous media yielded hybrids. Among them are fascinating maps of local municipalities drawn and painted by indigenous artists.[36] The maps were often produced in an indigenous cartographic tradition that defined territory by an enclosed sphere of logographic place-names representing boundaries and referring to common history. The representation of a closed circle, a sphere, establishes the inside of the community for its self-representation on the map. The map of Teozacoalco in Oaxaca from 1580 is a good example of indigenous cartography in colonial New Spain (fig. 1). The animals, plants, mountains, and figures dotted around the circle are such logographic place-names, which mark the border by referring to a feature of each area. As an environing medium, the map has many interesting features spanning centuries of environmental change. Apart from the current border, it also includes the boundary of a previous dynasty from four centuries earlier, when the neighboring Eoltepec was its subject.[37] In the top right corner of the circle rises an arc like a crescent moon that shows the logographic place-names of the old territory of Eoltepec (the mountain of God). The environment

33. Sahagún, *Historia General De Las Cosas De Nueva España*, 2:19.

34. See *The Florentine Codex: An Encyclopedia of the Nahua World in Sixteenth-Century Mexico*, ed. Jeanette Favrot Peterson and Kevin Terraciano (Austin, Tex., 2019).

35. See Ayesha Ramachandran, *The Worldmakers: Global Imagining in Early Modern Europe* (Chicago, 2015).

36. See Barbara E. Mundy, *The Mapping of New Spain: Indigenous Cartography and the Maps of the Relaciones Geográficas* (Chicago, 1996).

37. See ibid., p. 114.

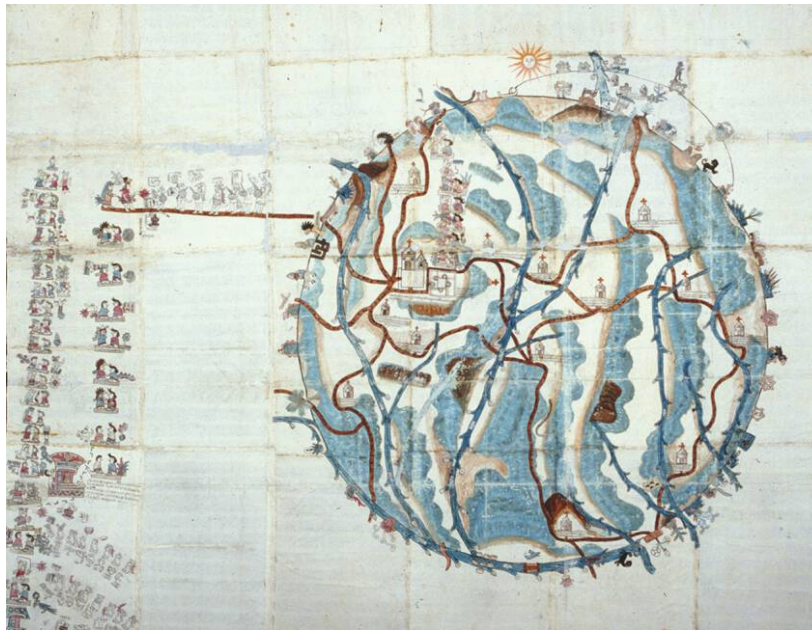

FIGURE 1. The Relaciones Geográficas map of Teozacoalco, 1580. Courtesy of the Benson Latin American Collection, the General Libraries, the University of Texas at Austin.

changed as the colonizers introduced new animals like horses and pigs. The painter of this map reflects the Spanish presence in the area by interlacing the traditional footprints of the paths with hoofprints to show that horse transportation was now used there.[38] In the twenty-first century, a team of archaeologists used the same map to unearth the lost sites of this Mixteca kingdom, now buried under modern building structures. Remarkably, the map correctly pointed out the place-names—rather like Schliemann showing that Homer, long dismissed as fantasy, had a genuine historical trace. The spherical shape of the map does not depart from a geometrical projection; it is rather a pictorial rhetoric of the community's importance and unity as expressed in the closed circle. The environing effect of this map lies in how it constitutes humans and their surroundings, while simultaneously serving the interest of securing overview and orientation over time.

The map of Teozacoalco's archaeological accuracy suggests it was a map that did more than fantasize a picture of the world; it grabbed hold of it.[39]

38. See Alex Hidalgo, *Trail of Footprints: A History of Indigenous Maps from Viceregal Mexico* (Austin, Tex., 2019), p. 42.

39. See Peters, "Resemblance Made Absolutely Exact: Borges and Royce on Maps and Media," *Variaciones Borges* 25 (Jan. 2008): 1–23.

As Siegert points out in another essay, maps are not just representations of space but also spaces of representation.[40] By this chiasmus he means that rather than just representing a given world, maps are epistemic objects that construct space and territory in the first place. In the Spanish Empire, as in many others, maps were considered highly classified national secrets that were guarded in particular rooms to which only trusted persons were admitted.

The map spanned time as well as space. The list of Mixtec couples shows the genealogy of rulership of the town with over twenty generations from the eleventh century, ending with Montezuma, before the small kingdom was subdued by the Spanish empire in the 1520s. Presenting the genealogy on the map—one made at the request of the Spanish authorities—was also a way of asserting the elevated history of the Mixtec kingdom of Teozacoalco. This environing medium thus encapsulates both the space and time axis that Innis articulates, becoming simultaneously a monumental archive and an instrument for colonial settlement. Perhaps this effect is due to its hybrid nature and results from the clash between the very space-biased Spanish empire and the more time-biased Mixtec kingdom. It is also possible that the inclusion of the old boundaries in 1580 was the result of copying from an original map that had simply been revised on the same manuscript rather than remade.

The map marks an interesting moment in Mexico's media history. It measures 176 × 138 cm and was made on a patchwork of about twenty-three blank paper folios of European origin, and it was used by the imperial bureaucracy.[41] While native paper-making techniques were never fully abandoned in New Spain, the use of the Spanish standard medium of the folio is characteristic of the hybrid nature that characterizes the maps made in response to the questionnaires. When the maps came back to royal cosmographer López de Velasco in the 1580s, however, they were formatted according to various local indigenous cartographic traditions. This mosaic of communities and land went against his wish to standardize all territory under the label of New Spain. The clash of space-representation techniques was never resolved, and the project was subsequently abandoned, but the hybrid form is one of several consequences of the cataclysmic blending of genes, mores, languages, and pathogens after 1519.

Environing Media—Tragic and Global

Such media as paper, maps, temples, bells, and crosses clearly marked the political, religious, and lived landscape for people in sixteenth-century New

40. See Siegert, "The Map Is the Territory," *Radical Philosophy* 169 (Sept./Oct. 2011): 13–16.
41. See ibid.

Spain. In this sense, they were clearly environing. But there is a stronger way to think about environing media: as media that violate the sometimes wishful or defensive boundary between nature and culture. The clash of Spanish and indigenous media accompanied one of the most catastrophic environmental transformations of the past millennia: the depopulation of the Western Hemisphere. In what is known as the Great Dying in the Americas, a hard-to-calculate number of people, often estimated at sixty million, disappeared over a century.[42] The decrease in population occurred initially through European epidemics, but their effects were aggravated by civil wars, ethnocide, slavery, and resource expropriation.[43] The abandoned farmland, which has been estimated at one hectare per person, such as sixty million hectares of land, quickly began to regrow into dense woodlands with quick carbon dioxide uptake. This reforestation led to a dip in global carbon dioxide levels first stratigraphically attested around 1611 from 285 ppm to 272 ppm over the next fifty years, the last low point before the steady rise to our current 420 ppm. The decrease in carbon dioxide concentration also led to a planetary cooling of about 0.5 degree Celsius, likely contributing to the so-called Little Ice Age in Europe at that time. These data have been used to argue for a starting date of the Anthropocene in 1611 in what is known as the Orbis hypothesis.[44]

In this way, events in the media history of the early years of contact between the Old and New Worlds turn out to be directly connected to changes to the deep history of the Earth system. The Great Dying in the Americas contributed to the Little Ice Age in Europe, driving famine and wars in the seventeenth century.[45] The teleconnections in the atmosphere were paralleled by the space- and time-transcending media of ship, document, gun, and map. These not only enabled a global exchange of human, animal, plant, and pathogen populations but also started a world economic system linking local and global spaces: Seville, Havana, Callao, Manila, Madrid, Mexico City. The Pacific and Atlantic joined in the world's first global trade network controlled by the Spanish empire, over which "the sun never set," a phrase

42. See Alexander Koch et al., "Earth System Impacts of the European Arrival and the Great Dying in the Americas after 1492," *Quaternary Science Reviews* 207 (Mar. 2019): 13–36.

43. See Clark Erickson, "Amazonia: The Historical Ecology of a Domesticated Landscape," in *Contemporary Archaeology in Theory: The New Pragmatism*, ed. Robert W. Preucel and Stephen A. Mrozowski (Malden, Mass., 2010), p. 108, and Caroline Levis et al., "Persistent Effects of Pre-Columbian Plant Domestication on Amazonian Forest Composition," *Science*, 3 March 2017, pp. 925–31.

44. See Simon Lewis and Mark Maslin, "Defining the Anthropocene," *Nature*, 12 Mar. 2015, pp. 171–180.

45. See Geoffrey Parker, *Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century* (New Haven, Conn., 2013). See also Koch et al., "Earth System Impacts of the European Arrival and the Great Dying in the Americas after 1492," p. 14.

probably first used by Charles V in 1611, and witnessed a moment not only when humans had built a genuine world system but one capable of influencing its nonhuman Earth system of weather and climate.[46] A radical shift in *cultural techniques*—taken in that term's most basic sense as agricultural engineering—altered the global climate. Not all of the environing media we have discussed change the Earth system in this way, but that some of them might is highly suggestive.

Conclusion: Toward Comparative Environing Media Histories

The full media history of Mexico is yet to be written. In this article we have emphasized similarities between old and new media more than their differences—*el padrón real* as Google, the Council of Indies as a database, *el Templo Mayor* as a broadcasting station, *cruz y campana* as audiovisual media of conquest, or the Aztec calendar as central coordinator of a social order. Obviously Aztec media of political-religious control and Spanish media of military-religious conquest differ importantly from recent media, and we certainly recognize the risk of the media concept becoming vaporous by overgeneralization. Good analogies can inspire historical research, but good historical research will reveal the limits of those analogies. Scholarship needs both grand comparisons and careful studies. We obviously think it is worth the risk. The long view reminds us of the sober lesson that new possibilities for the management of space, time, and power do not relieve the old challenges: inequality, domination, the risks of disease and death, and the ability to completely turn our worlds upside down.

In the essay "El tres y el cuatro," Octavio Paz ponders the legacy of the *letrados* for Mexico, the intellectual bureaucrats with university degrees in law who served as Latin American governors in the many positions assigned by the Crown during the colonial period.[47] According to Paz, European settlers in the New World were motivated by the utopian ambition of escaping from history. "To the European mind, America was not only a geographical exception but also a historical and theological one."[48] He details the role played by sixteenth-century visionaries in the foundation of Mexican culture, *letrados* who brought a potent mixture of Platonic utopianism, Roman stoicism, Christian primitivism, and Renaissance humanism to the task of building New Spain. That violence went together with the building of the new utopia proves his central point that Mexico is a country of contrasts.

46. Charles V, "Charles V: The Empire on Which the Sun Never Set," The World of the Habsburgs, www.habsburger.net/en/chapter/charles-v-empire-which-sun-never-set

47. See Richard L. Kagan, *Students and Society in Early Modern Spain* (Baltimore, 1974).

48. Octavio Paz, "El tres y el cuatro," in *El laberinto de la soledad* (Madrid, 2003), p. 554.

In the end what distinguishes Mexican identity for Paz is a tension between warring ideals.[49]

Paz does not quite connect the strain of national utopianism in Mexican history to its media history, though James W. Carey, following Innis, does so with regard to the US: "The desire to escape the boundaries of Europe, to create a new life, to found new communities, to carve a New Jerusalem out of the woods of Massachusetts, were primary motives behind the unprecedented movement of white European civilization over virtually the entire globe."[50] The colonial "migration in space was above all an attempt to trade an old world for a new and represented the profound belief that movement in space could be in itself a redemptive act."[51] Carey sees this history of space and movement and this American experiment in creating culture and society at a distance as producing an almost religious attitude toward technologies of communication.

Here we can take *American* as more than the US. The New World was invented before it was colonized, and the great experiments began already in Europe, in the thesis of Edmundo O'Gorman, whose emphasis on imagination was not incompatible with hardheaded criticism of older narratives of discovery or harmonious mixing. Imagination mattered, but not everyone's imagination mattered equally.[52] America was named, after all, for a mapmaker, Vespucci, who managed the New World's facsimile in Seville. America's history is a story of massive confusions between old and new realities—the Aztecs were taken as *moros* by the Spaniards, and the conquistadores had the luck to arrive in an especially sacred year of the Aztec calendar. The supposed *conquest* by Cortés was aided by a collision of local empires and wars, in which the Spaniards came to take advantage of the aspiration of the rival Tlaxcala to take down the Aztecs.[53] What makes Mexico distinct from the US and Canada is the collision of two logistical media empires: Spain and the Aztecs. The US and Canada, of course, have a long, sad, and complicated history with first nations, some of whom had complex political structures, but there were no indigenous state-based organizations north of the Rio Grande of comparable complexity at the time of European contact. All three countries were shaped by media, but each had its own unique path.

49. See ibid.

50. James W. Carey, "A Cultural Approach to Communication," in *Communication as Culture: Essays on Media and Society* (New York, 2009), p. 13.

51. Ibid.

52. See Edmundo O'Gorman, *La invención de américa* (Mexico City, 2006).

53. See Matthew Restall, *When Montezuma Met Cortés: The True Story of the Meeting that Changed History* (New York, 2018).

The Mexican case tells us much about the special features of colonial media in the sixteenth century: unprecedented global connection, confusingly productive and destructive transfers of new and old forms of life—both cultural and biological, violent enslavement of people and extraction of resources, epidemiological catastrophe, and remote control by data. As Innis would insist, any complex social formation—palace, market, temple, army—will have its media, but the Spanish colonies in the Americas as well as the Pacific are special in the intense and explicit ways that they show media practices to be constitutive of the first World Wide Web, albeit one of maps, chronicles, identity papers, floral specimens, gold, silk, lands, and bodies. Indeed, another O'Gorman, Benedict R. O'Gorman Anderson, based much of the argument in *Imagined Communities* on the case of the Philippines, a nation that, like Mexico, is a concentrated archive and hinge point for understanding the global history of the past five centuries.[54] This is not the place to attempt a comparative taxonomy, but clearly the media histories of long settled land- or river-based societies such as China, Egypt, or India, to say nothing of many other societies and cultures, would necessarily look quite different.

We conclude on a speculative note. The role of the sea marks New World environing media. Everyone in the Americas who arrived before 1900—save indigenous peoples—arrived by sea (and new evidence suggests that ancient indigenous Americans may not have only walked across the Beringia land bridge but used seafaring in their migration).[55] A maritime passage remains part of the cultural DNA or collective memory throughout the New World. On the high seas, in a completely artificial environment that is symbiotic with wind, waves, and weather, the technical apparatus cannot remain hidden. Shipping reveals cultural techniques of all kinds; it does not let one, at least a sailor, remain numb to craft. A ship is a total world in a hostile environment. It makes an environment by managing the environment and thus may be the fundamental environing medium. Captains were the first cybernetic organisms, living beings coupled to a machine—literally so, as the Greek root of *cybernetics* can mean the art of governing a ship.[56] The great discovery of cybernetics,

54. See Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (New York, 2006). We do not know if he was distantly related to O'Gorman. On the importance of the Philippines, see Christina H. Lee and Ricardo Padrón, *The Spanish Pacific, 1521–1815: A Reader of Primary Sources* (Amsterdam, 2020), pp. 11–20. See also Padrón, *The Indies of the Setting Sun: How Early Modern Spain Mapped the Far East as the Transpacific West* (Chicago, 2020).

55. See Jennifer Raff, *Origin: A Genetic History of the Americas* (New York, 2022).

56. See Siegert, *Cultural Techniques*, pp. 68–81. See also Peters, *The Marvelous Clouds*, pp. 101–14.

the postwar science of communication between humans and machines, is that information is not separate from organization—organic or mechanical.[57]

This reality-altering force of networked dataflows was certainly the case in the Spanish seaborne empire and in its varied legacies in the New World and elsewhere. The empire was obviously more than its systems of control, but dataflows were the element that made it possible as a (partly) governable totality. Its media were environing, meaning that they had ontological force. The colonial media of the Spanish empire in the age of Philip II—obsessive fact gathering, space-time compression, fantastical templates impressed on native lifeways and new habitats, rapidly abrupt exchange (or imposition) of genes, pathogens, and species within the accelerated course of a few decades—give us a concentrated and accelerated picture of a more general principle: that computation writ large can be a demographic, geographic, political, even geological actor. As we muddle forward on an internet-directed spaceship Earth, governed with full chaos by its cybernetic overlords, it is good to look back to an earlier moment of globe-spanning technologies, cultural clashes, lethal pandemics, and climate alterations. In pondering the disastrousness of this history, and taking stock of its varied and ironically happy results such as the hundreds of millions of inhabitants of the New World today, perhaps we can learn how to derive some good amid all the commotion.

57. See Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (Boston, 1954), pp. 95–104.