



ISSN: 1309 4173 (Online) 1309 - 4688 (Print)

A Tribute to Prof. Dr. Şerafettin Turan, Volume 6 Issue 3, p. 147-161, April 2014

When an American Minister Put His Faith in the Power of Islam: Muslim Medicine, Reason, and Public Health in the Modern World

*Bir Amerikan Rahibi İslamın Gücüne Güvendiğinde: Modern Dünyada Müslüman
Tıbbı, Akılcılık ve Kamu Sağlığı*

Ph. D. Assoc. Prof. Sean Foley
Middle Tennessee State University

Abstract: This paper discusses how Ottoman science helped a prominent American Protestant Christian Theologian, Cotton Mather (1663-1728), and the Anglo-Atlantic World accept inoculation—a process that saved lives from Smallpox in Boston in 1721 and led to advances in public health in the West. The process reflected the intersection of two trends in the Anglo-American Atlantic world in the seventeenth and eighteenth centuries: the European Enlightenment and a vision of Islamic civilization that recognized and sought to benefit from its intellectual and social achievements. It also challenges two misconceptions about Islamic science and American history: first, Islamic science stagnated after the medieval period and fell behind European medicine after the Renaissance; second, Islam and Muslims did not contribute to American history before the nineteenth century. In addition, this paper reframes Cotton Mather's place in American history. Despite his intellectual achievements, he is almost universally remembered for his unyielding adherence to Puritan Christian dogma and defense of the Salem Witch Trials (1692)—one of the worst miscarriages of justice in American history.

Keywords: Boston, Smallpox, Cotton Mather, Islam, Islamic Medicine, Ottoman Empire

Öz: Bu makale Osmanlı biliminin önde gelen bir Amerikan Protestan Hristiyan Din Adamı Cotton Mather (1663-1728) aracılığı ile Anglo-Atlantik dünyasına çiçek aşısı ile nasıl yardım ettiğini, 1721 yılında Boston'da yayılan çiçek salgını sırasında bu aşının nasıl birçok hayatı kurtardığını ve Batı'da kamu sağlığı hizmetini geliştirdiğini incelemektedir. Bu makale Anglo-Amerikan Atlantik aleminde onyedinci ve onsekizinci yüzyılda öne çıkan iki anlayışı da yansıtmaktadır: Avrupa Aydınlanması ve bu aydınlanmayı tanıyarak bunun fikri ve sosyal başarılarından faydalanmak isteyen İslam medeniyeti. Bu makale İslam bilimi ve Amerikan tarihi ile ilgili iki önyargıya karşı çıkmaktadır: birinci olarak İslam biliminin Orta Çağ'dan sonra durgunluğa girip Rönesans sonrası Avrupa'nın gerisine düştüğü önyargısı; ikinci olarak İslam ve Müslümanların ondokuzuncu yüzyıldan önce Amerikan tarihine bir katkıda bulunmadıkları önyargısı. Ayrıca bu makale Cotton Mather'in Amerikan tarihindeki önemini yeniden ele almaktadır. Düşünce alemindeki başarılarına rağmen, Mather genel olarak Puritan Hristiyan düşüncesine sıkı bağlılığı ve Amerikan tarihinin en kötü adaletsiz uygulamalarından biri olan Salem Cadı Yargulamalarını (1692) savunması ile bilinmektedir.

Anahtar Kelimeler: Boston, Çiçek Hastalığı, Cotton Mather, İslam, İslam Tıbbı, Osmanlı Devleti

Introduction:

“Cotton Mather, you dog, dam you! I'll inoculate you with this; with a pox to you!”¹ These were the words of a note attached to small bomb thrown into the Boston, Massachusetts home

¹This author thanks Dr. Mohd Feizel Alsiddiq Mohd Fakharuddin for arranging the August 2011 lecture at the Universiti Putra Malaysia's Faculty of Medicine and Health Sciences where the ideas in this paper were first presented. Cotton Mather, *The Diary of Cotton Mather*, ed. W.C. Ford (Boston: The Society, 1911-1912 and New York: F. Ungar Pub. Co., 1957), 2: pp. 657-658. Citations are to the Ungar Edition.



History
Studies

Volume 6
Issue 3
April
2014

of the Reverend Cotton Mather (1663-1728) in the early hours of November 21, 1721. Fortunately for both Mather and his nephew, who was in the room where the bomb landed, the fuse burned out and it never exploded.²

But this act of wanton terrorism illustrates the intensity of the public debate surrounding the medical procedure that Mather was vigorously advocating to combat the smallpox epidemic in Boston: inoculation. Although he was a minister, Mather had a lifelong interest in science and had heard of the success of the procedure in the Ottoman Empire (Turkey) through England's premier scientific organization, the Royal Society. In the debate over the procedure, in which a doctor gives smallpox material to a healthy person through a cut, Mather won the support of only one doctor, Zabdiel Boylston (1679-1766).³ Boylston, like virtually all eighteenth-century American doctors, had little formal schooling in medicine. But he had heard of the success of the procedure in Asia and Africa and was willing to inoculate anyone against smallpox. He was also a skilled statistician, whose work would help prove inoculation's benefits.⁴

By contrast, most of Boston's public and its elite opposed inoculation. Mather's congregation, elected leaders, other religious leaders, and the city's one doctor to attend a European medical school, Dr. William Douglass (1691-1752), vigorously opposed Mather and Boylston's actions. They were joined by James Franklin (1697-1735), the editor of a Boston newspaper, *The New England Courant*, and the older brother of one of America's founding fathers, Benjamin Franklin (1706-1790). The younger Franklin followed his brother into the printing business and became a leading progressive intellectual, politician, and scientist. He helped found America's first hospital, Pennsylvania Hospital in Philadelphia, Pennsylvania in 1751—fourteen years before the country's first medical school, the University of Pennsylvania Medical School, opened in the same city in 1765. For much of his life, Franklin opposed public inoculation.⁵

Franklin's views reflected the fact that inoculation not only challenged the religious principles and the practical experience of Anglo-Americans, but it also came from the medical tradition of a civilization that many viewed with suspicion: the Muslim World. In particular, inoculation undermined the Christian principle that diseases (and other human ordeals) were God's punishment for human sin.⁶ Mather referenced this principle whenever discussing the fate of Christian European mariners imprisoned in Muslim states in his sermons and 480 published works. In his eyes, the prisoners' captivity was punishment for personal sins and the horrors of prison were nothing in comparison to the damnation that awaited those who contradicted His commands by converting to Islam in order to win their freedom. Mather

²Ibid.

³Boylston's family had been in the Americas for multiple generations. His father was an apothecary and physician. By the early eighteenth century, Zabdiel was a prominent citizen and owned the largest apothecary shop in Boston. Anna Storm, "Religious Conviction and the Boston Inoculation Controversy of 1721" (B.A. Thesis, College of William and Mary, 2011), p. 7.

⁴John Blake, "The Inoculation Controversy in Boston: 1721-1722," *The New England Quarterly* 24 (4) (December 1952), p. 492.

⁵Walter Fox, "Another influential Franklin; Ben's half-brother James used the press to do the unthinkable: Challenge governmental authority," *The Philadelphia Inquirer*, July 20, 2006, p. A19, accessed via LexisNexis and Kristen A. Graham, *A History of the Pennsylvania Hospital* (Charleston, SC: History Press, 2008), p. 19; Maxine Van De Wetering, "A Reconsideration of the Inoculation Controversy," *The New England Quarterly* 58 (1) (March 1985), p. 47.

⁶Blake, "The Inoculation Controversy in Boston: 1721-1722," pp. 498-501.



JHS
148

*History
Studies*

*Volume 6
Issue 3
April
2014*

warned imprisoned Anglo-American mariners (and their families back home) that they should never forget that Christianity—even in the worst of circumstances—was superior to Islam.⁷

Nonetheless, it was the same Mather who argued in 1721 that Muslim science and medicine was superior to that practiced in Europe. The success of inoculation in the Ottoman Empire justified using inoculation to combat smallpox and that anyone opposing the procedure stood in the way of His plan for mankind and all Christian ethics. Ironically, Mather was far more willing to put his faith as a Christian in the knowledge of Islam than Boston's leading modernizing and secular voices at the time, such as Douglass or Franklin.

This paper discusses how Islamic science helped Mather and the Anglo-Atlantic World accept inoculation—a process that led to advances in the use of reason, science, and public health in the West and the wider world. The process reflected the intersection of two intellectual trends in the Anglo-American Atlantic world in the seventeenth and eighteenth centuries: the European Enlightenment and a vision of Islamic civilization that both recognized and sought to benefit from its intellectual and social achievements. This argument challenges two key misconceptions about Islamic science and American history among Western historians: first, Islamic science stagnated after the medieval period and fell behind European medicine after the Renaissance;⁸ second, Islam and Muslims generally did not contribute to American history before the nineteenth century. In addition, this paper reframes Cotton Mather's place in American history. Despite his considerable intellectual achievements, he is almost universally remembered for his unyielding adherence to Puritan Christian dogma and his defense of the Salem Witch Trials—one of the worst miscarriages of justice in American history.⁹

Smallpox, Islam, and Medical Knowledge

Before going further, it is important to have an idea of what smallpox is and why it was such a devastating and terrifying disease to the Anglo-Atlantic world that Boston was part of in the eighteenth century. Smallpox is an acute, often lethal infection. After initial symptoms of fever and pain, fluid-pox erupt in the skin and mouth. The pox makes it difficult to swallow, can stink like rotting meat, and can make skin turn purple from blood vessels rupturing below the skin. Mortality rates can be high (over 25%), and the smallpox is widely thought by historians to have facilitated the European conquest of the Americas by devastating Native American populations after it was introduced to the Western Hemisphere in 1507.¹⁰ Survivors

⁷Thomas S. Kidd, *American Christians and Islam: Evangelical Culture from the Colonial Period to the Age of Terrorism* (Princeton, NJ: Princeton University Press, 2008), p. 5.

⁸While this is an argument forwarded by many Arab scholars, Turks, however, have taken a different approach. They have documented how Islamic science and medicine continued to impact the West well after the medieval period. Among the scholars who have made a major contribution to this field are Fuat Sezgin and Ekmeleddin İslamoğlu. For a good example of this literature that has been translated into English, see Fuat Sezgin in collaboration with Eckhard Neubauer, *Science and Technology in Islam*, vol. IV, trans. Renate Sarma and Sreemaula Rajeswara Sarma (Frankfurt: Institut für Geschichte der Arabisch-Islamischen Wissenschaften an der Johann Wolfgang Goethe-Universität, 2011), pp. 2-94. Another example of this literature in Turkish is Süheyl Ünver, *Türkiyede çiçek aşısı ve tarihi* (İstanbul: İstanbul Üniversitesi Tıp Tarihi Enstitüsü, 1948). I thank the two individuals who peer reviewed this article and Dr. Philipp O. Amour for helping me better understand Turkish sources and insight into this subject.

⁹For the best recent study on the subject in American and specifically Colonial American historiography, see Amalie Kass, "Boston's Historic Smallpox Epidemic," *Massachusetts Historical Review* 14 (2012), pp. 1-51. Kass has written at length on medicine in Colonial Massachusetts, and her article touches on some of the British reports about the experiences of physicians combatting smallpox in the Ottoman Empire in the seventeenth century.

¹⁰Jared Diamond, *Guns, Germs, and Steel: The Fates of Human Societies* (New York: W.W. Norton and Co., 1997), pp. 77-78.



JHS

149

History
Studies

Volume 6
Issue 3
April
2014

of smallpox were immune to future infections but were often horribly disfigured, blinded, and sometimes sterile. Pregnant women who contracted the virus could miscarry.¹¹

To make matters worse, Boston was especially vulnerable to a smallpox outbreak in 1721. Because the smallpox virus often dies after two weeks if it is not transferred to new a susceptible human, it cannot survive for long periods in rural communities where the numbers of new people to infect can reach zero relatively fast. By contrast, if smallpox appears in areas with large populations living in close proximity to each other, it can be far more lethal for longer periods. Consequently, smallpox outbreaks usually lasted longer in towns and cities, such as Boston, especially if they were commercial centers and interacted with people from many different areas. Further complicating matters for Mather and others combating the disease in Boston in 1721 was the fact that the most recent previous smallpox outbreak had occurred in 1702. This meant that a significant part of the town's population had not been exposed to the virus before and therefore lacked natural immunity to it.¹²

In the context of the early eighteenth century, to willingly accept smallpox or to give it to someone else via inoculation could thus rationally be seen as exceedingly risky, cruel and insane. There was no clear reason at the time why smallpox contracted through inoculation was any less dangerous (or able to spread to others) than smallpox contracted inadvertently. These were not minor issues to Bostonians given the lethality of the disease and the number of people who could be infected and die. One would need a very good reason to go through the procedure yourself or ask others to do so.¹³

The challenges that smallpox posed to Bostonians were of course nothing new. Epidemiologists today believe that the disease originated in eastern Africa at least 12,000 years ago, and from there passed into the ancient cities of the Nile Delta. The first known written descriptions of the disease are in Egyptian papyri from 1350 BCE (or "Before the Common Era," or predating 1 AD). The mummy of the Pharaoh Ramses V of Egypt, who died in 1157 BCE, has lesions on its face that laboratory tests have confirmed were caused by smallpox. The disease then spread to Asia and would quickly reach as far as China by 250 BCE.¹⁴ (In 1340, the famous Muslim traveler, Ibn Battuta, wrote about a disease devastating a Muslim army in India that may have been smallpox.)¹⁵ It was not established in most of Europe until the eighth century CE, where it was called "the pox." The actual term smallpox dates from the fifteenth century when a new disease, syphilis, arrived in Europe. The newer disease became "the great pox," while the older disease was simply called "the small pox."¹⁶

For centuries physicians sought to find ways to combat smallpox. Chinese physicians sought to inoculate people against the disease via a scratch in the skin or by using cotton soaked in pus.¹⁷ In India, pus or scabs infected with the diseases were given to healthy people

¹¹Sara Stidstone Gronim, "Imagining Inoculation: Smallpox, the Body, and Social Relations of Healing in the Eighteenth Century," *Bulletin of the History of Medicine* 80 (2) (Summer 2006), pp. 248-249.

¹²J. N. Hays, *Epidemics and Pandemics: Their Impacts on Human History* (Santa Barbara, CA: ABC-CLIO Inc., 2005), pp. 143-145.

¹³Gronim, "Imagining Inoculation: Smallpox, the Body, and Social Relations of Healing in the Eighteenth Century," p. 249.

¹⁴Storm, "Religious Conviction and the Boston Inoculation Controversy of 1721," p. 9.

¹⁵Donald R. Hopkins, *Smallpox: The Greatest Killer in History* (Chicago, IL: University of Chicago Press, 2002), p. 140.

¹⁶Stanley M. Aronson and Lucile Newman, "God Have Mercy on this House: Being a Brief Chronicle of Smallpox in Colonial New England," John Carter Library of Brown University, 2002 (http://www.brown.edu/Administration/News_Bureau/2002-03/02-017t.html).

¹⁷Ibid.



JHS
150

*History
Studies*

*Volume 6
Issue 3
April
2014*

via cuts to inoculate them centuries before the modern period.¹⁸ In Salerno (southeast Italy), doctors may have used similar procedures in the tenth or eleventh century.¹⁹ There is also evidence it was part of European “folk” healing for centuries.²⁰ Muslim scholars throughout the medieval period furthered human understanding of smallpox. Perhaps the greatest accomplishment of the medieval Iranian physician Muhammad ibn Zakariya al-Razi (865-925) was his discovery that smallpox and measles were two different diseases.²¹ Previously it had been believed that they were the same disease. These and other findings of medieval Muslim medicine were detailed in the medical text of the Andalusian scholar Ibn Sina (980-1037), *al-Qanun fi al-Tibb* (the Cannon of Medicine), which served as the textbook for European medical schools until the seventeenth century.²²

While al-Razi, Ibn Sina, and the other Muslim medieval physicians deserve mention in any discussion of the history of medicine, physicians and scientists in the Muslim world continued to innovate and adopt new techniques of disease prevention into the modern era. As Birsan Bulmuş demonstrates in her 2012 study of Ottoman (i.e. Turkish) understanding of and responses to the plague, *Plague, Quarantines, and Geopolitics in the Ottoman Empire*, many of the mainstream conceptions about Muslim medicine generally and Ottoman medicine in particular are not borne out by the sources. While it is said that Ottoman (and post medieval Muslim) physicians blindly accepted the ideas of ancient scholars and were fatalists in the face of smallpox and other deadly diseases, there is sizeable evidence that a number of Muslim Ottoman physicians sought practical solutions to health challenges based on common sense and their own personal observations—much like their European contemporaries.²³

That does not mean they reached the same conclusions about disease as Europeans, did not face religious objections, or convinced Ottoman authorities to accept all of their ideas. These ideas included measures as novel as using alcohol to combat the plague and imposing the same types of maritime quarantines to check the spread of a disease which Europeans used. But Muslims in the Ottoman Empire were open to new ideas, such as using inoculation to combat smallpox. Those treatments may have entered Ottoman territories via Arab intermediaries from India in seventeenth century or the Silk Route from China.²⁴ Whatever the case, the earliest documented case of inoculation came from 1679 when a man from Asia Minor arrived in the Ottoman capital, Istanbul, and inoculated several children there.²⁵



JHS

151

History
StudiesVolume 6
Issue 3
April
2014

¹⁸Storm, “Religious Conviction and the Boston Inoculation Controversy of 1721,” p. 13.

¹⁹Edward J. Edwardes, *A Concise history of small-pox and vaccination in Europe* (London: H.K. Lewis, 1902), p. 5.

²⁰“The Boston Smallpox Epidemic, 1721,” *Harvard Library Open Collection Program: Contagion Historical Views of Diseases and Epidemics* (<http://ocp.hul.harvard.edu/contagion/smallpox.html>).

²¹Shahid Athar, *Islamic Perspectives in Medicine: A Survey of “Islamic Medicine”: Achievements and Contemporary Issues* (Oak Brook, IL: American Trust Publications, 1993), p. 43.

²²Athar, *Islamic Perspectives in Medicine*, p. 22.

²³Birsan Bulmuş, *Plague, Quarantines, and Geopolitics in the Ottoman Empire* (Chicago, IL: University of Chicago Press, 2012).

²⁴Several European writers, including Voltaire, have argued that this process was prompted by women from the Caucasus at the Ottoman court, whose beauty was prized. They supposedly had inoculation scars from childhood in parts of their body that were clearly visible in public. While it is certainly true that women from the Caucasus were prized by Ottoman elites for generations because of their beauty, there is little evidence that they played a role in popularizing inoculation in the Ottoman Empire. Darren R. Flower, *Bioinformatics for Vaccinology* (Oxford: John Wiley and Sons, 2008), p. 11.

²⁵Ibid.

The Royal Society

Europeans quickly recognized Ottoman success in combating smallpox, and the first authentic reports of Turkish inoculation were published in Leipzig, Germany as early as 1670. In 1699, Dr. Clopton Havers noted the importance of the new Turkish procedure to England's most prestigious scientific organization and a bastion of Enlightenment thinking, the Royal Society. In 1714, Dr. John Woodward convinced the Society to publish an article strongly endorsing inoculation in its journal, *Philosophical Transactions*, by an English-trained physician living in Istanbul, Dr. Emanuel Timonius. According to Timonius, the strongest argument in favor of inoculation was the differing rates of mortality: inoculated individuals died at a rate of 1% to 3%, while as many as a quarter of individuals who caught the disease naturally died. Two years later, the society's journal published another positive account of inoculation in the Ottoman Empire by Jacobus Pylarinus, who, like Timonius, was a doctor then living in Istanbul.²⁶

Among the readers of Timonius and Pylarinus' articles was the Reverend Cotton Mather. He was a member of the Royal Society and proud to be the first one from North America. His knowledge of the science dated to his days at Harvard and his reading of medical literature was consistent with that of the most qualified physicians in North America in the eighteenth century.²⁷ In a letter to Woodward dated July 12, 1716, Mather observed that Timonius' experience was consistent with that of a black slave he had once owned named Onesimus.²⁸ Mather described the former slave as clever and from Guinea (West Africa), where he had been inoculated as a young man. He bore a scar from the inoculation on his arm—much like other slaves from Guinea who were then in Boston. There is little biographical information on Onesimus,²⁹ but it is possible that he had been raised as a Muslim and very likely that he had been exposed to Islam: Guinea had a sizeable Muslim population in the eighteenth century and the country is overwhelmingly Muslim today. Convinced that inoculation was safe and effective, Mather declared in the letter to Woodward that he would call on Bostonians to be inoculated if he “should ever live to see the *Small-Pox* enter our city.”³⁰

At first glance, Mather's endorsement of an idea with deep roots in the Islamic world is surprising. But Mather had a lifelong interest in Islam and knew enough of the Quran to cite English translations of the text in his sermons.³¹ Nor was a nuanced view of Islam uncommon or outside of mainstream thought of the Royal Society and the other Anglo-American institutions that Mather saw himself as part of. In the seventeenth and eighteenth centuries, educated Anglo-Americans may not have considered Islam to be equal to Christianity but they respected Islam's achievements and believed that its civilization was superior to any other in Asia.³² The English lexicographer Dr. Samuel Johnson articulated this belief when he said: “There are two objects of curiosity—the Christian world, and the Mahometan [Muslim] world.

²⁶Blake, “The Inoculation Controversy in Boston: 1721-1722,” pp. 489-491 and Van De Wetering, “A Reconsideration of the Inoculation Controversy,” pp. 47-49.

²⁷Tony Williams, *The Pox and The Covenant: Mather, Franklin, and the Epidemic that Changed America's Destiny* (Naperville, IL: Sourcebooks, Inc, 2011), p. 36.

²⁸Letter of Cotton Mather to John Woodward, July 12, 1716, Cotton Mather, *Selected Letters of Cotton Mather*, ed. Kenneth Silverman, pp. 213-214 (Baton Rouge, LA: Louisiana State University Press, 1971).

²⁹Onesimus was freed in 1716 and is presumed to have died by 1721. For more on Onesimus and his life, see *African American Lives*, ed. Henry Louis Gates, Jr. and Evelyn Brooks Higginbotham, (Oxford: Oxford University Press, 2004), s.v. “Onesimus.”

³⁰Blake, “The Inoculation Controversy in Boston: 1721-1722,” pp. 490-491.

³¹Mather also taught about Islam at Harvard College. Mukhtar Ali Isani, “Edward Taylor and the ‘Turks,’” *Early American Literature* 7 (2) (Fall 1972), p. 120.

³²Linda Colley, *Captives* (New York: Random House, 2002), p. 106.



JHS
152

*History
Studies*

*Volume 6
Issue 3
April
2014*

All the rest may be considered as barbarous.”³³ In “A Letter Concerning Toleration,” John Locke, the preeminent seventeenth-century English political philosopher, wrote that Muslims should not be excluded from enjoying English civil rights solely because of their religion. Locke’s arguments reflected his own acquaintance with Islam: he could read Arabic, owned a Qur’an, and knew leading English Arabists. Locke’s arguments would later be incorporated into the writings of one of America’s foremost political thinkers, Thomas Jefferson.³⁴

The familiarity and respect that eighteenth-century English elites had for Islam and its civilization helps explain Lady Montagu’s willingness (1689-1762) to accept the Ottoman technique of inoculation and to become an advocate for the procedure in England. She first discovered the technique in 1718 when she travelled to Istanbul to accompany her husband, who was the British Ambassador to the Ottoman Empire. She had been a horribly scarred personally and socially when she contracted smallpox two years earlier in 1716.³⁵ In a letter that became part of the now famous *Turkish Embassy Letters*, we see her excitement at discovering inoculation in Istanbul: “I am going to tell you a thing that I am sure will make you wish yourself here. The small-pox, so fatal and general among us, is here entirely harmless.”³⁶ After assuring her correspondent, Sarah Chiswell, that inoculation was sufficiently safe that she had her son undergo the procedure, Montagu declares that she is “patriot enough to take pains to bring this useful invention into fashion in England” and to battle anyone who would oppose it.³⁷

True to her word, Montagu pressed a pharmacist who had accompanied her to Istanbul, Charles Maitland, to inoculate her three-year-old daughter upon her return to England in 1721—the first known case of inoculation in the British Isles. She pushed to make it fashionable for the elites of England to inoculate their children and partnered with Hans Sloane and the Royal Society to promote a series of public experiments of inoculation between June 1721 and March 1722. Critically, Sloane and Montagu convinced the new Whig government in Great Britain of the progressive benefits of inoculation and won its backing for the experiment. The government permitted Sloane to offer a deal to six healthy prisoners all condemned to death: they would have their sentences commuted if they agreed to submit to smallpox inoculation. The six accepted the deal; uncertain death was far better than certain death. The same man who inoculated Montagu’s daughter, Maitland, carried out the inoculations. The prisoners survived and were pardoned. Other experiments produced similar results. The positive results of these experiments—especially the first one with the six prisoners—were critical in the long run since they vindicated Montagu’s and others’ faith that inoculation would work as well in Europe as it had in the Ottoman Empire.³⁸

That proof also limited the criticisms opponents of inoculation in England—the opposition Tories and their Anglican Church allies—could make. They could not argue that it was either too dangerous or did not work. Nor did it matter where the procedure had come

³³ Albert Hourani, “Islam in European Thought,” in *Islam in European Thought*, by Albert Hourani (Cambridge: Cambridge University Press, 1991), p. 11.

³⁴ Sean Foley, “Muslims and Social Change in the Atlantic Basin,” *The Journal of World History* 30 (3), September 2009, p. 394.

³⁵ The disease not only impacted her physically but it also devastated her family. Her twenty-one-year-old brother died of the disease. Hopkins, *Smallpox: The Greatest Killer in History*, p. 47.

³⁶ Letter of Lady Montagu to Mrs. S.C. [Sarah Chiswell], Adrianople, April 1, 1717 in Lewis Melville, *Lady Mary Wortley Montagu Her Life And Letters 1689 to 1762* (London: Hutchinson, 1925 and Whitefish, MT: Kessinger Publishing 2004), p. 124. Citations are to the Kessinger edition.

³⁷ *Ibid.*, p. 124.

³⁸ Adrian Wilson, “Politics of Medical Improvement,” in *The Medical Enlightenment of the Eighteenth Century*, ed. Andrew Cunningham and Roger French, p. 27 (Cambridge: Cambridge University Press, 1990).



JHS

153

History
StudiesVolume 6
Issue 3
April
2014

from. Instead, they were limited to moral arguments, chiefly that the procedure threatened society's obedience to King and God. Within this framework, diseases were God's judgment on humanity; inoculation and other forms of "resistance" to these judgments was impious and threatened morality and basic social order.³⁹ The Reverend Edmund Massey articulated this position clearly when he stated that disease "was to test our faith and punish us for our sins. The fear of disease is a happy restraint upon men. If men were healthy, 'tis a real chance that they would be less righteous. Let the atheist and scoffer inoculate."⁴⁰

Boston Debate

The debate over inoculation in Great Britain provides a useful framework for understanding the challenges Mather faced in Boston in 1721. While Mather shared his colleagues in the Royal Society's confidence in inoculation, he lacked official support for the procedure or the opportunity to prove in a neutral framework that it worked. Nor did the news of Sloane's experiments reach Boston to help him. He was effectively on his own. Opponents of inoculation in Boston could thus utilize powerful moral and practical arguments not available on the other side of the Atlantic. To fulfill the promise he made in his 1716 letter to promote inoculation in Boston, Mather would have to utilize his considerable skills as a Christian theologian and do something even harder: ask Bostonians to put their faith in the teachings of their religion, Christianity, and that of a foreign one, Islam. That would be a bridge too far for some, but Mather's faith in Islamic medicine would be vindicated.

The actual crisis began when the crew of a British ship in Boston, the HMS *Seahorse*, developed signs of smallpox in May 1721. They were immediately quarantined, and at least a thousand people—nearly 10% of Boston's population—fled.⁴¹ Merchants from outside Boston refused to enter the city. The economy ground to halt. It was impossible to conduct business with the quarantine, the mass exodus, and the complete absence of external merchants. In the nearby college town of Cambridge, Cotton Mather's Alma Mater, Harvard College, canceled classes and sent students home.⁴² Governments in Boston and other affected communities were compelled to set aside as much as a quarter of their annual revenue to help families negatively impacted by the epidemic.⁴³

Boston's selectmen and officials sought to control the epidemic as best as they could. Initially guards were placed in front of the buildings containing the sick sailors and the Massachusetts Colony House of Representatives with orders only to allow in authorized persons. Slaves were dispatched to clean the streets, and officials limited the length of time funeral bells could toll to reduce public anxiety. But by the middle of June the city's government abandoned its strategy of guarding each house with a case of smallpox because there were too many homes to watch. The epidemic peaked in October with 411 deaths. By the end of the year, there would be 5,899 cases with 844 deaths—more than a quarter of all deaths in Boston that year. It would not be until the end of February 1722 that the town would be officially disease free.⁴⁴

³⁹Ibid., pp. 30-31.

⁴⁰Aronson and Newman, "God Have Mercy on this House: Being a Brief Chronicle of Smallpox in Colonial New England."

⁴¹Boston in 1721 was a wealthy port city with a population of 11,000 residents. There were approximately 11 practicing physicians in the city at the time. "Boston's 'Grievous Calamity of the Small Pox,'" *The New York Times*, December 17, 2002, p. F9, accessed via LexisNexis.

⁴²John D. Burton, "'The Awful Judgments of God upon the land:' Smallpox in Colonial Cambridge, Massachusetts," *The New England Quarterly* 74 (3) (Sept. 2001), p. 501.

⁴³Ibid, p. 498.

⁴⁴Blake, "The Inoculation Controversy in Boston: 1721-1722," pp. 491 and 496-497.



JHS
154

*History
Studies*

*Volume 6
Issue 3
April
2014*

Within weeks of the start of the outbreak, Mather circulated a letter among leading physicians in Boston calling on them to consider the possibility of inoculating the local population. To support his arguments, he provided synopses of both Timonius' and Pylarinus' articles in the *Philosophical Transactions*. Only one physician responded: Dr. Zabdiel Boylston.⁴⁵ He then inoculated his six-year-old son, Thomas, and two slaves. After several anxious days, the experiment proved a success and he inoculated ten more people within the next month, including Mather's son. He justified his action in an advertisement in the *Boston Gazette* by citing the work of Timonius and Pylarinus and his own success with the procedure. He promised to provide more proof in the near future.⁴⁶

The article produced a firestorm among Bostonians. Mather wrote in his diary that the Devil had "taken a strange possession of the People" and that he and Boylston were "an object of their fury."⁴⁷ Many members of Mather's congregation left his church in disgust and demanded that government officials take immediate action to stop Boylston. One individual threw a small bomb into Mather's home. Boston's leaders met with a leading doctor, Dr. Lawrence Dalhonde, to ask his opinion of Boylston's actions. He informed them that inoculation had been tried in Italy, Flanders, and Spain and the results had been disastrous.⁴⁸ Deaths had increased from the disease. Fearful of causing even more deaths, Boston's leaders forbade Boylston from performing more inoculations.⁴⁹

The publisher James Franklin further added to the pressure on Mather and Boylston by publishing secular and religious arguments against inoculation in his newspaper, *The New England Courant*.⁵⁰ The strongest secular arguments came from Dr. William Douglass—the one doctor in the town with a European medical degree. He had formed a local medical association and he may have pressured Boston's doctors to ignore Mather's letter. He assured the town that inoculation was an important medical issue but that it required far more experimentation. He argued that the community had to remain calm, rational and pragmatic. Now was not the time to try radical or untested medical procedures—no matter how promising the results may have appeared or how desperate the situation seemed. He summarily dismissed Boylston and Mather's findings: their test subjects were mostly children, who were naturally more resilient than adults. Their ideas were also based on the testimony of African slaves—not the most trustworthy source in his eyes—that inoculation was practiced in Africa.⁵¹ In addition, Douglass pointed out rightly that Boylston was actually putting more people at risk, since he was not quarantining the people he was inoculating. They could infect others after they had undergone inoculation.⁵²

In a separate pamphlet, *The Abuses and Scandals of Some Late Pamphlets in Favour of Inoculation of the Small Pox*, Douglass shredded the professional qualifications of Boylston and above all Mather. He argued that medical issues like smallpox should be left to real experts (like him) with advanced modern training and not to well-meaning amateurs. In earlier times, Christian ministers might have had a valid role in city politics and in its public health.

⁴⁵Williams, *The Pox and The Covenant: Mather, Franklin, and the Epidemic that Changed America's Destiny*, p. 75.

⁴⁶Blake, "The Inoculation Controversy in Boston: 1721-1722," p. 492.

⁴⁷Ibid., pp. 492-493.

⁴⁸Ibid., p. 493.

⁴⁹John D. Burton, "'The Awful Judgments of God upon the land:' Smallpox in Colonial Cambridge, Massachusetts," p. 498.

⁵⁰Van Wetering, "A Reconsideration of the Inoculation Controversy," pp. 47-48.

⁵¹Storm, "Religious Conviction and the Boston Inoculation Controversy of 1721," p. 62.

⁵²Van Wetering, "A Reconsideration of the Inoculation Controversy," pp. 48-55.



JHS

155

History
StudiesVolume 6
Issue 3
April
2014

But that time had long since passed. He also wondered how it was possible for Reverend Mather, who was neither a scientist nor a doctor, to be a member of an English scientific organization as prestigious as the Royal Society. It just didn't make sense. The implication of Douglass' words was clear: Mather must be lying and his recommendations should not be trusted.⁵³

If these secular arguments and personal attacks were not enough to dissuade Bostonians from undergoing inoculation, tobaccoist John Williams argued against inoculation on religious grounds meant to appeal to Boston's primary religious community, Puritan Protestant Christians. These arguments mirrored those of those of Massey and Mather. He argued that God's authority was absolute on earth and that disease was His way of punishing the inhabitants of Boston for their sins.⁵⁴ Williams asked: what would happen should Bostonians oppose His will through inoculation? Might He inflict a worst punishment upon the town than smallpox? Furthermore, he could not find any reference to inoculation in either the natural or divine laws of physics. Even worse was the fact that inoculation appeared to violate biblical injunctions. Williams quoted Matthew 9:12 in which Jesus says "It is not the healthy who need a doctor, but the sick."⁵⁵ If it were possible that someone might perish from inoculation, he asked, didn't it violate both the Golden Rule (do on to others as you would do to yourself) and the Sixth Commandment: thou shalt not kill?⁵⁶ Finally, was inoculation suitable for Christians in New England due to its roots in the Muslim world?⁵⁷

In a society as devout as eighteenth-century Boston, these were serious arguments that resonated with large segments of the public. But there were limits to even how far these religious arguments could be employed. The ministers of Boston, including those who opposed inoculation, were horrified by the language in the articles appearing in James Franklin's publications against inoculation. When James Franklin directly criticized the Colonial Government's handling of piracy, Mather's allies convinced local authorities to imprison him for four weeks. Even worse, he faced a determined response from both Mather and Boylston to the articles that he published in his newspaper.⁵⁸

Mather vigorously challenged the perception that inoculation was dangerous or against the will of God or Christian teachings and principles. Directly citing Timonius and Pylarinus' reports from the Ottoman Empire, he reminded Bostonians that "experience has declared that there never was a more unfailing Remedy employed among the Children of Men" than the practice of inoculation.⁵⁹ It was important for Bostonians to retain their faith in the gift that God had given them to combat smallpox—inoculation—a gift that had come to the Christian World from Islam.⁶⁰

The value of that "gift" played a powerful role in Mather's responses to the secular and religious arguments made against inoculation. He responded forcefully to Douglass by challenging the doctor's moral credentials as a Christian and implicitly his professional credentials as a doctor for opposing inoculation:

⁵³Ibid., pp. 53-55.

⁵⁴Blake, "The Inoculation Controversy in Boston: 1721-1722," p. 501.

⁵⁵Sean Foley, "An American reverend's faith in Turks, Islamic science revolutionizes modern medicine," *Today's Zaman*, September 12, 2011 (http://www.todayszaman.com/mobile_detailn.action?newsId=256591).

⁵⁶Ibid.

⁵⁷Van Wetering, "A Reconsideration of the Inoculation Controversy," p. 55.

⁵⁸David A. Copeland, *Debating Issues in Colonial Newspapers* (Westport, CT: Greenwood Press, 2000), p. 30.

⁵⁹Blake, "The Inoculation Controversy in Boston: 1721-1722," p. 500.

⁶⁰Storm, "Religious Conviction and the Boston Inoculation Controversy of 1721," p. 41.



JHS
156

*History
Studies*

*Volume 6
Issue 3
April
2014*

*Whether a Christian may not employ this Medicine (let the matter of it be what it will) and humbly give Thanks to God's good Providence in discovering of it to a miserable World; and humbly look up to His Good Providence (as we do in the use of any other Medicine). It may seem strange that any wise Christian cannot answer it. And how strangely do Men that call themselves Physicians betray their Anatomy, and their Philosophy as well as their Divinity in their invectives against this Practice?*⁶¹

In Mather's eyes, the motives became even more sinister when one realizes that they forced the community to *violate* the sixth commandment and risked condemning many more Bostonians to an untimely death than was necessary. He wrote:

*It is then the wonderful Province of GOD, that all there were Inoculated should have their Lives preserved; so that the Safety and Usefulness of this Experiment is confirmed to us by Ocular Demonstration: I confess I am afraid, that the Discouraging of this Practice, may cause many a Life to be lost, which for my own part, I should be loath to have any hand in, because of the Sixth Commandment.*⁶²

Ultimately, Mather's words were clear: both biblical and practical arguments justified using inoculation. Any other course of action would fundamentally violate His laws and would lead to needless suffering and loss of life.⁶³

In the long run, Boylston's statistics and account of the Smallpox controversy vindicated Mather's arguments and faith in Islamic science. In *A Historical Account of the Small-pox Inoculated in New England*, Boylston provides detailed statistics and shows how mortality from an experimental group (those inoculated in Boston) compares with a control group (those infected naturally in Boston). He demonstrates a clear difference: 2% of the 287 inoculated patients died compared with the 842 who died among the 4917 individuals who had been infected naturally (or 14.9%) in Boston.⁶⁴ This type of statistical analysis was groundbreaking in the eighteenth century and would lay the groundwork for the type of statistical analysis routinely used today to evaluate new medical procedures and drugs.⁶⁵ In 1724, Boylston traveled to London, where the Royal Society recognized the importance of his findings.⁶⁶ It published them in a book and made him a fellow, an honor Dr. Douglass never attained.⁶⁷

Conclusion

The outbreak in Boston subsided by early 1722 and the town was disease free again in late February 1722.⁶⁸ During the remainder of the eighteenth century, inoculation won acceptance in the English speaking world. Even Douglass eventually accepted the procedure. Benjamin Franklin bitterly regretted in his memoirs that he had not gotten his son Francis

⁶¹Cotton Mather, *Some account of what is said of inoculating or transplanting the small pox*. Boston: Sold by S. Gerrish at his shop in Corn-Hill, 1721. AC7.M4208.721s. Houghton Library, Harvard University, Cambridge, Massachusetts (<http://pds.lib.harvard.edu/pds/viewtext/7910093?op=t&n=25>).

⁶²Blake, "The Inoculation Controversy in Boston: 1721-1722," p. 500.

⁶³Ibid.

⁶⁴M. Best, D. Neuhauser, L. Slavin, "Heroes and Martyrs of Quality and Safety: 'Cotton Mather, you dog, dam you! I'll inoculate you with this; with a pox to you': smallpox, inoculation, Boston, 1721," *Quality Safety Health Care* 2004 (13), p. 83.

⁶⁵Ibid.

⁶⁶Raymond Stearns, *Science in the British Colonies of America* (Urbana-Champaign, IL: University of Illinois Press, 1970), pp. 437-440.

⁶⁷Ibid.

⁶⁸Hays, *Epidemics and Pandemics: Their Impacts on Human History*, p. 144.



JHS
157

**History
Studies**

Volume 6
Issue 3
April
2014

inoculated following his death at age four from smallpox in 1736.⁶⁹ Although smallpox outbreaks recurred in Boston and elsewhere in the Anglo-American Atlantic World, death rates declined and it was common practice, at least for elites, to have children vaccinated. Abigail Adams, for instance, had herself and her four children inoculated when her husband John met with the Continental Congress in 1776.⁷⁰

In 1796, Edward Jenner (1749-1823) built on the work of Boylston and Mather when he pioneered a far safer form of inoculation in which individuals exposed themselves to a form of a disease that could not infect others: vaccination.⁷¹ Vaccination would eventually become a cornerstone of modern public health and pave the way for the elimination of smallpox in the mid twentieth century—a major development in human history.

Yet it is impossible to see how this process would have been possible or would have developed as quickly without Islam and the ideas of Muslims from the Middle Ages until the eighteenth century. Not only did Muslims determine what smallpox was as a disease (and that it was not the measles), but they also refined the process of combating it through inoculation in various parts of the Muslim world—from Western Africa to the Middle East. The case of the Ottoman Empire is significant because it shows that post medieval Muslim scientists were still flexible enough to deploy new techniques to combat serious public health issues.

Here it is worth noting that reports of the success of inoculation in Istanbul and the absence of smallpox there were the backbone of Mather's early faith in inoculation. This was not an easy thing for a man of his world-view to do but Mather did it anyway and saved lives in 1721 and long afterwards. While Mather has left us a complicated historical legacy with an inexplicable defense of great injustice during the Salem Witch Trials, there is no question he did the right thing during the 1721 Boston smallpox epidemic by putting his faith in the power of Islamic medicine.

Bibliography

African American Lives. Edited by Henry Louis Gates, Jr and Evelyn Brooks Higginbotham. Oxford: Oxford University Press, 2004.

Aronson, Stanley M. and Lucile Newman. "God Have Mercy on this House: Being a Brief Chronicle of Smallpox in Colonial New England." John Carter Library of Brown University, 2002.
http://www.brown.edu/Administration/News_Bureau/2002-03/02-017t.html.

Athar, Shahid. *Islamic Perspectives in Medicine: A Survey of "Islamic Medicine": Achievements and Contemporary Issues*. Oak Brook, IL: American Trust Publications, 1993.

Edwardes, Edward J. *A Concise history of small-pox and vaccination in Europe*. London: H.K. Lewis, 1902.

Best, M., D. Neuhauser, and L. Slavin. "Heroes and Martyrs of Quality and Safety: 'Cotton Mather, you dog, dam you! I'll inoculate you with this; with a pox to you':

⁶⁹Dorothy A. Mays, *Women In Early America: Struggle, Survival, And Freedom In A New World* (Santa Barbara, CA: ABC-CLIO, 2004), p. 107 and Walter Isaacson, *Benjamin Franklin: An American Life* (New York: Simon and Schuster, 2003), p. 23.

⁷⁰Rebecca J. J. Tannenbaum, *Health and Wellness in Colonial America* (Santa Barbara, CA: ABC-CLIO, 2012), p. 96.

⁷¹Thomas V. DiBacco, "Early Americans Led the Way to a Smallpox Vaccine," *The Washington Post*, January 4, 1994, p. Z8, accessed via LexisNexis.



JHS
158

History
Studies

Volume 6
Issue 3
April
2014

smallpox, inoculation, Boston, 1721.” *Quality Safety Health Care* 13 (2004): 82-83. Doi:10.1136/qshc.2003.008797.

Blake, John. “The Inoculation Controversy in Boston: 1721-1722.” *The New England Quarterly* 24, no. 4 (December 1952): 489-506.
<http://www.jstor.org.ezproxy.mtsu.edu/stable/pdfplus/10.2307/362582.pdf>.

“Boston’s ‘Grievous Calamity of the Small Pox.’” *The New York Times*, December 17, 2002, F9. Accessed via LexisNexis.

Bulmuş, Birsan. *Plague, Quarantines, and Geopolitics in the Ottoman Empire*. Chicago, IL: University of Chicago Press, 2012.

Colley, Linda. *Captives*. New York: Random House, 2002.

Burton, John D. “‘The Awful Judgments of God upon the land:’ Smallpox in Colonial Cambridge, Massachusetts,” *The New England Quarterly* 74, no. 3 (Sept. 2001): 495-506. <http://www.jstor.org.ezproxy.mtsu.edu/stable/pdfplus/3185429.pdf>.

Copeland, David A. *Debating Issues in Colonial Newspapers*. Westport, CT: Greenwood Press, 2000.

The Diary of Cotton Mather. Edited by. W.C. Ford. New York: F. Ungar Pub. Co., 1957.

DiBacco, Thomas V. “Early Americans Led the Way to a Smallpox Vaccine.” *The Washington Post*, January 4, 1994. Z8. Accessed via Lexis/Nexus.

Diamond, Jared. *Guns, Germs, and Steel: The Fates of Human Societies*. New York: W.W. Norton and Co., 1997.

Flower, Darren R. *Bioinformatics for Vaccinology*. Oxford: John Wiley and Sons, 2008.

Foley, Sean. “Muslims and Social Change in the Atlantic Basin.” *The Journal of World History* 30, no. 3 (September 2009): 377-398.
http://muse.jhu.edu.ezproxy.mtsu.edu/journals/journal_of_world_history/v020/20.3.foley.html.

-----“An American reverend’s faith in Turks, Islamic science revolutionizes modern medicine.” *Today’s Zaman*, September 12, 2011.
http://www.todayszaman.com/mobile_detailn.action?newsId=256591.

Fox, Walter. “Another influential Franklin; Ben’s half-brother James used the press to do the unthinkable: Challenge governmental authority.” *The Philadelphia Inquirer*, July 20, 2006, A19. Accessed via LexisNexis.

Graham, Kristen A. *A History of the Pennsylvania Hospital*. Charleston, SC: History Press, 2008.

Gronim, Sara Stidstone. “Imagining Inoculation: Smallpox, the Body, and Social Relations of Healing in the Eighteenth Century.” *Bulletin of the History of Medicine* 80, no. 2 (Summer 2006): 247-268.
http://muse.jhu.edu.ezproxy.mtsu.edu/journals/bulletin_of_the_history_of_medicine/v080/80.2gronim.html.



JHS
159

*History
 Studies*

Volume 6
 Issue 3
 April
 2014

- Hays, J. N. *Epidemics and Pandemics: Their Impacts on Human History*. Santa Barbara, CA: ABC-CLIO Inc., 2005.
- Hopkins, Donald R. *Smallpox: The Greatest Killer in History*. Chicago, IL: University of Chicago Press, 2002.
- Hourani, Albert. "Islam in European Thought." In *Islam in European Thought*, 7-60. Cambridge: Cambridge University Press, 1991.
- Isaacson, Walter. *Benjamin Franklin: An American Life*. New York: Simon and Schuster, 2003.
- Isani, Mukhtar Ali. "Edward Taylor and the 'Turks,'" *Early American Literature* 7, no. 2 (Fall 1972): 120-123.
<http://www.jstor.org.ezproxy.mtsu.edu/stable/pdfplus/10.2307/25070563.pdf>.
- Kass, Amalie. "Boston's Historic Smallpox Epidemic." *Massachusetts Historical Review* 14 (2012): 1-51.
<http://www.jstor.org.ezproxy.mtsu.edu/stable/pdfplus/10.5224/masshistrevi.14.1.0001.pdf>.
- Kidd, Thomas S. *American Christians and Islam: Evangelical Culture from the Colonial Period to the Age of Terrorism*. Princeton, NJ: Princeton University Press, 2008.
- Mather, Cotton *Selected Letters of Cotton Mather*. Edited by Kenneth Silverman. Baton Rouge, LA: Louisiana State University Press, 1971.
- Some account of what is said of inoculating or transplanting the small pox*. Boston: Sold by S. Gerrish at his shop in Corn-Hill, 1721. AC7.M4208.721s. Houghton Library, Harvard University, Cambridge, Massachusetts.
<http://pds.lib.harvard.edu/pds/viewtext/7910093?op=t&n=25>.
- Mays, Dorothy A. *Women In Early America: Struggle, Survival, And Freedom In A New World*. Santa Barbara, CA: ABC-CLIO, 2004.
- Melville, Lewis. *Lady Mary Wortley Montagu Her Life and Letters 1689 to 1762*. London: Hutchinson, 1925 and Whitefish, MT: Kessinger Publishing 2004.
- Storm, Anna. "Religious Conviction and the Boston Inoculation Controversy of 1721." B.A. Thesis, College of William and Mary, 2011.
<https://digitalarchive.wm.edu/handle/10288/13706>.
- Sezgin, Fuat. *Science and Technology in Islam*. vol. IV. In collaboration with Eckhard Neubauer. Translated by Renate Sarma and Sreemaula Rajeswara Sarma. Frankfurt: Institut für Geschichte der Arabisch-Islamischen Wissenschaften an der Johann Wolfgang Goethe-Universität, 2011.
- Stearns, Raymond. *Science in the British Colonies of America*. Urbana-Champaign, IL: University of Illinois Press, 1970.
- Tannenbaum, Rebecca J. J. *Health and Wellness in Colonial America*. Santa Barbara, CA: ABC-CLIO, 2012.
- Ünver, Süheyl. *Türkiyede çiçek aşısı ve tarihi*. İstanbul: İstanbul Üniversitesi Tıp Tarihi Enstitüsü, 1948.



JHS
160

**History
Studies**

Volume 6
Issue 3
April
2014

- Van De Wetering, Maxine. "A Reconsideration of the Inoculation Controversy." *The New England Quarterly* 58, no. 1 (March 1985): 46-67.
<http://www.jstor.org.ezproxy.mtsu.edu/stable/pdfplus/365262.pdf>.
- Williams, Tony. *The Pox and The Covenant: Mather, Franklin, and the Epidemic that Changed America's Destiny*. Naperville, IL: Sourcebooks, Inc., 2011.
- Wilson, Adrian. "Politics of Medical Improvement." In *The Medical Enlightenment of the Eighteenth Century*. Edited by Andrew Cunningham and Roger French, 4-39. Cambridge: Cambridge University Press, 1990.



JHS

161

**History
Studies**

Volume 6
Issue 3
April
2014