Surgery in the early nineteenth century posed serious challenges to both the surgeon and the patient due to unbearable pain. However, surgical textbooks of the day scarcely mentioned this pain; accompanying illustrations showed patients lying quietly, apparently unconcerned in the midst of gruesome and painful procedures. All this changed on October 16, 1846. William T.G. Morton, a Boston area dentist, administered ether to a patient with a large vascular malformation in his neck. John Collins Warren, a senior surgeon at the Massachusetts General Hospital, painlessly excised the tumor in an operating theater filled with hospital staff. Morton’s demonstration revolutionized the way surgery was practiced, but the credit for the discovery of surgical anesthesia is certainly not his alone. Several individuals challenged Morton’s attempts to claim sole credit, including Horace Wells, Charles T. Jackson, and Crawford W. Long. Long, a physician from Georgia, was actually the first to perform an anesthetized operation using ether in March 1842, but failed to publish his results until several years after Morton’s demonstration. Morton learned of inhalation anesthesia at a failed demonstration by Wells, his former dental partner, who in turn noted the analgesic qualities of nitrous oxide at a public lecture in 1844. Jackson, a former mentor to Morton, supplied the critically important advice of using pure sulfuric ether, rather than impure commercial concoctions. Hope of financial gain led to acrimonious legal battles erupted between Morton, Wells, and Jackson. Ironically none received any financial reward, and all met untimely and tragic deaths.

Introduction
Surgery before the mid nineteenth century is difficult to comprehend today – patients suffered unbearable only relieved by a speedy conclusion. The necessity of anesthetic agents was not lost on surgeons, but there was a lack of systematic research. Opiates were administered gratuitously, alcohol intoxication, hypnotism, and sometimes even a blow to the chin was used. Unfortunately none worked reliably, and surgical textbooks of the day scarcely mentioned pain. Illustrations showed patients lying quietly, apparently unconcerned in the midst of gruesome and painful procedures. All this changed on October 16, 1846 thanks to a resourceful but profiteering dentist.

Discovery
William T.G. Morton began his dental career at the Baltimore College of Dental Surgery. Without finishing his degree, he studied with Horace Wells, a Hartford dentist, in 1841. The two became partners during 1842 and 1843, but this proved unsuccessful and Morton set up his own practice in Boston. He attended several classes at Harvard Medical School in 1844 and studied briefly with Charles T. Jackson, an internationally famous physician, chemist, and geologist. He quit his extracurricular academic interests to focus on his practice when it began to flourish.

Morton specialized in prosthetic dentistry, considering it essential to extract all tooth material from the jaw before fitting a prosthesis. Although skilled, his technique was laborious and painful, discouraging many potential clients. He realized that he was losing business, so he looked for a way to make extractions painless. At this time, dentistry was a trade, not a profession, and many kept their special techniques secret. It is no surprise that Morton was so cautious in his search. He took interest in ether because Charles Jackson had suggested its local application might deaden the pain of extractions. Results were inconsistent, and his interest turned to ether vapor. His experiments in the summer of 1846 were on household pets, then on himself and his assistants. His results were unreliable, and Morton sought Jackson’s help. Jackson suggested that Morton could improve his results if he used chemically purified sulfuric ether rather than less pure commercial products. After additional tests on himself and his assistants, Morton felt confident...
enough to administer ether to a patient. On the evening of September 30, 1846, Eben Frost came in with an intensely painful tooth and begged Morton to hypnotize him, a standard but ineffective pain reliever. Morton claimed that he could offer something far more effective, and Frost agreed to ether. After inhaling the ether through a handkerchief, Morton painlessly extracted the tooth and Frost had no recollection of the extraction.\(^5\)

After this success, Morton inquired about the possibility of patenting a new process using sulfuric ether. He received an uncertain response, but was assured that a definitive answer could be provided by consulting the law.\(^3\) Morton then approached John Collins Warren, head of the surgical staff at the Massachusetts General Hospital (MGH), about a public demonstration. Hoping for a patent and fearing piracy, he refused to disclose his exact preparation. Warren had ethical misgivings because the preparation’s identity and safety were unknown. Despite misgivings, Warren had an invitation sent to Morton written by one of the junior house officers, perhaps reflecting Warren’s skepticism and reservations.\(^1\)

Morton’s demonstration was scheduled for October 16, 1846. The operating theater was full and skepticism was pervasive. Morton was late because of several last minute changes to the inhaler.\(^5\) Warren was impatient and decided to proceed. “As Dr. Morton has not arrived, I presume he is otherwise engaged,” he remarked to the audience implying that Morton was too fearful of failure to show up.\(^6\) Morton rushed in with his newly configured inhaler and applied the ether vapor to the patient, who was soon asleep. The theater watched in silent anticipation as Warren started his incision over a vascular tumor in the patient’s neck. To everyone’s surprise, the patient didn’t startle, scream, or give any indication of pain. As Warren ligated the deep vessels, the patient started moving his limbs and uttering nonsensical expressions. Warren doubted the success of the operation until he had full confirmation from the patient that he had had no pain. He then turned towards the amazed audience and famously remarked, “Gentlemen, this is no humbug”.\(^3\)

**Origins**

The origins of inhalation anesthesia predate Morton’s interest. After nitrous oxide was shown to be relatively safe in the early 19th century, traveling chemistry professors lectured on gases and demonstrated their exhilarating effects. Nitrous oxide was quite popular because intoxicated individuals spoke foolishly and would sometimes laugh uncontrollably. It became fashionable to inhale nitrous oxide at lectures and social gatherings.\(^3\) In many social circles, ether replaced nitrous oxide because of the ease of obtaining, storing, and administering it. Ether frolics, where participants would become drunk from ether vapor, became popular, particularly among students.\(^7\)

Morton wasn’t the first to demonstrate ether as an anesthetic - Crawford Long, a well-trained physician practicing in the small town of Jefferson, Georgia, was. His offices were a clubroom for the town’s young intellectuals, and meetings often turned into ether frolics. Long enjoyed inhaling ether and often discovered new bruises on himself and his friends afterward. They had no recollection of pain or the causes of these bruises, and Long concluded that ether could eliminate pain. He put his observations into practice on March 30, 1842, when a boy named James Venable approached him requesting removal of two small neck masses. Long explained his observations to Venable, as he knew that Venable enjoyed inhaling ether.\(^3\) After getting consent, Long painlessly removed one of the sebaceous cysts. Although thrilled with his achievement, he only gave ether for seven minor operations over the next four years and didn’t publish the report of his cases until 1849. Regardless of his lack of influence, Long had the innovation and courage to experiment with ether as a surgical anesthetic.\(^5\)

Horace Wells also had an important impact on the development of anesthesia. On December 10, 1844, he and his wife attended a lecture in Hartford, Connecticut by Gardner Colton, a traveling professor. Colton demonstrated with
laughing gas, but Wells noticed that a participant suffered a severe gash to his knees without reacting to the pain. He reasoned that nitrous oxide might be able to alleviate the pain associated with dental procedures. After asking Colton to produce some nitrous oxide for him, Wells inhaled it and had one of his own wisdom teeth extracted. Upon waking he exclaimed, “I felt it no more than the prick of a pin. This is the most wonderful discovery of our time.”

In the following month, Wells performed about fifteen painless dental procedures with nitrous oxide and felt confident enough to demonstrate it publicly. John Warren invited Wells to demonstrate a dental extraction on a student in January 1845. Unfortunately, the gasbag was withdrawn too soon, the anesthesia was incomplete, and the student screamed in pain. This proved disastrous, and the surgeons took no further interest in Wells or his methods. This demonstration had a strong and lasting impression on Morton, launching his clandestine quest for an effective and reliable anesthetic agent.

Fallout
Morton’s success with ether continued after his original demonstration. The following day he aided in the removal of an adipose tumor from a woman’s arm. The patent commissioning office confirmed that etherization could be patented. Unhappily, the patent commissioner was a friend of Thomas Jackson’s, and had been persuaded by Jackson to consider a joint discovery. Although Jackson was a distinguished academic, he had an unsavory tendency to take credit for other people’s inventions, especially when they had financial promise. Jackson’s friend at the patent office persuaded Morton to include Jackson’s name, and the patent was issued on November 12, 1846.

During this time, Morton had been prohibited from using ether at MGH because he had kept his preparation a secret, calling it Lētheon, Greek for forgetfulness. John Warren and other senior surgeons at MGH were concerned about using a preparation whose composition and safety were unknown. He finally revealed it to be nothing more than sulfuric ether on November 6. The next day Morton administered ether in two major operations both of which were complete successes, and the MGH surgeons were fully persuaded of the importance and effectiveness of this discovery. Morton enjoyed the endorsement of the MGH staff in his mission to collect fees and regulate the use of ether anesthesia.

As ether anesthesia became more accepted, Jackson wrote two letters to a friend in Paris claiming that he discovered ether anesthesia and introduced it into surgery, and that it had been thoroughly tested and accepted at MGH. These letters were presented to the Académie des Sciences, and the European scientific community accepted Jackson’s claims. Morton learned of Jackson’s letters and collected evidence to refute his claims, but Jackson’s connections in Europe had more influence. He continued to enjoy the support of his international friends from Paris and London.

Horace Wells also challenged Morton’s claims. After Wells’ failure with nitrous oxide at MGH, he returned to Hartford and became so seriously ill that his practice was ruined. In December 1846, his friends advised him to publish a statement in the Hartford Courant. He claimed that he should have rights to the discovery based on the fact that his nitrous oxide experiments used the same principles as Morton’s ether discovery.

Morton’s patent was soon ignored all over America and Europe, as surgeons used a sponge instead of Morton’s specialized inhaler. The United States Army and Navy broke his patent with their widespread use of ether during the Mexican War in 1847. Morton’s efforts to collect fees and regulate anesthesia failed and his dental business was ruined. In 1849, Morton petitioned Congress to recognize his claims and to compensate him. After three appeals, Congress finally agreed to reward Morton with a $100,000 award in 1852. Jackson’s and Wells’ supporters objected, and Crawford Long was persuaded to submit a claim in 1854. All the proposed bills were rejected due to the excessive number of claimants, and no one received any reward.
Afterward

Of the four figures involved in the ether controversy, only Crawford Long’s life wasn’t destroyed by the desire to gain prestige and monetary reward. After the Congressional debates of 1854, he gave up and continued his practice in Georgia until his death. As a hero of the South, his successful use of ether is commemorated by Doctor’s Day every March 30.5

Horace Wells’ attempts at recognition failed, and he left his family unsupported in Hartford, returning to New York City to resume experiments. He became addicted to chloroform and committed suicide after being incarcerated for throwing sulfuric acid on prostitutes. Twelve days later, the Paris Medical Society gave him the honor of being first to use vapors or gases to make surgery painless.5

Charles Jackson became an uncontrollable megalomaniac. When he came across Morton’s grave in 1873, Jackson developed a severe psychotic illness. He was placed in an institution for the insane outside of Boston and remained there until his death in 1880. He was buried just a short distance from Morton at Mount Auburn.5

Morton became obsessed with financial reward and recognition for his contribution to anesthesia. However, none of his schemes were successful, and he was ruined by them. His creditors ignored him; he lost his home, and was censured by the American Medical Association. In the summer of 1868, Morton journeyed to New York City to refute a new publication by Thomas Jackson claiming credit for ether anesthesia, but Morton suffered heat stroke during a heat wave.5

The discovery of ether anesthesia revolutionized surgery and dentists had the most important influence on this discovery. Many surgeries that save or improve lives are now readily possible. Although their motives may have been suspect, it was their drive, courage, and innovation that led to this important discovery. Because of the bitterness and peculiarities of the ether controversy, it is fitting that no individual receives credit. The Boston Public Garden is home to the Ether Monument commemorating the discovery of ether anesthesia as a treatment rather than an individual.8

References