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Volume: 4
Pg 167-175

When the Earth Shakes: A Status Report on Dissertation Research Regarding Mexican Volcanoes

Megan McDonie
PhD Candidate, Department of History, The Pennsylvania State University

Situated above multiple tectonic plates, central Mexico and highland Guatemala often experience strong earthquakes and volcanic activity. During the sixteenth to eighteenth centuries, this unpredictable topography shaped the human interactions with the natural environment. While indigenous populations in these regions were familiar with this terrain, Spanish colonists struggled to make sense of this volcanic topography upon their arrival. This field report provides an overview of 4 months of dissertation research completed during fall 2017 in Mexico City, Puebla, and Tetela del Volcán. This research occurred in the aftermath of a 7.1 earthquake, measured on the Moment Magnitude scale, that struck central Mexico 2 weeks after my arrival. This essay discusses the realities of living in post-earthquake Mexico and the archival research undertaken in each city. Preliminary findings reveal that knowledge concerning the volcanic topography influenced the outcome of property conflicts in favor of indigenous litigants. Research for this project will continue throughout 2018 in Spain and Guatemala.

Keywords: *Central Mexico, Earthquake, Popocatépetl, Volcano, Archives, Methodology*

doi 10.18113/P8ik460632

1.0 Introduction

On September 19, 2017, I was sitting at one of the long tables in *Galería 4* at the *Archivo General de la Nación* in Mexico City, engrossed in reading an archival document about a property conflict from 1732 over volcanic lands. A deep rumbling abruptly disrupted the reading room's sleepy silence, forcing me back into the present, when I realized that small tremors were shaking the floor beneath my feet. Suddenly, screeching wails reverberated around the halls, causing my stomach to drop. It was the seismic siren, signifying that an earthquake was seconds away. As I attempted to reach the exit, the tremors became massive waves, causing me to stumble into the wall. "*Corre!"* (Run!), one of the archivists shouted, her voice barely audible above the cacophony. When I reached the courtyard door,

the ceiling began to crack. With a horrendous roar, large pieces of brick and plaster crashed down in the doorway, accompanied by enormous clouds of dust. Trapped, unable to see, and with a mouthful of brick powder, I huddled with a group of archivists, hoping that the violent shaking would not topple the dome ceiling.

Everyone emerged safely from the archive that day, but the earthquake of September 19, 2017, took the lives of hundreds and collapsed buildings in Mexico City, Puebla, and Morelos. This earthquake eerily occurred on the 32nd anniversary of the 1985 earthquake that killed thousands and demolished large areas of the city. An overwhelming force of local residents, emergency workers, medical students, doctors, and hundreds of others responded to this most recent deadly disaster by rescuing individuals trapped in the ruins, clearing the rubble, and providing shelter and supplies. As the threat of an aftershock remained, concern also shifted towards the Popocatépetl volcano. Looming about 45 miles southeast of Mexico City, the volcano had been spouting ash and lava since the earthquake, stirring fears of a massive eruption. One did not occur, but Popocatépetl's outbursts and tiny tremors, along with the ruined cities in its vicinity, caused a state of increased anxiety during the following months.

For most of those months, I was living in Mexico City, supported by a Whiting Indigenous Knowledge Research Award to conduct archival research for my dissertation. My project coincidentally focuses on the effects of volcanoes and seismic activity in Mexico and Guatemala, but during the early modern period. The September earthquake occurred just two weeks into my research trip, shutting down the city for days. Afterwards, many people suggested that I might now have a better understanding of the experiences of the historical subjects in my project, albeit at a high cost. Nothing can compare to the surreal experience of the earth trembling beneath your feet and the lives an earthquake can take in an instant. It serves as a reminder of the potency of the earth and human resilience to rebuild each time the earth shakes or a mountain erupts. Historians are often trained to direct their focus on the archive, yet, especially on this trip, the current realities were as important, if not more so, than the archival record.

2.0 Project Overview and Significance

My dissertation project investigates the human-environmental interactions in Mesoamerica in the sixteenth through eighteenth centuries. More specifically, it focuses on the ways that volcanoes served as sites of cultural and intellectual exchange among Nahuas in central Mexico, Kaqchikel Mayans in highland Guatemala, and Spanish priests, colonists, and naturalists who settled in this topography. For varying historical actors, volcanoes offered places for rituals, provided fertile soil and water sources, and became the loci of empirical expeditions aimed at expanding knowledge of the natural and subterranean worlds. Looming over moments of Spanish colonial interactions, volcanoes offer a lens through which to illuminate the role of indigenous knowledge in early modern interpretations of geological phenomena.

This project brings together insights from ethnohistory and the history of science. Using native language sources and ethnographic methods, ethnohistorians have profoundly expanded our understanding of the lives of Nahuas and Kaqchikel Maya. Building from these insights, I use ethnographic information about

indigenous relations with volcanoes to underline their cultural persistence and knowledge concerning this topography. This methodology resonates in scientific history debates on indigenous knowledge, the importance of locality in scientific development, and Spain's role in the Scientific Revolution. While recent scholarship on Spain's involvement in European intellectual developments asserts that key scientific information came from Spain, my project evaluates volcanoes to suggest developments also came from indigenous peoples in the Americas. Volcanoes were familiar to Kaqchikel Maya and Nahuas, and gave them privileged knowledge about the topography that Spaniards lacked. This project expands the traditional geographic boundaries in the Scientific Revolution and stresses the role of indigenous knowledge in natural histories and understandings of volcanic landscapes.

3.0 Research Sites and Archives

Situated above the subduction of the Rivera and Cocos plates under the North American Plate, Mexico has a long history of seismic activity. This region contains the Trans-Mexican Volcanic Belt, which stretches from the Pacific Ocean to the Gulf of Mexico and contains several active volcanoes. Despite careful monitoring and alert systems, seismic outbursts have shaped, and continue to shape, the lives of millions who inhabit this area. Similarly, Guatemala is located above the subduction of the Cocos plate under the Caribbean Plate, which also has created an earthquake-prone region and several active volcanoes. In central Mexico, my investigation focuses on Nahua towns located around four volcanoes: Popocatépetl, Iztaccihuatl, Matlalcueye, and the Nevado de Toluca. In Guatemala, I focus on the volcanoes surrounding present day Lake Atitlàn and Antigua.

Figure 1: Research areas in Central Mexico

From left to right: Volcanoes Nevado de Toluca (1); Iztaccihuatl (2); Popocatépetl (3); Matlalcueye (4)

I selected these areas because Nahuas and Kaqchikel Maya maintained economic, cultural, and socio-religious connections to their volcanic homelands after the Spanish arrival. They considered these often-volatile landscapes to be animate members of their communities, believing that volcanoes housed their deities and ancestors, and that rivers originated from within them. During the conquest, Spaniards relied on Nahua allies to guide them through this unfamiliar volcanic terrain towards highland Guatemala. Many of these Nahua then resettled in the Kaqchikel Maya highlands, bringing their own understandings of volcanoes into a familiar topography. Both highland regions contain especially active, as well as dormant,

volcanoes. Since these volcanoes could impact the lives of anyone, no matter their position in the colonial hierarchy, documents concerning the volcanoes are located in numerous archives in Mexico, Guatemala, and Spain. In my larger project, I rely on over fifteen different archives and libraries, but for this report, I am only addressing the research completed in Mexican archives last fall.

4.0 Mexico City

My research in Mexico City focused on the ethnohistorical components of my project that address the ways indigenous populations, as well as Spaniards, lived among volcanoes. This section of my research focuses on periods of light volcanic activity and/or dormancy to understand the effects of the topography on colonial interactions. To do this, I worked in two different archives, the Archivo General de la Nación (AGN), and the Archives and Manuscripts Division of the Fondo Reservado at the National Library of Mexico. Although I had originally planned to spend most of my time in the AGN, it closed after the earthquake, so I went to the Fondo Reservado instead. During several weeks there, I surveyed the Franciscan Collection, as well as the *Tenencias de Tierras de Puebla*, or documents pertaining to land ownership in Puebla.

Figure 2: Inside the Biblioteca Nacional in Mexico, facing the entrance to the Fondo Reservado

The Fondo Reservado houses one of the largest collections of Franciscan documents in Mexico, along with the Biblioteca Franciscana in Puebla. Both contain the materials once held in small archives and libraries in the Franciscan convents located throughout central Mexico. These sixteenth to eighteenth

century records include general information about the daily functioning of the convents, inventories of their libraries, information on indigenous evangelization, and some natural history materials. I searched for documents from, or pertaining to, the Franciscan, Dominican, or Augustinian convents located on the slopes of Popocatepetl. These fourteen convents provided spaces to evangelize the Nahua populations in the region southeast of Mexico City. Now UNESCO World Heritage Sites, the convents reflect the earliest evangelization efforts in the region, while their presence on or near the volcano's slopes highlights the tensions between the built and natural environments. After assessing the Franciscan documents, I spent a week examining the Puebla land materials, which were primarily from the eighteenth century. I looked for records produced in towns close to Popocatepetl and Iztaccihuatl to find information regarding how individuals described the topography or used the terrain.

When the AGN reopened, I returned to consult documents from the collection about land and water conflicts. Similar to the process in the Fondo Reservado, I searched for conflicts located around Popocatépetl, Iztaccihuatl, and the Nevado de Toluca to understand how Spanish and Nahua individuals clashed over control of the volcanic topography and debated over resources such as fertile land and water. Many of the land cases I consulted also contained valuable hand-drawn maps produced by the courts. Not only did many of the maps contain depictions of an erupting volcano, but they also drew upon both indigenous and Spanish cartographic techniques. Additionally, I consulted records from the General Indian Court that provided additional information about the topography.

5.0 Puebla

After spending two months in Mexico City, I went to Puebla for a few weeks to consult the Archivo Histórico Municipal de Puebla and the Biblioteca la Fragua, as well as to visit some of the towns in my project. Although I arrived a month after the earthquake, many buildings were still damaged or in ruins. Wooden beams supported the corners and doorways of countless buildings, while giant cracks disturbed the otherwise smooth surfaces of stone walls. The fallen cupolas, the broken stones and saint statues from the façades of churches created an uneasy reminder of the disaster: it was strange to see such ornate and well-kept structures as asymmetrical and damaged. Ropes blocked the doors of numerous buildings deemed unsafe to enter, and the earthquake still dominated daily conversations. One of the archives I planned to consult remained closed during my entire stay in Puebla due to damage.

I was able to consult the Municipal Archive, where I surveyed the *cabildo*, or city council records, for information on volcanic or seismic activity. The cabildo records of Puebla are some of the most comprehensive records we have of this genre, as they begin in the 1530s with the founding of the city, and continue through the nineteenth century. These records contain accounts of the proceedings and descriptions of local conflicts that appeared before the council. Although this did not yield much information on the volcanoes, I did obtain some records that referenced the landscape and small property conflicts. In the La Fragua library, I searched the Jesuit records for information from missionaries and geographical surveys. In addition to their manuscript collection, the La Fragua library also contains valuable printed primary materials, such as the nineteenth century scientific journal *Memorias de la*

Sociedad Científica Antonio Álzate. Several editions contained documentation of the historical activity of Popocatepetl since the sixteenth century, as well as information on seismic activity in Mexico.

Figure 3: Valley of Atlixco in Puebla, Mexico

While in Puebla, I visited some of the towns in my project, including Atlixco and Huaquechula. Located in the fertile Valley of Atlixco, these towns often appear in my documents regarding conflicts over this land. Although the landscape descriptions in my documents are from hundreds of years prior, visiting these towns provided me with a better visualization and perspective of the terrain. At the same time, the damage from the earthquake was more visible here than anywhere else. While wooden beams provided support to some structures, other streets contained nothing more than piles of bricks and stones.

Figure 4: Earthquake damage in Atlixco, Puebla

6.0 Tetela del Volcán

In December, I spent several days in the small town of Tetela del Volcán, located in Morelos at the foot of the Popocatépetl volcano. After taking a bus and small van, I arrived in Tetela to attend the Seventh Annual Symposium on the Popocatépetl and Iztaccihuatl volcanoes. The conference was held outside the sixteenth century San Juan Bautista convent (due to the earthquake damage we were not able to enter the building). Over the course of three days, I listened to presentations by top volcanologists, archaeologists, sociologists, and anthropologists, and attended poster presentations by biologists and earth scientists. I was able to meet numerous scholars, including archaeologist and anthropologist Arturo Montero, who later invited me to consult his library.

During the last day of the symposium, I traveled with a group of ten other researchers on a *vista del campo*, or field visit, to several small towns on the slopes of Popocatépetl. Throughout the day, we visited different farms where we saw the economic activities of this region and viewed the different types of construction methods used to withstand the seismic activities. We also witnessed other structures that had been ravaged by the earthquake and heard countless stories about when the disaster struck: fallen houses; families separated; and the rebuilding process.

7.0 Conclusion

During the 4 months I spent in Mexico, I developed important perspectives for my research and collected valuable archival materials. While my research will continue in Spain and Guatemala throughout 2018, I have begun to construct a narrative about the interactions with the volcanic landscape and its human inhabitants, which will become part of several chapters. I found that Nahuas and Spaniards had distinct understandings of this region's ecology, which often worked in favor of Nahua litigants. Although Spaniards slowly developed an understanding of this region's topography, they often overlooked the various ways that Nahuas engaged with this terrain, which cost them their claims to the land.

Both in the sixteenth century and now, this topography exists in a precarious balance between creation and destruction. The threat of another disaster constantly simmers beneath the earth, yet the surface provides valuable water sources and fertile fields. I plan to spend the next year consulting additional archives to better understand how indigenous and Spanish inhabitants lived with and constructed knowledge concerning these unpredictable topographies.

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