

The End of Religious Fatalism

Boston as the Venue for the Demonstration of Ether for the Intentional Relief of Pain

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The following article grew out of a series of lectures given in Boston by the author over a three-year period. In 2001, Dr. Campagna first outlined the general thesis of this manuscript during an annual Lowell Lecture Series presentation for the Bostonian Historical Society. Three years later while presenting the keynote address at the Halsted Surgical Historical Society, Dr. Campagna made clear his contention that Boston was the site memorialized as the venue for the first anesthetic for reasons that were largely due to social and cultural considerations, not primarily for medical or scientific reasons. The then Chairman of the Department of Surgery at the Massachusetts General Hospital, Dr. Andrew Warshaw, commissioned Dr. Campagna to prepare a book-length manuscript of that thesis. The abridged, essay version was published in the journal *Surgery* in 2005. The full-length book is currently nearing completion. This abridged article is reprinted in this issue of the *CSA Bulletin*.

Suffering so great as I underwent cannot be expressed in words. . .but the blank whirlwind of emotion, the horror of great darkness, and the sense of desertion by God and man, which swept through my mind, and overwhelmed my heart, I can never forget.

—J. Ashhurst¹

Such was the experience of surgery before Morton's successful public demonstration of ether anesthesia at the Massachusetts General Hospital in 1846. Although men before Morton had utilized certain inhaled gases to produce insensibility, the credit for the planned, intentional use of ether for this purpose during surgery belongs to Morton because it was his demonstration of ether in 1846, not one of the uses before this date, that led to the widespread acceptance and use of inhaled vapors for the purpose of "anaesthesia." Although much has been written about this event and those involved with it, little attention has been paid to the question of why Boston was the venue for this wondrous and historical experiment. This essay will explore just that question. Examining the social environment of 1846 Boston, I will argue that a complement of social conditions were present that allowed for and were ultimately required for the acceptance of the use of ether for pain relief during surgery.

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Introduction

Boston in the early 19th century did not have a reputation as a center of medical excellence. By many measures, the seat of medicine in postcolonial United States was Philadelphia.² Boston lacked both a long-established medical school and a hospital, and had been damaged by the British occupation during the Revolution. The Boston institutions associated with the public demonstration of ether—the Massachusetts General Hospital and Harvard Medical School—were upstarts relative to similar institutions in Philadelphia, with the former having been commissioned in 1811 and the latter in 1782. A letter written on behalf of the University of South Carolina in petitioning their state legislature for a medical school best illuminates the perception of Boston medicine at this time: “. . .I say nothing respecting those [hospitals and medical schools] of New England, because they have furnished no manifest occasion for peculiar notice, nor have they risen beyond the level of mediocrity.”²

The focus on Boston as a uniquely significant locale for ether's use demands the reader accept two concepts: first, that venue per se was an important factor for the ultimate acceptance of anesthesia and, second, the timing of the demonstration mattered. If the same men who demonstrated ether in Boston on October 16, 1846, had instead traveled on that day to New York or Philadelphia for their experiment, would ether's use have been as well received? In the late 1840s, heated debates on the merits of pain versus painlessness during surgery were aired in both the medical literature and the popular press, and this discourse suggests not.³ For example, in 1847, after the successful demonstration of ether in Boston, the *New York Journal of Medicine* noted that “pain is essential to the surgical procedure, its removal is harmful to the patient,” and, in March of that year, a leading Philadelphia surgeon noted that during an operation “pain is a physical necessity. . . .” Also that year, the American Dental Association, in response to the “alarming” dissemination of ether anesthesia outside of Boston, wrote that “pain is evidence of God's love of humanity, to alleviate it is to do the work of the devil.”³ In this regard, the venue did matter, and in some capacity, therefore, Boston was unique.

What about the timing of the event? What if this demonstration had been staged earlier, say perhaps in 1799? I contend that an earlier demonstration would have resulted in an even more vituperative response by the general population than the actual one of 1847-1853. This exact situation had occurred in Boston more than 100 years before the use of ether in response to a different medical advance, that of variolation for smallpox. On at least three occasions before 1801, it had been shown in Boston that variolation against smallpox was protective; yet there was no widespread acceptance of the

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practice until the early 19th century. Like the post-ether debates, the postvariolation debates of the mid- and late-18th century were based on religious doctrines that the practice was “endeavoring to baffle Divine judgment.”⁴ Even as late as 1885, Catholics in Montreal refused vaccination on religious grounds, believing smallpox to be the result of sin. Boston (venue) was uniquely positioned in 1848 (time) to offer the world this discovery.

Why Relieve Pain?

For much of human history, pain and suffering were viewed as resulting from God’s divine will and were widely understood to be punishment for sin.^{3,5} Pain is a central metaphor of Judeo-Christian thought, and suffering and pain are aspects of life that all religious people of the world have attempted to make sense of.⁵ Hinduism sees suffering as the result of a “karmic debt” owed from a prior life. Buddhists understand suffering to be the result of desire, while Islam (Arabic for literally surrendering to God) views suffering as the result of Allah’s positive will. Even modern, nonorthodox Christians (Protestantism) still see suffering as the result of personal sin, while the more orthodox sects believe that suffering has its penultimate origins in human action (the original sin of Adam) for which atonement is not possible.

The Judeo-Christian doctrine of the late 16th century onward embraced this diverse liturgy of pain and offered a message of comfort as well as constant reminders of the **daily** dominion of man by God. Pain was many things, but it was at least understood to be redemptive, a heritage of pain clearly illustrated in both the old and the new testaments.^{5,6} In fact, a major argument against the use of anesthesia in the 1840s was that without pain, men would sin: “...the fear of the Lord which depends upon the petitions of the afflicted will be destroyed.”⁷ As O.W. Holmes so eloquently penned in the 19th century, “Disease itself, the offspring of sin and penalty of a poisoned nature, was for them [17th- and 18th- century persons] a theological entity rather than a disturbed physiological process.”⁸ Pain was not a representation of some organ system dysfunction; it was divine punishment. The modern question—“What did I do to deserve this?”—has origins in a human need for an explanation for misfortune, and for the meaning of suffering and pain, which are otherwise inexplicable.⁹ In a world in which most interventions against disease and pain were without effect, comfort resulted from understanding the meaning of the affliction, not in curing it.⁵ It was accepted that “physical suffering was inevitable; the meaning, rather than the fact of pain, was what mattered....”¹⁰ Early 19th-century physicians and patients embraced the long-held concept of “the healing power of pain” and believed that suffering had a higher purpose: “pain is the megaphone that God uses to assist people in hearing him.”¹⁵

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For most persons alive in the years 1640-1840, intervening against pain was not thought possible, or appropriate.¹¹ Still two years after the introduction of ether, New York physicians were arguing against its use on a fundamentalist platform that it violated the “genesis curse.” In Boston, Emerson wrote of pain as offering spiritual rewards and that it is “spiritually uplifting,” and as late as the 1880s, Zurich, a major medical center at that time, had banned all use of anesthetics because of “the curse of the primal sin.”¹³ Why did Boston of 1846 accept the modern, secular idea that the intentional (not attributed to divine intervention) relief of pain was intrinsically moral and just when other, more advanced centers of medicine in America and Europe failed to do so for a number of years afterward?

People of Religion and Healing

Through most of the prerevolutionary period, Puritan ministers in Boston served both as pastors and physicians, which is reflected by the fact that there were a very small number of graduates of formal medical education programs (European by definition) during this period.^{11,12,13} In England, Puritans were heavily persecuted during the late 16th and early 17th centuries, and had planned for what they foresaw as their eventual banishment by training their ministers in the art and practice of medicines.⁸ Even the most learned and rational among them saw no clear boundary between the physical and the spiritual, with the former being understood largely as a function of religious belief. Cotton Mather, who shall be discussed at length, spoke of the union between medicine and ministering as an “Angelical Conjunction” and wrote that “ever since the days of Luke the Evangelist, Skill in *Physick* [emphasis in the original] has been frequently professed and practiced by *Persons whose more declared Business was the Study of Divinity* [emphasis in the original].”⁸ In short, Puritans, members of the major religious denomination in prerevolutionary Boston, believed that religion and medicine were one entity.

An important consequence of ministers being physicians and of the paucity of formally (university) trained physicians was that the practice of folk or lay medicine flourished in early Boston. Holmes’ description best captures this period when he wrote of the folk practitioners, “The relation of cause and effect was slighted by them, and an air of mystery and superstition pervaded the whole domain of therapeutics.” It was not until the acute demand for physicians during the American Revolutionary War that the European or “formally” trained and the self-taught or apprenticed “lay” physicians were forced into a cooperative relationship.

The moniker *Puritan* has been said to have origin in the 16th-century desire to “purify” the Church of England and to represent the “purity” of the lives that

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its devotees chose to live.¹⁴ Yet, despite the deep presence of religion in daily life, the Puritans valued education nearly as highly as their faith.¹⁵ New England ministers, including those in Boston, were profoundly learned. Many of them could read the Old Testament in Hebrew, the New Testament in Greek, and preach them both in Latin.¹⁵ A few years after Boston was founded, a young clergyman named John Harvard, noting the absence of a school in the Massachusetts Bay Colony, donated a portion of his estate to found the college that today bears his name.

Figure 1. *Cotton Mather*. Portrait showing him near the end of his life. Cotton was far ahead of the corpus of medical science of his day and without sacrificing his deep piety, aimed to prove to the world that science and religion were not mutually exclusive. Despite the power of his ideas, he was largely unpopular in his day. It has been said of Mather that we are still discovering his footprints in the most unexpected places. {Mather, 1722 (reprinted 1972) #2}



Cotton Mather (1663-1728; Figure 1) was prototypical of the pious yet curious Puritan. Mather wrote dozens of books, but it was his *Angel of Bethesda* (1722), the only systematic compilation of medical knowledge prepared in the Colonies, for which he is best known.^{16,17}

The assumption of the treatise was, of course, theological. In the opening pages, examining the cause of sickness, Mather writes: “If we enquire after the origins of diseases we shall not enquire wisely...if we do not find that SIN [emphasis in the original] against the HOLY [emphasis in the original] and Blessed ONE [emphasis in the original], to be the root of bitterness, from whence they have all arisen...Lett [sic] us Look upon SIN [emphasis in the original] as the cause of sickness.” Perhaps because the Puritans were insatiably curious about the world, these most pious of people gave the scientific method the firm foundation that Boston needed eventually to replace religious scripture as an explanation for events of the natural world.

Smallpox

In Boston, repeated smallpox epidemics during the period between roughly 1700 and 1800 were crucial to the town's social transformation from a predominantly religious society to a more secular one. In 1721, a major

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epidemic of smallpox struck Boston, and Mather's extensive knowledge of the world placed him squarely in the middle of the major debate of that era: that of variolation for the prevention of smallpox.¹⁸ At the time of publication of Mather's *Angel of Bethesda*, there were but a few formally "educated" physicians in the town. One of these men, educated in Europe and a close friend of Mather's, was Dr. Zabdiel Boylston (1679-1766). Mather and Boylston were both advocates of variolation, the practice of inoculating uninfected persons with effluent from open sores on persons infected with smallpox. So, in 1721, when smallpox again struck Boston, Mather urged Dr. Boylston to begin the practice immediately. With Mather's support, Dr. Boylston successfully inoculated his own son, two slaves, and Mather's children as well.^{13,11,14} Variolation was shown to be overwhelmingly effective at preventing death from smallpox, and, in 1723, the Royal Society of London, the source of the original narratives on variolation, requested that Dr. Boylston publish an account of his activities. Why, though, did variolation not become generally accepted until nearly 80 years later?

The variolation experiments of 1721 demonstrate clearly the importance of the social environment for scientific advancement. Even though variolation, on the basis of reasonable evidence, was proposed in the early 18th century, the social environment was such that the general population reacted not with approbation and acceptance, but with vitriol and violence. In 1721, intervening in smallpox epidemics was viewed as heretical. *Many* of the townspeople expressed sentiments that the practice of variolation was "heathen" and "unChristian." Ironically, Mather noted in his diary that, "the town [at] this time is strangely possessed by the devil," and a bomb tossed through Mather's window bore an appended note "COTTON MATHER You Dog, Dam you; I'l [sic] inoculate you with this, with a Pox to you!"^{18,19} The rejection of variolation by some of the Boston colonists can be understood not by examining the merits or weaknesses of the experimental evidence per se, but instead with the difficulty that persons had simply accepting the actual idea itself. Beecher and Altschule's statements that "Boylston's data should have cleared the air" and that they could not "get at the reasons for this remarkable behavior [by the townspeople]"¹⁸ demonstrate a failure to appreciate the underlying issue that, as Kuhn best stated, "the issue of paradigm choice can never be unequivocally settled by logic and experiment alone."²⁰

Variolation, despite evidence of its effectiveness, was not uniformly adopted in New England until after 1790, and much of this eventual adoption owed more to the collective horrendous experiences of the colonies with smallpox during the American Revolution than with a sudden late 18th-century reevaluation of previously accumulated evidence about the practice.²¹ Ironically, Mather and

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Boylston's writings facilitated the practice of variolation and further research in England. These activities eventually led Edward Jenner to experiment with vaccination in the late 1700s. The effectiveness of variolation and then vaccination became accepted and broadly embraced in due course, but only when a slate of social conditions (that were not present in the Boston of 1721) had come to be.

The American Revolution

The population of Boston during the Revolutionary War fell from approximately 16,000 in 1774 to 4,000 in 1783. Because all known doctors in Boston at the outbreak of the Revolution were active politically, many died in the war. The loss of so many "physicians" to the war resulted in a new cultural and social framework for medical practice in the town and helped to finally encourage cooperation among very different groups of doctors.^{12,13} Also, because the war presented an acute demand to train new physicians, the need for a local medical school and a hospital was brought into sharp focus.^{2,12} Whereas Philadelphia and New York each had a medical school and a hospital at the time of the war, Boston had neither. The war also created new opportunities for the investigation of injury and disease via the military hospitals and the large number of injured men seen there. Dr. John Warren, a noted surgeon of his day who rose to prominence after his brother Joseph Warren was killed at the Battle of Breeds (Bunker) Hill in 1775, gave a series of anatomic lectures in such venues. In 1782, Dr. Warren was tasked to lay the plans for a medical school at Harvard College, and, at the public induction of medical officers in 1783, he became the first Hersey Professor of Anatomy and Surgery. Warren played parts as well in the formation of the Boston Medical Society (1780) and the founding of the *Boston Journal of Medicine and Surgery*, the predecessor to the *New England Journal of Medicine*.

Vaccination and the Triumph of Secular Medical Thought

By the early 19th century, Boston had evolved substantially from the town that in 1721 had unsuccessfully argued the merits of variolation. In 1801, there was a medical school, a united medical profession, and a strong economic recovery. However, in comparison with Philadelphia and New York, Boston was still an insignificant player in American medical affairs.² Even with the new buttresses that were supporting the nascent "medical profession," the newly unified group still lacked the most vital component of a profession: legitimacy conferred by reputation.¹²

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Figure 2. Benjamin Waterhouse. Early 19th-century painting of Dr. Benjamin Waterhouse (1754-1846) who held the professorship of the Theory and Practice of Physic at Harvard Medical School. In 1799, a London physician sent to Waterhouse a copy of Edward Jenner's *An Inquiry into the Causes and Effects of the Variolæ Vaccinæ*. In 1800, Waterhouse received from Jenner some specimens of thread impregnated with the vaccine matter. So confident was Waterhouse of the efficacy and safety of vaccination that he used Jenner's material to vaccinate his young son and a household servant. Vaccinations of three more Waterhouse children and another servant soon followed "to convince the faithless, and silence the mischievous."



Toward the end of the 18th century, Boston was again hit with a smallpox epidemic. Because of the striking maturation of the medical arts, the social and political response was astonishingly different from that to the outbreak of 1721. Late 18th-century Boston presented an environment in which genuine medical advancement and its acceptance were now possible. In 1798 in England, Edward Jenner published his pivotal manuscript on the vaccination of humans with the cowpox virus to prevent the similar human disease smallpox. In the United States, a Boston physician, Dr. Benjamin Waterhouse (1754-1846), was the first to perform vaccination (Figure 2). In the years 1799-1801, Dr. Waterhouse, experimenting first on his children and then on selected members of the general populace, became convinced of the efficacy of the vaccine and sought to disseminate it widely. Not unlike the variolation battles during the early and mid-18th century, vaccination at the turn of the 19th century met with resistance by the established churches and general population. In England, both Protestants and Catholics refused vaccination as "against God's will," but the former group eventually allowed some vaccination. In many areas of the United States (the South and notably in New York), ministers joined in a multicity "manifesto," proclaiming that vaccination was "endeavoring to baffle Divine judgment."⁷

Dr. Waterhouse in Boston fared much better. In 1802, Waterhouse commenced human experiments on Noddles Island in Boston Harbor. The publication of these experiments, mostly done with young children, was directly responsible for the spread of the practice of "vaccination" to

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Philadelphia, New York, and subsequently to the rest of the United States. Waterhouse personally vaccinated President Thomas Jefferson.¹⁸ Like Mather in 1723, Waterhouse produced evidence of vaccination's efficacy, but it was the acceptance of the general populace and the governing leaders of Boston that were a major factor in Waterhouse's success, compared with Mather's failure 80 years earlier.

1820-1846: Boston's Continued Social Transformation and the Use of Ether for Relief of Pain

To variable degrees, the millennium-old belief that sickness was a punishment that had origin in God's anger had dissipated. The seemingly innate "urge" one might have had to relieve pain, an urge that was sanctioned neither by social nor theological premises, became a tenable thought amenable to critical analysis and scientific experimentation. Slowly but assuredly, medical traditions that were of dubious value came under the scrutiny of the medical practitioners of Boston and elsewhere. With each success, physicians and their patients solidified their belief that the thoughtful application of scientific reasoning could improve man's lot in the world and that men were not powerless against diseases long considered evidence of God's will.

The transmutation of the idea of pain from one of a purely religious matter to one of primarily a societal matter was a fundamental prerequisite for the eventual use of ether for medical purposes. Ariel Glucklich has written extensively on this point. "Religion had always sought not to remove (offer anesthesia) pain, but to allow for the transformation of pain from that which causes suffering, to that which leads to insight, meaning and perhaps salvation."³ Pain was a source of a shared, common experience for man, and the displacement of pain from a spiritual concern to a medical concern ("the medicalization of pain," as Glucklich calls it) altered the thinking about its value and therefore what should be done about it. Although there were larger currents helping to shape the evolving perception of pain as a shared matter to be addressed in a positive (utilitarian) way, the secularization of pain was the main outcome.

The overall trend of medical secularization in 19th-century America and Europe occurred at a more rapid pace in Boston where ideas, however radical, were open for discussion and ultimately decided in a manner more similar to the 20th-century practice of medicine than to that of the 19th. One new discovery in particular is representative of many of the themes discussed in an essay by Dr. Oliver W. Holmes (father of the U.S. Supreme Court justice). In Boston in 1843, Dr. Holmes published "Puerperal Fever," which stated that puerperal or "childbed" fever was "due to a contagion conveyed by the hands of physicians from one patient to another."⁴ The importance of a cultural

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readiness for new ideas is attested by the ready publication and acceptance of this concept in Boston, while cultural conditions in Austria had not yet evolved adequately to allow the acceptance of such a radical concept by Ignaz Philipp Semmelweis, a contemporary of Dr. Holmes. There, it was argued vociferously that physicians were gentlemen and consequently it was simply not possible that their unwashed hands could be the source of sickness. Dr. Semmelweis died in 1865, alone in an insane asylum, having been rejected by his peers and colleagues.²² The best evidence, however, that Boston was far advanced relative to other major centers in secularizing medicine is evident in the rapid and enthusiastic acceptance by Bostonians of the use of ether to induce “anaesthesia,” a term coined by Holmes, in the first months after October 1846. This was not the case in any other major medical center in America or Europe.²³

How ether actually came to be demonstrated in Boston is the final component to answering the question of why Boston became the venue for such an event. Many people in many locales had experimented and, to variable degrees, were familiar with the effects of various anesthetics. Nitrous oxide had been written about extensively and had entered the popular literature as early as 1810. It had been used for the relief of pain during dental extraction in the 1830s and 1840s, but the gas was largely viewed as a stimulant, not an anesthetic. “That medical and scientific thought in the early decades of the 19th century was completely oriented toward considering nitrous oxide as a stimulant is apparent from the disregard of the temporary unconsciousness sometimes produced...loss of consciousness was simply ascribed to ‘a faint’....”²⁴ Ether was known since the 13th century and had been popularized in “ether frolics” (as they were known), genuine social phenomena in 1840s Boston and elsewhere.²⁵ Before 1846, ether was widely available from dealers in pharmaceuticals and had a number of uses listed in therapeutic texts of the day.²⁴

Before 1846, ether and nitrous oxide had been demonstrated to cause exhilaration and a lessening of sensation,²⁴ but the use of ether for intentional pain relief required three things: a recognition that such an effect is a property of ether, a perspective on pain that made it amenable to relief, and an acceptance by the medical community and the population to be “etherized.” The first two conditions had been met in other cities and at earlier times than in Boston (Horace Wells had shown nitrous oxide to be effective for such a purpose in Hartford, Connecticut, by 1844). It is the last component, the subsequent acceptance by the Boston populace of the use of inhaled gases for the relief of pain that would prove decisive to the success of the 1846 ether demonstration.

After the public demonstration of ether, debates about its use and of the idea of anesthesia continued for years. Except in Boston, in all of the other cities

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mentioned above, the popular opinion was against anesthesia.^{11,23} Martin Pernick²³ has clearly illustrated the nature of these debates: Anesthesia was thought to be dangerous, pain still was generally believed to be a necessary part of life, anesthesia was thought to constitute an abuse of medical power; or all three opinions were thought to be true. Some of the most passionate debates centered on the ethical implications of anesthesia use. A Philadelphia newspaper noted in 1847 that “everyone who values free agency beware the slavery of etherization.” It was argued in that city that depriving a patient of consciousness was inherently dehumanizing, and reduced surgery and medicine to nothing more than the “cutting, of meat.”²³ James Simpson (1811-1870), a most important Scottish physician, encountered fierce resistance to the use of ether and chloroform for nearly a decade after 1846. His attempts were denounced “from pulpits across the land as impious and contrary to Holy Writ.”¹¹ It was not until 1853 when Queen Victoria received chloroform during the birth of her son Leopold that anesthesia use in Europe became fully legitimized.

The uniqueness of the ether event in 1846 Boston rests therefore not with the fact that it was conceived or occurred at the Massachusetts General Hospital. Rather, it rests on the fact that the demonstration occurred in a place where afterwards it would be understood and accepted. It is this framework of acceptance that ultimately explains why Boston was the venue for the introduction of ether to the world and why history has conferred upon Boston the eternal thanks of man in his quest to relieve suffering.

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References

References will be available on the CSA Web Site in the archives for the Spring 2007 issue of the CSA Bulletin or you may contact the CSA executive office and request a copy of the references.

[Editor's Note: The majestic Ether Monument in the Boston Public Garden, perhaps the most visible and public symbol of American medical history, has just been restored. We collectively are indebted to those who have made this possible and we urge those visiting Boston to make a “pilgrimage” to the monument and the famous Ether Dome in the Massachusetts General Hospital.]