Shocks to the Natural Order: Euroamerican Understandings of the New Madrid Earthquakes

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ABSTRACT
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My thesis uses firsthand accounts and early scholarly studies of the New Madrid Earthquakes to investigate the worldviews of a range of Euroamerican observers in the early nineteenth-century United States. Emanating from their epicenter on the Mississippi River in present-day southeastern Missouri, the earthquakes were great and sustained disruptions in nature that frightened and fascinated all sectors of the North American populace. Regardless of one’s geographical or social location, observation and empiricism became the vehicles for negotiating the chaos in nature. The widespread Christian conversions in the western territories constituted one means of making sense of the disaster, but backcountry thinkers’ observations and interpretations show that trans-Appalachian communities were not merely revivalistic release valves opposing the rationalism and faithful empiricism that early national elites embraced. Euroamericans instead drew from porous systems of scientific and religious knowledge and personal observations to construct their own empirical earthquake analyses.
# TABLE OF CONTENTS

Chapter

I. INTRODUCTION ................................................................. 1

II. THE ATLANTIC ROOTS OF EARTHQUAKE INQUIRY .......... 6

III. EXPERIENCING AND UNDERSTANDING THE NEW MADRID EARTHQUAKES .................................................. 15

IV. CONCLUSION ........................................................................ 45

BIBLIOGRAPHY ......................................................................... 47
CHAPTER 1: INTRODUCTION

In the late evening of December 16, 1811, a violent tremor jolted John Bradbury’s docked boat on the Mississippi River. Contracted by a friend to pilot fifteen tons of lead to New Orleans, the well-traveled Scottish botanist awoke to a panicked crew and a rapidly disintegrating riverbank that threatened his cargo. Despite his men’s desire to flee the boat and climb to steady ground, Bradbury decided that it would be safer to ride out the earthquakes in open water. After calming each crewmember with “a glass of spirits” and “reminding them that their safety depended on their exertions,” Bradbury continued down the river. The next morning, another aftershock induced a memorable scene of disorder. “The trees on both sides of the river were most violently agitated, and the banks in several places fell in, within our view carrying with them innumerable trees, the crash of which falling into the river, mixed with the terrible sound attending the shock, and the screaming of geese and other wild fowl, produced an idea that all nature was in a state of dissolution,” he recounted. His boat’s crew refused to continue rowing, and Bradbury docked for the day. After a new round of aftershocks halted their progress again the next morning, the group stopped at a small community near the Lower Chickasaw Bluffs. Observing a “bible lying open on the table” in a log cabin packed with anxious people, Bradbury spoke with a settler who explained that the earthquakes were the result of the earth trying to dislodge itself from its position between “two horns” of a comet that had appeared in recent months. If the earth were successful in its endeavor to free itself from the horns of the comet, “all would be well,
if otherwise, inevitable destruction to the world would follow.” “Finding the man confident in his hypothesis” and “unable to refute it,” Bradbury continued down the Mississippi.¹

Given the antagonism that exists between religious and scientific understandings of nature today, it would be convenient to project this dichotomy back in time to suppose that Bradbury’s encounter with the apocalyptically-minded settler demonstrates an irreconcilable divide between science and religion that spans United States history. On the surface, Bradbury’s meticulous observations contrast with his counterpart’s astrological musings in the same way that Enlightenment rationalism allegedly opposed Christian enthusiasm. But this overstated dualism obscures the complexity of Euroamerican understandings of nature in the early American republic.² Euroamericans drew from porous systems of scientific and religious knowledge and personal observations to construct their own empirical earthquake analyses. The backcountry settler was far-removed from the cosmopolitan nodes of enlightenment erudition, but he too acted empirically by observing and theorizing about the array of natural phenomena that surrounded him in the last days of 1811. The “horned comet” that this settler linked to the earthquake was the Great Comet of 1811, which was most prominent in American skies throughout the preceding autumn and captivated observers across the world with its brilliant pronged tail. His vivid memory of the Great Comet, a


²In *Doomsayers: Anglo-American Prophecy in the Age of Revolution* (Philadelphia: University of Pennsylvania Press, 2003), historian Susan Juster suggests “that we stop seeing the enlightenment and religious enthusiasm as distinct and antagonistic forces” (viii).
bible, and an earthquake that rerouted the Mississippi River created the perfect recipe for his eschatological concern.³

Although they would have disagreed with the man’s deductions about the destruction of the earth, the members of early nineteenth-century elite scientific circles would have found his connection between the comet and earthquakes plausible. Bradbury did not agree with the horned comet hypothesis, but neither did he offer an alternative explanation for the mechanism driving the “state of dissolution” that surrounded him. Like other learned naturalists of his day, he could not refute the man’s explanation with a more “scientific” answer, because one did not exist. As a botanist who largely supplemented his travels by collecting plants to ship to Britain for study, which was a coveted but rare occupation in the early nineteenth-century United States, Bradbury’s duty was simply to record his observations. Those scholars more removed from the visceral experience of the earthquakes ultimately compiled a variety of accounts and proposed theories, debated them in journals, and weighed them against other evidence, but the cause of what came to be known as the New Madrid Earthquakes of 1811 and 1812 remained a tantalizing mystery.⁴ Whether the earthquakes were a providential act foretelling the end of the world or simply an awe-


⁴For a discussion of the democratic nature of scientific discourse in the period and the curious topics of debate that this discourse produced, see Andrew J. Lewis, “A Democracy of Facts, An Empire of Reason: Swallow Submersion and Natural History in the Early American Republic,” William and Mary Quarterly 62, no. 4 (2005), 663-96. As with Bradbury’s inability to refute the horned comet explanation, it was “poor science” for naturalists to repudiate the theories that swallows hibernated under water or that snakes charmed their prey without being able to prove otherwise.
inspiring natural phenomenon, Bradbury and the riverside doomsayer mutually recognized the limits of human knowledge.

The earthquakes rattled the periphery of the new nation, but the tremors exposed a core of early nineteenth-century Euroamerican worldviews.⁵ Reflected in Euroamericans’ experiences and understandings of the earthquakes, these worldviews were by no means unified or fully coherent, but neither were they oppositional and static. As great and sustained disruptions in nature that frightened and fascinated all sectors of the American populace, the earthquakes induced a common sense of awe and disorientation that confused understandings of natural order. Euroamericans sought to explain and predict earthquakes as a means of salvaging a sense of order from the chaos unleashed in nature. Regardless of one’s geographical or social location, observation and empiricism became the vehicles for negotiating this utter absence of natural order. The widespread Christian conversion and renewed religiosity that occurred in the western United States territories during and immediately following the tremors constituted a way of explaining the turbulence, but this backcountry search for order was not a singular, oppositional means of understanding nature. A commitment to making detailed observations and an interest in theories about the natural cause of the earthquakes were compatible with belief in a divine power driving processes in nature. Although this democratic intellectual impulse was a source of national pride for scientific elites determined to distinguish their national brand of observation and empiricism from the supposed European reliance on theory, reports published in American journals in the years following the New Madrid earthquakes through the 1820s reveal the limits of this

⁵Although African and Native Americans drew from their own inherited cultures and epistemologies to construct equally rich and legitimate interpretations of the New Madrid Earthquakes and the accompanying natural phenomena, this paper will explore only Euroamerican understandings.
democratic inquiry and continued American dependence on European theories about earthquakes. Like other nationalizing enterprises in the early United States, elite scientific inquiry sought unity and order to stabilize the republic, but a series of cataclysmic earthquakes, at a time of territorial expansion, revivalism, and a burgeoning popular press, offered neither.
CHAPTER 2: THE ATLANTIC ROOTS OF EARTHQUAKE INQUIRY

Conflicting theories about the causes of earthquakes and the concurrent rise of evangelicalism and empiricism in the eighteenth-century North Atlantic world framed the contours of the interpretation and early study of the New Madrid earthquakes. Although scholars contest the coherence, periodization, and applicability of the terms “Scientific Revolution” and “Enlightenment” when referring to intellectual developments in early modern Europe and its overseas empires, an intellectual commitment to empiricism, classification, and order reigned in eighteenth-century inquiry. Theories required measurable evidence that accorded with understandings of the laws that supposedly governed nature and human societies. As exotic natural and social environments, American colonies were thus intriguing sites for collecting evidence, which fed transatlantic currents of intellectual exchange. Prominent European intellectuals dictated the Atlantic hierarchy of knowledge about nature by purchasing and studying specimens and disseminating theories about processes and oddities in nature. But as thinkers, specimen gatherers, and occasional specimens themselves, American Indians, African slaves, and Euroamerican colonists were nonetheless integral, although unequal, participants in this flow of knowledge.  

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6 On colonial British natural history and the contributions and positioning of colonists, African slaves, and Native Americans in this Atlantic matrix of ideas and specimens, see Susan Scott Parrish, American Curiosity: Cultures of Natural History in the Colonial British Atlantic World (Chapel Hill, N.C.: University of North Carolina Press, 2006). Parrish argues that the terms of colonial Anglo-Atlantic scientific exchange were more fluid and diffuse than the economic and political boundaries instituted between the colonies and the metropole. She maintains that only after the 1760s did the boundaries of participation and influence in Anglo-American science became more rigid and exclusive.
Among colonists in mainland British North America, preachers were the most prominent part-time naturalists. Cotton Mather’s case demonstrates both Protestants’ long-standing fusion of sacred and empirical understandings of nature in North America and the position of prominent Anglo-American thinkers in the transatlantic hierarchy of knowledge about nature. Despite his strict adherence to the Calvinism, which stressed humanity’s total inability to comprehend God’s plan, the Puritan polymath deemed the natural sciences a legitimate object of study. During the Salem Witch Trials of the early 1690s, Mather sought to distinguish between accusations of witchcraft based on spectral evidence, or the alleged visitation of the devil in the form of an accused person, and “more evident and sensible things” like confessions or evidence of the actual practice of witchcraft. He also penned a series of letters to the Royal Society of London between 1712 and 1724 in hopes of being accepted into the highest circles of European learning. Entitled “Curiosa Americana,” the missives featured Mather’s thoughts on a number of topics related to nature, most notably the discovery of giant bones in New England. At once theological, scientific, and occult, these musings contained subtle appeals for European recognition of both their author’s intellect and the Americas as a legitimate arena of study.

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Mather further attempted to construct what one literary scholar has deemed his “harmonious structure of knowledge” with intertwining principles of the occult, religion, and the enlightenment in his 1721 work *The Christian Philosopher*. His discussion of earthquakes borrowed heavily from Athanasius Kircher, a seventeenth-century German Jesuit whose study of the subterranean world yielded elaborate illustrations and schema for understanding “the Divine Structure of the under-ground World, and the wondorous distribution of the Work-houses of Nature, and her Majesty and Riches therein.” In his empirical quest to explore and comprehend the processes guiding the natural world, Kircher went as far as lowering himself into Mount Vesuvius’ active volcano with a rope. Mather incorporated Kircher’s theories about the combustible combination of minerals within the earth’s underground networks, but concluded that earthquakes offered a stern warning against materialism and the foolhardy assumption that one could defend against tremors of the earth. “*Fear, lest the Pit and the Snare be upon you! Against all other Strokes there may be some Defence or other be thought on: There is none against an Earthquake!*” Mather wrote, adding that earthquakes “will effectually instruct me to avoid the Folly of setting my Heart inordinately on any Earthly Possessions or Enjoyments.” For Mather, earthquakes functioned simultaneously as God’s warning and an object of study.

By the middle of the eighteenth century, empirical, religious, and colonial enterprises remained intertwined, but structures of knowledge, particularly as they applied to

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understanding earthquakes, were not harmonious. Since Antiquity, natural philosophers had theorized about the hypothetical roles of subterranean fire, water, and air in earthquakes, but a series of tremors in London and New England and a devastating shock that destroyed Lisbon in 1755 gave naturalists ample opportunity to apply the principles of firsthand observation and empiricism. Not surprisingly, experts in astronomy, electricity, and other specialized disciplines attributed earthquakes to their objects of study. Months before the 1750 tremors in London, astronomers proposed an “airquake” theory, suggesting that rumbling in the air rather than underground was responsible for tremors. Most natural philosophers continued to privilege subterranean explanations, but the “airquake” theory forced them to reckon with meteorological oddities that accompanied earthquakes. Also in 1750, William Stukeley drew from Benjamin Franklin’s writings to submit that if the electrically charged earth hit a cloud, the earth would “snap.” If subterranean fire were the cause of earthquakes, as Kircher and others who related combustion with earthquakes had proposed, Stukeley questioned why the fires did not always shoot up through the earth to create large tears in the ground. He also doubted that “airquakes” could be capable of inflicting mass destruction. Although Franklin’s laws of electricity were crucial for Stukeley, Franklin favored the idea that waves of internal fluid inside the earth were responsible for its shaking. The question of an electrical cause for earthquakes became a topic of lively debate among New England intellectuals. In his 1755 pamphlet *Earthquakes the Works of God*, Boston preacher Thomas Prince explained that God had used electricity to shake New England, which drew criticism from Harvard mathematician and astronomer John Winthrop
IV, who dismissed electricity as a fashionable, but ultimately unsatisfying mechanism for explaining earthquakes. 11

While the tremors in New England and London excited Anglo-American interest in the cause of earthquakes, the Lisbon earthquake of 1755 unleashed unimagined disorder and suffering, tempering enlightenment optimism about humanity’s capacity for infinite understanding. With estimates at 30,000 killed, the port city destroyed, and rumors of craters swallowing surrounding villages whole, the disaster in Lisbon was a sensational news item that demanded the attention of prominent European thinkers. Voltaire’s *Candide, or Optimism* famously critiqued the age’s hopefulness and preoccupation with categories of natural order. For Voltaire, the earthquake in Lisbon defied the laws of nature and reason, repudiating the related sense of natural order that the Linnaean system of classification sought to construct. The disaster fractured nature and the categories constructed for its study. 12

Methodist leader John Wesley seized upon prevailing unease about the limits of human reason to argue that faith in God was the only true means of understanding nature. In


a 1756 pamphlet entitled *Serious Thoughts Occasioned by the Earthquake in Lisbon* and sermons and hymns printed soon thereafter, Wesley sought to disprove the ideas that fire, water, and air were the responsible agents by questioning why each element did not leave behind more evidence of its impact. But Wesley reserved most of his disdain for the “airquake” theory. “For as to the fashionable Opinion, that the exterior Air is the grand agent in Earthquakes, it is so senseless, unmechanical, unphilosophical a Dream, as deserves not be named, but to be exploded,” he wrote. Wesley then launched into a jeremiad against worldly means of seeking control. When “the Earth threatens to swallow you up,” he argued no amount of money, honor, intelligence, strength, or speed offers protection. “Wealthy Fool, where is now thy Golden God?” he taunted, adding that even if one could escape, “there is another grim Enemy at the Door: and you cannot drive him away. It is death.” In short, terrible earthquakes delivered a message that evangelicals believed they already knew: humanity lacked control.13

Despite his distaste for the “airquake” theory and his insistence on human helplessness to escape earthquakes, much less identify their natural cause, Wesley’s beliefs

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regarding human and divine agency did not preclude an interest in nature. After reading Franklin’s work, he published his own treatise on electricity and purchased four “electricity machines” to treat illnesses among his London congregants. For Wesley, nature could be studied and harnessed to serve humans, but human reason was incapable of understanding natural disasters and their devastation. Arguing against a rational means of seeking the natural order that his Enlightenment contemporaries craved, Wesley urged readers to embrace their earthly limitations by pursuing faith in divine control.

The Lisbon disaster evoked a profound sense of human limitation, but it did not leave the European intelligentsia entirely dissatisfied with the Enlightenment impulse to explain nature, nor did it uniformly stoke clergymen’s impassioned calls for conversion. In 1757 Huguenot preacher and naturalist Jean-Élie Bertrand published *Memoires historiques et physiques sur les tremblements de terre*, a treatise that functioned both as a compilation of observations related to the recent European earthquakes and a call for a methodological reorientation in their study. A frequent correspondent with Voltaire, Bertrand sought divine and natural explanations for earthquakes. He insisted that one must never forget that God directed these “extraordinary events” and claimed the need to learn more about the interior of the earth, where “all the reasons that make earthquakes useful and necessary” would be discovered. Because of the great variety in the eruptions of dust, water, fire, and ash that accompanied “particular” tremors, Bertrand also cautioned against oversimplifying explanations for earthquakes. To “hold on to a single cause” would be a “methodological error and against the truth,” he argued. The Lisbon disaster left Bertrand without definitive
conclusions, but with faith in God and an empirical method that did not obscure the variety and complexity of tremors, he hoped to advance the study of earthquakes.\footnote{Jean-Élie Bertrand, \textit{Memoires historiques et physiques sur les tremblemens de terre} (La Haye: Chez Pierre Gosse, Jr., 1757), 2-3, 21-23, 171-172. On Bertrand and his correspondence with Voltaire, see Francis J. Crowley, “Pastor Betrand and Voltaire’s \textit{Lisbonne},” \textit{Modern Language Notes} 74, no. 5 (1959), 430-433.}

In the second half of the eighteenth century, the North Atlantic world hosted its share of shocks to the environmental and political order. Just as overseas colonies had become objects of European study, the Louisiana Purchase and the seizure of Indian territory offered the new United States opportunities to link imperial and scholarly enterprises. The scientific and diplomatic impulses underlying Lewis and Clark’s mission exemplified the connection between the study of nature and the extension of empire, but the Corps of Discovery was not the only group that Thomas Jefferson dispatched to the trans-Mississippi West. After sailing to the United States to collect cotton specimens around New Orleans, John Bradbury travelled first to Monticello, where Jefferson encouraged him to gather plants around St. Louis instead. Bradbury obliged and even ventured up the Missouri River to a northern Mandan village before returning to St. Louis, where he finally set out for his original destination in time to meet the earthquakes at their epicenter.\footnote{On Bradbury’s travels before the earthquakes and interaction with Jefferson, see Bradbury, \textit{Travels in the Interior of America, in the Years 1809, 1810, and 1811}, 1-204; Rodney H. True, “A Sketch of the Life of John Bradbury, Including His Unpublished Correspondence with Thomas Jefferson,” \textit{Proceedings of the American Philosophical Society} 68, no. 2 (1929), 133-150; and H.W. Rickett, “John Bradbury’s Explorations in Missouri Territory,” \textit{Proceedings of the American Philosophical Society} 94, no. 1 (1950), 59-89.}

The circumstances that led to Bradbury’s fateful position on river are telling not only for his intrepid pursuit of plants and terrible luck. Bradbury’s case demonstrates that in the early nineteenth century, the study of nature in North America became increasingly transcontinental, but it remained transatlantic. The colonies may have broken political ties with Britain, but the post-colonial exchange that followed reflected their continued
dependence on European centers of learning, which supplied the former colonies with books, scientific instruments, and professional scientists like Bradbury. For American-born elite men at the turn of the century, the study of nature was largely a leisure activity and marker of social distinction reserved for physicians, politicians, and lawyers who could afford the equipment and time away from their regular occupations, but who could not support themselves through scientific study alone.¹⁶

Scholars have shown that the practice of natural science in the early Republic was not an isolated intellectual sphere free of domestic social and political entanglements. As popular presses widened public access to information and evangelical leaders questioned elite religious and academic institutions, intellectual authority became increasingly contested. The study of nature embodied this tension between popular and elite impulses. While classification established a sense of stability and order in a language that held currency only for educated elites, empiricism scattered authority by encouraging more democratic participation. Meanwhile, popular print and the renewed Protestant revivalism of the early nineteenth century blurred distinctions between rational and enthusiastic, cosmopolitan and folk, and other dichotomous understandings of knowledge and order. The New Madrid earthquakes would expose this intellectual incoherence.

¹⁶On early national science and its continuing dependence on Britain, see John C. Greene, *American Science in the Age of Jefferson* (Ames, Ia.: The Iowa State University Press, 1984), and Kariann Yokota, “‘To Pursue the stream to its fountain’: Race, Inequality, and the Post-Colonial Exchange across the Atlantic,” *Explorations in Early American Culture* 5 (2001), 173-229. Throughout the article, Yokota develops the image of elite early national students travelling “upstream” across the Atlantic to learn from European founts of knowledge. She limits her analysis to the “upstream” flow of knowledge in the postcolonial age, but as Cotton Mather’s case demonstrates, an Anglo-American intellectual inferiority complex also pervaded the colonial period. On the intellectual companionship that elite men sought through their scientific correspondence, see Konstantin Dierks, “Letter Writing, Masculinity, and American Men of Science, 1750-1800,” *Explorations in Early American Culture* 2 (1998), 167-198.
CHAPTER 3: EXPERIENCING AND UNDERSTANDING THE NEW MADRID EARTHQUAKES

1811 was a year replete with natural disorder, providing ample cause for those who would later seek to connect the earthquakes to other anomalies in nature. Across the United States and its adjoining territories, there were unusually prevalent and extreme periods of flooding and drought, along with a summer heat wave and stagnating pools of water that spread disease and yielded a “pestilential vapour” along the Mississippi River. From the Gulf of Mexico to New England, storms pounded ships and seacoasts, and a September hurricane devastated Charleston. Inland tornados contributed to the growing sense of a “war of elements.” Traveler Charles LaTrobe later remarked that “a spirit of change and a restlessness seemed to pervade the very inhabitants of the forest” as squirrels “obeying some great and universal impulse…were seen pressing forward by tens of thousands in a deep and sober phalanx to the South.”

In the months before the earthquakes, a solar eclipse and the Great Comet of 1811 fueled speculation from popular and scholarly audiences alike. Journals became forums for lively discussions about the study and ultimate meaning of these astronomical oddities. A chronicler of the events of 1811 noted that the eclipse “displayed a most impressive combination of the terrible and the sublime” that captured the attention of all animals. For an

unusual event like the comet, “a thousand conjectures are formed as to its immediate object and ultimate effects, the spirit of philosophy is awakened, sinners tremble at the dreaded termination of their career, while the philosopher calmly prepares to search into the hidden secret,” wrote a contributor to Baltimore’s Weekly Register.18

Based upon the descriptions and interpretations of the phenomena offered in the Weekly Register and The Monthly Magazine and Literary Journal, the literate public accommodated the worldviews of the trembling sinner and the stoic natural philosopher, but both recognized their limitations. The chronicler of 1811 in The Monthly Magazine and Literary Journal favored Providence as the explanation for the disasters that had befallen the country, but God’s intention in unleashing this array of natural fury remained unclear. Instead of presenting a chronology of catastrophe as a warning to sinners or the faithless about God’s capacity to punish, the writer emphasized divine power and mystery.19

The Weekly Register’s discussion of the comet assumed a much less devotional tone, but the periodical nonetheless showcased a variety of points of view. One writer dismissed the “ancient” notion that with their “extreme vicissitude of heat and cold,” comets were “so many hells to torment the damned,” but simultaneously entertained the idea that “these opaque bodies many be habitations for rational creatures suited to such climes.” After enumerating a number of scholarly calculations related to the comet, another contributor ended the largely mathematical discussion with an esoteric rumination on the mysteriousness of God’s “Infinite Mind” and humanity’s “dependence” on the divine. Two weeks later, however, the publication printed a letter by a man who claimed that “in this enlightened age,”


19“A retrospect of the year 1811,” 33.
the idea that comets were “supernatural visitations, and the harbingers of Divine wrath” was “more the defect of education, than the result of conviction.” Despite the author’s aversion to divine explanations, he nonetheless granted that there was a “mysterious connection,” perhaps the influence of gravity, which accounted for the array of natural phenomena in 1811. Regardless of their understandings of the forces driving the comet, people across the continent shared in feelings of wonder, curiosity, and confusion.20

The night skies of 1811 retained their mystery, but with three major shocks spanning three months and reports of tremors well into the fall of 1812, the earthquakes commanded more immediate attention and fear. Although people near the epicenter, actually located closer to Little Prairie, Missouri, than New Madrid, experienced a wider array of eerie sights, sounds, and smells, Americans reported moderate shaking from at least Detroit to New Orleans on the western edge of the United States and from Baltimore to Charleston on the eastern seaboard.21 The physical damage inflicted was minimal, but the quaking sensation of


21 New York Congressman, physician, and naturalist Samuel Mitchill compiled testimony from across the century and established this rough estimate of the geographical reach of the earthquakes. He questioned the “dubious character” of reports of shocks as far north as Philadelphia and New York, but other studies extend the earthquakes’ reach to New England. For Mitchill’s discussion of the “limits of their extension,” see Samuel L. Mitchill, “A Detailed Narrative of the Earthquakes which occurred on the 16th day of December, 1811, and agitated the parts of North America that lie between the Atlantic Ocean and Louisiana,” *Transactions of the Literary and Philosophical Society of New York*, Vol. 1, March 1815, 295-6. Because this study focuses on Euroamerican religious and scientific speculation about the earthquakes, it is not my intention to dispute the validity of claims about the earthquakes’ scope, other than to emphasize that these earthquakes affected a wide swath of North America. Further, this study is not meant to be a full treatment of the social, political, and economic significance and impact of the earthquakes. For useful introductions to the earthquakes and their wider implications, see Jay Feldman, *When the Mississippi Ran Backwards: Empire, Intrigue, Murder, and the New Madrid Earthquakes* (New York: Free Press, 2005); Jake Page and Charles Officer *The Big One: The Earthquake that Rocked Early America and Helped Create a Science* (Boston: Houghton Mifflin Company, 2004); Norma Hayes Bagnall, *On Shake Ground: The New Madrid Earthquakes of 1811-1812* (Columbia, Mo.: University of Missouri Press, 1996); Myrl Rhine Mueller, *Lost in the Annals: History and Legends of the New Madrid Earthquake of 1811-12* (Little Rock, Ar.: J&B Quality Book Bindery, 1990); and James Lal Penick, Jr., *The New Madrid Earthquakes*, rev. ed. (Columbia, Mo.: University of Missouri Press, 1981). These works also discuss how advances in geology have informed the modern scientific study of the New Madrid earthquakes.
was unforgettable. The earth’s oscillation awoke Americans with ill-timed church bells across the country. Groggy citizens imagined home intruders as their most likely nighttime threat. In Washington, D.C., families moved from room to room to search for thieves, and a young girl in Indiana Territory thought that Indians were trying to break into her house. The vibrations also induced nausea. A man writing at his desk on Capitol Hill in the middle of the night “suddenly perceived his body to be in motion, vibrating backward and forward, and producing dizziness.” Before they interpreted the earthquakes, people across the country shared in this unease.

The experience closer to the epicenter was, of course, even more disorienting, “dismaying men and beasts” alike. Prominent naturalist John James Audubon was riding his horse in Kentucky when, moments before he sensed the ground shaking, his mount slowed “as if walking on a smooth sheet of ice” and “fell a-groaning piteously, hung his head, spread out his four legs, as if to save himself from falling.” Multiple accounts likened the quaking sensation to the ocean. “It seemed as if my bedstand was on a rough sea, and the waves were rolling under it, so sensible were the undulations,” wrote preacher James Finley from Kentucky. In a letter to prominent itinerant minister Lorenzo Dow, New Madrid resident Eliza Bryan described a landscape “in continual agitation, visibly waving as a gentle sea.” The feeling of waves intensified the nausea that people experienced on the East Coast. A Kentucky settler wrote in his diary that during the most severe shocks, “you feel light

Seismologists Myron Fuller and Otto Nuttli, who published numerous studies in scientific journals and the United States Geological Survey, pioneered the geologic study of the earthquakes.

head[ed] and reel about like a drunken man.” “In some instances, where individuals had been deprived of their usual sleep, through fear of being engulfed in the earth, their stomachs were troubled with nausea, and sometimes even with vomiting. Others complained of debility, tremor, and pain in the knees and legs,” added an observer from northwestern Tennessee, capturing the impact of the earthquakes on “both the body and mind of human beings.”

Broken land, dark skies, and churning bodies of water surrounded dizzied settlers and terrified boat crews, who may have experienced slight tremors before but nothing like an earthquake of this magnitude. John Bradbury was not the only boat passenger on the water to survive and record his observations. The first steamboat to ply the Mississippi River had begun its voyage from Pittsburgh to New Orleans that November and was north of New Madrid during the first shock. The boat weathered the turbulence, but the earthquake restructured the course of the Mississippi River, and the pilot soon found that his navigation manual for determining water depth and avoiding eddies was useless. Islands had disappeared and riverbanks disintegrated. In the nights following the initial earthquake, another passenger on the boat reported being frequently awakened by chunks of former islands that had floated down the river and were scraping against the boat. A boatman near New Madrid during the second major shock on February 7, 1812, observed that as trees

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“agitated like reeds on a windy day” and “sparks of fire” flew, the river temporarily flowed backwards, and water “violently sucked into some chasm deep in the river’s bottom” spawned vortexes as deep as thirty feet. Clouds of dark smoke, collapsed riverbanks, and trees rose from the turbid water.24

The scene on land was no less shocking to the senses. “The awful darkness of the atmosphere which, as formerly, was saturated with sulphurous vapor, and the violence of the tempestuous thundering noise that accompanied it…formed a scene, the description of which would require the most sublimely fanciful imagination,” wrote Eliza Bryan. One man in New Madrid remembered the helpless feeling of trying to decide where he would be least exposed to danger. Residents did not want to stay in their houses, which were in various states of collapsing, sinking, burning down, or floating away, but they also feared riding out the shocks in open air because trees were falling and the ground was “opening in dark, yawning chasms, or fissures, and belching forth muddy water, large lumps of blue clay, coal, and sand.” The fallen trees did offer some means of survival, as residents clung to tree trunks to avoid falling into deep chasms that split the ground for distances as long as ten or fifteen miles and made nighttime travel especially dangerous. One family lost their cattle and dispatched its youngest son to hunt for missing cattle on horseback, but he was never seen again. The family suspected he disappeared in “some of those fearful chasms.” The earthquake transformed familiar travel routes, and another family’s flight to higher ground

24J.H.B. LaTrobe, The First Steamboat Voyage on the Western Waters (Baltimore: Maryland Historical Society, 1871), 28-31; Mitchell, “A Detailed Narrative,” 290-1, 300. Several accounts corroborate the observation that the Mississippi River ran backwards. For other eyewitness accounts, see Firmin La Roche, “A Sailor’s Record of the New Madrid Earthquake” Missouri Historical Review 22, no. 2 (1928), 269; and Vincent Nolte, Fifty Years in Both Hemispheres or, Reminiscences of the Life of a Former Merchant (New York: Redfield, 1854), 182. Charles LaTrobe and James Ross relate the memories of inhabitants who experienced the earthquakes and claimed the river ran backwards in LaTrobe, The Rambler in North America, 1832-1833, vol. 1, 111, and James Ross, Life and Times of Elder Reuben Ross (Philadelphia: Grant, Faires & Rodgers, n.d.), 207.
became a wading expedition through water “twelve to forty inches in depth, of a temperature of 100 degrees...at times of a warmth to be uncomfortable, for the distance of four to five miles.” Having witnessed their town sink twelve feet by one estimate, some residents of New Madrid fled to a hill thirty miles north as water gushed in to submerge the newly sunken land. Colonel John Shaw of Wisconsin was in New Madrid on February 7 and described the flight to the hill as “a most heart-rending scene.” Once encamped on the hill, the refugees began to reflect. “It was proposed that all should kneel, and engage in supplicating God’s mercy, and all simultaneously, Catholics and Protestants, knelt and offered solemn prayer to their Creator,” Shaw reported, adding, “It was a matter of doubt among them, whether water or fire would be likely to burst forth, and cover all the country.”

Near their epicenter, the earthquakes elicited a level of fear and disorientation that called all knowledge about nature into question. As Americans began to piece together their recollections of the phenomena, no one held a definitive answer for the cause of the tumult. Just as the Lisbon earthquakes had raised questions about the limits of human reason in enlightenment Europe, the stable, ordered sense of nature that naturalists sought to construct in the first decades of the United States was utterly fractured by this “state of dissolution.” In this era of widening literate discourse, commitment to observation and empiricism, and deep transatlantic confusion about the cause or causes of earthquakes, the shocks emanating from the heart of the continent revealed a more democratic intellectual landscape that accommodated an array of reactions, observations, and opinions in the decade that followed.

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25Bryan to Dow, History of Southeast Missouri, 305; La Roche, “A Sailor’s Record of the New Madrid Earthquake,” 268-70; Timothy Dudley, “The Earthquake of 1811 at New Madrid, Missouri,” Annual Report of the Board of Regents of the Smithsonian Institution (Washington: James B. Steedman, Printer, 1859), 421-22; Charles Lyell, A Second Visit to the United States of America, vol. 2 (New York: Harper Brothers, 1850), 177; and “New Madrid Earthquake Account of Col. John Shaw,” Missouri Historical Review 6, no. 2 (1912), 91-92. Interestingly, Shaw described the settlers’ flight from New Madrid to the hill as a “hegira,” the Arabic term used to describe Muhammad’s flight from Mecca to Medina in 622 CE.
In this period of fact gathering and hypothesizing, elite commentators privileged the observations of the educated over the unlearned, but their inquiry could not contain the pervasive uncertainty that came with attempts to predict and understand the causes of earthquakes. From Bradbury’s detailed observations to the settler foretelling the earth’s destruction, Euroamericans attempted to re-exert a sense of control by observing nature and seeking to extract meaning from the literal and figurative imbalances that they believed the earthquakes had signaled.

In communities at the western edge of the United States, the earthquakes frightened nonbelievers into at least a brief period of religiosity. In one sense, borderland settlers “experimented” with evangelical Christianity as a way of explaining the cause and meaning of the earthquakes. In accordance with this spirit of religious experimentation, Methodist membership near the epicenter spiked. The Western Conference of Methodist Church, which comprised the states and territories most affected by the earthquakes, grew from 30,000 to 45,000 members between 1812 and 1813. This growth in the Western Conference, which was broken into the Ohio and Tennessee Conferences in 1813, constituted nearly seventy-five percent of the new Methodist membership in the United States for 1813. By 1814, national Methodist conference minutes recorded a loss of more than 3000 members, nearly 2000 of which came from the Western Conference. An early scholar of borderland Protestantism concluded that the earthquakes probably did swell church rolls. The statistics are indeed compelling evidence for major demographic shifts in western United States Methodism during this period. But to identify the earthquakes as the sole causal agent for mass conversion and to correlate the end of the quaking with the decline in membership would exaggerate the earthquakes’ importance and oversimplify settlers’ religious lives.
Less sensational factors like fluctuations in westward migration and difficulties in backcountry reporting may have been more responsible for this massive growth and brief slide in Methodist membership. Furthermore, without equally detailed Baptist figures to compare to Methodist growth, the earthquakes’ statistical impact on territorial evangelicalism remains imprecise.  

Still, observations across the most shaken regions of the country corroborate the conversion statistics as preachers used the shocks to their rhetorical advantage. “It was a time of great terror to sinners,” remembered Methodist circuit rider James Finley, who found the earthquakes a useful preaching tool, particularly when an aftershock occurred during a funeral in Kentucky. “For the great day of his wrath is come, and who shall be able to stand?” he demanded of his congregation amidst the tremors. A recent migrant to Ohio wrote to his sister in North Carolina to tell her that although earthquake damage in his neighborhood was minimal, several people “got religion” during a revival at the tremors’ peak. In Tennessee, Baptist preacher Reuben Ross addressed a community north of Nashville that huddled around bonfires with “many knees bent in prayer that had, perhaps, never bent in that way before.” Furthermore, James Shaw’s portrayal of the ecumenical prayers of  

26 For Methodist membership statistics in the United States between 1810 and 1814, see “Minutes Taken at the Several Annual Conferences of the Methodist Episcopal Church, in the United States of America,” published by Daniel Hitt in New York City for each of the years in question. These compilations of minutes from each of the major “conferences,” or regions of the national Methodist church, list the preachers assigned to the “districts” within the conferences, the figures for white and black congregants in each district, and obituaries for circuit riders who died the preceding year. The minutes do not, however, include information about the minutes’ publication date each year, making it more difficult to determine precisely if the tremors from December 1811 through the fall of 1812 had a measureable statistical impact. This means, for example, that the minutes for 1812 may have printed statistics from 1811, but this lag remains unclear. Walter Brownlow Posey cites statistics printed in the 1812 minutes as figures for 1811 in Posey, “The Earthquake of 1811 and its Influence on Evangelistic Methods in the Churches of the Old South,” Tennessee Historical Magazine 1, no. 2 (1931), 111. For a more recent discussion of the religious consequences of the earthquakes, see Tom Kanon, “‘Scared from their Sins for a Season’: The Religious Ramifications of the New Madrid Earthquakes, 1811-12,” Ohio Valley History 5, no. 2 (2005), 21-38. Kanon suggests that the increases in Methodist church membership after the earthquakes are comparable to the growth of Methodist, Baptist, and Presbyterian denominations during the revivalism at the turn of the nineteenth century.
hilltop refugees from New Madrid shows that Protestants were not the only Euroamericans deeply concerned about the fates of their souls after the earthquakes. After the first major tremor, people in New Madrid also sought out a French priest whose boat had docked there, and “they knelt and had absolution.”27

The earthquakes bent knees across the western United States, but whether or not people would remain prostrate and reform their ways after the shocks subsided remained a lingering concern. Some commentators found the impact lasting and impressive. Baptist preacher and missionary Jacob Bower converted in 1812 and directly addressed the question of continuity in his memoir. “It was frequently said by the enemies of religion, the Baptists are all shakers, that when the Earth is don shaking, they will all turn back, and be as they were before,” he wrote. He dismissed the criticism by citing nineteen revivals after the earthquakes in which there were “perhaps fiewer apostates among them” as any revival that he had seen since and a “host” of converts from the time of the earthquakes who, like Bower, later became ministers. The supposed transformation of borderland communities also heartened Finley, who witnessed people of all ages previously devoted to “mirth and revelry” suddenly become concerned about their souls. News of lifestyle reforms closer to the epicenter traveled quickly across religious correspondence networks that spanned the country. After the first major earthquake in December, Moravian missionaries in the Cherokee Nation wrote home to Salem, North Carolina, that they heard about people in

Nashville, Tennessee, who “had omitted completely the usual Christmas frolics and had passed the holidays quite soberly and quietly.”

At least in some settled areas closest to the epicenter, as people became accustomed to the shocks that continued into 1812, this outburst of religious fervor and commitment to moral reform proved short-lived. According to a visitor to New Madrid, revelers “became so accustomed to the recurring vibrations, that they paid little or no regard to them, not even interrupting or checking their dances, frolics, and vices.” During one seismic episode, patrons at a tavern in Louisville “leaped to their feet, exclaiming, ‘There’s the earthquake, by jingo! There is no humbug about it!’” Preachers and moral reformers used the earthquakes to their advantage, but as people adjusted to the frequent tremors, the shaking became something about which it was more difficult to make a moral or theological “humbug.”

Looking back on his experience, a Baptist schoolmaster in southwestern Kentucky who converted during the earthquakes lamented his community’s fickleness. “Many made a profession of religion,” he wrote. “Far the greater proportion of these, so far as my observation went, threw off their concern as soon as the earth ceased to shake.” In a Baptist community in west Tennessee, “Earthquake Christians” became the title bestowed upon those “whose faith became more and more unsteady” as “the earth became more and more steady.”


Considering the common renderings of early nineteenth-century camp meetings by artists, firsthand observers, and scholars alike – those of fiery, wide-eyed orators hovering over crowds swooning at messages about their sinfulness and prospective salvation – combined with the destructive force and fear that the earthquakes unleashed, it should not be surprising that the earthquakes briefly stimulated rates of conversion and that some settlers believed the world was ending. But elements of responses to the tremors complicate as much as they confirm trans-Appalachian settlers’ understandings of nature and revivalism in the early nineteenth century. As much as preachers would have liked to cultivate a communal sense of religious devotion through consistent biblical interpretations of natural order and the end of the world, the earthquakes introduced abnormal experiences and even greater threats to backcountry life that occasioned less coherent approaches to the tremors’ explanation and interpretation.

Although revivalism relied on the energy and emotion of large crowds, accounts of spiritual experiences during the earthquakes were often deeply personal, and they ranged widely in tone from emphatic declarations of faith to utter confusion to humor. In one instance of individual exuberance, when the earth began to rumble in Kentucky, a man jumped out of bed and ran from the house shouting, “My Jesus is coming.” His wife begged him not to leave her, to which he replied, “My Jesus is coming, and I cannot wait for you.” Also in Kentucky, an enthusiastic woman echoed the bondswoman’s excitement as she ran through the streets clapping and exclaiming, “Glory, glory, glory to God! My Savior is

coming! I am my Lord’s and he is mine!” But not all reactions were as triumphal as individuals doubted the applicability of the Bible and the authenticity of their own experiences during the earthquakes. A young boy from Kentucky remembered that during an earthquake, a woman exacerbated fear and confusion in a crowd by reading foreboding bible verses. In response, people grew upset and somberly dispersed. Methodist Circuit rider Joseph Tarkington recalled his family’s dissatisfaction with the “dusty old prayer-book,” which could not explain the earthquakes. The experience made Tarkington’s mother more devout for a time, but like other “Earthquake Christians,” her religious fervor waned.31

As time passed, other settlers could joke about their experiences. Reuben Ross’s son visited New Madrid in 1836 and related two stories circulating there about prayer during “the Shakes” that seem folkloric, but they nonetheless demonstrate how some settlers chose to remember religious acts during the tremors with humor rather than the schoolmaster’s gravity. In one, an elderly widow went to a riverbank for water and decided to say her prayers there when a tremor sent sand sliding down on top of her. “Springing to her feet and brushing the sand from her shoulders, she said: ‘Well! I declare! what is this world a-comin’ to?...’ and she hurried off, as if highly offended.” Also in New Madrid, a man remembered going hunting with a “very religious” Frenchman after they believed the tremors had subsided. When the ground began to shake violently again, the American hunter kneeled

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down to pray amid the toppling trees and “yawning chasms,” much to the Frenchman’s dismay. “Ever pray to God before, or thank him for any of his blessings?” the pious Frenchman asked him. When the American replied that he had never before thought to pray, the Frenchman said, “Well, you mean, pitiful cowardly fellow, you shan’t do it now. If you attempt it, I’ll kill you on the spot.” His companion interpreted this threat as “a good lesson – not to put off praying till the last moment.” Revealed both in individuals’ immediate reactions to the tremors and their memories of experiences, the earthquakes generated a range of emotional and spiritual responses that confound the assumption of a monolithic “religious” understanding of the cataclysm.32

The earthquakes reinforced the convictions of some borderland Christians who rejoiced at the prospects of the end of the world, but in their moment of terror, not all Christian settlers assumed that the apocalypse was imminent. Some people ran through Kentucky streets in anticipation of Jesus, but after uneven success in assuaging their concerns with sacred and secular sources of knowledge, others were not convinced about the immediacy of His return. They may have considered the earthquakes divinely sanctioned, but the tremors remained natural events that could be observed and studied without diminishing their religious significance. John Allan ultimately became a Baptist during the tremors, but he identified the shaking that first awoke him as an earthquake, not a portent of end times. Allan, the Kentucky schoolmaster, rose out of bed to see if his sister “had either

32Ross, Life and Times of Elder Reuben Ross, 207-08. Literary scholar Wayne Viitanen distinguishes between the bodies of “folklore” and “fakelore” that developed after the earthquakes. Whereas a legitimate body of folklore developed in the form of songs and stories about the earthquakes, which reveal values, humor, and aesthetics in backcountry culture, Viitanen cautions against reading too far into a “patently phony” body of “fakelore” that includes popular, romanticized stories about Indians and forbidden love between members of different tribes. See Wayne Viitanen, “Folklore and Fakelore of an Earthquake,” Kentucky Folklore Record 19, no. 4 (1973), 99-111, and Viitanen, “The Winter the Mississippi Ran Backwards: The Impact of the New Madrid Earthquake of 1811-12 on Life and Letters in the Mississippi Valley,” Ph.D. diss., Southern Illinois University, 1972.
got up in her sleep and was dancing or had fallen into a fit,” but he realized the “real cause of
the commotion,” informed his wife that they would “probably have another shock in a few
minutes,” and, having “satisfied” himself as to the cause of the disturbance, “slept soundly
till daylight.” Perhaps wondering if he had only dreamed about the earthquake, Allan awoke
the next morning “expressing a strong desire to witness another shock.” The earth granted
his wish, and he “was then quite satisfied and had no desire to see any more shocks.” Allan
would later convert, although he emphasized that he had “been more or less serious for
several years” about becoming a Baptist and found “the reproach of having merely an
earthquake religion” terrifying. Between hoping for another earthquake to confirm the cause
of the previous night’s shaking and questioning the authenticity of his religious experience,
Allan’s understanding of the earthquake was never apocalyptic. 33

After telling his congregation the story of the Ninevites, an ancient civilization that
God punished with earthquakes in the Hebrew Bible, and explaining that “great fires raging
in the bowels of the earth” caused earthquakes, Reuben Ross instructed his congregants to
plant their crops in spite of their fears. He reasoned that starvation threatened the
community’s wellbeing more than earthquakes and “made them more hopeful, too, by
informing them that there were many instances on record, where after the earth had been
violently agitated for a time, no great calamity had been suffered by the people where it had
occurred.” Like many thinkers in this age of empiricism and widened access to information,
Ross drew from disparate sources of written and experiential knowledge to try to restore a
sense of order and understanding to his frightened and confused congregation. From biblical
references, theories about the natural causes of earthquakes, and his own observations

regarding the impact of earthquakes and the importance of agriculture, this literate but hardly classically educated preacher in west Tennessee constructed an empirical response to the disaster. The amalgam of sources of knowledge from which he drew exemplified the democratized intellectual landscape of the early nineteenth century.\textsuperscript{34}

The earthquakes provoked questions about divine agency, prayer, and the apocalypse, but settlers’ otherworldly preoccupations did not prevent them from investigating the natural world. In some cases, the observations of common people who attached religious importance to earthquakes corroborated the observations and hypotheses of learned naturalists. As he contemplated Baptist conversion and feared “immediate destruction,” Jacob Bower noted “it was a thick, dark, and foggy morning” before a major shock. “All nature appeared to be dressed in mourning, and the god of nature frowning, oh what a time of melancholy.” Lydia Bacon, who accompanied her husband during the United States military campaigns against American Indian and British forces in the Old Northwest during 1811 and 1812, managed to send a number of letters detailing her experiences of earthquakes back to her family in New England. She recognized the earthquakes as God’s judgment, even advising her younger sister Abby that in response to the earthquakes and other manifestations of God’s warning, Abby should recognize that “youth is the time for preparation, Piety in youth is delightful.” Concurrently, however, Bacon sensed a connection between weather conditions and the repeated aftershocks. “I often rise in the night & go to the door to examine the Weather, for the most severe ones have been felt in calm lowering weather,” she wrote.\textsuperscript{35}

\textsuperscript{34}Ross, \textit{Life and Times of Elder Reuben Ross}, 202-04.

These seemingly insignificant observations, one made by a man contemplating Christian conversion and another by a devout Protestant woman in a private letter, pointed to a fundamental scientific problem that had been debated since the inception of the “airquake” theory in the 1750s: were the New Madrid earthquakes related to conditions or objects in the air? In the decade that followed the shocks at New Madrid, naturalists more removed from the epicenter compiled observations and measurements related to conditions in the sky, on the land, and underwater during the earthquakes. Armed with these accoutrements of systematic empirical inquiry and the European earthquake theories that had been proposed but doubted after Lisbon, they hoped to reclaim a sense of natural order from land and people devastated by natural chaos. The naturalists, many of whom studied nature only part-time while earning livings as metropolitan politicians and physicians, were undiscriminating in the kinds of evidence and observations that they personally collected. From temperature readings to cloud colors, contributors to elite natural inquiry accommodated a range of evidence that proved tangential to modern seismology but was empirically essential for the time. Elite and folk understandings of nature shared this commitment to experiential knowledge, which led educated and backcountry observers alike to cite weather conditions, electricity, volcanoes, and other natural oddities as possible causes for the tremors. Despite this widespread empirical understanding of nature, the reports published in elite journals based the authenticity of accounts on the supposed intelligence and respectability of observers, reflecting an intellectual dissonance common in the early nineteenth-century United States.

Premised upon democratic rule, the new country distinguished its commitment to observation and empiricism from a European proclivity for theory. But like its democracy,
the United States’ empirical inquiry had distinct social and cultural limits designed to differentiate the elite from the folk. The published reports thus imposed another layer on the transatlantic and increasingly transcontinental intellectual hierarchy of the early nineteenth century. Learned elites sought order through understanding, but major earthquakes on the nation’s territorial periphery exposed the limits of American empiricism and only elicited more confusion. The earthquakes afforded elite commentators an opportunity to carve out a uniquely American intellectual identity; instead they transposed colonial Atlantic hierarchies of knowledge on to the continent’s backcountry and replicated long-disputed European theories about airquakes, electricity, and volcanism as the possible causes for earthquakes.

Though they did not mention the eighteenth-century European airquake theory by name, elite observers joined Bacon and Bower in looking to the sky for explanations. Reports sponsored by American scientific and philosophical institutions listed countless observations and measurements of atmospheric conditions. Correspondence from Winthrop Sargent, governor of the Mississippi Territory, to a member of the American Academy of Arts and Sciences in Boston captured the scholarly preoccupation with the weather. After comparing the thermometer and barometer readings, wind direction, and the extent of cloud cover on the days of two major earthquakes, Sargent wrote that before the tremor on February 7, “the stars shone uncommonly bright, and the atmosphere was remarkably serene at the this time, and continued so during the night – moon rose clear, but was succeeded by a dense vapour rising to the tops of the trees which was dissipated half an hour after sun rising.” Some others reported that “serene” and clear skies followed by thick vapor preceded the earthquakes, but inconsistencies and regional variations confounded a definitive link between atmosphere and the earthquakes. Whereas Sargent emphasized the brightness of the
stars from Mississippi, an observer in Washington, D.C. remembered that the sky was clear, but found the stars were “lurid and dim, and afforded little light.” In Louisville, one man made notes about cloud cover, precipitation, wind, and temperature for each tremor, but the weather conditions ranged widely. Other accounts were divided regarding the clarity of the sky and the frequency of lightning and thunder before the seismic activity.\textsuperscript{36}

As scientific elites recorded conflicting measurements from the sky, a spectrum of observers supposed a connection between the Great Comet of 1811 and the earthquakes. The comet had disappeared by the winter of 1812, and its recent absence from the night skies fueled widespread speculation about its influence on the shaking. Although his explanation lacked the millenarian edge of the settler’s horned comet hypothesis, a contributor to the \textit{Weekly Register} proposed a link between the comet and the earthquakes. The writer dismissed religious explanations for the comet and layered his analysis with a more mathematical discussion of the celestial body’s trajectory and acceleration, but he shared his core contention with the riverside leader that Bradbury encountered: the comet was connected to disruptions in the natural order of the land. Preacher Abraham Snethen’s memoir elaborated on this notion by suggesting that the comet had induced the earthquakes by striking the earth. With his characteristic disregard for orthographic convention, Snethen remembered “there was an earthquake in the year Eliven and a comet just before and as it had just went out of sight when the earthquake occur’d it was thought it had hit earth and mad

\textsuperscript{36}Sargent, “Account of Several Shocks,” 353-4; Mitchell, “A Detailed Narrative,” 290, 289, 283-5, 288; Henry McMurtrie, \textit{Sketches of Louisville and its Environs} (Louisville, Ky.: S. Penn, 1819), 233. Earthquake accounts from the McMurtrie volume are found in its appendix, which is labeled “an accurate Account of the Earthquakes experienced here from the 16\textsuperscript{th} December 1811, to the 7\textsuperscript{th} Feburary 1812, extracted principally from the Papers of the late J. Brooks, esq.” Mitchell corroborated Sargent’s account by citing a judge in Detroit who reported that the “atmosphere was serene, but cold” and observers in St. Louis and Columbia, South Carolina, the latter of whom remarked that the “air felt as if impregnated with a vapour.” In Indiana and Kentucky, however, people reported rain showers and “dark and gloomy” skies before an earthquake. Another commentator noticed that there had been twenty-two fewer days of thunder in 1811 than in average years.
it shake.” Someone aboard the first steamboat also alleged that “there were those who insisted that the comet of 1811 had fallen into the Ohio and had produced the hubbub!” The Louisiana Gazette and Daily Advertiser of New Orleans made a similar assertion, locating the comet’s point of impact in the California mountains. Regardless of their geographical or social location, some observers and commentators sought to tie the earthquakes to the comet that preceded them.37

Accounts of other unusual airborne objects also served to encourage and confound the supposed link between earth and sky. According to a letter from Reverend John Carrigan to a judge in the western part of North Carolina, the state’s skies were alight with other oddities before the earthquakes. Carrigan reported that an army captain described seeing “three extraordinary fires,” which were “as large as a house on fire,” flying in different directions across the sky. On a November afternoon before the earthquakes, the Reverend himself witnessed a meteor “attended with a fulminating noise.” A curious “whitish substance, resembling a duck in size and shape” accompanied the meteor before tailing off in a cloud of smoke. “Whether these things are ominous or not, one thing is certain, this is a time of extraordinaries,” Carrigan wrote.38 His observations and reasoning demonstrated the possibility for experiential and confessional understandings of nature in the early nineteenth century.

Reports of flashing lights and soggy conditions led some American scholars to revisit Englishman William Stukeley’s 1750 assertion that electricity caused earthquakes. In a letter


38 Ibid., 299.
to a minister published in *The American Journal of Arts and Sciences*, Louisiana land
surveyor Louis Bringier supposed that the ground had been primed for electrical and seismic
shocks after unprecedented rainfall in Louisiana. An earthquake, perhaps resulting from
contact between the soggy ground and the aforementioned flashes of light or a more
conventional lightning strike, “produced emotions and sensations much resembling those of a
strong galvanic battery.”39 Contributors to Samuel Mitchell’s report offered separate
testimonies and theories that echoed Bringier’s contention. A correspondent from Tennessee
linked shocks that “seemed to produce effects resembling those of electricity” to unusually
wet seasons and an atmosphere “impregnated with sulfurous particles.” A South Carolina
doctor’s observations in the report also addressed “the agency of electric fluid.” By
Mitchell’s reasoning, the infrequency of autumn thunderstorms, a “red appearance of the
clouds, which had much darkened the water for twenty-four hours immediately before the
shock,” and the “loudness of the thunder” supported an electrical understanding of the
earthquakes.40

Less educated spectators also noted this supposed connection between lightning,
moisture, and the earthquakes. Eliza Bryan remarked that the air “was saturated with
sulphurous vapor.” Missionary, naturalist, and prolific author Timothy Flint traveled to the
Mississippi Valley three years after the New Madrid earthquakes and included eyewitness
accounts and his own impressions of the damage in a number of publications. He was
impressed that although “the people without exception were unlettered backwoodsmen, of

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39Louis Bringier, “Notices of the Geology, Minerology, Topography, Productions, and Aboriginal inhabitants of
the regions around the Mississippi and its confluent waters – in a letter from L. Bringier, Esq. of Louisiana, to
Rev. Elias Cornelius – communicated for this journal,” *American Journal of Arts and Sciences*, 1 January 1821,
20. Bringier described himself as a land surveyor when he testified before the Senate Committee on Memorial

the class least addicted to reasoning,” it was “remarkable how ingeniously, and conclusively they reasoned from apprehension sharpened by fear” when remembering the sights and sounds of those horrific days of quaking. Flint wrote that people witnessed “a continued glare of vivid flashes of lightning” accompanied by “repeated peals of subterranean thunder.” In claiming that there was a familiar scene during the concurrent but deadlier earthquakes in Caracas, Venezuela, in March of 1812, Flint also implied that there was an electrical process linking shocks on land and in the sky.41

Even if accounts of flashing lights, duck-sized projectiles, and abnormal weather distracted elite and folk observers from the subterranean causes of earthquakes, those Americans proposing electrical and atmospheric explanations sought evidence for their theories, demonstrating an American intellectual commitment to empiricism and observation. But as Isaac Lea’s case demonstrates, not all American scholars were as determined to distinguish their supposedly democratic brand of inquiry from the more theoretical and hierarchical scientific enterprises in Europe. Although Lea conceded that the subject allowed for “great latitude in speculation,” he maintained that earthquakes were byproducts of volcanic eruptions. In his article in the American Journal of Science and Arts in 1825, Lea cited Isaac Newton’s discussion of “sulpherous streams” that circulated throughout the earth’s inner cavities and supposed that they were responsible for both volcanoes and earthquakes. Lea acknowledged that the New Madrid earthquakes occurred a great distance

from active volcanoes, but he claimed that these intricate and far-reaching networks of steam and magma could stimulate faraway volcanic and seismic activity. He added that earthquakes could occur unaccompanied by a volcano when a body of water made contact with an “ignited mass,” which could have been the case for the violent earthquakes along the Mississippi River, but he maintained that they were more likely the result of a distant volcano.42

The volcano argument had taken a different, albeit more suspect, form in the pages of the Charleston Courier. On February 13, 1812, the newspaper reported receiving a letter from a man who claimed that a volcano had erupted in the mountains near the border of North Carolina and Tennessee. “Should the account prove correct, we shall find no difficulty in ascertaining the cause of the late numerous earthquakes,” the article suggested. Two days later, the newspaper printed the actual letter. John Clark Edwards of Burke County, North Carolina described an amazing scene at Spear’s Mountain near the French Broad River:

It still continues to burn with great violence, and throws up lava, scoria, ashes, calcined stones and vitrified matter, in great quantities, and with the most noise. The quantity of lava discharged at the beginning of the eruption was immense; it ran down the mountain in a stream of liquid fire for more than three quarters of a mile and has formed a dam across French Broad River…In the nighttime, the ignited stones, cinders, &c. which are thrown two or three hundred feet in the air, present a grand appearance, and have a great resemblance to artificial fire works, such as rockets, &c. During the day a column of whitish smoke issues from the crater: at night it has a flame like appearance, and where it has been driven with the wind, has withered the small dwarf pines which had taken root in the barren soil…their bark and leaves are incrusted with a yellowish powder, which has an acid taste and a strong sulfuric smell.43


43 Charleston Courier, February 15, 1812, 2.
Edwards added “no person has courage sufficient to approach the crater.” If someone had summoned the courage to approach the crater, he or she would not have found it, because the volcano never existed. Edwards had even invented a mountain community led by an itinerant preacher who claimed that the lava coursing through the mountains transformed into “spirits, devils, &c.” at night. The Charleston Courier was skeptical. On the next page, the newspaper printed a reminder to readers that Edwards was the same man “who furnished us with the marvelous account of the falling of the Painted Rock, which account was very soon after contradicted.” Consequently, the article instructed readers that Edwards’ story should “be received with great caution, notwithstanding the circumstantial evidence which he gives of the phenomenon” and added that there were other “gentlemen now in town, who are recently from that part of the country, but who had neither seen nor heard of any thing of the kind.” Needless to say, in his scholarly volcano explanation, Isaac Lea did not cite John Clarke Edwards.

The possibility of fabricated accounts thus presented a problem for early nineteenth-century scholars seeking to explain the New Madrid earthquakes. Accompanied by a major comet and other irregular patterns in the sky, the shocks induced a level of natural fury that most minds would have considered unbelievable if the scenes of destruction had not been corroborated by multiple eyewitnesses and left an indelible impact on the land. Furthermore, the people most affected by the earthquakes lived in isolated communities with little access to formal education. Although Timothy Flint noted how “ingeniously, and conclusively” some “unlettered backwoodsmen” had reasoned in the face of unparalleled damage to their communities, one sailor on the Mississippi River explained that the prolonged terror of the

44Ibid., 2-3.
first major earthquake, along with a broken arm from a fallen tree, had restricted his observational capacity. Three months after his experience, when an unknown source asked him to estimate how long the initial shaking lasted, Firmin La Roche responded, “I do not know how long this went on, for we were all in great terror, expecting death.” When the interview ended, he added, “I hope this is what you require, and I am sorry I can tell you so little. When a man expects nothing but instant death it is hard for him to think or notice anything but his danger.” A priest accompanying La Roche echoed his uncertain memory, maintaining that because it was dark and the earthquake awoke the crew, “nobody could agree in his recollection of that awful night.”

Confusion and trauma may have clouded memories, and people on the East Coast who felt only minor shocks may have doubted the extent of the reported damage near the epicenter, but for two young travelers passing by the epicenter in the months following the earthquakes, their human and environmental toll was all too real. Twenty-three year old James McBride was piloting goods down the Mississippi to sell in New Orleans when he passed through New Madrid in early April 1812. He explained in a letter to his aunt in central Pennsylvania that he had been skeptical about reports of damage, but after seeing coffins from a riverside graveyard “exposed along the bank,” complete with a large cross grave marker “made of strong Cyprus wood…broken and prostrated to the earth,” and experiencing “considerable shocks every few hours,” he no longer questioned stories of what had transpired there, including the notion that the river had run backwards. In an undated diary entry, the scene left young Stephen F. Austin of later Texas renown equally bewildered. “As I viewd the present situation of this place and reflected on the cause which desolated it I

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45Firmin La Roche, “A Sailor’s Record of the New Madrid Earthquake,” 269-70.
could not refrain from regarding with fearfull astonishment the Force of a Power sufficient thus to agitate the Earth,” he noted.

Although McBride’s letter and Austin’s diary reflected the reality of the scene near the epicenter, John Clarke Edwards’ fabrication nonetheless highlights a major shortcoming in this democratic intellectual landscape. In the spectrum of previously unimaginable possibilities that the earthquakes had unleashed, gauging the veracity of accounts proved difficult. Readers must have gravitated to sensational reports of the phenomena, but with accounts of the Mississippi River flowing backwards, volcanoes erupting in the southern Appalachian mountains, and people disappearing into crevices, the astounding impact of the earthquakes blurred the lines of truth in nature and reporting. For all the honest backcountry observers and outsiders who corroborated the extent of the damage and its human toll, there were characters like John Clarke Edwards, who fed readers’ imaginations with his own.

Some naturalists’ preoccupation with tagging observers as “intelligent” or “respectable” demonstrates that in the process of gauging the authenticity of accounts, earthquake commentators staked their findings on the reputations of their correspondents. This scholarly concern with the status of western informants reveals the social limits of scientific inquiry in the early nineteenth century. In his letter to the American Academy of Arts and Scientists, Mississippi Territorial Governor Winthrop Sargent identified a man as “a gentleman of respectability.” As he wrote about “an intelligent traveller” and “settlements of enlightened French people,” Sargent continued this refrain throughout the letter. He was also particularly compelled to verify his confidence in the testimony of an “old servant.”

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Samuel Mitchill’s report echoed similar concerns. “Much exaggeration was interwoven with some of the narratives. Some, indeed, were tinctured with fable and burlesque. Among the various recitals it became exceedingly difficult to find out the true, or even the most probable, account,” wrote the legislator, who mostly relied on information from judges and other politicians. Mitchill referred to observations made by “one of [his] most correct and respectable friends” in conversation and in writing, implying that the friend’s information was more reliable because he communicated his findings through two mediums. In another instance, Mitchill identified an “ingenious writer” from Charleston whose assorted findings were no more insightful than anyone else who had noticed the comet preceding the earthquakes and the nauseating feeling induced by the shocks.\(^{47}\) Winthrop’s and Mitchill’s emphasis on the reputability of their sources indicate that as the practice of science institutionalized, naturalists conflated observational accuracy and insight with social status. This development was at the heart of the divergence of religious and scientific epistemologies in the nineteenth-century United States, where debates often assumed a dimension of class conflict. In this era of commitment to observation, when scientific practice was premised upon trust, elite concerns about an observer’s social status restricted the supposed democracy of empiricism. As scientific institutions grew hierarchical, the experiments and observations that sustained them followed suit.

The irony of the naturalists’ concern with authenticity was that regardless of the source, no observation brought them closer to a definitive understanding of the cause of the earthquakes. Eighteenth-century European theories linking the tremors to volcanoes, comets, and electricity attempted to solve the puzzle, but an understanding of continental drift would

elude scientists until the next century. Although naturalists like Louis Bringier and Isaac Lea were confident in their respective theories that earthquakes were functions of electricity and volcanism, which had long been considered in Europe, Samuel Mitchill acknowledged that he could not formulate even “something like a tolerable theory of earthquakes” from his extensive study. Mitchill had not only theorized from eyewitness accounts but conducted experiments to determine the flammability and alkalinity of a shipment of coal that he had procured after the earthquakes ejected it from inside the ground. In the final pages of his report, however, he resigned himself to compiling a list of principles that he had deduced from the accounts and addressing the strengths and weaknesses of several hypotheses. Mitchill concluded with ten facts that addressed the earthquakes’ scope and the fiery gasses and other substances released from the ground, but none of these statements were particularly insightful or authoritative. The last of his ten points was that “it is not very evident what kindles the flame beneath; by what means it is supported by air, and kept from extinction by water; how deep it lies; how it convulses the superincumbent strata, and communicates its tremors instantaneously, for several hundred miles.”48 In other words, after three major earthquakes and countless aftershocks that affected hundreds of thousands of square miles of populated land and yielded droves of lasting evidence, Mitchill, and indeed the broader American scientific community, had not come close to consensus about how earthquakes functioned. He nonetheless retained faith in the progress of enlightened scientific inquiry, as he hoped his report would “assist some more happy inquirer into nature, to deduce a full and adequate theory of earthquakes.”49

48 Ibid., 305.
49 Ibid., 298-306.
Mitchill further showed how the “mechanical reasoner,” the “chemical expositor,” the “electrical philosopher,” and believers in the “alkaline system of earthquakes” had evidence to support their claims. “And yet, these various expositions, plausible, in some respects, as each of them is, are deficient in that general character and universal application which ought to pervade scientific researches,” he wrote.\(^{50}\) Not unlike the responses of less-educated Euroamericans to the tumult that surrounded them, Mitchill’s recognition of the human limits of comprehending the cause of earthquakes was perhaps his most enlightened bit of reasoning.

To conclude their respective volumes about the earthquakes’ impact in Ohio and Kentucky, Henry McMurtrie and Daniel Drake echoed the enlightenment compulsion for classification by categorizing tremors by the degree to which they shook people and buildings. From observations in Louisville, McMurtrie constructed six “rates of violence,” ranging from the quaking that caused “a strange sort of sensation” and “giddiness” to the agitation that was “most tremendous, so as to threaten the destruction of the town.” Drake established four classes of tremors based on “their efficiency in altering the structure of the more superficial parts of the earth, and in agitating, subverting or destroying the bodies which they support.” Recognizing that “the theory of these phenomena” had not been “settled” by his work’s 1815 publication date, Drake ended by mentioning “electrical and other physical phenomena” from 1811 through 1813 “for the gratification of the speculative reader.” In a nod to his entangled investments in empiricism and print culture, Drake recognized that his list of major floods, thunderstorms, “luminous spots” in the sky, and uneven evidence for impact of electricity was unsatisfying but nonetheless worthy of print.

\(^{50}\)Ibid., 307.
“It is not supposed that they [the list of natural phenomena] can interest the general reader, or aid the speculative philosopher, in the same degree as those made where the last visitation was more signal,” he wrote, “but they may, perhaps, be found of sufficient moment to justify their publication.”51

CHAPTER 4: CONCLUSION

In classifying dozens of tremors by strength, Drake and McMurtrie attempted to impose order on an uneasy time in both North American natural history and the history of the young United States. Like the mass conversions recorded by the Western Conference of the Methodist Church, however, the classes of earthquakes constructed by the naturalists captured only the broadest sense of change in the land. Americans knew what had occurred, but their confident statistics, measurements, and observations masked complete ignorance about the earthquakes’ causes. In this era of empiricism, when elite Americans tried to distinguish their commitment to gathering facts from what they considered European proclivities for theory and speculation, the earthquakes rattled American epistemologies and exposed the early nation’s intellectual entanglements. After gathering observations limited by their sources’ “authenticity” and “respectability” and weighing conflicting accounts of sights, sounds, and processes in nature, published findings proved frustratingly inconclusive. Unable to glean any definitive principles from an array of data, American naturalists largely rehashed eighteenth-century European theories about “airquakes,” electricity, and other phenomena that took place on or above the earth’s surface. The human tolls from the New Madrid and Lisbon earthquakes were incommensurate, but in their reports, American scholars echoed the European scholarly unease and uncertainty occasioned by the Iberian disaster of 1755. Without a compelling interpretation of the cause of earthquakes or a means
of predicting them, scientific categories of classification held only hollow meaning and fueled only more speculation.

Confusion also gripped those backcountry traders and settlers closer to the earthquakes’ epicenter, who constructed natural order and meaning through their own observations and reflections on the “state of dissolution” in nature. Trauma and disorientation imposed intellectual limits on those who experienced the most intense destruction firsthand, and religious conversions constituted one means of making sense of the disaster. But backcountry thinkers’ observations and interpretations show that trans-Appalachian communities were not merely revivalistic release valves opposing the rationalism and faithful empiricism that early national elites embraced. In this period of pervasive uncertainty about the cause of earthquakes, communities like the one John Bradbury encountered on the disintegrating banks of the Mississippi River could still confidently maintain that the earth was trapped in the Great Comet’s horns.
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