

ON SHAKY GROUND: THE PRECARIOUS ARGUMENTS OF THOMAS PRINCE AND JOHN WINTHROP OVER EARTHQUAKES, LIGHTNING RODS, AND GOD

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According to Professor Winthrop's observations, it began at exactly thirty-five seconds past 4:11 in the morning, November 18, 1755.¹ The night was "perfectly calm and serene," with a bright moon in the dark, clear sky and a thick fog over the marshes along the banks of the Charles River.² New Englanders were first awoken by the barking of their dogs.³ Next, they heard a thunderous roar out of the Northwest,⁴ followed later by the sound of Gabriel's trumpet.⁵ The ground began to undulate and spew brimstone from its cracks;⁶ the ocean swelled violently⁷ and precipitated a floating blanket of dead fish.⁸ Chimneys crumbled, roofs collapsed, and stone walls were thrown into a chaotic rain of hail.⁹ Shrieking families fled into the streets to confront the fearful immediacy not only of Judgment Day, but also of "seeing their neighbors, as it were, naked."¹⁰

The earthquake itself consisted of four successive shocks over an exhausting period of eighteen hours. Its effects were felt through an area about 550 miles wide and 800 miles long, ranging from Nova Scotia down to Maryland and from Lake George (New York) out into the open Atlantic.¹¹ Modern seismologists have assigned the event a Richter value of 6.0 and believe its likely epicenter to be Cape Ann, Massachusetts.¹² The earthquake's devastating damage spread terror throughout the colonies,¹³ and once it became

¹ John Winthrop, "An Account of the Earthquake Felt in New England, and the Neighboring Parts of America, on the 18th of November 1755," *Philosophical Transactions* 50 (1757-1758): 4-5. Also, John Winthrop, *A Lecture on Earthquakes; Read in the Chapel of Harvard-College in Cambridge, N.E. November 26th 1775* (Boston: Edes & Gill, 1755), 13-14. Winthrop had stowed "a pretty long glass tube" inside the case of his clock "for security" after using it in a previous experiment. The first tremor of the earthquake was "violent enough" to overthrow the tube, which "lodged against the pendulum, and stopt its motion." Thus, the time at which his clock was stopped corresponds exactly to the beginning of the earthquake.

² Winthrop, "An Account," 2.

³ Jourdan Houston, "The Great Earthquake," *American Heritage* 31 (1980): 102.

⁴ Winthrop, "An Account," 2; Houston, 102 and others (see bibliography) compile firsthand reports of the earthquake.

⁵ Houston, 104.

⁶ Houston, 103. Volcanic sulfur, which often surfaces during earthquakes, was then known as brimstone.

⁷ Winthrop, "An Account," 2.

⁸ William Tufts Brigham, "Historical Notes on the Earthquakes of New England, 1638-1869," *Memoirs of the Boston Society of Natural History* 2 (1871): 12.

⁹ Charles Edwin Clark, "Science, Reason, and an Angry God: The Literature of an Earthquake," *The New England Quarterly* 38 (September 1965): 340.

¹⁰ An unnamed firsthand observer, quoted in Houston, 102.

¹¹ Raymond Phineas Stearns, *Science in the British Colonies of America* (Urbana: University of Illinois Press, 1970), 649 reports these figures. William T. Brigham, "New England Shaken," 1872, *Harvard University Alumni Writings* 1 (class of 1862): 32 deduces the earthquake's geographical range from primary reports.

¹² Houston, 107.

¹³ Brigham, "Historical Notes," 11; Josiah Quincy, *The History of Harvard University, vol. 2* (Boston: Crosby, Nichols, Lee, & Co., 1860), 218.

apparent that there were no human casualties, their fear was mingled with disbelief.¹⁴ Throughout New England, and especially in Boston, mass curiosities and consciences were shaken into serious contemplation of the earthquake, and the presses responded enthusiastically.

At least twenty-seven sermons, poems, and other accounts of the earthquake were published by New Englanders in the weeks that followed the event.¹⁵ In the drive to understand why the earthquake had happened as it did and how the colonists should respond to it, almost all of these documents drew, in significant proportion, from the wisdom of both theology and natural philosophy.¹⁶ As a result, natural philosophy and religion were compounded throughout the colonies to provide a unified interpretation of earthquakes: it was agreed that earthquakes were caused by God, although in doing so, he may have acted through natural causes.¹⁷ God, then, was the 'primary' cause of earthquakes, and discussion of caverns, vapors, and pressure within the earth represented the 'secondary' or natural causes He manipulated to produce them. Operating under this understanding of the phenomena, questions over the emphasis of primary or secondary causes and the exact nature of secondary causes generated a four-month public dispute between Thomas Prince and John Winthrop. In the wake of the 1755 earthquake, these two men brought differing theological perspectives to the discourse, and as a result, they clashed over earthquakes, lightning rods, and the public's best interest.

Pastor of the widely-known Old South Church in Boston and Hollis Professor of Mathematics and Natural Philosophy at Harvard College, respectively, Prince and Winthrop were two major public figures to whom the people of New England turned for guidance and answers in response to the terrifying earthquake.¹⁸ Immediately after the event, Prince reprinted two earthquake sermons he had on file from the 1727 rumblings,¹⁹ and Winthrop dedicated two of his regular course lectures to the event.²⁰ Prince

¹⁴ Clark, "Science, Reason, and an Angry God," 341.

¹⁵ Charles Edwin Clark, "The Literature of the New England Earthquake of 1755," *Papers of the Bibliographical Society of America* 59 (1965): 295. Clark identifies fifteen sermons or series of sermons, five poems, four accounts of earlier earthquakes, three scientific pieces, and one official document occasioned directly by the 1755 New England earthquake (Clark, "Science, Reason, and an Angry God," 342).

¹⁶ A sampling of the earthquake sermons (see bibliography) reveals that they typically allotted at least one to two pages to the discussion of earthquakes' natural or "secondary" causes. Conversely, a sampling of the poetic, scientific, and other pieces (see bibliography) corroborates the ubiquity of religious themes. In fact, according to Clark ("The New England Earthquake," 296), John Perkins' 1758 *Essay on the Agitations of the Sea* is the only piece of earthquake literature in which the causes of earthquakes and similar phenomena are explained without reference to God as the First Cause. For more extensive discussion of Perkins as the only colonial theorist to advance an original earthquake theory, see Houston, 106-107; Clark, "The New England Earthquake," 355-358; and especially Marguerite Carozzi, "Reaction of British Colonies in America to the 1755 Lisbon Earthquake - A Comparison to the European Response," *Earth Sciences History: The Journal of the History of the Earth Sciences Society* 2 (1983): 24-25.

¹⁷ Carozzi, 17.

¹⁸ Houston, 106.

¹⁹ Clark, "Science, Reason, and an Angry God," 344. Prince originally wrote the two sermons in response to the 1727 New England Earthquake and printed them together under the combined title, *Earthquakes the Works of God, and Tokens of His Just Displeasure. Two Sermons on Psal. XVIII.7*. The first 1755 reprint was the second sermon of this pair, which consists mainly of a historical account of New England Earthquakes. Prince updated it by appending "an Account of the most dreadful EARTHQUAKE that has ever happen'd since the first settlement of New England," that is, the present one (see Prince, *An Improvement of the Doctrine of Earthquakes...*). Prince's reprint of the other 1727 sermon (Prince, *Earthquakes the Works of God...*) is far more philosophical, and it was updated with the appendix on electricity that instigated the dispute with Winthrop.

²⁰ See Winthrop, *A Lecture*, and Dennis R. Dean, "Benjamin Franklin and Earthquakes," *Annals of Science* 46 (1989): 488. Winthrop delivered his lectures in two sessions on November 26, the day after Prince's first sermon reprint was

updated the discussion of natural causes in his second sermon by appending a presentation of a newer electrical theory of earthquakes and concluded that earthquakes were in fact electric, the use of lightning rods may have been more dangerous than helpful.²¹ If earthquakes are initiated by an excessive buildup of electrical charge within the earth, he reasoned in a postscript, lightening rods which channel electricity out of clouds and into the earth would accelerate such a buildup.²² In response, Winthrop printed his lectures with an appendix rebutting the physical feasibility of Prince's electrical claims,²³ and thus began their four-month public tiff.²⁴ In the series of pamphlets and letters to *The Boston Gazette* that followed, each party reiterated an increasingly bitter and personal position on primary causes, secondary causes, and electricity.²⁵

On the literal level, the dispute between Prince and Winthrop is very explicitly an engagement with the drive to explain the earthquake. But, like the vapor and electricity that they discuss, these points of contention are actually secondary causes of their quarrel. Focusing on their arguments through a lens of colonial science and religion has led previous historians to cast Prince and Winthrop as a simple preacher and anachronistic scientist and to draw inconsistent conclusions about the degree of conflict between science and religion in the colonies. In order to pursue the "primary cause" of this dispute, I examine these individuals' writings not in terms of a struggle between science and religion but as the product of an intellectual divide between two complex and thoughtful human beings. I argue that a basic difference in these men's personal theologies—Winthrop's belief in a benevolent God as opposed to Prince's concept of a more wrathful supreme being—can be identified as the true epicenter of their quarrel. This theological divergence is implicitly evident in their writings on earthquakes and lightening rods, and it generated opposing visions of public service that can be used to reinterpret and better explain their dispute.

published. During the mid-eighteenth century, lecture-going became a popular source of entertainment in colonial urban communities (Stearns, 508-511; Simon Schaffer, "Natural Philosophy and Public Spectacle in the Eighteenth Century," *History of Science* 21 (1983): 1-43); considering this trend in conjunction with Winthrop's dedication to public education and Prince's intellectual appetite, several historians suggest that Prince was actually present at Winthrop's lecture. (This possibility is discussed in Dean, 488, and Eleanor M. Tilton, "Lightning Rods and the Earthquakes of 1755," *The New England Quarterly* 13 (1940): 85.) Though an interesting prospect, Prince's presence at Winthrop's lecture is extremely difficult to verify, and the assertion that the appendix Prince added to his second sermon reprint was a response to what he heard at the lecture is even more speculative.

²¹ This appendix is found in Thomas Prince, *Earthquakes the Works of God, and Tokens of His Just Displeasure* (Boston: D. Fowle and Z. Fowle, 1755), 20-23. The sermon and appendix are summarized concisely in Carozzi, 22, and John E. Van De Wetering, "God, Science, and the Puritan Dilemma," *The New England Quarterly* 38 (December 1965): 501.

²² For the postscript, see Prince, *The Works of God*, 23. The secondary literature unanimously identifies this postscript as specifically responsible for provoking Winthrop into direct argument with Prince.

²³ Winthrop's appendix is found in Winthrop, *A Lecture*, 32-38. It is summarized concisely in Carozzi, 23.

²⁴ Houston, 106.

²⁵ In chronological order, the remaining items are as follows: Thomas Prince, [Letter to "Messieurs Edes & Gill"], *The Boston Gazette, or, Country Journal*, 26 January 1756; John Winthrop, *A Letter to the Publishers of the Boston Gazette, &c., Containing an Answer to the Rev. Mr. Prince's Letter, Inserted in Said Gazette, on the 26th of January 1756* (Boston: Edes & Gill, 1756); Thomas Prince, [Letter to "Messi'rs Printers"], *The Boston Gazette, or, Country Journal* (Boston), 23 February 1756; and John Winthrop, [Letter to "Messi'rs Printers"], *The Boston Gazette, or, Country Journal* (Boston), 1 March 1756. Although posed as a direct response to Prince's letter, Winthrop's first "letter" was actually released as a pamphlet and never printed in the *Gazette*. A brief characterization of each of these letters may be found in Van De Wetering, 504-506; Tilton presents all of the primary sources in a more extended analytical chronology.

HISTORIOGRAPHY AND BIOGRAPHY

The historiography on the Prince-Winthrop dispute is characterized by an almost unanimous focus on the question of conflict between science and religion. By anachronistically awarding Winthrop the title of scientist and simplifying Prince's role as a preacher, almost every historian reduces these men to personifications of the opposing forces of science and religion. And in most cases, Winthrop is championed as the defender of reason and progress against old-fashioned superstition. This interpretation was conceived during the latter half of the nineteenth century, when historians first examined the dispute,²⁶ and it was fostered by generations of later historians throughout the twentieth.²⁷

After a handful of conjectural acknowledgements,²⁸ the first thorough study of the Prince-Winthrop dispute was published in 1940, by Eleanor M. Tilton. Writing of "the professor" and "the preacher... [who] had been so bold as to invade the professor's own territory," Tilton fleshes out the conception of the dispute as "a minor engagement in the long war between science and religion."²⁹ For a quarter-century, her analysis was answered only with an endorsing silence from historians,³⁰ and even when later historians criticize Tilton's piece, their revisions are continually oriented within a rigid framework of science and religion. Writing in the 1960s, for example, Charles Edwin Clark boldly claims that science and religion were not in direct conflict, but were rather in a state of "forced harmony" during the dispute. Although he rejects the notion of a conflict between science and religion, however, Clark's analysis of the event is focused on defining his own interpretation of the science-religion dynamic, and he continues to privilege Winthrop as a representation of modern science's superiority.³¹

This emphasis on the relationship between science and religion extends even into the most recent

²⁶ Perhaps as a result of his Harvard loyalties, Josiah Quincy privileged John Winthrop in the first extant treatment of the lightning rod controversy, published in 1860 (Quincy, 219-220). The science-versus-religion framing of the dispute was codified in 1896 by Andrew Dickson White (Andrew Dickson White, *A History of the Warfare of Science with Theology in Christendom*, vol. 1 [New York: D. Applegate and Company, 1896], 366, who, along with William Draper marshaled historians of science to a lengthy focus on science and religion. Other early discussions of the dispute include W. DeLoss Love, Jr., *The Fast and Thanksgiving Days of New England* (Boston: Houghton, Mifflin and Company, 1895), 295-298 and Frederick E. Brasch, "John Winthrop (1714-1779), America's First Astronomer, and the Science of His Period," *Publications of the Astronomical Society of the Pacific* 165 (August-October 1916): 1-18.

²⁷ For a concise outline and evaluation of some of the major historiography on the debate, see Ronald L. Numbers, "Science and Religion," *Osiris*, *Second Series* 1 (1985): 59-61.

²⁸ Winthrop's lecture is mentioned in several survey works, such as George P. Merrill, *The First One Hundred Years of American Geology* (New Haven: Yale University Press, 1924), 7-8. Perhaps the most embarrassing example of the topic's cursory treatment among earlier secondary literature is Theodore Hornberger, "The Science of Thomas Prince," *The New England Quarterly* 9 (1936). Hornberger argues essentially that there was no direct discourse between Prince and Winthrop; he writes that Prince's PS was not about lightning rods and that Winthrop's appendix was not directed at Prince. This interpretation, however, is simply nonsensical when contextualized with a more careful reading of the primary sources.

²⁹ Tilton, 85-86.

³⁰ It is not until 1965 that another piece on the subject appears. In fact, in a 1952 paper on the introduction of lightning rods, I.B. Cohen remarks that since "this famous debate" has been so thoroughly treated by historians, "there is no need here to do more than indicate some of the major issues" (I. B. Cohen, "Prejudice Against the Introduction of Lightning Rods," *Journal of the Franklin Institute* 253 (1952): 425).

³¹ Clark, "Science, Reason, and an Angry God," 341-349. Another example of a bold, revisionist attempt which only partially succeeds in breaking with historiographic tradition is John E. Van De Wetering's piece from the same year. Rather than emphasizing Winthrop's modernity and success, Van De Wetering expresses compassion for Prince, portraying his attempt at fusing science and religion as a tragedy for his own theological philosophy. To explain this perceived tragedy, however, Van De Wetering returns to the concept of an irreconcilable conflict between science and religion.

historiography on the Prince-Winthrop affair, dating to the early 1980s.³² In a 1983 analysis of responses to the Lisbon Earthquake,³³ Marguerite Carozzi creatively suggests the possibility that neither man was singly focused on either theology or natural philosophy.³⁴ On the contrary, she claims that “they were both interested in the same fields of science and theology and that they disagreed in both.”³⁵ In science, according to Carozzi, they disagreed on the effectiveness of lightening rods, and “as preachers,” they disagreed on whether their “congregation” should be offered more spiritual guidance or information on the natural causes of earthquakes.³⁶ As if, however, these new observations would not be valid without being related to the older science-versus-religion analysis, Carozzi explains this bi-layered disagreement as simply “a conflict between a younger and an older generation where the younger had become more interested in science than religion.”³⁷

This paper endeavors to further develop Carozzi’s idea of a double disagreement between the two men, but I undertake to explain it with reference to the individuals’ personal theological philosophies rather than in terms of a science/religion dichotomy. And instead of viewing the two levels of their disagreement as science and religion, I define them as theological-philosophical beliefs and their resultant practical concerns. Carozzi is correct that there was a theological disagreement between the two men, but the differing visions for the public good she identifies is only a result of that disagreement, not the disagreement itself. I argue that Prince and Winthrop had fundamentally different conceptions of God—Prince viewed God as wrathful, and Winthrop believed in a more benevolent deity—and that this difference in their theologies precipitated both their opposing presentations of natural philosophy and ultimately their disagreement over the immediate needs of their flock. The perpetual reduction of Prince and Winthrop to clergyman and scientist throughout the secondary literature has functioned cyclically as both one of the major distortions of the science/religion lens and as one of the major observations responsible for the invocation of that lens; by examining the Prince Winthrop dispute from a different perspective, I hope to better explain these individuals’ efforts to understand and cope with their volatile world.

John Winthrop, great-grandson and namesake of the Massachusetts Bay Colony’s first governor, was a thirteen-year-old freshman at Harvard College when Prince first issued his earthquake sermons in 1727. Within the next decade, he earned appointment as Harvard’s second Hollis Professor of Mathematics and Natural and Experimental Philosophy, and during the forty years he held this post, Winthrop made prolific contributions to colonial science.³⁸ Opposers to his Harvard appointment voiced suspicion that

³² The most extreme example, Houston’s informal 1980 account of the 1755 earthquake, illustrates Prince and Winthrop virtually as caricatures of a science-religion dichotomy.

³³ Carozzi’s paper contrasts responses to the Lisbon earthquake from different geographical-political locations. Stearns (648) writes that Prince and Winthrop could not have heard of the November 1st Lisbon earthquake by the time their sermons and lectures went to press, so Carozzi’s interpretation of the Prince-Winthrop dispute as a colonial response to the Lisbon earthquake is inherently flawed.

³⁴ In his 1952 paper, I.B. Cohen explained that “The quarrel between Winthrop and Prince...operated on two separate levels—scientific and theological,” but like previous historians, he focused on the “scientific” aspects of Prince’s work and neglected the theological aspects of Winthrop’s. Cohen is not listed in Carozzi’s bibliography, so she may be credited with deducing and applying the bi-level analysis to both men equally.

³⁵ Carozzi, 23.

³⁶ Carozzi, 23-24.

³⁷ Carozzi, 23.

³⁸ Winthrop is most noted for introducing the colonies to calculus, assembling America’s first experimental physics laboratory, and publishing groundbreaking astronomical observations. For further biographical information on Winthrop, see “Winthrop, John,” *American National Biography Online*; Stearns, 642-644; Brasch, 3-5; and Houston, 106

Winthrop held unorthodox religious views,³⁹ but theological speculation consistent with prevailing doctrines pervades his scientific and academic work.⁴⁰

Anachronistically characterized as a scientist by his biographers,⁴¹ Winthrop was an exceptionally sharp scholar who pursued diverse interests and developed innovative theories and methods.⁴² A loyal disciple of Newton,⁴³ he made systematic and exact observations of all the physical phenomena he encountered,⁴⁴ and his work earned him fame as the most accomplished natural philosopher and learned man in the colonies, with only the possible exception of Benjamin Franklin.⁴⁵ As a teacher, he was known for his lucid, stimulating lectures and demonstrations as well as his dedication to extending his lessons to the community at large. Throughout his career, Winthrop offered public lectures, demonstration, and popular writings on scientific phenomena,⁴⁶ so by the time of the 1755 earthquake, it was rather his established duty to inform the public on the natural causes of such an event.⁴⁷

Twenty-seven years the senior of his counterpart, Thomas Prince was also a graduate of Harvard College. His career as a pastor and historian eventually earned him a prominent post at the Old South Church in Boston and a reputation as one of the most respected New England ministers of his generation.⁴⁸ The colonists of Prince's time were far less intensely religious than their forbearers; a general trend of secularization had begun in the previous century and continued through their own, but it was punctuated by the first Great Awakening, whose revival of fear and piety was at a peak when the 1755 earthquake struck.⁴⁹ Prince's theological orientation was aligned mostly with the milder form of Puritanism that had developed

³⁹ "Winthrop, John," *ANB Online*. Orthodox and other religious movements of the time will be discussed shortly.

⁴⁰ The theological elements of Winthrop's science are referenced by Brasch, 10; Clark, "Science, Reason, and an Angry God," 349; and Carozzi, 23.

⁴¹ "Winthrop, John," *ANB Online*.

⁴² Brasch, 3-9. Winthrop's interests were widely distributed among both the sciences and the humanities.

⁴³ Winthrop defended the new science of Newton to his contemporaries in the Royal Society, and he taught it to several generations of young scholars in his Harvard course "Experimental Philosophy," including the likes of Benjamin Thompson (Count Rutherford) and John Adams ("Winthrop, John," *ANB Online*). For more on Winthrop and Newtonianism, see Stearns, 669; Clark, "Science, Reason, and an Angry God," 348-349; and "Winthrop, John," *ANB Online*. For more on Winthrop's participation as a Fellow of the Royal Society, see Stearns, 635-638.

⁴⁴ Stearns, 643; Brasch, 5.

⁴⁵ On Winthrop's public reputation, see Stearns, 644; Brasch, 3-5; and "Winthrop, John," *ANB Online*.

⁴⁶ Brasch, 5; "Winthrop, John," *ANB Online*.

⁴⁷ The range of earthquake theories available for Winthrop to draw on, however, was quite limited. Although Robert Hooke (1635-1703) postulated that earthquakes may be caused by the collapse and settling of strata within the earth's crust, such a modern understanding of earthquakes was not widely considered until after the earthquake in question: Hutton's 1795 *Theory of the Earth* and Lyell's 1830 *Principles of Geology* are considered the beginning of the modern school. In the mid-eighteenth century, earthquakes were generally considered rare chemical phenomena, and their equally-rare natural philosophical discussion was closely tied to that of the ancients. For more on Hutton and Lyell, see Peter J. Bowler, *Evolution: The History of an Idea* (Berkeley: University of California Press, 1984). For more on Hooke and the history of seismology, see David R. Oldroyd, *Thinking About the Earth: A History of Ideas in Geology* (London: Athlone, 1996).

⁴⁸ For further biographical information on Prince, see Hornberger, 26; John Van De Wetering, 494; and "Prince, Thomas," *American National Biography Online*.

⁴⁹ The first Great Awakening began in central Massachusetts in the 1740s and continued into the 1770s and 1780s. For more on the Great Awakening and the mid-eighteenth century religious climate in New England, see William W. Sweet, *The Story of Religion in America* (Grand Rapids, MI: Baker Book House, 1973), 127-137, and Mark A. Noll, *A History of Christianity in the United States and Canada* (United States: Wm. B. Eerdmans Publishing Co., 1992), 110-113.

in the colonies during the seventeenth century, but he was also very supportive of the newer movement's creative efforts to revitalize religious enthusiasm.⁵⁰

One of the newer religious trends that Prince adapted with particular enthusiasm was the use of natural philosophy as a complement to theology. Especially among the Harvard-trained ministers that clustered around Boston, physical experimentation and theories such as Newtonian mechanics came to be interpreted as tools by which the perfection of God's works could be further explored and revealed; as a result, many clergymen kept abreast of scientific progress and incorporated it into their theology.⁵¹ Prince found natural philosophy extremely stimulating and pursued it even more passionately than his clerical colleagues, both within and beyond his official responsibilities.⁵² Thus, while incorporating natural causes is the norm among 1755 earthquake sermons, Thomas Prince's work is unique in the extent to which he does so.⁵³

THOMAS PRINCE'S SERMONS: INVOKING A WRATHFUL GOD

The contexts in which Prince includes natural philosophy in his sermons and the ways he presents specific secondary causes indulge his conception of God as wrathful. Of Prince's two earthquake sermons, only one addresses natural causes; the first characterizes earthquakes simply as "the Works of GOD, and Tokens of his just Displeasure."⁵⁴ This first sermon presents historical accounts of New England earthquakes "of the last *Fourscore Years*, and even of these, the *most Remarkable* only,"⁵⁵ along with the lessons which may be drawn from them. By focusing the bulk of this text on the effects rather than the causes of earthquakes, Prince is able to use terrifying personal narratives to compound the fears of his audience and then present God as a clear and simple object for their fear. Combined with an interpretation of earthquakes as punishment,⁵⁶ this exaggerated sense of fear maximizes the conceptual dangerousness of sin and thereby renders his audience more responsive to his advocacy of reform. Heading off any counterarguments to his scare tactics, Prince addresses the question of God's clemency by remarking that New Englanders are fortunate the earthquakes have not been worse. He reflects, "What *abundant Reason* have we to adore the *Patience and Mercy of GOD*, and be exceeding *Thankful*."⁵⁷ Prince's concept of God

⁵⁰ Prince's approach to religion is discussed relative to his contemporaries in John Van De Wetering, *insert title* 494; Hornberger, 26; and "Prince, Thomas," *ANB Online*.

⁵¹ Clark, "Science, Religion, and an Angry God," 348-349, and Tilton, 86.

⁵² Hornberger, 26-27, and John Van Der Wetering, 494. While other ministers merely kept informed on scientific theory, Prince attempted to contribute. His published speculations on the aurora borealis and other astronomical phenomena earned him the reputation of an amateur natural philosopher early in his career, and he later submitted a paper on 'Droughts and Rains' to the Royal Society (Hornberger, 38, and John Van Der Wetering, 501).

⁵³ A sampling of the 1755 earthquake sermons (see bibliography) reveals that most preachers briefly enumerated the most well-established natural theories of earthquakes in the space of less than two pages; by contrast, Prince's speculative discussion of natural causes claims almost seven pages of his sermon. Although the Boston clergy tend toward lengthier discussion of secondary causes than their provincial counterparts, Prince's sermon contains the most extensive account by an enormous margin.

⁵⁴ Thomas Prince, *An Improvement of the Doctrine of Earthquakes, Being the Works of God, and Tokens of his Just Displeasure* (Boston: D. Fowle and Z. Fowle, 1755), 1.

⁵⁵ Prince, *An Improvement*, 6. Prince limits himself because "it wou'd fill a Volumn [sic] to recite them all."

⁵⁶ Prince, *An Improvement*, 3. Prince names as the first of the sermon's two main points "the extreme Evil and Danger of Sinning."

⁵⁷ Prince, *An Improvement*, 5.

is certainly more complex than just a blindly thrashing, angry titan, but the negative way he incorporates God's mercy and its subordination here to His wrath will provide a distinct contrast for the way Winthrop presents God's mercy in His works.

In order for Prince to convince his readers that earthquakes are indeed punishment for human sin, he had to describe a rational rather than a mysterious universe,⁵⁸ and this need was a primary motivation for the introduction of natural philosophy into his second sermon. The mechanized cause-and-effect universe of the new Newtonian science was ideal for this aspect of theological arguments because it implies that the world was governed by rational rules. However, this worldview also implies that the god who established these natural laws is now observing the world from a distant, more passive position, like a watchmaker surveying his work. The evidence most frequently cited for friction between science and religion during this period is that the natural laws discovered by the new science removed the universe's operation from the constant or direct involvement of the hand of the Almighty.⁵⁹ In his comprehensive analysis of the philosophical motivations and consequences of Prince's work, John E. Van De Wetering concludes that Prince is driven mainly by a desire to reclaim God from the new science's external, Deistic transplantation.⁶⁰ Although his interpretation of Prince as defending religion against science is rather extreme, John E. Van De Wetering identifies real period issues of which Prince was acutely aware; knowing that the theological use of natural philosophy led to this shaky ground, Prince attended its appearance in his sermon with tremendous caution.

In the second sermon, then, Prince skillfully positions his natural-philosophical discussion so as not to obscure in any way the more important point it is intended to be serving. He refers to known natural laws only to illustrate "How the mighty GOD invisibly works by sensible Causes," rather than irrationally.⁶¹ In the original 1727 version of the sermon, his discussion of the natural causes of earthquakes is embedded between a condensed version of the sensationalized earthquake history and a metaphysical discussion designed to "Lead you up to GOD as having the highest and principal Agency in this tremendous Action."⁶² Further, the section is kept "as brief as possible, least I keep you too long from the view of the *First and Principle* Cause in these great Affairs."⁶³ The priorities and constraints that Prince himself expresses with reference to this natural-philosophical interlude suggest there is significance to be found in which physical theories he chooses to include and how he presents them.

Prince does not formulate any new theories on the natural causes of earthquakes; rather, his sermon presents a sampling of conventional seventeenth- and eighteenth-century meteorology and earthquake theory.⁶⁴ Even in updating the 1755 printing with an appendix on possible electrical causes of earthquakes

⁵⁸ Maxine Van De Wetering, "Moralizing in Puritan Natural Science: Mysteriousness in Earthquake Sermons," *Journal of the History of Ideas* 43 (July-September 1982): 419-421. Maxine Van De Wetering's article provides an extended explanation for what she perceives to be a conspicuous absence of a sense of the mysterious from eighteenth-century earthquake sermons.

⁵⁹ Clark, "Science, Reason, and an Angry God," 394.

⁶⁰ John Van De Wetering, 495.

⁶¹ Prince, *The Works of God*, 9.

⁶² Prince, *The Works of God*, 4.

⁶³ Prince, *The Works of God*, 9. The temptation natural philosophy represented for his own intellectual curiosity may partially explain why Prince expresses such reservation about its potential to be a dangerous distraction.

⁶⁴ Maxine Van De Wetering, 526. On conventional earthquake theory, see footnote 47.

and a nod to “the sagacious Mr. *Franklin*,”⁶⁵ Prince compiled more a report on European developments than an original contribution.⁶⁶ For most colonial natural philosophers, referencing the work of their peers across the Atlantic was a necessary means of securing credibility,⁶⁷ but in the natural-philosophical middle section and appendix of Prince’s sermon, this practice was employed with an additional purpose: he used the authority of European scientific theories to reinforce the validity of the fear demanded by his omnipotent and wrathful God. Prince chose to “omit the many fine but uncertain *Hypotheses*”⁶⁸ of earthquakes that had been advanced and present those he included to evoke an image of unequivocal violence and terror.

In terms of classical theory, Prince chooses to support what historians have called the “construct thesis,” an idea that the earth was created in a form conducive to earthquakes, making it easy for God to touch them off.⁶⁹ He writes, “I must in the first place observe, That in the very Constitution and Frame of this Earth, GOD has created and form’d [*sic*] it in such a particular manner as to prepare and dispose it for such fearful Convulsions.”⁷⁰ In supporting the construct thesis, Prince implies that if God created this earthquake-prone earth before he created people (and therefore before he could have been provoked by human sin), He must have done so out of a general, intrinsic wrath. Or, at least, the mere anticipation of human sin must have aggravated God’s anger into “ma[king] sufficient Provision for such dire Convulsions.”⁷¹ The pessimism expressed by Prince’s support of the construct theory is even more apparent in light of his choice to ignore all other tenants of classical geology. The ancient theory of “formed stones,” for example, is referenced extensively by Winthrop and will provide a major contrast for Prince’s use of classical construct theory.⁷² Prince deliberately chooses earthquake theories that evoke the work of a wrathful god and whose explanations reinforce the terror of these “fearful” and “dire Convulsions.”

With the older construct theory as well as with the more contemporary speculation he decides to incorporate, Prince presents the ideas of natural philosophy in extremely violent and frightening terms. In speaking of earthquakes, he draws repeated analogies with “Thunder and Lightening,”⁷³ which had already long been associated with the dangerous power and wrath of God.⁷⁴ Citing the most prevalent contemporary geological beliefs,⁷⁵ he lists as the chemical ingredients of earthquakes unpleasant “*Sul-*

⁶⁵ Prince, *The Works of God*, 20.

⁶⁶ Not all of the secondary literature views Prince’s work as entirely without innovation, but Carozzi points out that William Stuckeley and other English naturalists and theologians had advocated an electric understanding of earthquakes well before Prince’s 1755 appendix was written. (Carozzi 22-24).

⁶⁷ Brasch, (4) writes “the science of the colonial period was transplanted English science or thought” and “the Royal Society acted as an authority and sponsor of the colonial scholarly attainments.”

⁶⁸ Prince, *The Works of God*, 9-10.

⁶⁹ Maxine Van De Wetering, 424-426 explains that this “construct thesis” was commonly supported in earthquake sermons in both the seventeenth and eighteenth centuries.

⁷⁰ Prince, *The Works of God*, 10.

⁷¹ Prince, *The Works of God*, 11.

⁷² The formed stone theory states that rocks and minerals grow within the earth like seeds. It will be discussed at length in the next section.

⁷³ Prince, *The Works of God*, 10, 20.

⁷⁴ Even Winthrop (*A Lecture*, 7) references Biblical discussion of lightening and thunder as the works of God.

⁷⁵ Maxine Van De Wetering, 426. Reference to what Doolittle originally termed “nitreous and sulphureous particles” pervaded both geological discourse among natural philosophers and earthquake sermons.

phurious, nitrous, firey, mineral, and other Substances."⁷⁶ Prince explains that these substances produce earthquakes by reacting in an explosion he likens to "*Gun-Powder*" and declares "will tare and rend away all before them...with the greatest Violence."⁷⁷ When Prince presents a particular earthquake theory in detail, however, it is especially apparent that he is using natural philosophy to illustrate the power of God's wrath and thereby to imply the severe peril of sin. Of these independent sub-theories I will analyze two examples: his discussion of Boyle's gas pressure in the original text and his appendix on electricity.

Upon reading Boyle's theory of gas pressure, Prince amended his understanding of earthquakes: he now believed they consist not only of chemical explosions within the earth, but also of an implosion caused by atmospheric pressure forcing the earth's surface into new subterranean spaces opened by the initial explosions. He writes,

Nor is this a Twentieth Part of our Imminent Danger: There is a terrible *Atmosphere* over us, which few are aware of, that is found to press with the Weight of above *Two Thousand Pounds*± on every *Square Foot* of the Surface of the Earth. And when by the violent Explosions made from beneath, the Vapours within are of a sudden discharg'd and leave a Vacuity; then this astonishing Weight, besides that of the Earth, immediately bares away every thing before it into the Spaces below, and sinks whole Cities and Mountains at once. Yea, though their [*sic*] shou'd be Eruption through an easier Passage in any Part of the Land or Water about us, a great many Miles off; Yet Here, a whole Town being over such an emptied Cavern, it may sink in a moment: and even this without perceiving so much of the Shake of the Earth, as the Places nearer and round the Eruption⁷⁸

To Prince, the incorporation of Boyle's gas theory multiplies "our Imminent Danger" twenty-fold. The "*Atmosphere*" is "terrible," and "few are aware of it," so it is imperative that people heed his warning. The atmosphere's weight is "astonishing," like any of God's works ought to be, but it is also rationally explainable. And of course, the image of "whole Cities and Mountains" sinking suddenly into the ground "without perceiving so much of the Shake of the Earth" is terrifyingly dramatic. This passage is a clear instance of what many historians have interpreted as Prince's habit of expounding scientific fact without fully understanding it,⁷⁹ but what is important here is that he understood Boyle's gas theories as further indication to fear God. Later, in the appendix, he uses the electrical theory of earthquakes the very same way, and in that case, he makes the connection even more explicit.

Prince's "APPENDIX Concerning the Operation of GOD in *Earthquakes* by Means of the *Electrical Substance*" and in particular the "PS" that follows its main body, are the specific items that occasioned a direct response from Professor Winthrop and thereby instigated their dispute.⁸⁰ The appendix invokes a fear of the unknown by discussing how electricity, a godly substance "truly wonderful and beyond our

⁷⁶ Prince, *The Works of God*, 10.

⁷⁷ Prince, *The Works of God*, 10-11.

⁷⁸ Prince, *The Works of God*, 11.

⁷⁹ Tilton, 87.

⁸⁰ Almost all of the secondary literature agrees upon Prince's postscript as the ember that grew into the public conflagration. The only exception is Hornberger, who does not think there was a dispute at all. Prince, *The Works of God*, 20.

Account" may contribute to the initiation of earthquakes.⁸¹ In his fatal P.S., Prince considers whether, if earthquakes truly are electrical phenomena, the use of lightening rods ('iron points') might contribute to creating earthquakes by channeling more electricity into the earth:

P.S. The more *Points of Iron* are erected round the *Earth*, to draw the *Electrical Substance* out of the *Air*; the more the *Earth* must needs be charged with it. And therefore it seems to be worthy of Consideration, whether *any Part* of the *Earth* being fuller of *this terrible Substance*, may not be more exposed to *more shocking Earthquakes*. In *Boston* are more erected than any where else in *New England*; and *Boston* seems to be more dreadfully shaken. O there is no getting out of the mighty Hand of God! If we think to avoid it in the *Air*, we cannot in the *Earth*: Yea it may grow more fatal; and there is no Safety any where, but in *His Almighty Friendship* through CHRIST the *Mediator*, and by *heartily Repenting of every sin* and *heartily embracing the Savior* in *all his Offices*, and *uprightly Living to HIM*.⁸²

This excerpt is another case in which Prince's theory is composed equally of partially-understood scientific fact and well-versed theological dogma, but again he succeeds in using natural philosophy to amplify and propagate a fear of God.⁸³ Like Boyle's atmosphere, the "*Electrical Substance*" is "terrible," and its description compounds the horror of earthquakes. In this passage, however, Prince makes his purpose explicit: the "Hand of God" is "mighty" and "fatal," and "there is no Safety any where" except for in righteous living. Both in choosing which natural-philosophical earthquake theories to include and in deciding when and how to present them, Prince manipulates his congregation's latent fears into an acutely wrathful conception of God; according to his sermons, New Englanders must repent in order to evade further visitations of explosive, implosive, chemical-electrical earthquakes.

JOHN WINTHROP'S LECTURES: EVOKING A BENEVOLENT GOD

While Prince capitalized on New Englanders' fears to conjure repentance to a wrathful, earthquake-triggering god, Winthrop was attempting to ease their worries.⁸⁴ He did so by arguing that the earthquake was not a token of God's wrath in the form of a punishment or warning, but rather a natural part of His operations as a benevolent deity.⁸⁵ When Winthrop first delivered his earthquake lectures to students and faculty assembled in the Harvard Chapel,⁸⁶ the New World had not yet heard of the tragic Lisbon earthquake,⁸⁷ and the miraculous sparing of life in their own earthquake was just coming to light. As a result,

⁸¹ Prince, *The Works of God*, 20.

⁸² Prince, *The Works of God*, 23.

⁸³ Tilton, 87.

⁸⁴ Stearns, 649.

⁸⁵ Clark, "Science, Reason, and an Angry God," 351.

⁸⁶ Stearns (648) and Brasch (9) discuss the audience and setting of Winthrop's lecture. The college chapel was frequently utilized for purposes other than religious services, so its use in this case for an academic lecture is not unusual or significant.

⁸⁷ A relevant account and discussion of the Lisbon earthquake may be found in T.D. Kendrick, *The Lisbon Earthquake* (London: Methuen & Co., Ltd., 1956), especially chapter VII, "Optimism Attacked." The enlightenment philosopher Leibniz is credited with advocating a philosophy of optimism, claiming that men inhabit the best of all possible worlds.

his audience could potentially be receptive to an optimistic point of view.⁸⁸

Winthrop's *Lecture on Earthquakes* may be readily broken into two parts: the first half consists of detailed observations and calculations, and the second half attempts "to trace out the causes of these great phenomena."⁸⁹ The first half serves to neutralize his audience's fears by making earthquakes seem less of the unknown and more easily understandable;⁹⁰ then, in the second half, Winthrop attempts to build a positive attitude toward earthquakes by postulating beneficial effects they might serve. Finally, in an intensely Leibnizian conclusion, he argues that these beneficial effects outweigh the terrible destruction that had been most people's immediate focus.⁹¹ Far from ascribing earthquakes to purely physical causes like the secondary literature suggests,⁹² Winthrop could not have supported this optimistic interpretation of earthquakes without referencing to God's agency in them: ultimately, according to Winthrop, earthquakes must be good *because* they are caused by God.⁹³

Although Winthrop's earthquake lecture has been widely cited as the earliest classic of American scientific literature⁹⁴ and the beginning of scientific seismology, it is not the paragon of scientific objectivity and originality most historians would like it to be.⁹⁵ Just as in Prince's sermons, the content heavily

In practice, this philosophy calls for individuals not to despair at misfortune, but to remember that all events are contrived for the greatest good of the whole. On November 1, 1755, however, 17 days before the New England earthquake, the famed Lisbon earthquake shook a large portion of Europe and caused tens of thousands of deaths. This immense destruction prompted an anti-optimistic backlash throughout Europe, typified by works like Voltaire's bitter satire *Candide*. Had such an atmosphere spread through the new world, it would have precluded any serious attempts at optimistic earthquake interpretation like Winthrop's lecture.

⁸⁸ Clark, "Science, Reason, and an Angry God," 352, characterizes Winthrop's position as "as optimistic a view of a natural catastrophe as has been committed to print since the drowning of Pharaoh's army."

⁸⁹ Winthrop, *A Lecture*, 17. The modern and original causal deductions that have impressed historians of science and led them to characterize his lecture as purely scientific include Winthrop's recognition of the wavelike nature of earthquake motion as well as his identification of the earthquake's direction, duration, epicenter, and chronology. For detailed discussion of Winthrop's seismological accomplishments, see Stearns, 650; Brasch, 9-10; Houston, 106; and "Winthrop, John," *ANB Online*.

⁹⁰ In the first half of the lecture, Winthrop presents the quantitative measurements he made around his home immediately after the earthquake. He uses these observations to perform precise calculations from which he later deduces properties of the earthquake. For example, by measuring the height and distance that a key was displaced from his mantle to the floor and invoking the newly-defined acceleration of gravity ("Now bodies fall thro' 16 feet nearly in one second of time,") Winthrop is able to reduce a violent effect of the earthquake to a simple Newtonian projectile problem and solve it to demonstrate that earthquake motion follows as a well-understood wave-type pattern (Winthrop, *A Lecture*, 10). The report that Winthrop submitted to the Royal Society contains an almost identical set of observations and calculations, so the lecture Winthrop printed for the Boston public represents a rigorous employment of the most recent developments in natural philosophy. Although Carozzi (23) claims that "this [Philosophical Transactions] account bears very little in common with his lecture," (Carozzi, 23), she is focused more on the explanations than the descriptions in Winthrop's work. The difference between Winthrop's lecture and report is that the former deduces causes from its observations, while the latter only offers observations; this difference is a product only of Winthrop's different roles within the colonies and within the Royal Society. Since Winthrop's report to the Royal Society mentions neither primary nor secondary causes of earthquakes, Carozzi is mistaken in emphasizing the absence of reference to God's agency.

⁹¹ Winthrop, *A Lecture*. As defined here, the first half may be found on pages 5-16, and the second half on pages 17-28. The conclusion comprises pages 29-31.

⁹² Stearns, 649.

⁹³ Winthrop makes this argument clear in *A Lecture*, 29-31. It will be presented more fully in the next few paragraphs.

⁹⁴ Brasch, 9.

⁹⁵ Stearns, 650. merge with 95

reflects the prevailing views of European geologists, and the natural-philosophical theories included are arranged and presented to best support a largely theological argument.⁹⁶ The most powerful example of Winthrop's stylistic manipulation of scientific theory is with the common theory of "formed stones," mentioned above as a contrast to Prince's use of "construct theory." Aristotelian in origin, the formed stone theory postulates that that rocks and minerals grow inside the earth from "rocky seeds."⁹⁷ Winthrop puts this analogy to work as an extended metaphor; throughout the lecture, his biological descriptions liken the earth to both animal and vegetable and thereby reap an agreeable ethos of life and fertility. By explaining that "even the hardest, inorganized bodies, as stones, metals, &c. do, in their proper way, grow within the earth, as truly as vegetables grow on it's [*sic*] surface, or animals in their parent animals,"⁹⁸ Winthrop neutralizes the raw ingredients of earthquakes to the innocence of a motionless plant or an unborn child or animal. Then, when he discusses the "combustible minerals, as fossile coals, sulphur, nitre, &c"⁹⁹ thought to chemically ignite earthquakes, his presentation forms a sharp contrast with Prince's: rather than likening their operation to the violence of gunpowder, Winthrop writes that these substances "impregnate" the earth with a "promiscuous disposition of materials"¹⁰⁰ that leads to earthquakes almost as a consequence of the earth's personality. By attributing to the earth the female capacity to become impregnated, Winthrop associates earthquakes even more closely with benevolent, constructive, and even gentle motherly deeds.

This extended biological metaphor serves not only to cultivate a more humane image of the natural causes of earthquakes; it also provides one of Winthrop's main tools for illustrating earthquakes' potential for positive consequences. Later discussion of the earth's "bowels," "pores," "entrails," and other living characteristics provides a biological allegory for how earthquakes may "upon the whole...produce a *maximum* of good."¹⁰¹ Like humans or animals, the earth is subject to "a certain unwholesome sultriness [in the 'atmosphere'] which often infects it"¹⁰² and which must therefore be purged. Moreover, Winthrop argues that "ploughing, digging, &c." are necessary to "the operations of agriculture"¹⁰³ as a means to release these toxicities from the earth and that earthquakes effect a large-scale, natural version of that process. In biological terms,

It may be added, that as in the animal body, the evacuations, which are of absolute necessity to maintain life and health, do yet sometimes run to such extremes as to prove mortal; so in like manner, these explosions of subterraneous vapor, whose effects have sometimes been so fatal, may, notwithstanding this, be highly conducive, and even indispensably necessary, to the good of this globe in general. The explosions themselves, as well as the laws, in consequence of which they are produced, may be necessary on various accounts; and particularly to the carrying on the

⁹⁶ Merrill, 8.

⁹⁷ For the origin and variations of the formed stone theory, see Stearns, 10-13.

⁹⁸ Winthrop, *A Lecture*, 20.

⁹⁹ Winthrop, *A Lecture*, 6.

¹⁰⁰ Winthrop, *A Lecture*, 20.

¹⁰¹ Winthrop, *A Lecture*, 20, 28-30.

¹⁰² Winthrop, *A Lecture*, 28.

¹⁰³ Winthrop, *A Lecture*, 30.

more secret and noble works of nature within the entrails of the earth.¹⁰⁴

Thinking of earthquakes as a sort of geological diarrhea is certainly not pleasant, but it stands as an appealing option to divine wrath. While earthquakes may cause destruction to property and occasionally threaten human life, they “promote...the growth of vegetables on it’s [*sic*] [the earth’s] surface, as well as of minerals in it’s [*sic*] bowels,” so overall, earthquakes are a force supportive to life. They are “noble works” which occur only in accordance with God’s “secret” but benevolent “laws” of nature.¹⁰⁵

Even with Winthrop’s elegant stylistic gifts,¹⁰⁶ however, this Leibnizian, optimistic perspective on earthquakes must have been difficult to defend in the wake of New England’s most destructive earthquake on record. Although it helped his position that “not a single life has been lost by any of them,” Winthrop knew that this observation was shaky ground from which to claim “GOD [should] be thanked” for his mercy.¹⁰⁷ Consequently, he was forced to acknowledge the “images of horror and desolation, which accompany the more violent earthquakes,” but unlike Prince, Winthrop chose to “dwell no longer on these tragical scenes.”¹⁰⁸ Instead, he referred audience members “desirous of farther information” to descriptions “in the Philosophical Transactions” and “in the holy scriptures.”¹⁰⁹ Winthrop’s equal recommendation to his readers of natural philosophical and theological texts is inexplicable in terms of the science-versus-religion historiography—Winthrop would not cite the argument he is attempting to undermine. Rather, this gesture is emblematic of the crucial support he was able to provide for his position by embracing “the [primary] agency of GOD” in “all those which we call *natural* effects.”¹¹⁰

Later in the debate, as the focus turned from earthquakes to lightning rods and eventually to personal issues, Winthrop continued to invoke his benevolent God. In response to Prince’s interpretation of lightning rods as instruments conceived for the subversion of God’s wrath, Winthrop counters that such an idea would be self-contradictory and that lightning rods are more likely to meet with approval than anger from God. He sarcastically claims,

I cannot believe, that in the whole town of *Boston*, where so many iron points are erected, there is so much as one person, who is so weak, so ignorant, so foolish, or, to say all in one word, so atheistical, as ever to have entertained a single thought, that it is possible, by the help of a few yards of wire, to ‘get out of the mighty hand of GOD.’¹¹¹

¹⁰⁴ Winthrop, *A Lecture*, 28-29. Winthrop goes on from this analogy to discuss earthquakes as the cure for a turgid, constipated earth: when “the earth becomes continually more and more hard, compact and dense,” nature arranges “the perpetual consumption of fluids” (water levels in wells sinking before earthquakes), and “the most general effect of earthquakes is...shaking to loosen and disunite the parts of the earth, and to open its pores.”

¹⁰⁵ Winthrop, *A Lecture*, 30.

¹⁰⁶ Winthrop’s lucid and convincing literary style receives universal praise in his biographers’ summaries of his pupils’ reports.

¹⁰⁷ For a comparison to Leibniz and responses to the Lisbon Earthquake, see footnote 88. Winthrop, *A Lecture*, 9.

¹⁰⁸ Winthrop, *A Lecture*, 9.

¹⁰⁹ Winthrop, *A Lecture*, 7-9.

¹¹⁰ Winthrop, *A Lecture*, 7-8.

¹¹¹ Winthrop, *A Lecture*, 37 (appendix).

Further, he asserts that if God has provided New Englanders with lightening rods, they should use them: “the use of the *iron points*...by the blessing of GOD, might be a means of preventing many of those mischievous and sorrowful accidents, which we have so often seen to follow upon thunder storms.”¹¹² To Winthrop and his benevolent God, it would be far more “mischievous” and “foolish” to abstain from the use of such a helpful asset. Winthrop’s ubiquitous theological beliefs provide both the impetus and the evidence for his somewhat circular optimistic philosophy and its application to natural phenomena; according to Winthrop, God is benevolent, so all of his works—even earthquakes—are advantageous by association.

REINTERPRETING THE DISPUTE

Now that the two men’s opposing personal theologies—the wrathful god of Prince and the benevolent god of Winthrop—have been established, the incongruity of their beliefs may be used as a framework for reinterpreting their debate over the use of lightening rods. The historiographic literature is not wrong in identifying a conflict between science and religion; once the debate becomes more personal, there is clearly a tension regarding the questions of whether a theological or natural-philosophical consideration of earthquakes is more pressing and about who is best suited to pursue either explanation. Prince, for example, explicitly contrasts “my peculiar Office, as a Student of *Divinity*” with “his [Winthrop’s] academical Office.”¹¹³ He defines Winthrop’s concerns to be therefore “meerly [*sic*] or chiefly in a *Philosophical/View*, as the Powers and Operations of material Substances” as opposed to his own responsibility for examining the actions of “that omnipresent, perfectly intelligent, spontaneous, and almighty Being we call by the Name GOD.”¹¹⁴ But Prince’s attempt to compartmentalize the debaters’ positions as theologian and natural philosopher serves only to foreshadow the similarly inadequate characterizations of many historians to come. As illustrated in this paper, both men built their arguments with elements from both natural philosophy and theology, so the clean departmentalization implied by their “offices” is really misleading.

Winthrop’s response to Prince’s distinction between their offices illuminates more clearly the relationship between natural philosophy and religion in this debate. He writes, “The consideration of a DEITY is not peculiar to *Divinity*, but belongs also to *natural Philosophy*. And indeed the main business of natural Philosophy is, to trace the chain of natural causes from one link to another, till we come to the FIRST CAUSE,” which is always God.¹¹⁵ Rather than countering that natural philosophy is for some reason more important than theology and, in turn, not the concern of Prince’s office, Winthrop bolsters the standing of his natural-philosophical approach by showing that it *is* theological. Prince and Winthrop were not arguing over the primacy of either science or religion, because both men agreed that God was paramount. What they disagreed on was the *character* of God, and that disagreement is the “First Cause” of their dispute. Their different concepts of God as more wrathful or benevolent generated conflicting goals for the public good, and their dispute over the use of lightning rods may be interpreted much more productively in terms of these conflicting goals than as a contest between science and religion.

¹¹² Winthrop, *A Lecture*, 36 (appendix).

¹¹³ Prince, 26 January 1756 Letter to the *Gazette*. This is the first of two letters he printed in the paper.

¹¹⁴ Prince, 26 January 1756 Letter to the *Gazette*.

¹¹⁵ Winthrop, *A Letter*, 2. This is Winthrop’s reply to Prince’s first letter to the *Gazette*. Though entitled as a letter to the *Gazette*, this substantial piece was printed only as a separate pamphlet by the *Gazette*’s publishers.

Prince truly believed that earthquakes were “the Works of GOD, and Tokens of his just Displeasure,” as his sermon boldly proclaims, and from this mindset, the most pressing needs of his flock were spiritual.¹¹⁶ Something terrible and frightening had just occurred, and he felt that the only way to prevent more of the same was through repentance. Thus, Prince’s electric explanation of earthquakes is employed as only one in a series of means to bring about the end of moral reform, and this is why he makes such little protest when it fails to pass Winthrop’s technical scrutiny. Prince writes, “for the present, I had rather be apprehended by his Readers to be *mistaken* in a point of [natural] *Philosophy*; than by entering into a more particular Enquiry into the *natural Causes of Earthquakes* in this extraordinary Season, to divert the Minds of any from attending to *Matters of infinitely greater Moment*.”¹¹⁷ Although Prince is “yet uncertain”¹¹⁸ whether Winthrop is right about electricity not being a secondary cause of earthquakes, accurately determining these natural causes is not a priority for him; even if they are not electric, earthquakes are still violent and frightening, and they are certainly still cause for repentance. In this regard, Prince is sincere in claiming that the disagreement between him and Winthrop was one of “emphasis” rather than one of “content,”¹¹⁹ and the motivation for that statement was more than just rhetorical strategy, as has been implied by the secondary literature.¹²⁰

Winthrop, on the other hand, was largely exempt from these spiritual worries; his benevolent god did not instigate the earthquake as punishment and therefore did not require appeasement. Without the class of spiritual concerns with which Prince consumed himself, Winthrop was able to channel his energy into the physical and psychological well-being of his public. The theories and observations of natural philosophy could soothe people’s anxiety and fear of the unknown by rendering earthquakes more understandable, and lightning rods provided a concrete form of protection from a very real and physical threat. For these reasons, Winthrop felt it *was* a priority to reach an accurate understanding of the secondary causes of natural phenomena, and it was imperative for people to be accurately informed on natural philosophy. He initially responds to Prince’s PS with both psychological and physical goals clearly setting his agenda: Winthrop is “concerned...that it would fill with unnecessary terrors the minds of many persons, who were not well enough acquainted with the laws of electricity, to discover [Prince’s] mistakes,” and he hopes he has “fully vindicated the character of these innocent and injured *iron-points*” whose use could “prevent many...sorrowful accidents.”¹²¹ To Winthrop, the remedy for these problems is informing the public of “The truth.”¹²² Prince even mocks his conspicuous sense of duty to “publish...what He apprehended to be the Truth, and...promote the Greater Safety of Mankind,”¹²³ and Winthrop uses the last words in the dispute to reiterate that “my Answer did not proceed from a Desire of *Victory*, but of *Truth*

¹¹⁶ Prince, *An Improvement*, 1.

¹¹⁷ Prince, 26 January 1756 Letter to the *Gazette*.

¹¹⁸ Prince, 26 January 1756 Letter to the *Gazette*.

¹¹⁹ Van De Wetering, 504, and Tilton, 90-91 explicate Prince’s first letter to the *Gazette*.

¹²⁰ Both John Van De Wetering and Tilton interpret this move by Prince as insincere and inconsistent with his earlier claims. In her discussion of the letter, Tilton sarcastically writes, “After this magnificent gesture, Prince professes to have been misunderstood” (Tilton, 90).

¹²¹ Winthrop, *A Lecture*, 36-38 (appendix).

¹²² Winthrop, *A Lecture*, 36 (appendix).

¹²³ Prince, 26 January 1756 Letter to the *Gazette*.

and *Justice*.¹²⁴ Like Prince, Winthrop is conscious of his priorities in the dispute, and he declares them with an air of lofty morality.

CONCLUSION

The actions of John Winthrop and Thomas Prince during the earthquake and lightning rod controversy may thus be understood to be driven by a major difference in their personal theologies and the contrasting visions for public welfare they pursued as a result of that difference. Prince, fearing a wrathful god, concerned himself with the spiritual health of New Englanders by urging repentance. Winthrop, meanwhile, operating under a benevolent god, felt it his duty to attend to the physical and psychological health of the populace by keeping them informed on contemporary natural philosophy. The respectively spiritual and physical/intellectual public agendas these men pursued suggest indeed that their behavior may be categorized as that of a theologian and natural philosopher; perhaps it is this observation that gave rise to the science-versus-religion interpretation that dominates the secondary literature. Prince and Winthrop's behavior, however, is only a superficial manifestation of their identities as individuals. This paper demonstrates that once the complex personal motivations for their behavior are considered, the reductionist classification of these men as theologian and natural philosopher breaks down. It must be conceded that simplifying their religious beliefs into diametrically opposed concepts of God may be a similarly problematic reduction, but in examining the dispute through this fresh lens, I hope to have corrected some of the major distortions of the science-versus-religion historiography. By establishing the sharp contrast in Prince and Winthrop's personal theologies, I have added another link to the "chain of causes" responsible for their dispute.

¹²⁴ Winthrop, 1 March 1756 Letter to the *Gazette*. This is the last piece published in the dispute.

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