

Life of C. T. Jackson

Joseph Hale Abbot, Transcribed by Charles Bird

This essay was written for the American Encyclopedia but not published, only a part of it having been used contrary to the author's directions and against his protests. C.T. Jackson.

Note: J.H. Abbott was an American educator, inventor, and science writer who was a contemporary of C. T. Jackson and like Jackson was a member of the American Academy of Arts and Sciences and served as its recording secretary for several years.

Jackson, Charles Thomas, chemist, mineralogist, and geologist, and the discoverer of etherization, was born at Plymouth, Massachusetts, June 21, 1805. He is descended on the father's side from Abraham Jackson, one of the first settlers of Plymouth, who married a daughter of Nathaniel Morton, the Secretary of the Colony. Dr. Jackson's father was Charles Jackson of Plymouth, a respectable and successful merchant. His mother was Lucy Cotton, daughter of Rev. John Cotton of Plymouth, a descendant of Rev. John Cotton of Boston, England, and afterwards the first pastor of the first Church of Boston New England, in compliment to whom the name of Boston was given to the latter city. He had the misfortune to lose both his parents when he was twelve years old. He was at this time attending a private school kept by Rev. John Allyne, D.D. of Duxbury, under whose instruction he remained for three years. At the expiration of this, he was placed by his guardian in a mercantile house in Boston. He had already acquired so strong a taste for experimenting in electricity and chemistry, that the leisure he could command, after his duties had been faithfully discharged, was chiefly devoted to experimenting in those sciences and often with apparatus made by himself. His thirst for scientific knowledge was so strong that at the end of a year the idea of his becoming a merchant was, though against the wishes of his friends, given up, and he applied himself with great diligence under the excellent private instruction, to the preparatory studies for entering Harvard College. Having qualified himself to enter College he

decided, with a view to save time, to prosecute the various studies embraced in the collegiate course under private instruction, and to offer himself for admissions in the last term of the Junior year. When he had completed this course of study, his health was so much impaired that his friends dissuaded him from entering college, as he had intended. To recruit his health, he traveled on foot through the states of New York and New Jersey in the company of several distinguished naturalists, among whom were Baron Lederer, McClure, Say, Lesueur, and Troost, making scientific observations and collecting objects of natural history.

On his return to Boston, he commenced the study of medicine, under the instruction of Dr. James Jackson and Dr. Walter Channing, and received the degree of Doctor of Medicine in Harvard University, January 21, 1829. In the same year he gained the Boylston Prize for the best medical dissertation, the subject assigned being *Paruria Mellita*. In the summer of 1827, while he was a student of medicine, he made in company with his friend, Francis Alger of Boston, a mineralogical and geological survey of the British province of Nova Scotia, an account of which was jointly published by them in the *American Journal of Science* in the year 1828. In the summer of 1829, they chartered a vessel and revisited Nova Scotia, and greatly extended their former Survey. They collected a large number of interesting minerals and fossils and presented them to various scientific institutions in America and in Europe. They afterwards published a fuller account of the Mineralogy and Geology of Nova Scotia, together with a geological map of the province, in the *Memoirs of the American Academy of Arts and Sciences*.

This scientific paper was reviewed in the most favorable terms by M. Elie de Beaumont in the *Revue Encyclopedique* in the year 1832. In the autumn of the year 1829, Dr. Jackson embarked for Europe, where he spent three years. He continued his medical and scientific studies at Paris in the University of France, attended all the lectures in the *Ecole de Medicine* and the *College de*

France, the scientific lectures at the Sorbonne, and the geological lectures of M. Elie de Beaumont at the Ecole Royale de Mines, and attended with great assiduity the hospitals of Paris. He was also a private pupil of M. Auguste Berard, professor in the Ecole de Medecine, and under this able teacher had every facility for rendering himself a skillful anatomist and operative surgeon.

In 1831 he made a pedestrian tour through Switzerland, Piedmont, Lombardy, Tyrol, Bavaria, and Austria. While he was at Vienna the cholera broke out in that city. In company with Dr. John Fergus of Scotland and Dr. Johannes Glaisner, a Pole, he dissected the bodies of about 200 patients who had died of cholera in the hospitals of Vienna, and transmitted to Dr. James Jackson of Boston, his former medical instructor, a minute description of the disease and the morbid appearances observed on dissection. This paper was published in the Boston Medical Mag. for 1832. On leaving Vienna, he visited Trieste, Venice, Padua, Florence, Rome, and Naples, and made a geological tour round the island of Sicily in company with Professor Jameson Torrey, Dr. John Home of Edinburgh, and Alexander DeClouct of Louisiana, and with them ascended Mt. Etna. Of this volcanic mountain, and also of Mt. Vesuvius and the Lipari Islands, he made a very minute geological examination. On his return to France, he travelled alone on foot through the picturesque volcanic region of Auvergne, and visited its mines, furnaces and manufactories. One of his prominent objects in this journey was the study of the geology of the countries through which he had passed, and the collection of specimens of their rocks and minerals.

Having arrived at Paris, he devoted the summer months to the study of surgery, especially of gunshot wounds received in the insurrection of the 5th and 6th of June in 1832; and to giving a course of private instruction in the hospital St. Antoine to some of the pupils and the internes of that hospital, in which he repeated to a great extent the surgical lectures of M. Berard, illustrating them by operations on the dead subject. Having purchased, together with a select medical and

scientific library, a considerable variety of surgical, philosophical and chemical apparatus, including an Electro-magnet, two galvanic batteries, and a considerable quantity of silk bound wire for experiments, he took passage in October 1832, in the packet ship Sully for New York. During the voyage he described an experiment recently witnessed by him in Paris, in which electricity had been transmitted instantaneously several hundred times round the Sorbonne. Some remarks having been made about the desirableness of transmitting intelligence with the same rapidity, he at once declared it to be possible to do it and proceeded to point out several ways of accomplishing that object.

The idea of telegraphic correspondence by means of electricity was not new. It was first suggested, according to M. Savary (Comptes Rendus of the French Academy of the Sitting of July, 1838), by Dr. Franklin, and frictional electricity was applied for that purpose by several Individuals during the last century, and the earlier part of the present century. In 1826 and in 1827, Mr. Harrison Gray Dyar, then of New York, contrived a registering telegraph in which frictional electricity was, by means of wire supported in the air, to be sent through moistened litmus paper, made to move uniformly by means of clockwork, producing red spots; and these spots, being produced at different distances, were variously combined so as to form a system of alphabetical signs. In 1809 Soemmering applied to telegraphic purposes the visible evolution of gases from the decomposition of water by the action of the voltaic current. In the year 1810, Dr. J. Redman Coxe of Philadelphia, according to the statement of Professor W. R. Johnson, passed signals along a wire, a mile in length, and proposed a telegraph founded on the instantaneous passage of the galvanic current, and its property of producing chemical changes upon prepared paper. Dr. Coxe published his plan in the 1816 in Thompson's Annals of Philosophy. In May, 1802 Giandomenico Romagnosi discovered the deflection of the magnetic needle from its normal position by the action

of galvanic current. This first discovery in the science of electro-magnetism, though published in a newspaper at Trent in August of the same year, and in 1805 at Paris in Professor Izarn's "Manuel du Galvanisme," did not become generally known to scientific men until Oersted published an account of similar observations in 1820. (See Historical account of the introduction of the Galvanic and Electro-magnetic Telegraph by Dr. Hamel, member of the Imperial Academy of Sciences in Saint Petersburg: London; August 1859.)

In 1820, Ampere contrived an electro-magnetic telegraph, in which the deflection of the magnetic needle by the galvanic current was to be employed as a visible signal. Baron Schilling of St. Petersburg constructed a telegraph on this principle, and exhibited to the Emperor Alexander; and in 1830, then using either one or two circuits and having reduced it in other respects to great simplicity, to the Emperor Nicholas. It was not known to philosophers in Western Europe till 1835, when he exhibited it at a meeting of German naturalists at Bonn, on the Rhine. Professor Henry had, during Dr. Jackson's absence in Europe, published his important discovery, that, by employing a battery consisting of a number of pairs of plates instead of a single pair, a voltaic current may, contrary to the opinion previously published by Barlow, be transmitted through a long circuit with little diminution of power; and that it may be made to produce mechanical effects at a distance, as the ringing of a bell, by developing magnetism in a bar of iron surrounded with a long coil of fine wire forming a part of the voltaic circuit.

This brief statement is sufficient to show what was the state, in the year 1832, of electric and electro-magnetic telegraphy. No recording electro-magnetic telegraph had been devised or suggested, and no electric telegraph of any kind was or had been used except in the way of mere experiment. Several methods of telegraphic communication were devised by Dr. Jackson on board the Sully. One of them was to use sparks of frictional electricity in an interrupted wire circuit as

visible signals. Later research has shown this method of telegraphy to have been previously proposed by others. Another method was to produce changes of color and chemically prepared paper by transmitting a voltaic current through it. This method had been proposed by Dr. Coxe of Philadelphia and has been since applied in Bain's telegraph, though with paper prepared in a different manner from that proposed by Dr. Jackson.

Another method, which was entirely new, and to which he attached most importance, was to transmit a voltaic current through a wire circuit connecting the transmitting and the receiving station, and including as a part of it at the latter place a coil of insulated wire surrounding an iron bar and forming an electro-magnet. The short arm of the lever was to be attached to the armature of the electro-magnet, and the longer arm to have affixed to it a marking point or pin, which, when the circuit was closed, should impress on a fillet of paper, uniformly moved before it by means of a clockwork, dots or short lines according to the duration of the closure. The dots or short lines and the interspaces being taken singly or variously combined into groups according to a prearranged system, were to serve as signs or symbols of letters or numbers. The idea was also conceived of printing telegraphic communications by affixing self-inking types, instead of points, to the long arms of the levers. The general plan of the electric-magnetic telegraph just described the minor details of which were not definitely arranged, embraces the essential features of the American Telegraph patented in the year 1840 by Mr. S. F. B. Morse.

This gentleman then a painter, and afterwards Professor of the Literature of the Arts of Design in the New York University, was a passenger on board the Sully and was greatly interested in the plans described to him by Dr. Jackson and exercised his ingenuity in arranging a system of signs and symbols to be marked on the fillet of moving paper, and various mechanical contrivances relating to them. Dr. Jackson in the spring of the year 1834 constructed, successfully worked, and

exhibited to Mr. Francis Alger and other friends a telegraph combining the peculiar features of that which he had invented on board the Sully, and thus demonstrated, so far as it could be done by an experiment on a small scale the practicability of his method of telegraphic communication; but he did not think that it could be profitably brought into public use till the invention of the sustaining battery by Daniell in the year 1837 furnished the means of obtaining a long continued voltaic current of uniform strength. Dr. Jackson makes no claim to the exclusive invention of the American Telegraph in the improved form in which it is now used. With his plan have been combined various inventions and discovery of others; -as a system of alphabetical signs or symbols similar in principle to one applied by Steinheil, at Munich in 1837 to telegraphic signaling with a single voltaic current, the discovery by Steinheil in 1837 that the ground may be used for half the voltaic circuit; the discovery, made independently about the year 1836 or 1837 by Henry and Wheatstone, of the principle of the combination of circuits, whereby one galvanic circuit made to be made to bring into action another galvanic circuit.

A controversy arose in the year 1837 between Prof. Morse and Dr. Jackson in regard to their respective claims to the invention of the Telegraph contrived on board the Sully, Professor Morse claiming to have been the sole inventor of it. The evidence printed for the use of the Court and Counsel in subsequent trials of cases between litigating proprietors of telegraphs,---which the writer has carefully examined, together with other published evidence, disproves this and various other claims by Professor Morse, and makes it morally certain that from his ignorance of the science of electro-magnetism when he was on board the Sully and afterwards, he could not have then contrived the telegraph as alleged by him. Dr Jackson, on the other hand, was intimately acquainted with that Science, had electro-magnetic apparatus on board the vessel, and published a

few weeks afterwards a description of Pixii's magneto-electric machine, which had recently been invented, in the American Journal of Science and Arts.



Photo of Hippolyte Pixii's electromagnet.

Courtesy of the Collection of the Massachusetts Historical Society.

In the year 1833, Dr. Jackson settled at Boston, and entered upon the practice of medicine and surgery, under favorable auspices and with flattering success. In 1834, he married Miss Susan Bridge, daughter of the late Nathan Bridge, a respectable merchant of Boston, a union which has been productive of much happiness. His leisure hours were devoted to medico-chemical research, to analytic chemistry, and mineralogy; and he occasionally made geological excursions in Massachusetts and in neighboring states. Finding his services as a chemist and geologist and frequent request, and his health being impaired, he was induced to abandon the practice of medicine, and to devote himself to chemistry, mineralogy and geology, as his professional pursuits.

Since that time, he has made many private geological surveys and explorations of mines, and various numerous chemical analyses. In 1836, he received the appointment from Governor Everett of Massachusetts, and Governor Dunlap of Maine, of state geologist to survey the State of Maine and the public lands of Massachusetts in that State. The labors of this survey occupied him three years. He prepared two annual reports for Massachusetts and three for Maine: the latter forming a

thick octavo volume and, and one quarto volume of plates. In 1836 he drew up at the request of General Dix, secretary of State of New York the plan for a geological survey of that state, which was adopted as the best plan proposed. He was appointed by Gov. Marcy one of the State Geologists of New York, but resigned the commission, preferring the geological survey of Maine. This survey was interrupted by the boundary troubles, which absorbed the money in the state treasury, and prevented further appropriations for its completion. In the year 1839 he was appointed by the Governor of Rhode Island Geologist to that State and made a geological and agricultural survey of it in one year. His report with a colored geological map of the State, was published in one octavo volume, and is much valued by the agriculturalists of Rhode Island. In 1840 he was appointed State Geologist to New Hampshire by Governor Page. He was employed three years on the geological survey of that State, and in 1844 he prepared a Report containing a geological map, sectional views, numerous illustrations, and valuable results of the original research for the improvement of agriculture, the whole forming a quarto volume, printed in a style credible to the State.

While the report was in the press, he was called to explore the wilderness on the Southern shore of Lake Superior in company with Hon. David Henshaw, formerly Secretary of the Navy, and first made known the wonderful mineral resources of that region, so remarkable for its enormous veins of native copper, its accompanying native silver, and for its inexhaustible masses of specular and magnetic iron ores. At the time of this visit, the whole country was one unbroken, uninhabited wilderness of forest trees, without road, path, or Indian trail. By the discovery of valuable copper mines, this first exploration of Keweenaw Point attracted adventurous miners, and abundant capital soon flowed in from the Eastern States. In two years the most valuable copper mines were all leased from the United States by individuals or companies; and now the whole mining region is

thickly peopled, flourishing villages, with all the resources of civilization, having grown up along the shores of the Lake, and steam navigation enlivens the waters of that great island sea. In 1845, Dr. Jackson again visited this region, and opened other mines of copper, and discovered the existence of mountains of iron ore which were explored by his assistants and are now extensively wrought. He then caused the first systematic mining for native copper by means of regular works to be undertaken; and the mine then opened continues to excite wonder on account of its enormous masses of native copper, weighing hundreds of tons.

In the year 1847 an appropriation having been made by Congress for geological survey of the mineral lands of the United States in Michigan, Dr. Jackson was appointed by the Hon. Robert J Walker, Secretary of Treasury, to make that survey. The work was carried on for two years in a very thorough manner. The exact position of the rocks and the mineral veins was designated, and colored geological maps and sectional profiles in great detail, were prepared, giving a true picture of the surface and of the relief of the rocky strata. The minerals of the region were collected and described, and the ores and the metals were analyzed and assayed, so that a report could be made which should embrace every fact important to the interest of science or of mining. The selfish intrigues of several individuals, on the change of administration at Washington, prevented a completion of the survey by Dr. Jackson, and much valuable work was lost. His report was published in the year 1850, in one octavo volume.

In the year 1834, Dr. Jackson made the discovery, which was communicated by him at the time to N. C. Keep, M.D.—a highly respectable dentist, by whom and by others it was practically applied—that an alcoholic solution of chloroform, when made to act locally on a nerve, renders it insensible to pain; and that if a piece of lint saturated with a mixture of one part of chloroform and three parts of alcohol is inserted into the cavity of the painful carious tooth, it destroys the pain at

once, and that by repeated applications it completely destroys the sensibility of the nerves. This was local anesthesia. Having been early impressed with the remarks of Davy concerning the remedial agency of gaseous matters, and having long before experimented with exhilarating gas or protoxide of nitrogen, he resumed in 1837 his experiments with that gas, in order to test the comparative effects on the nervous system of different modes of administering it; but the only new result he obtained was to satisfy himself that the temporary insensibility which it sometimes produces, especially when inhaled through a small aperture, is due in greater or lesser degree to partial asphyxia, and is consequently dangerous.

Subsequently to this date, but previously to the winter of 1841-2, having received from his friend Mr. John H. Blake, a skillful chemist, the present of some perfectly pure sulfuric ether prepared by himself, Dr. Jackson conceived of the idea of inhaling its vapor to ascertain the effect on the human system. He knew that sulphuric ether, as then sold in the shops, was very impure, containing alcohol and various noxious acids and amylic compounds. He believes that the deleterious effects which had been produced by inhaling it, were owing to the want of a due admixture of atmospheric air, and to the use of very impure sulfuric ether; and he determined to try the effects upon himself of inhaling pure ether vapor duly mixed with atmospheric air. He inhaled it to such an extent as to lose all sensation, and soon afterwards all consciousness and without suffering any injurious or disagreeable consequences. From this and from other experiments in which he inhaled ether without producing loss of consciousness, he became satisfied that sulphuric ether vapor, if pure and mixed with common air, may be inhaled without danger.

In the winter of 1841-2, he inhaled ether vapor for relief from the very severe distress occasioned by the accidental inhalation of chlorine. Dr. John B.S. Jackson, professor in the

Medical School of Harvard University describes this pain as being “quite as agonizing as the pain inflicted by the Surgeon’s knife”. Dr. William F. Channing and Mr. James T. Hodge met each with a similar accident. The former describes the distress he suffered as having been of “such a character as to make him apprehend and immediately fatal result”, and the latter states he was “rendered speechless for several hours.” Immediately after the accident referred to above, Dr. Jackson inhaled sulphuric ether and ammonia alternatively, hoping thus to neutralize the chlorine by the hydrogen of the ether and the acid so formed by the ammonia; and he experienced considerable relief at the time. The next morning his throat was severely inflamed and very painful, his lungs were much oppressed, and he made a more thorough trial of ether vapor. In a published letter addressed to Mr. Jos. Hale Abbot, he gives a minute account of this trial of ether vapor for the relief of pain. The interest which must ever be attached to this Experiment fraught with inappreciable benefits to mankind, is sufficient reason for inserting the following extract from the letter notwithstanding its length:

Having taken a bottle of pure sulphuric ether, from my laboratory, I went into my office, soaked a folded cloth with it, squeezed it out slightly, and seated myself in a rocking chair. Having laid my head back against the rocking chair, with my feet supported in another, so as to give me a fixed position, I placed the cloth over my mouth and nostrils and commenced inhaling the ether. The effects perceived by me were at first a little coughing, a sensation of coolness, then warmth and fullness of the head and chest, exhilaration and giddiness, numbness, or want of feeling in the feet and legs, a swimming sensation as if I had been afloat in the air, together with a loss of all feeling of the rocking chair in which I was seated, loss of all sensation of pain in the throat and chest, a state of reverie, and soon entire unconsciousness, for a space of time unknown to me. Recovering, I felt a sense of giddiness, but with no desire to move, found the cloth I had moistened with the ether had dropped from my mouth, had no feeling of pain in the throat and chest but began to feel a strange thrilling in the body. In a short time, I felt the soreness in the throat gradually returning, and the distress in the chest also, though much less than it had been before. From the cessation of all pain, and the loss of all feeling of external objects, a little while before and after the loss of entire consciousness, I was led to infer, that the paralysis of the nerves of sensation would be so great, during the continuance of the unconsciousness and the total loss of feeling, that a surgical operation could be performed upon a patient, under the full influence of ether vapor, without giving him any pain; and, therefore, I prescribed it, with entire confidence in the result. The effects observed in the previous experiment, in which

I had inhaled sulphuric ether in order to notice its effects upon the system, were, with the exception of coughing, and relief from pain similar to those I have just described.

In a subsequent letter addressed to Baron Humboldt, Dr. Jackson explains the process of reasoning by which he inferred “that a surgical operation could be performed on a patient under the full influence of sulphuric ether without giving him any pain”, as follows:

In the rapid inductions of the mind, it is not always easy to trace the exact method of thought, by which we suddenly arrive at great truths; but so far as I can trace the reasoning which rapidly flowed through my mind, it was upon principles well understood by all educated physicians and physiologists. I knew that the nerves of sensation were distinct from those of motion and of organic life, and that one system might be paralyzed without necessarily and immediately affecting the others. I have seen often enough, in my medical practice, the nerves of sensation paralyzed without those of motion being affected, and those of motion paralyzed without the ganglionic nerves or those of organic life being affected. I knew also that the nerves of sensation are stationed as sentinels near the exterior of our bodies, to warn us of danger from external causes of injury; and that there is no feeling in the internal portion of our bodies. I knew also that when the knife is applied in surgical operations, there is little sense of pain in any parts beneath the skin. This my own surgical experience, as well as that of others, had long ago demonstrated, and the philosophy of these physiological facts was made known to the medical in England and this Country, by the research of Sir Charles Bell, of England and was fully proved by all eminent anatomists and physiologists of the continent of Europe.

Now I had observed. 1st. That the nerves of sensation in my own body were rendered insensible to pain for some time before unconsciousness took place. 2nd That all pain had ceased in a suffering part of my body during the stages of etherization, preceding and following the unconscious state. 3rd That this state of insensibility of the nerves of sensation continued for a sufficient length of time to admit of most surgical operations, and I had reason to believe that, during the unconscious, the degree of insensibility was still greater, so that it would be impossible that any pain could be felt in the surgical operation. 4th That the nerves of motion and of the involuntary functions of respiration and of circulation were in no wise affected, the functions of life going on as usual while the nerves of sensation, were rendered devoid of feeling, and the body could suffer no pain.

The induction drawn by Dr. Jackson from the facts observed by him, required, like Jenner’s discovery of vaccination, verification on an extended scale. He proposed, in September 1842 to Dr. S. A. Bemis, a highly respected dentist, to apply ether vapor in his dental operations. Subsequently, on his recommendation, W.F. Channing, M. D. Inhaled ether vapor with entire relief

for the time from exceedingly severe distress caused by the accidental inhalation of a large quantity of chlorine. In February 1846, he recommended to Mr. Joseph Peabody, a graduate of Harvard college, and then a student in chemistry in his laboratory, who was about to have two teeth extracted, to inhale ether vapor as a perfectly safe and sure means of rendering the operation painless, and fully instructed him how to purify and use the ether. Mr. Peabody began to re-distill some ether for the purpose; but the highest medical authorities being arrayed in opposition to Dr. Jackson's opinion of the safety of producing insensibility by ether vapor, and his father objecting to his incurring risk for so slight an operation, he finally decided not to make the proposed trial of ether.

Thus it appears that previous to the first application of ether vapor to render the extraction of teeth painless in 1846, Dr. Doctor Jackson had experienced in his own person, and witnessed in the case of Dr. Channing, the power of ether vapor to annihilate exceedingly severe pain; and it is in evidence that he had communicated with more or less fullness to at least ten gentlemen, most of whom are medical or scientific men, his observations and conclusions respecting the anesthetic power of sulphuric ether. One of them testifies that in 1842 or 1843, Dr. Jackson after communicating to him his observations and conclusions, added, "If you will come to me sometime hence, you can have a tooth extracted, or a limb cut off without pain, and without knowing anything about it." Several of them state that he expressed his conviction that ether vapor is capable of rendering the severest surgical operations painless. Dr. Augustus A. Gould, a Fellow of the American Academy of Arts and Sciences, in his deposition in perpetuum taken in 1852 upon the petition of W. T. G. Morton, testified that some three or four years before Morton's first use of ether in a dental operation, Dr. Jackson told him of his having used sulphuric ether with great relief as an antidote for the pain caused by inhaling chlorine, and spoke of "its producing relief from

pain and surgical operations.” Dr. Gould also testified in reply to cross-interrogatories by Dr. Jackson’s counsel, that Mr. Morton stated to him very soon after his first use of ether by inhalation and dental operation that Dr. Jackson had proposed to him (Morton) previously to that operation the use of sulfuric ether to induce Insensibility to pain; had specified the use of rectified ether; and had directed the manner, and assured him of the safety of the application.

On the 30 of September 1846 Mr. W.T.G. Morton, a dentist and then nominally his pupil in medicine, came to Dr. Jackson’s office to borrow a gasbag for the purpose, as he stated, of administering common air to a patient by inhalation, in order, by acting on her imagination, to induce her to submit to the extraction of a tooth. He was dissuaded from this attempt to deceive her by Dr. Jackson, and was leaving the office, when Dr. Jackson stopped him and said, “Now, Morton, I can tell you of something that will produce a real effect.” He then directed him to go to Burnett’s an apothecary, who was known to be particularly careful in regard to the quality of his medicines, and get some pure sulphuric ether, pour it on a handkerchief put it to his patients mouth and let her inhale it; and assured him that a state of insensibility, of short duration, would be produced without danger to the patient, in which he could extract a tooth from her without giving her any pain. A conversation of considerable length ensued in which Dr. Jackson, in order to remove Mr. Morton’s fears of injurious consequences, briefly described his own experiments and their effects, and distinctly said, “It will not do the least harm, I assure you”. In the words of a witness, “Dr Jackson urged the matter very earnestly and with perfect confidence, taking on himself the whole responsibility.” He went through the process of applying ether to the handkerchief, placing it to his mouth, and making several deep inhalations saying, “This is the way you must take it.”

Mr. Morton promised to try ether vapor. He made the trial in the manner prescribed by Dr. Jackson, and with entire success. A tooth was extracted without giving any pain or causing any other unpleasant effects. The next day Mr. Morton reported the result to Dr. Jackson, who expressed no surprise, it being exactly what he had predicted. He immediately told Mr. Morton that leave must be obtained from one of the surgeons of Massachusetts General Hospital to administer sulphuric ether to a patient about to undergo a capital operation. To this Mr. Morton, having conceived the idea of taking out a patent for the application of sulphuric ether vapor to prevent pain, and fearing the ether would be detected odor, strongly objected, and it was only after much urging and after showing him how to disguise the odor by oil of Neroli, that Dr. Jackson succeeded in inducing him to go to the hospital. In this conversation Mr. Morton repeatedly requested Dr. Jackson to keep the matter secret, which the latter refused to do. The first surgical operation upon a patient under the influence of ether vapor administered by Mr. Morton, was performed by Dr J. C. Warren with little suffering from the patient. The second operation which was performed by Dr Geo. Hayward, was entirely successful, the patient suffering no pain. Dr. Jackson's induction relative to the power of ether vapor to destroy pain, which had been partially verified by the effects experienced in his own person, by the effects experienced by Dr. Channing, by the experiments performed by Mr. Morton and under his instructions and on his responsibility was now verified in its whole extent, viz. that ether vapor has power safely and surely to render the severest surgical operations painless.

The knowledge and application of this great discovery were widely diffused through the civilized world, and it was everywhere hailed with enthusiasm and delight. In November, Dr. Jackson, through undue confidence in the judgment of a solicitor of patents, was very reluctantly prevailed upon to unite with Mr. Morton in applying for a patent, to be issued in the name of the

latter, for the application of ether vapor as an anesthetic agent, the solicitor representing this step to be necessary in order to secure his right of discovery, as Mr. Morton would otherwise take out a patent, and obtain a legal paper in which he alone would be recognized as discoverer. Dr. Jackson deeply regrets that he departed in this instance, from a rule which he had prescribed to himself, and to which he has adhered in all other cases, never to take out a patent for any discovery or invention. He afterwards destroyed the bond securing him a certain percentage of the profits. In Nov. 1846 he refused to accept the sum of money accruing from the sale of patent rights and has never received any pecuniary advantage from the patent. Till February 1847, Mr. Morton, uniformly ascribed his first knowledge of the applicability of sulfuric Ether for producing insensibility to pain to Dr. Jackson. This fact is proven by the printed testimony of the assistants in his office, of his agents for selling patent rights, of various purchases for such rights, and of others. He then set up pretensions to the discovery of etherization. He alleged in direct contradiction to his previous statements, that he had experimented with sulphuric ether during the previous summer, with a view to discover how it could be made available as an anaesthetic agent, but without alleging that he had ever obtained any satisfactory result, or that he had ever applied it in a single dental operation.

On the two grounds of Mr. Morton's alleged seeking for the discovery, and the acknowledged fact of his first painless extraction of a tooth from a patient under the influence of ether vapor, Mr. N.J. Bowditch, his principal advocate, in the annual Report of the Board of Trustees of the Massachusetts General Hospital, claims for him the discovery of etherization. The letters of the other members of the Board of Trustees, written in reply to inquiries of Hon. Edward Stanley, member of the Congressional "Select Committee on the Ether question", leave Mr. Bowditch solely responsible for everything relating to the ether controversy contained in that Report, Others

had long before sought to discover means of preventing the pain of surgical operations. For this purpose, says Sedillot (Charles-Emmanuel Sedillot (Sep 18,1804—Jan 29,1883) an eminent French surgeon, “narcotics, compression of the nerves, the ligature of the limbs, intoxication, nitrous oxide, and (animal) magnetism had been tried. These means variously employed, had been less efficacious than dangerous. “Seeking for a discovery” confers no title to discovery. Halley, Hooke and Wren sought to discover the law of gravitation, but on their meeting with difficulties they could not surmount, Halley applied for assistance to Newton, who in the words of Whewell, “supplied him with what he had ardently sought for”. No one claims for Halley, Hooke and Wren a participation in the discovery because they had been unsuccessfully “seeking” to make it. The claim set up on behalf of Mr. Morton on the ground of his first extracting without pain in a tooth from a patient to whom he had administered ether vapor in the manner prescribed by Dr. Jackson, or in the words, on the ground of partial verification, is equally unsound. This principle has been repudiated by mankind in the case of Franklin and others. Franklin inferred from his own and others’ observations and experiments the identity of electricity and lightning; and devised and published to the world an experiment for verifying his induction.

Coiffier, an ex-dragon first verified the induction by taking an electric spark during a thunderstorm from a rod erected at Marly la Ville, near Paris, by Dalibard, who had instructed him how to perform the experiment contrived by Franklin. Franklin’s experiment with the kite was performed a month later: that experiment and others similar to it were but the further verification of a discovery already complete. “Posterity have unanimously agreed” say the Edinburgh Encyclopedia, in associating his (Franklin’s) experiment with this brilliant discovery” Mr. Morton’s claims to discovery on the grounds of verification, are as groundless as those of Coiffier. Whewell, the eminent author of various works on the inductive sciences, in a letter addressed to

Dr. Jackson uses these words: "I do not concede that experiments of verification, made after a discovery has been clearly brought to view by one person and devised by the discoverer, and committed by him for performance to another, give the operator a right to claim the discovery as his own." The facts admitted by Mr. Bowditch are abundantly sufficient according to the principle universally recognized by mankind in the case of Franklin, to establish Dr. Jackson's exclusive claim to the discovery of etherization.

These admissions of Mr. Bowditch are accurately stated in the following extract from Stanley's Congressional Report: "He (Mr. Bowditch) adopts as in accordance with his views, the declaration of Dr. George Hayward, one of the surgeons of hospital, that, Dr. Jackson first suggested the use of ether in surgery and the declaration of Dr. Jacob Bigelow, one of the physicians of the Hospital that Dr. Jackson made partial experiments and recommended but did not make decisive ones." He admits that Dr. Jackson devised and communicated to Mr. Morton the experiment performed by the latter, and gave him information and directions absolutely essential to its safety and success; that Dr. Jackson had experienced on his own person and observed in Dr. W. F. Channing, the anaesthetic effects of sulfuric ether; that he recommends Mr. Joseph Peabody, in March 1846, sulphuric ether to prevent the pain of the operation of extracting two teeth, and gave him full instructions as to the requisite purity of ether and the proper mode of using it as he did in the September following to Mr. Morton; And yet, after all these admissions, Mr. Bowditch declares that Mr. Morton by the mere performance of the first painless extraction of a tooth from a patient and under influence of sulfuric ether made the great discovery of etherization. His language is as follows: "He (Mr. Morton) certainly first administered it (sulphuric ether) to a patient; by so doing, he made the discovery! In other words, performing with the hands an experiment devised and

committed to him for performance by another man made him the author of one of the greatest discoveries ever made in inductive sciences!”

From Mr. Morton’s ignorance of chemistry and physiology, it was morally impossible for him to discover the two conditions of safety of etherization—the purity of ether from acids and alcohol, and a due admixture of atmospheric air. It is in evidence that a few days after the first trial of sulphuric ether in a dental operation he exhibited to Dr. Jackson’s students in chemistry an apparatus for administering ether vapor without any provision for common air and Dr. Keep, who had ample opportunity for witnessing his dental operations testifies that “he appeared to be in no sense aware of the importance of admitting air.” Even surgeons committed the same error. The first account of the application of ether in surgery which were transmitted to Europe contained no statement of the aforesaid two conditions of safety; in consequence of which not a few eminent surgeon’s early experiments with sulphuric ether at Paris were failures, and the new anaesthetic agent fell into general discredit. Dr. Jackson’s letter to Eli de Beaumont had been placed in paquet-cachete in consequence of its being erroneously supposed to be his wish to take out a patent for the discovery in France.

A few weeks afterwards Dr. Jackson’s paper, in which he made known those two conditions of safety, M Roux, one of the aforesaid surgeons exclaimed “J’y prends part en ce moment” — from this moment I take part in it (the discovery). From this time dates the prosperity of etherization in Europe. Dr. Jackson has been widely recognized as the discoverer of etherization and has received numerous tokens of the high appreciation in which his services for the relief of human suffering are held. In the year 1852 one hundred and forty-three physicians of Boston and its vicinity signed a memorial to Congress, in which they ascribed the discovery of etherization exclusively to Dr. Jackson. Among the distinguished men who have after examination of the

evidence in the case recognized in published letters or other writings the justice of Dr. Jackson's claims to the discovery and may be mentioned Hon. Edward Everett, Hon. Edward Stanley, former member of Congress and author of a report on the ether question, Charles G. Loring, Sir Charles Lyell, Rev. W. Whewell D.D. author of the history of the inductive sciences and the late Hon. Franklin Dexter, and numerous others.

In forty-two works published in various languages by physicians and surgeons in Europe between the years 1847 and 1852, the discovery of anesthesia is ascribed with entire unanimity to Dr. Jackson. The French Academy of Sciences on the proposition of the Commission on the Montyon Prize of medicine and surgery for the years 1847 and 1848, which had thoroughly examined and weighed the evidence in favor of the various claimants to the discovery, decreed a prize of 2,500 francs to M. Jackson for his observations and his experiments upon the anesthetic effects produced by the inhalation of ether. and another 2500 francs likewise to M. Morton for having introduced that method into surgical practice in conformity with the indications on M. Jackson (d'après les indications de M Jackson)" *Comptes Rendus des Seances de L'Academie des Sciences*, 17 Mai 1852.

M. Elie de Beaumont, now Perpetual Secretary of the French Academy, in a letter to Dr. Jackson dated Paris 17 May, 1852 uses the following language in reference to this award: "In point of fact, the Academy of Science decreed one of the Montyon prizes of 2500 francs to you for the discovery of etherization, and that has decreed a prize of 2500 francs to Mr. Morton for the application of this discovery to surgical operations." In 1849 Dr. Jackson received from Louis Napoleon then President of the French Republic, the cross of the Legion of Honor and from Oscar King of Sweden the Gold Medal of Merit struck expressly for him; in 1855, the Imperial decoration of the Order of the Medjidie, from the Sultan of Turkey; in 1857 he was appointed Cavaliere dei

Santi Maurizio e Lazzaro by Victor Emmanuel, King of Sardinia and in the same year he received the Order of the Red Eagle from Frederick Wilhelm, King of Prussia the order was conferred on the recommendation of Baron Von Humboldt to whom the King had referred to documentary evidence procured through Daniel Webster Secretary of State from the several American claimants of the discovery of ether.