

Horace Wells' Demonstration of Nitrous Oxide in Boston

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ABSTRACT

Horace Wells, a dentist in Hartford, Connecticut, first used nitrous oxide in dentistry in December 1844. A few weeks later he travelled to Boston, Massachusetts, to demonstrate to physicians and dentists the use of nitrous oxide in painful procedures. Wells' unsuccessful demonstration of nitrous oxide for the extraction of a tooth is well known, but other details of this trip are poorly understood. A description of Wells' visit to Boston was compiled using information from 21 statements and 5 newspaper notices. The precise date and location of Wells' demonstration could not be determined. There is no primary evidence that Wells' demonstration occurred in the surgical amphitheater (Ether Dome) at Massachusetts General Hospital. Wells' demonstration of nitrous oxide probably occurred around the end of January 1845, in a public hall on Washington Street, Boston.

HORACE Wells† (1815–1848) (fig. 1), a dentist in Hartford, Connecticut, was a pioneer in the use of nitrous oxide to prevent pain during dental and surgical procedures. The generally accepted description of events relating to this “discovery” is that on December 10, 1844, Wells and his wife, Elizabeth (1818–1889) (fig. 2), attended a “Grand Exhibition” of nitrous oxide by Gardner Q. Colton (1814–1898; itinerant lecturer on nitrous oxide; founder of

the Colton Dental Association) at the Union Hall, Hartford. Samuel A. Cooley (1821–1900), a clerk in an apothecary shop in Hartford, injured his legs when he ran into some wooden benches while under the influence of nitrous oxide. Cooley was unaware of his injuries until the effect of the nitrous oxide had worn off, and Wells had asked him whether he had any pain. Wells, who had been concerned about pain during dental procedures, realized that nitrous oxide may be useful in dentistry, and made arrangements with Colton to conduct a trial of the gas.

The next morning, Wells displayed great courage in undergoing the extraction of a tooth under nitrous oxide in order to verify its analgesic properties. The tooth was extracted by John M. Riggs (1811–1885; D.D.S.,‡ dentist, Hartford), who was later honored for his treatment of gingivitis expulsa or alveolar pyorrhoëa by having the condition named after him (Riggs' disease). After successful trials in Hartford by Wells and Riggs, Wells traveled to Boston, Massachusetts, in a fateful attempt to convince the medical and dental profession of the efficacy of nitrous oxide. In Boston, Wells sought out William T. G. Morton (1819–1868; M.D., dentist and medical student, Boston, Massachusetts), his former dental student and former business partner. Morton introduced Wells to several physicians, including George Hayward (1791–1863; M.D., Professor of Surgery, Harvard University, Cambridge, Massachusetts), John Collins Warren (1778–1856; M.D., Hersey Professor of Anatomy and Surgery, Harvard University, Cambridge, Massachusetts), and Charles T. Jackson (1805–1880; M.D., physician, chemist, and geologist, Boston, Massachusetts). A medical student volunteered to undergo a tooth extraction under nitrous oxide, but he cried out during the extraction, and appeared to be in pain. Most of the observers at the demonstration considered it a failure, and a dejected and disheartened Wells returned to Hartford the following day. The date of the demonstration was not recorded, and only a few details of Wells' trip to Boston, and his demonstration of nitrous oxide are known.

Richard J. Wolfe, author of books on Wells,¹ Morton,² and Jackson³ did not provide a specific, or a likely, date for

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† On October 10, 1990, the Baltimore College of Dental Surgery, Dental School, University of Maryland, awarded a posthumous degree (Doctor of Dental Surgery, D.D.S.) to Wells. The award ceremony was held in the Ether Dome, Massachusetts General Hospital, because it was believed to be the location of Wells' demonstration of nitrous oxide in January 1845.

‡ In 1879, Riggs was awarded an honorary degree (D.D.S.) by the Baltimore College of Dental Surgery.

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Fig. 1. Portrait of Horace Wells (1815–1848). Artist and date unknown. Catalog number MG-M-06911, on loan to Division of Medicine and Science, National Museum of American History, Smithsonian Institution, Washington, D.C.

Wells' demonstration in Boston, but stated that Wells was in Boston in January 1845. In his book, *Tarnished Idol*, Wolfe stated that apart from accounts by Wells and Morton, there was only one other known eyewitness account of the demonstration by Wells.²

Twenty-one statements relating to Wells' trip to Boston to demonstrate nitrous oxide were identified (appendix). The statements were found in correspondence, books, depositions, and transcripts of oral testimony. Apart from four descriptions by Wells,^{1,4–6} and one by Morton,⁷ there are seven statements by five former medical students (Thomas William Kennedy, M.D.,⁶ Pierre B. Mignault, M.D.,⁶ Cincinnatus A. Taft, M.D.,^{6,8,9} William M. Cornell, M.D.,¹⁰ and Mason M. Miles, M.D.¹¹) who were present when Wells addressed the medical students after Warren's lecture. One former student, Cincinnatus A. Taft, provided two written statements^{6,8} and testified under oath in 1852.⁹ Cornell's description was cited by Wolfe as the only known description by a nonparticipating observer of Wells' demonstration.² However, Cornell only claimed he was present at Wells' address to the medical students and the "experiments" that Wells conducted immediately afterward; it is obvious from Cornell's letter that he was not at Wells' demonstration in the evening of the same day when nitrous oxide was administered for a tooth extraction.¹⁰ Wells' demonstration was witnessed by four of the five former medical students who provided statements, and by Daniel T. Curtis



Fig. 2. Portrait of Elizabeth Wells (1818–1889). Artist and date unknown. Catalog number MG-M-06912, on loan to Division of Medicine and Science, National Museum of American History, Smithsonian Institution, Washington, D.C.

(fig. 3),⁶ a friend of Wells. There are six known statements by individuals who had seen, or heard of, Wells during his visit to Boston, but had not observed Wells' demonstration (Abel Ball, M.D.,⁸ John Collins Warren, M.D.,¹² Joseph S. Walton,¹³ Ester W. Walton,¹⁴ Theodore Metcalf,⁹ and Joseph

Boston, March 23d, 1847.

I do hereby testify that Horace Wells, of Hartford, Connecticut, with whom I have been acquainted for several years, came to Boston in the year 1844, (I think in November or December,) and informed me that he had made a valuable discovery, which enabled him and others to perform surgical operations without pain. He then informed me of the result of his experiments, which he assured me were numerous, and perfectly successful. I accompanied him to a hall in Washington street, where a large number of medical students had assembled, as I understood, to witness an operation to be performed by Dr. H. Wells, upon a patient while under the influence of exhilarating gas, which was the discovery above referred to. The gas was administered, and the tooth extracted under its influence by the said Wells, in presence of myself and many others. I am not able to say whether the patient experienced any pain or not. There was certainly no manifestation of it, yet some present expressed themselves in the belief that it was an imposition.

I was subsequently informed that his operations in Hartford, prior to 1845, were uniformly successful under the influence of gas.

DANIEL T. CURTIS,
No. 23 Bedford street.

Fig. 3. Testimony of Daniel T. Curtis.⁴

"In the month of January succeeding this discovery, my husband went to Boston, for the purpose of making known his discovery to the public there, and was absent about a fortnight. He said on his return that he had been but partially successful; that his discovery was treated as a humbug, and the people there would lend him no assistance."

Fig. 4. Extract of a deposition by Elizabeth Wells.⁹

Burnett).⁹ The remaining two statements are by Elizabeth Wells (figs. 2 and 4),¹⁵ and John M. Riggs,¹⁵ both of whom were in Hartford during Wells' trip to Boston.

Information from these statements and five newspaper notices was used to compile a description of Wells' trip to Boston. The statements were made between 3 and 20 yr after Wells' demonstration in Boston, and the most obvious discrepancies are in the dates. No date for the demonstration could be determined, but it is likely to have occurred in late January 1845. The location of the demonstration could not be determined with certainty, but there is no primary evidence that it occurred in the surgical amphitheater (now known as the Ether Dome) at Massachusetts General Hospital, Boston, Massachusetts.

Boston versus New York

After 12–15 successful trials of nitrous oxide for dental procedures,^{4–6} Wells considered demonstrating nitrous oxide in either Boston or New York. Hartford (population approximately 10,000 in 1840) did not have a hospital in 1844; Hartford Hospital, the first hospital in Hartford, was founded in 1854. Wells may have chosen Boston for a number of reasons. He had studied dentistry in Boston (it is not known with whom he had studied), was still on friendly terms with Morton, and he was probably aware of the reputation of Boston's physicians.

Nitrous Oxide and Sulfuric Ether as Anesthetic Agents

Wolfe believed there was ample evidence that sulfuric ether (ethyl ether) was tried in Hartford before Wells' trip to Boston.¹ E. E. Marcy, M.D., a physician in Hartford, claimed he suggested to Wells that ether could be used as a substitute for nitrous oxide.⁹ However, Marcy believed nitrous oxide was safer, and advised Wells not to use ether. In his third statement, Marcy claimed that ether was used for a surgical operation in Hartford "prior to 1845."⁹ Wells also reported that an operation under ether was performed in Marcy's office.⁶ The operation was an excision of an "encysted tumor" from the head of a young man.⁹ Thus it appears that Wells and Marcy discussed using ether, and Marcy may have administered ether on one occasion in December 1844. Although ether was easier to prepare and store, nitrous oxide was considered to be safer and more pleasant to inhale. Wells was probably aware of the inhalation of ether for its pleasurable effects ("ether frolics"), but there is no evidence that he administered ether before his trip to Boston.

When Did Wells Travel to Boston?

Wells stated that his discovery and initial trials were in November 1844, and he traveled to Boston in December 1844.^{1,5,6} These dates were also used in the statements solicited by Wells.⁶ Colton's exhibition of nitrous oxide was on December 10, 1844, so Wells' discovery could not have been in November 1844. Wells' statement can, however, be interpreted as evidence that he went to Boston in the month after his discovery. Riggs stated that Wells went to Boston several weeks after the discovery.¹⁵

According to six statements, Wells was in Boston in January 1845.^{8,9,13–15} Elizabeth Wells stated that Horace Wells traveled to Boston in January 1845, and was away for "about a fortnight" (fig. 4).¹⁵ Abel Ball, a physician who was then practicing as a dentist, stated that he met Wells in January 1845, and Wells remained in Boston for a "few weeks."⁸ Joseph S. Walton¹³ and Ester W. Walton¹⁴ testified that they were visiting Boston in January 1845 when Ester required dental treatment. While in Morton's rooms they overheard a conversation between Wells and Morton.^{13,14}

A day book of Horace Wells with records of his dental practice for the years 1841–1845 ("Day Book A" in possession of the Hartford Medical Society since 1928) was transcribed and published in the book, *I Awaken to Glory*.¹ The entries in the day book are thought to be records of dental work that was not paid for at the time of treatment. The last entries for January 1845 were for Friday, January 17, 1845.¹ In 1845, a journey by train from Hartford to Boston (via Springfield, Massachusetts) could have been accomplished in 1 day. Wells could have been in Boston by Sunday, January 19, 1845 if he has left Hartford on Friday or Saturday and 2 days were allowed for the journey.

Boston Bee, January 20, 1845

A short announcement on the use of nitrous oxide for dental extractions was published in a Boston newspaper, *Boston Bee*, on Monday, January 20, 1845 (fig. 5): "A dentist in Hartford, (Conn.) has adopted the use of nitrous oxide gas, in teeth pulling. It is said that after taking this gas the patient *feels no pain*." This little-known newspaper announcement is the earliest known public announcement of the use of nitrous oxide for dental or surgical procedures. There are no known earlier reports or announcements of the use of nitrous oxide in dentistry in newspapers in Hartford.

If it is assumed that Wells was the source of this information, and he approached the newspaper when he arrived

A dentist in Hartford, (Conn.) has adopted the use of nitrous oxide gas, in teeth pulling. It is said that after taking this gas the patient feels no pain.

Fig. 5. Announcement in the *Boston Bee*, January 20, 1845, of the use of nitrous oxide in Hartford, Connecticut.

in Boston (and not by correspondence from Hartford), this announcement can be regarded as confirmation that Wells arrived in Boston on, or before Monday, January 20, 1845.

Who Did Wells Meet in Boston?

In Boston, Wells met several dentists and physicians, and the chemist Theodore Metcalf whom he approached for information on procuring nitrous oxide.

Wells sought the assistance of Morton in arranging a demonstration of nitrous oxide. Their practice in Boston had been dissolved in October 1844, but they remained on friendly terms. Joseph and Ester Walton were in Morton's rooms when Wells and Morton discussed the use of nitrous oxide.^{13,14} Wells proposed to demonstrate his discovery before a public audience although Morton was skeptical. According to Mrs. Walton, Morton "made light of it, treating the subject as chimerical."¹⁴ Wells then exclaimed, "I have done it and can do it again."¹⁴ Wells was intending to place an advertisement in a Boston newspaper for volunteers for a demonstration of nitrous oxide.¹³ The next day, Joseph and Ester Walton were informed by Morton that only one person had turned up, and no operation was attempted.¹³

According to statements by Ball⁸ and Burnett,⁹ Wells had established temporary rooms on Tremont Street. Ball stated Wells had "taken a room nearly opposite the Tremont House, where he had advertised he would extract teeth without pain."⁸ Ball also stated that Wells had "invited the medical faculty and Dr. J. C. Warren and his medical class to attend a lecture he designed giving upon this subject."⁸ Apart from Morton and Ball, Wells probably met other dentists in Boston to promote his discovery.

Wells also met a number of physicians in Boston, but only three physicians have been identified from the statements relating to Wells' visit. According to Wells, both Morton and Jackson did not believe that surgical operations could be performed without pain, and that "this *modus operandi* was entirely new to them."⁶ No confirmation of this meeting was found in Jackson's writings or testimony. Morton introduced Wells to Hayward and Warren,⁷ and Morton was present when Wells addressed the students at the Massachusetts Medical College (also known as the Harvard Medical School) on Mason Street.

Wells failed to convince Morton and Ball, who were his friends and fellow dentists, of his major breakthrough in controlling pain. Morton and Ball did not trial nitrous oxide in their dental practices. Ball and his partner, Dr. Fitch, were offered trials of the gas in their practice, but they were too busy to "make the necessary arrangements for preparing and administering the gas to our patients."⁸ The surgeon, Warren "was very much occupied at the time" that "these occurrences made so little impression on my mind."¹² The announcement in the *Boston Bee* also appears to have been overlooked by physicians and dentists. Wells' novel concept of a safe, and easily reversible, induced insensibility to pain was regarded with skepticism.

Gardner Q. Colton testified in December 1852 that he could not supply Wells with equipment to produce nitrous oxide, and he had advised Wells to go to Boston to obtain the equipment.¹⁵ Apart from setting up temporary rooms in Boston, and meeting physicians and dentists, Wells may have bought equipment to manufacture and store nitrous oxide for his intended demonstrations in Boston.

Newspaper Notices in the *Daily Evening Transcript*, Boston

Three issues of a Boston newspaper, *Daily Evening Transcript*, January 21–23, 1845, carried identical advertisements for Wells' proposed trials of nitrous oxide (fig. 6). Joseph Walton, who had overheard a conversation between Wells and Morton, thought that Wells had placed an advertisement in the *Daily Evening Transcript*.¹³ However, the existence of these advertisements has not been previously documented. The issues of January 21 and 22, 1845, also contain "editorial" notices that directed the readers to Wells' advertisements. The advertisements are definitive evidence of when Wells was in Boston, but they do not provide any clues to the duration of his stay, or the date of his demonstration.

The first notice was found on page 2 of the *Daily Evening Transcript*, January 21, 1845: "An extraordinary notice will be seen in our advertising columns of today respecting surgical operations on teeth."

Page 3 of the same issue of the *Daily Evening Transcript* contained an advertisement (fig. 6): "NOTICE EXTRAORDINARY. A gentleman from the West who is now on a visit in this city, wishes to introduce a new system of Surgery having especial reference to the Extracting of Teeth, by which nearly or quite all the pain which is usually caused by the operation may be avoided. The Doctor proposes to explain his theory to an audience at some public hall, and then proceed to perform operations in extracting teeth for those who will consent to undergo the operation. In order to be sure of a sufficient number of patients for the occasion, he wishes to engage a few persons of respectability who may require the operation, on whom he may depend to be present. They will be required to state to the audience the sensation produced by the operation. The above project will be abandoned if a sufficient number do not volunteer immediately, as the Dr can remain in town but a short time. Those persons who are willing to appear for the above purpose are requested to leave their names and residences at Mrs Curtis's, 175 Tremont st, opposite the Tremont House. 31st Jan 21

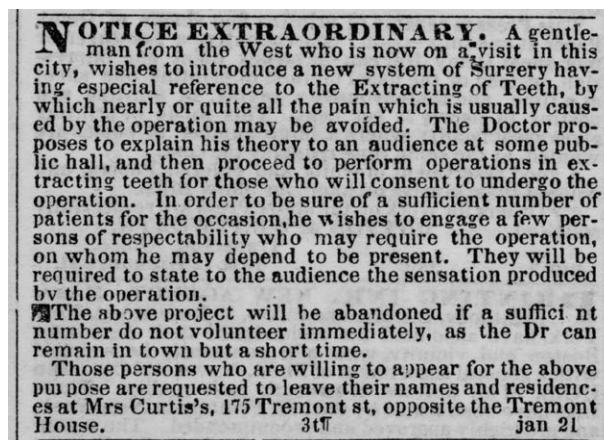


Fig. 6. Advertisement by Horace Wells in the *Daily Evening Transcript*, Boston, January 21, 1845. Image courtesy: The American Antiquarian Society, Worcester, Massachusetts.

engage a few persons of respectability who may require the operation, on whom he may depend to be present. They will be required to state to the audience the sensation produced by the operation.

The above project will be abandoned if a sufficient number do not volunteer immediately, as the Dr can remain in town but a short time.

Those persons who are willing to appear for the above purpose are requested to leave their names and residences at Mrs Curtis's, 175 Tremont st, opposite the Tremont House."

The next issue of the *Daily Evening Transcript* (Wednesday, January 22, 1845) contains a longer "editorial" notice on page 2, pleading with dentists to provide patients for Wells: "The Dental operator whose extraordinary advertisement may be seen in our paper, informs us that he has had but one application as yet, and that it is his intention to leave town without performing the proposed operations unless a sufficient number apply this day or tomorrow. Cannot our Dentists take enough interest in this matter to furnish patients for the occasion? The Dr will be ready to receive calls today and tomorrow between the hours of 3 and 6 o'clock P.M. Enquire for Dr H."

When Did Wells Address the Students at the Medical College in Boston?

Morton⁷ stated that he and Wells first approached Hayward but they could not wait for 2–3 days for an operation so they approached Warren (presumably on the same day). Wells' version is different. Wells stated that he waited for 2–3 days for a patient to agree to an amputation, but the patient decided not to have the operation.^{4,6} Wells and Morton *then* approached Warren, who agreed to introduce Wells to the medical students at the end of one of his (Warren's) lectures at the Massachusetts Medical College, Mason Street (this was the location of the Harvard Medical School from 1816 to 1846). The two-storey building had several lecture rooms, an anatomical theater (on the second floor) with a dome and skylight, two dissecting rooms, a laboratory, library, and an anatomical museum.

After Warren's lecture, the medical students moved to an adjoining room for an address by Wells. Wells may have allowed some students to inhale nitrous oxide without attempting any painful procedure—these "experiments" were reported by Cornell¹⁰ and Miles.¹¹ The date of the Wells' address to the medical students is not known. The statements by Morton⁷ and five former medical students^{6,10,11} are in agreement that the extraction of a tooth under nitrous oxide was performed in the evening of the same day.

What Was the Date and Location of the Demonstration of Nitrous Oxide?

Most historical accounts state that Wells' demonstration of nitrous oxide occurred in January, 1845,^{1,2} and this is supported by six statements relating to Wells' trip to Boston.^{8,9,13–15} Vandam¹⁶ stated that the demonstration occurred after January 17, 1845.

The date of the demonstration has occasionally been reported as January 20, 1845.^{17,18}§ The origin of this date for the Wells' demonstration may be related to the newspaper report in the *Boston Bee* on the same date. Archer¹⁹, in discussing the events in Boston, quoted the newspaper report, and made the following statement: "This was at the time it is believed Horace Wells gave his demonstration in Boston." The statement by Wells⁴ that he waited 2–3 days for a patient to agree to an amputation *before* arranging the demonstration involving the dental extraction appears to rule out January 20 as the date of the demonstration.

Wells returned to Hartford the day after the failed demonstration.^{4,7} According to Elizabeth Wells, Horace Wells had been away for approximately 2 weeks.¹⁵ If this is correct, it is likely that Wells' demonstration occurred around the end of January 1845.

The location of Wells' demonstration of nitrous oxide is often reported as the surgical amphitheater (now called the Ether Dome) at the Massachusetts General Hospital.^{20–22} Wolfe and Menczer, in their book of essays celebrating Wells, did not provide a location or a specific date for the demonstration, but they thought it occurred in January 1845.¹ A publication by the American Dental Association of the proceedings of the centenary commemoration of Wells' discovery in 1844 contains at least six statements that the demonstration was at Massachusetts General Hospital.²⁰ Prominent anesthesia historians Barbara M. Duncum²¹ and Stanley Sykes²² stated that the demonstration occurred at Massachusetts General Hospital, whereas Thomas F. Keys²³ thought that it occurred at the Harvard Medical School. Both locations are unlikely to be correct for several reasons. The demonstration occurred in the evening,^{6–11} a time of the day when students would not be expected to assemble at the hospital or the medical college. No description of the event has clearly documented its location. Cornell¹⁰ and Miles¹¹ stated that the demonstration occurred in the evening of the day that Wells addressed the medical students at the Massachusetts Medical College, but at another location that was not identified.

Only three statements provide some indication of its location. Morton⁷ stated that he accompanied Wells to "the hall," whereas Taft testified that the demonstration was in a "public hall."⁹ Curtis stated that he accompanied Wells to a hall on Washington Street (fig. 3)⁶; this is the only statement to name a particular street, and it remains unconfirmed.

Vandam¹⁶, in his article on Charles Frederick Heywood, suggested three possible locations: "Quincy Hall, above Faneuil Hall Market, and Phoenix Hall and Boylston

§ Wikipedia web page on John Collins Warren, M.D. Available at: http://en.wikipedia.org/wiki/John_Collins_Warren. Accessed November 1, 2008.

|| Carranza FA. The Discovery of Anesthesia. The Tragic History of Wells and Morton. Available at: <http://www.dent.ucla.edu/pic/members/carranza/anesthesia.html>. Accessed June 28, 2012.

Hall, over Boylston market, Washington Street corner of Boylston.” Vandam did not provide any other information, or any references for his statement.

Boylston Market, on the corner of Boylston and Washington Streets, was designed by Charles Bulfinch (1763–1844), who was also the architect of the Massachusetts General Hospital. Boylston Hall was on the third floor of Boylston Market, which was demolished in 1887 (there is also a Boylston Hall at Harvard University, Cambridge, Massachusetts).

The identity of the medical student who had his tooth extracted under nitrous oxide is not known. Taft and other medical students also inhaled nitrous oxide that evening from “a mouthpiece attached to a bag.”⁸ These inhalations may have been supervised by Wells, or may have been initiated by the students with their own supply of nitrous oxide. According to Morton, the students had been planning to inhale nitrous oxide that evening.⁷

Wells stated that his demonstration was conducted in the presence of a large number of students and several physicians.⁴ No physicians who witnessed Wells’ demonstration have been identified. Descriptions of the patient’s response to the extraction of his tooth are fairly consistent. According to Wells, the patient experienced some pain, but later stated that the pain was “not as much as usually attends the operation.”⁴ Wells attributed the failure of complete insensibility to the fact that he had withdrawn the bag too soon.⁴ Some observers considered it a “humbug affair.”⁴ A similar description was provided by Taft: A tooth was extracted from one person, who “halloed somewhat during the operation, but on his return to consciousness, said he felt no pain whatever.”⁸ Curtis thought the patient did not appear to experience any pain, but some of the students believed it was an “imposition.”⁶ Morton⁷ was more dismissive, “Dr. Wells administered the gas, and extracted a tooth, but the patient screamed from pain, and the spectators laughed and hissed.”

The next morning Wells returned Morton’s dental instruments before leaving for Hartford.⁷ Metcalf testified he was told by Morton on the day after the failed experiment that Wells had “left in the early train, in great disgust, or disappointment.”⁹

Wells told Riggs that he had administered nitrous oxide to only one person with partial success.¹⁵ This is one of the surprising aspects of Wells’ trip to Boston. Wells could have performed a number of trials of nitrous oxide for painful procedures while he was in Boston, but he gave up after one unconvincing attempt and returned to Hartford.

The Aftermath of the Demonstration

Wells became ill shortly after the failed demonstration in Boston. The stress and humiliation that he felt after his failure in

Boston may have precipitated his illness. Wells wrote in 1847, “The excitement of this adventure immediately brought on an illness, from which I did not recover for many months; being thus obliged to relinquish, entirely, my professional business.”⁶ The nature of Wells’ illness is not known, but it may have involved both physical (probably respiratory) and psychological ailments. On February 5, 1845 Wells advertised his home for rent.¹ Shortly thereafter, he withdrew from his dental practice, and only resumed dentistry in September 1845. Wells had suspended his dental practice in Hartford on at least one previous occasion because of health issues.

After Morton’s demonstration of ether anesthesia in Boston in October 1846, Wells sought public and official recognition, largely unsuccessfully, for the discovery of anesthesia. In January 1848, in New York City, Wells threw sulfuric acid on two women while he was under the influence of chloroform. He was arrested (possibly on January 21, his 33rd birthday), and committed to prison in “The Tombs” (The New York Halls of Justice and House of Detention, Manhattan, New York). Ashamed of his actions, Wells committed suicide on the night of January 23, 1848 by inhaling chloroform and cutting his left femoral artery (*The New York Herald*, January 25, 1848). Interestingly, Wells’ chloroform-assisted suicide occurred a few days before the death of Hannah Greener, regarded as the first death under chloroform anesthesia.

Wells died unaware that a few weeks earlier the “Parisian Medical Society” had recognized him as the inventor of anesthesia, and made him an honorary member.¹ Christopher Starr Brewster (1799–1870; D.D.S.#), an American dentist living in Paris, France, wrote to Wells on January 12, 1848 with this news, but no record of this award or the diploma have been found.¹ Wells’ exhilaration in his discovery lasted approximately 6 weeks, and the next 3 yr were characterized by numerous misfortunes and failures that ended with his untimely death.

Conclusions

Wells traveled to Boston on, or after Friday, January 17, 1845. He was probably responsible for the notice in the *Boston Bee*, January 20, 1845, regarding the use of nitrous oxide in dentistry in Hartford. Wells may have spent his first few days in Boston setting up temporary rooms on Tremont Street (opposite Tremont House), meeting dentists, advertising for volunteers, and securing a supply of nitrous oxide.

The date that Morton introduced Wells to the surgeon Hayward is not known. According to Wells, they waited 2–3 days for one of Hayward’s patients to agree to an amputation of a limb. When the patient refused the operation, Wells and Morton approached Warren for permission to address the medical students. Wells’ demonstration of nitrous oxide for a tooth extraction probably occurred in the evening of the same day, but its date could not be determined. Wells left Boston the morning after the failed demonstration. If Wells had been away from Hartford for

In 1841, the Baltimore College of Dental Surgery awarded an honorary degree (D.D.S.) to J. S. Brewster, residing in France. No other details of this honorary degree are known, but it was most likely awarded to Christopher Starr Brewster.

about a fortnight (as reported by his wife, Elizabeth), his demonstration would have occurred around the end of January 1845. None of the known statements have identified the surgical amphitheater at Massachusetts General Hospital as the location of the demonstration. According to one statement, the demonstration occurred in a public hall on Washington Street, Boston.

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Appendix

Twenty-one statements relating to Wells' trip to Boston are listed. The dates provided are the dates on which the statements were made, or earliest known dates of publication of the statements.

Horace Wells, 1846

On December 9, 1846, the *Hartford Courant* published a letter from Wells. This letter was republished by Archer in 1960.⁴ Wells stated that he waited 2–3 days for a patient to agree to an amputation of a limb, but the patient eventually decided not to have the operation. Wells then administered nitrous oxide for the extraction of a tooth. This was done in the presence of a large number of students and several physicians. The patient experienced some pain, but later stated that the pain was “not as much as usually attends the operation.” Some observers considered it was a “humbug affair.” Wells “left the next morning for home.”

Horace Wells, 1847, *Boston Atlas*

Wells wrote this letter in February 1847 while he was in Paris, France. The letter was first published in *Galvani's Messenger*, an English newspaper in Paris. It was reprinted in the *Boston Atlas*, April 2, 1847, and by Archer in 1960.⁵ According to Wells, the discovery and initial trials were in November 1844, he traveled to Boston in December 1844, and returned home in January 1845. Wells reported that he had used nitrous oxide for dental extractions in 12–15 patients before his trip to Boston.⁵

Horace Wells, 1847, *Memoir*

Horace Wells wrote a “memoir” that was read before the Academy of Sciences, Paris on March 8, 1847.¹ As in other publications, Wells stated that his discovery had been made

in November 1844, and he went to Boston “the same or the following month (December).” Wells chose nitrous oxide “as it was more agreeable to inhale than the vapour of ether.” Wells also stated that he had experimented with both nitrous oxide and ether “prior to 1845.”

Horace Wells, 1847, Pamphlet

In 1847, Wells published a 25-page pamphlet, *A History of the Discovery of the Application of Nitrous Oxide Gas, Ether, and Other Vapors, to Surgical Operations*, in which he provided a brief account of his trip to Boston that ended in the failed demonstration.⁶ The pamphlet also contains four statements by witnesses of the demonstration in Boston, three by former medical students, and one by Daniel T. Curtis, a friend of Wells.⁶

Thomas William Kennedy, M.D., P. B. Mignault, M.D., Cincinnatus A. Taft, M.D., 1847

These three physicians, who were medical students in Boston in 1844–1845, signed nearly identical statements in March 1847 that they were present at the demonstration by Wells.⁶ Wells addressed the students after Warren's lectures, and they were invited to “meet in the evening to witness an operation, which operation was performed in our presence, while the patient was under the influence of the gas.”⁶ The date of the demonstration was not recorded, but was stated to have occurred in the “fall of the year 1844.”⁶

Daniel T. Curtis, 1847

Daniel T. Curtis testified on March 23, 1847 that Wells, whom he had known for several years, came to Boston in November or December 1844 (fig. 3).⁶ Curtis had accompanied Wells to a hall on Washington Street where a large number of medical students had assembled to witness a tooth extraction under the exhilarating gas (nitrous oxide).

William T. G. Morton, 1847

Morton's⁷ statement was first published in French in 1847. It was published in English in *Littell's Living Age*, March 18, 1848, and reprinted in 1946 with a foreword by Fulton. Morton⁷ stated that Wells came to him in the winter of 1844–1845 for assistance in “procuring an opportunity to administer the nitrous oxide gas.” Morton introduced Wells to Hayward, but there was no operation for 2–3 days. They could not wait that long, so they approached Warren, “whom we found engaged with his class.” Warren told them “his students were preparing to inhale it that evening, for sport.” In the evening Morton accompanied Wells to “the hall” where the unsuccessful demonstration occurred. Wells came to Morton's rooms the next morning to return the dental instruments that he had borrowed, before returning to Hartford, Connecticut.⁷

Warren, 1848

John Collins Warren, M.D., stated that Wells “in company with Dr. Morton, visited me at the Medical College, for the purpose of requesting that the medical class should have an opportunity of hearing some remarks on the use of the nitrous oxyde [sic] for the prevention of pain. These remarks were actually made, and at a subsequent day a trial of the gas took place. But, as I was very much occupied at the time, these occurrences made so little impression on my mind ...”¹²

Joseph S. Walton, 1852

In April 1852, Joseph S. Walton of Sherbrooke, Canada, wrote a letter that was published in the *Hartford Courant*, April 5, 1852, and also made a sworn statement¹³ that he and his wife, Ester, were in Morton’s rooms in Boston in January 1845 when they overheard a conversation between Morton and Wells.

Abel Ball, M.D., 1852

Abel Ball, M.D., a physician who was then practicing as a dentist, made a sworn statement in 1852 (published by Smith in 1858⁸). According to Ball, Wells visited him in his rooms in January 1845 to discuss his discovery. Ball stated that Wells remained in Boston for a “few weeks.”⁸

John M. Riggs, 1853

According to Riggs, “Several weeks elapsed after making the discovery before Dr. Wells went to Boston.”¹⁵ On his return, Wells stated that he had only one trial of nitrous oxide in Boston, and “the whole thing was received with ridicule.”

Elizabeth Wells, 1853

Elizabeth Wells (fig. 2) stated in a deposition (fig. 4) published by Smith in 1853, that Wells went to Boston in January after the discovery, and was away for about a fortnight.¹⁵

Theodore Metcalf, 1853

Theodore Metcalf, a chemist and druggist on Tremont Street, stated that Wells approached him for information on who could prepare nitrous oxide for experiments in extracting teeth without pain.⁹ Metcalf recommended Morton, who was then a student of Jackson. Metcalf was told by Morton on the day after the failed experiment that Wells had “left in the early train, in great disgust, or disappointment.”⁹

Joseph Burnett, 1853

Joseph Burnett purchased Theodore Metcalf’s business in January 1845.⁹ It does not appear that Burnett met Wells, but he recalled that Wells had advertised his intention to conduct experiments at a location opposite Tremont House.⁹ Burnett later heard the experiments had failed. According to Burnett, “It was a matter of general remark.”⁹

Cincinnatus A. Taft, M.D., 1853 (Testimony in 1852)

Taft testified in 1852 that Wells’ demonstration occurred in January 1845 in a “public hall.”⁹

Cincinnatus A. Taft, M.D., 1858 (Second Statement by Taft)

The second statement by Taft was published by Truman Smith in 1858.⁸ Taft first met Wells in Boston in January 1845. Wells was introduced to the medical class by Warren, and administered nitrous oxide on the same or the following evening to several students and spectators. Taft also inhaled the gas, and was “entirely unconscious.” The gas was inhaled from “a mouth-piece attached to a bag.”

William M. Cornell, M.D., 1864

William M. Cornell¹⁰, M.D., a physician in Philadelphia, writing nearly 20 yr after the event, thought the demonstration was in the winter of 1843–1844. Warren told his students that Wells was in the “room below.” Wells addressed the students and “proceeded to make his experiments, which did not perfectly succeed.” Cornell “was told by some of the class, however, that in the evening of the same day, he did succeed in another place.”¹⁰

Mason M. Miles, M.D., 1864

Mason M. Miles¹¹, M.D., a physician in Aurora, Illinois, wrote that in 1843–1844 the medical students met Wells after a lecture by Warren. “Wells made some experiments before the class with this new agent, but I was not able to remain and see them at this time. But I did witness some of his experiments in the evening of the same day, in another place, and was highly pleased with the results, and I think the class were greatly interested in his remarks and experiments.”¹¹

Ester W. Walton, 1867

Ester W. Walton of Sherbrooke, Canada, had a dental procedure in Morton’s rooms in January 1845.¹⁴ While there, she overheard a discussion between Wells and Morton.

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