

The results obtained in the determination of the four samples examined are as follows:

Pepper:

Percentage of shells by weight.....	3.3%
Percentage of shells by ash.....	3.1%
Percentage of shells by cylinder measure.....	3.22%
Percentage of shells by microscopical analysis.....	3.2%

Colocynth:

Percentage of seeds by cylinder measure.....	4.3%
Microscopical analysis, with the aid of Millon's reagent.....	4.61%
The same, with the aid of chlor-zinc iodide.....	4.7%

Buchu:

Percentage of stems by weight.....	17%
Percentage of stems by Cylinder measure.....	16.1%
Percentage of stems by Microscopical analysis.....	16.2%

Saffron:

Percentage of yellow tissue by weight.....	23.0%
Microscopical analysis.....	23.7%
Cylinder measure.....	23.0%

BOSTON'S ETHER MONUMENT TO THE UNNAMED DISCOVERER OF GENERAL ANESTHESIA.*

BY CHARLES M. FORD.

Prior to March 1842, there is no evidence extant that any surgical operation had ever been performed under a general anesthesia; that is, by means of an agent producing paralysis of the sensory nerves, as well as the nerves of motion, notwithstanding the fact that sulphuric ether was known to chemists and pathologists for two centuries. But the world at large was not informed of the properties of ether as a general anesthetic until after a demonstration in the Massachusetts General Hospital at Boston, October 16, 1846.

Rival claimants to the honor of discovery with sordid zeal were instrumental in heralding to humanity everywhere the discovery of this greatest blessing to mankind, medical or otherwise.

How proud we should be that this great blessing was conferred by an American in America. How natural that the State of Georgia when called upon to name its two most distinguished sons, to be immortalized in the Hall of Fame at Washington, should have given one of these places to Crawford Williamson Long as the author of painless surgery. Harvey, the discoverer of circulation of the blood; Jenner, in saving the world from the scourge of small-pox, are dwarfed in the presence of the modest dignified physician-pharmacist, who, in the little hamlet of Jefferson, Ga., performed a surgical operation with general anesthesia induced by ether. And the greatest act in the career of the brilliant Dr. Jackson—whom the scientific world would have loved to honor as the first to make use of ether as a general anesthetic—was, when after a painstaking investigation, he, in 1861, placed the crown of original discoverer upon the brow of Crawford Williamson Long.

*Read before Section on Historical Pharmacy, A. Ph. A., New York meeting, 1919. Illustrated by lantern slides.

The medical world, at all periods, seems to have been content in the delusion that pain and surgery were inseparable, mitigated only by the use of some narcotic drug such as poppy, henbane, conium, belladonna, cannabis, etc. Freezing of the part to be operated was sometimes resorted to, it having been observed that in war the frozen limbs of soldiers were painlessly amputated. Alcoholic intoxicants, to a degree producing complete insensibility, were resorted to. Carbonic acid gas to produce partial suffocation with attendant unconsciousness was reported on in 1828. In 1800, Sir Humphrey Davy proclaimed the peculiar properties of Nitrous Oxide and suggested its use for painless dentistry and surgery. Chloroform, first produced in its pure state at Sacketts Harbor, by Guthrie in 1831, was not employed by the surgeon until 1847. Though a close rival of ether, and possessing some marked advantages, the large number of fatalities following in its wake, with that everpresent dread of danger, have retarded the use of chloroform and given ether, to this day, an easy precedence.

It is not possible for the people of this generation to realize the blessings of ether. It is necessary to have lived in a period preceding its use in surgery, to have heard the groans of thousands of soldiers upon the field of battle, and to have known the sufferings of thousands in private life who were forced against the surgeon's steel. As we contemplate the limitations placed upon surgery by the interference of pain we are able to measure the sufferings of a vaster number, deterred from obtaining that relief which surgery would surely bring them. It is true we have made progress in the use of local anesthetics; it is also true, that chloroform, ethyl chloride, and nitrous oxide are at present dividing the honors with ether, still it is beyond dispute that modern surgery, with its almost super-human achievements, rests squarely upon the use of sulphuric ether.

It is significant that one of the earliest uses made of ether was to allay the pains of parturition. A twilight sleep for the agonizing mothers of humanity—*there* is pain in a class by itself, the most awful the race is made to endure, and not remotely approximated by any experienced in surgery. As we behold the vastness of the agony and torture, that have been banished by ether, we are able to appreciate its blessings with everlasting gratitude.

How natural, therefore, the impulse that prompted the erection of a most magnificent monument in the Public Gardens of Boston to Ether. Although standing, as it does, in the heart of the City of Boston, it may easily have escaped the notice of a majority of the pharmacists visiting that city, where so much that is historic is to be seen. Here resistance to England's domination first took concrete form on this continent, and in this region the first gun was fired for American Liberty, which was heard around the world.

Boston and its environs have in no wise neglected to perpetuate the memory of the leading part which those early settlers took in the founding of an American Nation. Their deeds are fittingly inscribed on tablets of bronze and marble, and upon shafts of everlasting granite. No writer of American history is competent, and no student can even have commonplace knowledge, who has not visited Boston. A short course at Boston should be a prerequisite for teachers of history in our public schools.

The Public Gardens in which the Ether Monument stands are an extension of the famous Boston Common, the most highly prized piece of public land held

within the confines of any city of the world, and therefore, Boston's foremost attraction. It is well named the Common, for all who enter it are upon a level, no means of locomotion being permitted, except that which nature most equitably bestowed upon us all. The ubiquitous automobile, that Juggernaut of the reckless rich, is not able to invade this sacred and hallowed playground of the people.

The monument need be but briefly described here, as it is so completely shown in the slides that are placed before us. It was dedicated in 1868; the donor was Thomas Lee, a public spirited citizen, of Boston. It is a granite and red marble structure rising thirty feet in height from a square basin into which, from the four sides of a cubical base, spouting lions gush forth streams of water. Sculptured water-lilies and other aquatics adorn this base. At the summit of the structure



Two Views of the Boston Ether Monument.

rests a group representing the Good Samaritan giving aid to a wounded sufferer; the capitals are carved with poppies and oak leaves. In each of its four canopied sides is built a marble slab bearing an appropriate inscription and surmounting an allegorical bas-relief.

The principal inscription the monument bears is as follows:

“To commemorate the discovery that the inhaling of ether causes insensibility to pain, first proved to the world at the Massachusetts General Hospital, in Boston, October, A. D., 1846.”

The stranger within the gates of Boston, viewing the ether monument for the first time, is struck by the absence of the name of any person in connection with the discovery or administration of the agent to whom credit might be given, and the inquiry arises, who administered the ether on October 16, 1846?

Thereby hangs a tale, a real drama, with its scenes extending over two continents, and both houses of our National Congress, through several sessions, vigorously debating in detail the rights of the various claimants, and the principles of anesthesia. As pharmacists we have more than a passing interest in that controversy, and it is a matter that this Section of the American Pharmaceutical Association may properly take cognizance of since Dr. Long, whose title to being an original and independent discoverer of General Anesthesia is now undisputed, was a pharmacist of repute as well as a physician. The only cloud on his title to being the earliest original discoverer was placed there by the foremost Boston claimant, Dr. C. T. Jackson, who stated that he had observed general anesthetic properties of ether sometime during the winter of 1841-2, while inhaling the vapor at his laboratory, though he was unable to give the exact date of this observation and had never then or subsequently administered it to another or witnessed its use in surgery.

Dr. Jackson was a scientist of world-wide repute with attainments to appropriately grace the discoverer of the greatest boon ever given to humanity. He was graduated from Harvard Medical College in 1829, and spent the three following years in study and travel abroad. Upon his return to this country he reported upon 200 autopsies of cholera victims in Europe. The human body was not a large enough subject for Jackson. Geology and chemistry of minerals attracted him. While his professional card announced that he conducted a chemical and geological laboratory at 32 Somerset Street, Boston, the area of his activities was unbounded.

The states of Maryland, Maine, New Hampshire, Rhode Island, as well as his native state of Massachusetts, made use of his distinguished services. He was called even to the upper peninsula of Michigan, at that time beyond the frontiers of Commerce, to report upon the copper deposits found there. The British Government sent him to Nova Scotia and other provinces to make investigations. His published papers, reports, maps and surveys were voluminous and of the highest order. His fame was international. It is known that he was to some extent a collaborator of Morse, and not unwilling to share in the honor of discovering the electric telegraph. In 1873 the light became dimmed in the dome of this great intellect, his mind gave way, and he died in Massachusetts General Hospital, August 28, 1880.

Among the students in Jackson's laboratory was a young dentist named W. T. G. Morton, who graduated in dentistry at Baltimore Dental College in 1842, at 23 years of age. He came to Boston to practice dentistry, and for a time lived in Dr. Jackson's home. He also registered for a course in medicine in 1844. Pain-



The Boston Ether Monument.

less dentistry was a hobby with Morton, and nitrous oxide gas did not fully satisfy him. He learned of ether, and used it successfully in the extraction of teeth. Perhaps he was indebted to Jackson for his knowledge of ether, though Jackson never had said so at the time, and was apparently willing that Morton should have all the glory and gain for making use of ether in his dental practice. How natural it is that young Morton should have suggested the use of ether in surgery; the fact in all probability being unknown to him that it was already in use, and had been for four years in Georgia, for this fact was not even known to the management of the Massachusetts General Hospital, who willingly arranged an opportunity for a demonstration of the properties of ether. The first operation October 16, 1846, the removal of a tumor from the neck, was sufficiently successful to convince all present that the era of painless surgery had arrived. The second operation, the removal of a tumor, was even more satisfactory, and the third operation was a successful amputation above the knee.

Though Dr. Jackson was not present at these, and had never even witnessed the use of ether in surgery, he comes forth with a statement that during the winter of 1841-2 (his favorite way of giving that date), he had observed the properties of ether as a general anesthetic, by inhaling its vapor, while seated in a rocking chair in his office, and he marshals his friends to testify to his having mentioned the fact in their hearing. But he was not able to convince the management of the hospital. With reason they asked why he had not for four years proclaimed its usefulness in surgery and directed attention to the vast amount of pain needlessly endured because of his neglect. The hospital authorities sustained Morton in his contention, and have never wavered.

Immediately following the splendid performance at the Massachusetts General Hospital, the activities of Dentist Morton take on a strange turn. Philanthropy and science are cast to the winds, opportunity to make a name for himself highest among the benefactors of mankind ignored, and we see him in the rôle of a promoter, bent only upon capitalizing his superficial knowledge. He circularizes the dental and medical professions throughout the country, offering to license at a certain schedule of royalties the use of his compound, which he christened "Letheon," beautifully suggestive of that "river of forgetfulness" from which the gods were wont to drink, and places attorneys at once to work securing a U. S. patent. While criticizing Morton for his methods we may temper our condemnation when mindful that the great Behring sought to limit and control, with a U. S. patent, the use of antitoxins in combating diphtheria and tetanus and, the foremost medical mind of the age, the great Ehrlich who, following those valuable researches which led to the discovery that certain carbon compounds of arsenic were powerfully antagonistic to the syphilis spirochete, gave the use of his name and a laboratory number to a gang of daylight robbers. But why blame individuals for what is but the natural avarice of our species, while Uncle Sam authorizes the extortion and protects it with an iron hand?

Morton was a testimonial getter, and able to induce members of the staff of the Massachusetts General Hospital to sign up for the merits of his alleged secret compound. A queer code of ethics, to say the least, that must have prevailed in those days. Dr. Jackson was willing to accept a modest one-tenth interest in the patent, which was duly issued, November 12, 1846, within one month

after the ether demonstration in Boston. What visions of wealth must have disturbed the slumbers of the crowd that put that patent through. Every family was sure to have the luxury of a painless surgical operation. Each individual with thirty-two teeth, and a pain in every one; oh, what a revenue! but there was a miscalculation somewhere. Ether was a common article of commerce, and the people used it instead of sending to Boston for Letheon. The patent yielding no return, the adventurous Morton petitioned Congress to award him \$100,000, as a public benefactor, and he spent years of his life in this fruitless endeavor.

He was able to secure the support of some of the ablest members of Congress, and the Congressional debates of those years upon the properties of ether afford even now very interesting reading.

Stephen A. Douglas, then in the Senate, and later defeated by Lincoln for the Presidency of the United States, was an ardent champion of Morton, while W. H. Seward, afterwards Secretary of State during the Civil War, vehemently opposed his claims. Other contestants, with their special champions in Congress, opposed Morton, in the hope of profiting by the award, with the exception of Dr. Long, who sought none of the monetary benefits, being content to have shown himself to be the earliest known, original and independent discoverer of general anesthesia.

The Great Academy of Science of Paris was induced to take notice of the ether controversy, there being no such institution in this country, and no national medical organization at that time. The claims of Jackson and Morton only were before the French Academy; though the former was well known and highly esteemed for his writings and scientific attainments, the best he was able to secure in the contest before the Academy might be termed a "draw." The sum of twenty-five hundred francs and a medal was voted to each of the two contestants, the French way of putting it being, "that it was the hand of Morton, but the head of Jackson."

It is easy now to see why the people of Boston believed neither Jackson nor Morton worthy of having his name upon the Ether Monument. The inscriptions were wisely ordered and record the exact truth, because the world at large was not informed of the properties of ether until after the demonstrations at Boston, October 16, 1846. The pursuit of gain or glory by the various claimants gave the needed publicity. The monument, however, should record the fact of an earlier independent discoverer, in the person of Crawford W. Long, and this could be added, without in the least marring a word or a thought of the original inscription.

To the credit of Dr. Jackson it must be stated that he publicly declared "if he had known of the claims of Dr. Long at the time he would have presented them to the Academy of Sciences in Paris." The prospects of immense revenue or Congressional award brought forth several claimants, who had little or nothing on which to base a claim. Most persistent among these was Horace Wells, a young dentist of Hartford. He had had some experience with nitrous oxide of an empirical nature, but little or no knowledge or experience with ether. Yet after his death in 1848 his friends were able to secure valiant spokesmen in Congress in his behalf, and the state of Connecticut erected in the city of Hartford a monument to his memory, as the discoverer of surgical anesthesia.

Probably the most exhaustive investigation into the claims of the various

contestants for the honor of first having used ether was that by J. Marion Sims, and published in the Virginia Medical Monthly in 1877. Dr. Sims gave the force of his great name and character to an unqualified indorsement of the claims of Dr. Long.

Knowing that Dr. Joseph Jacobs, of Atlanta, an honored member of the American Pharmaceutical Association, had in his youth been apprenticed in the pharmacy of Dr. Long, and throughout the life of the latter continued on terms of closest friendship, he was appealed to for particulars in the career of this great man. Through the three daughters of Dr. Long, still living in Athens, Ga., this section is furnished with an authentic biographical sketch.

Ether being a leading article of manufacture of the firm with which I have the honor to be associated, makes its history of special interest, and it was with no little emotion, when business duties carried met hither, that I found myself in the home town of one of the world's greatest benefactors, and permitted to look upon the instruments used by Dr. Long, among which were those first used in painless surgery.

Dr. Crawford Williamson Long's immediate ancestors were Irish; his great grandfather, James Long, emigrated from Donegal County in 1762, with his wife, who was Ann Williamson of the same county, together with his nine-year-old son, to Carlisle, Pa. This son afterward became Captain Samuel Long, who fought throughout the Revolutionary War, and in 1792 moved to Madison County in Georgia. Here his son, James Long, the father of Dr. Crawford W. Long, grew up to manhood, and when established in business in Danielsville, married Elizabeth Ware. The discoverer's maternal ancestors were from Albermarle County, Virginia, and settled in Georgia after rendering service in the War for Independence.

Thus we find that Crawford Williamson Long was born at Danielsville, Ga., November 1, 1815, and of an ancestry from which to inherit vigor, intelligence and gentle instincts.

His academic education was received at Athens, Ga., in old Franklin College, afterward made a part of the University of Georgia. He graduated at the University of Pennsylvania as a medical student in 1839, after a course of two years' study, having previously attended for a year Transylvania University at Lexington, Kentucky. From Philadelphia he went to New York City, and spent one and a half years in the hospitals of that city, familiarizing himself with all branches of painful surgery. His sensitive nature was doubtless shocked very often by the agonies of patients, with no agent to destroy or lessen the keen and awful attendant sufferings.

On his return to his native State, Dr. Long elected to settle and establish practice in a county adjoining that in which his *Alma Mater* is situated, and it was thus at the county seat of Jackson County, in the town of Jefferson, he made his debut as a general practitioner of medicine, with special attention paid to surgery.

A form of amusement among the people for which Dr. Long was responsible was known as the "ether party." A number of young people would meet in some hospitable home to observe the peculiar actions of those exhilarated by ether. Doubtless at these frolics a sufficient quantity of ether was occasionally given to produce general insensibility. How natural that the keen mind and kindly soul

of Dr. Long should have seen the possibilities of painless surgery. He was soon to have an opportunity of putting his theory into practice.

James M. Venable, Esq., a friend and patient afflicted with tumors located on the back of his neck, agreed on March 30, 1842, to inhale ether and give his consent to the removal of one of the tumors while under the influence of the anesthetic. Venable was required to allow a towel saturated with ether to be held over his mouth and nose; and, while continuing to inhale the ether, Dr. Long made the necessary incisions and cuts and removed an encysted tumor. Mr. Venable afterwards stated that he had suffered no pain whatever. The facts of this operation as here related are attested by Dr. Long's written and published statement, and the affidavit of James M. Venable, Esq., now treasured by Dr. Long's daughters at Athens, also by dozens of sworn statements made by physicians, neighbors and citizens who had personal knowledge of the facts of the operation and its freedom from pain, all giving particulars as to time, place and other essential circumstances.

This event marks the first surgical operation, known in history, to have been performed with a general anesthesia, and the day, March the 30, 1842, one of the most important in medical annals.

A second operation, removing another tumor from the neck of Mr. Venable, was performed by Dr. Long, June 6, 1842. Proof of the date and manner and painlessness of these operations is sustained by verified statements of William H. Thurmond, Esq., J. E. Hayes, Esq., and E. S. Rawls, Esq., kept in a bank vault at Athens by members of Dr. Long's family.

The third operation under ether which Dr. Long performed was the amputation of the toe of a negro boy, without pain to the patient.

The preserved testimony of Mr. William Vinson shows that Dr. Long, September 9, 1842, removed from the head of Mrs. Mary Vinson three wens, two of them without ether, causing great pain, and the third free from pain, when the patient submitted to the use of ether.

Milton Bailey, Esq., and G. L. Thompson, Esq., credible men, swear that Dr. Long amputated two fingers of a negro boy, one without ether and with much pain, and the other without pain while under ether. This was during the summer of 1846.

In 1851 Dr. Long removed to Athens, Ga., where he resided and practiced his profession until his death on June 6, 1878.

A monument stands on the public square at Jefferson, Jackson County, Ga., in honor of the great discoverer, unveiled in 1910, by the Medical Association of Georgia. His *Alma Mater* in medicine, the University of Pennsylvania, has placed in its medical building a bronze medallion bearing the following inscription:

"To the memory of Crawford W. Long, who first used ether as an anesthetic in surgery, March 30, 1842."
