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BUXTON, Dudley W.
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Crawford Williamson Long (1815-1879): the Pioneer of Anæsthesia and the first to suggest and employ Ether Inhalation during Surgical Operations

BY

DUDLEY W. BUXTON, M.D.

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1912

Crawford Williamson Long (1815-1879): the Pioneer of Anæsthesia and the first to suggest and employ Ether Inhalation during Surgical Operations.

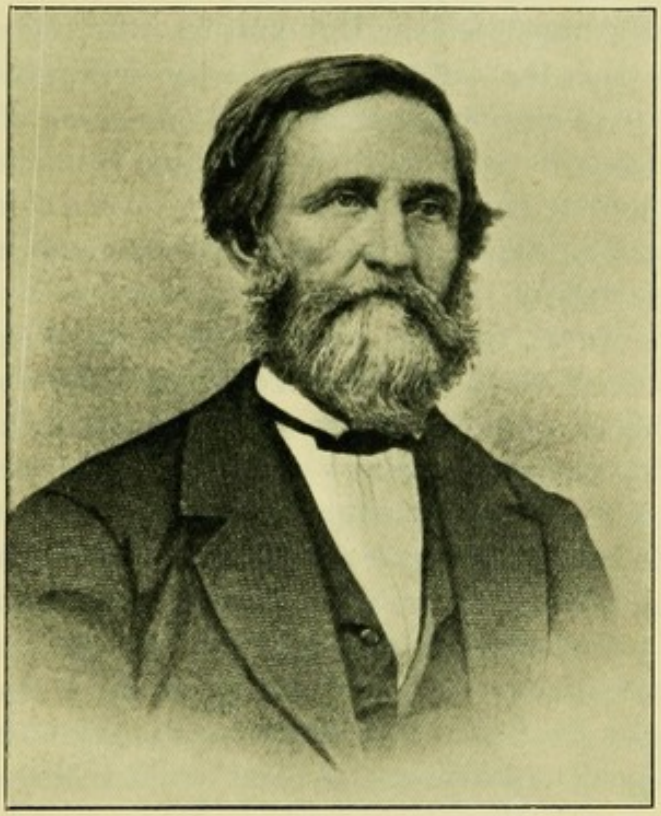
By Dudley W. Buxton, M.D.

Although the discovery of anæsthetics has bestowed the greatest blessing upon suffering humanity, its birth has been marked by much polemic and in some cases with scant recognition of those who have done so much for mankind. While disputants claiming for themselves, or their friends, the plaudits due to great discoverers, have rent the welkin with their angry cries and clamoured for a material solatium, one man, Crawford Williamson Long, reputed to be actually the first to produce artificial anæsthesia by inhalation of ether—was content to stand aside, calm and dignified, as one who strove to benefit his race while seeking for himself neither guerdon nor worldly honour. I propose to submit to your consideration the facts which have been accumulated and which to my mind prove Long's right to the world's acknowledgment that he was the pioneer of anæsthesia. It is impossible to do justice to the man without making at least an attempt to understand the environment in which he worked, and to analyse the professional and public opinion at the time he lived concerning the possibility of anæsthesia. Even so late as 1846 Sir Benjamin Brodie wrote: "Physicians and surgeons have been looking in vain, from the days of Hippocrates down to the present time, for the means of allaying or preventing bodily pain." In his mind were, no doubt, the spongia

somnifera of Theodoricus of Lucca, opium, cannabis indica, mandragora, and the whole gamut of nostrums vaunted through the centuries; the claims of Denis Papin, and of Cardan, whose magnet he averred could abrogate pain; the compression of the carotid arteries by Valverdi; nerve compression, suggested by Ambroise Paré and practised by James Moore and subsequently by John Hunter in what is now St. George's Hospital; Wardrop's (1832) bleeding to syncope, adopted by Richerand; and Mesner's claims to dissociate the astral from the corporeal body. Many methods had been called, but, as the sequel will show, few had been chosen.

But what of the man himself? Crawford Williamson Long was born on November 3, 1815, at Danielsberg, Georgia. His family were of high intellectual and social standing; his grandfather, Captain Samuel Long, who had emigrated from Ireland, was a philanthropist and man of affairs, prominent in the war of his troublous times. Captain Long's wife was a Miss Williamson, of Ulster, and her maiden name was perpetuated in that of her grandson. Of Long's father we learn that he was high in the esteem of his fellow-countrymen and the intimate friend of W H. Crawford, after whom he named the subject of this history. Crawford held important official posts, twice represented his country in France, and was a Secretary of State. Long's mother, although an invalid, by her literary gifts added culture to her home. Thus was Crawford Long brought up amidst refined and public-spirited persons, an environment which could but make for those traits of character which in later life developed him into the best type of the man and of the physician. A few words will suffice to tell the subsequent story. "Studious and wise beyond his years," Long, whose extreme youth when he went to college earned him the sobriquet of "The Baby," graduated brilliantly at Franklin College — now the University of Georgia—when but 19 years old. His chief friend and class-mate was Alexander H. Stephens, later to be elected Vice-President of the Southern Confederacy, and to him and Long were erected monuments in Statuary Hall, Washington, the twain chosen by Georgia as the greatest men of her State. From Franklin College he proceeded to the University of Pennsylvania, and at the age of 23 graduated in Medicine. As was customary for those who could afford it, Long spent some time after this walking the hospitals of New York. The suggestion made to him by his teachers, who recognized his peculiar merit as a surgeon, that he should attach himself to the medical service of the United States Navy, was discountenanced by Long's father, at whose instance he

settled as a general practitioner in Jefferson, Georgia, and commenced civil practice in 1841 at the age of 26. It should be remembered that it was in this same year that Braid, of Manchester, made his trial of the "neurhypnotic trance," and Esdaile in India successfully operated upon hypnotized patients. Elliotson, who had migrated from St. Thomas's to University College Hospital, was then giving the full weight of his great mental power to mesmerism, although his book on "Surgical Operations performed in the Mesmeric State without Pain" was not



Crawford Williamson Long.

published until 1843. There is no doubt that, at the time of which we write, mesmerism or the hypnotic trance was regarded as the accomplished fact of anæsthesia, and that in the United States many of the leading men in medicine and surgery accepted it as the long hoped for panacea whereby suffering humanity could pass unflinchingly through the ordeals of the surgeon's knife. In France, Richerand had tried it and pronounced for its value, and other surgeons scarcely less eminent were willing to swallow the doubtful reputation of Anton Mesmer so long as they could benefit their patients by employing methods which

had been exploited by his fertile brain. Inhalational anæsthesia thus started with a heavy handicap. In 1846, to anticipate, the editors of the *New Orleans Medical and Surgical Journal* wrote apropos of ether inhalations: "That the leading surgeons of Boston could be captivated by such an invention as this under such auspices and upon such evidences of utility and safety as are presented by Dr. Bigelow excites our amazement. Why, mesmerism, which is repudiated by the savants of Boston, has done a thousand times greater wonders and without any of the dangers here threatened. What shall we see next?" *En passant*, let it be remarked that the sapient editors were condemned to see many things apparently unpalatable. But putting this aside, the quotation appears to show that the utility of mesmerism was widely accepted and constantly practised during surgical operations, even if the Bostonian savants condemned it; and further, that any fresh departure in the direction of promoting painless surgery was open to the most embittered criticism. The importance of this fact will be made manifest in the sequel of our narrative.

We must, however, retrace our steps for a brief space and try to obtain a clear idea of what was the current knowledge about ether before Long's first trials of its powers as an anæsthetic. In the books dealing with drugs and poisons ether found a place. It had been known since the thirteenth century and although some of its merits were recognized it was regarded as so dangerous as to be taboo. However, when through the enthusiasm of Dr. Beddoes, the work of Priestley and the discovery of oxygen and nitrous oxide, pneumatic medicine became a vogue ether again assumed prominence. The foundation of the Hotwells Hospital at Clifton, Bristol, by Dr. Beddoes gave that astute physician a wide experience in inhalational medication. He had studied Mayou's experiments and was familiar with Priestley's work, so that when young Humphry Davy, freed from his indentures to a doctor in Penzance, became his assistant, Beddoes was able to study the gases, the effects of which in the treatment of disease he has given in his delightful collected writings in four volumes entitled, "Considerations on the Medicinal use and on the Production of Factitious Airs." The first part was Beddoes's work, the second being due to James Watt, the engineer. In one of these volumes we find a letter from Dr. Pearson, of Birmingham, the accepted authority in his day upon therapeusis both in this country and in the States. In it he says that Beddoes's researches on "Factitious Airs" had led him to try "the vapour of ether" to relieve the suffering of phthisical patients and with benefit to them. Further, when Mitchell's

book on chemistry appeared Beddoes found to his chagrin that the chemist declared nitrous oxide to be a "virulent poison," so he re-commenced experiments with oxygen and nitrogen as well as with nitrous oxide gas. Davy, who undertook these researches, came to the conclusion that Mitchell was wrong, and that "the gaseous oxide of azote is perfectly expirable." He also announced that its inhalation cured the pain of an aching tooth and added, "It may probably be used with advantage during surgical operations in which no great effusion of blood takes place." Alas, no one took the hint and nitrous oxide remained for nearly fifty years the chief stock-in-trade of travelling lecturers who gave this gas to members of their audience to provoke exhilaration and semi-unconscious gyrations. These "frolics" were well known, and M. Filvée, in his "Lettres sur l'Angleterre" (1802),[1] mentions these revels as one of the many follies to which English people were prone.

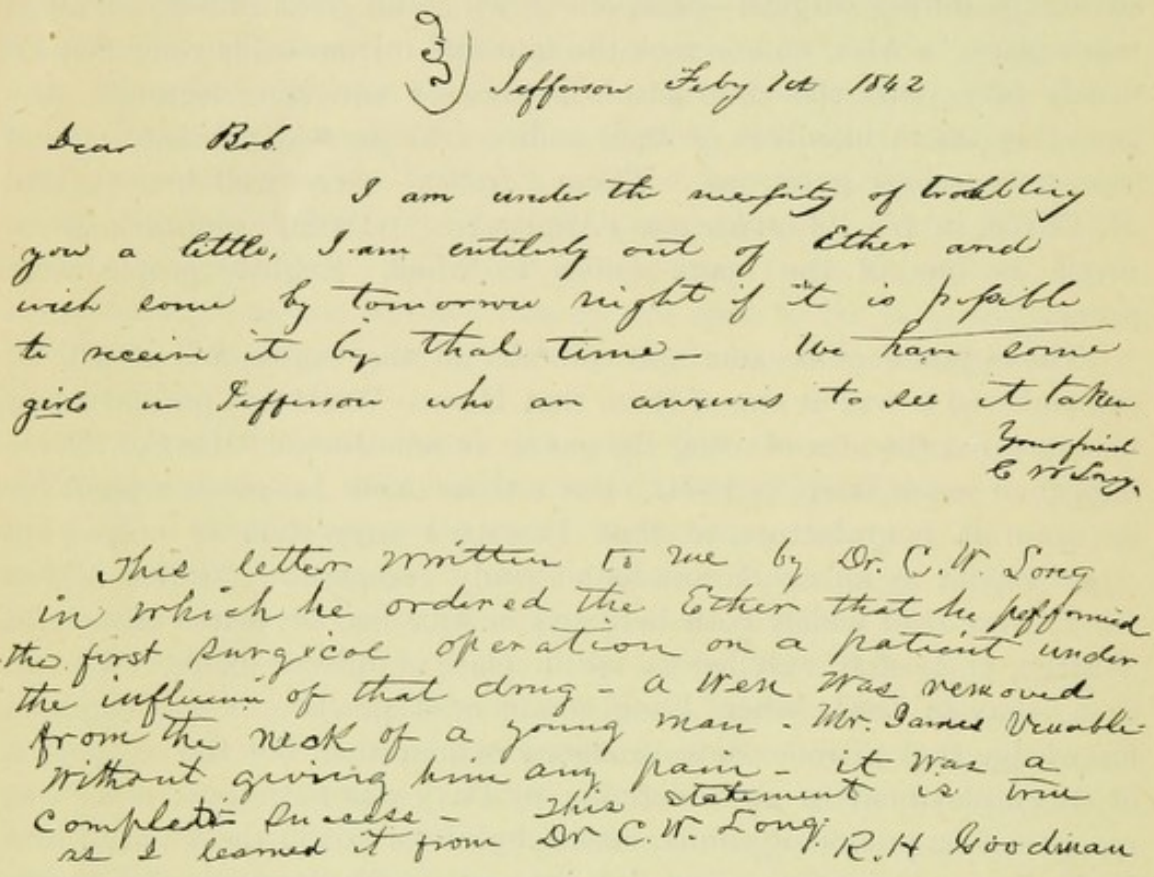
These practices became also common in the States, and it will be remembered it was at one of them that Horace Wells was present when he conceived the idea of using the gas as an anæsthetic. This of course happened much later, in 1844. But nitrous oxide gas needs a plant for its accurate manufacture, so that Pearson's suggestion of employing ether vapour as an exhilarant found ready acceptance. Cullen, whose works were read widely both here and in America, advocated ether, and Warren, of Boston, extolled its use in place of nitrous oxide. We see, then, that in 1841, when Long commenced practice, it was common knowledge that nitrous oxide produced exhilaration, but the suggestion of its employment as an anæsthetic by Davy was forgotten; ether was recognized as producing similar effects, but if we except the doubtful hint in the *Journal of Sciences and Arts* associated with the name of Faraday (1818), no one had grasped its greater merits, while the books of Pereira and others cautioned against its employment, since stupor and death, they averred, might readily be brought about. Long, it appears, had when a student actually inhaled ether during an "ether frolic," and was so far familiar with its effects.

Jefferson in those days was an isolated country village—one might almost say, "the world forgetting, by the world forgot"—so that Long had to pursue his own way relying upon himself and practically out of touch with the centres of surgical thought. His personal charm and high scientific attainments made his house a place of social resort for

[1] Quoted by Mr. Geo. Foy ("Janus") in his life of C. W. Long, 1900, p. 2.

the neighbourhood. Let Long himself tell us of the fateful happenings of December, 1841. He says (*see* Protocol I) :—

"In the month of December, 1841, or January, 1842, the subject of the inhalation of nitrous oxide gas was introduced in a company of young men in this village (Jefferson), and several persons present desired me to produce some for their use. I informed them that I had no apparatus for preparing or preserving the gas, but that I



Jefferson Feby 1st 1842

Dear Bob

I am under the necessity of troubling you a little, I am entirely out of Ether and wish some by tomorrow night if it is possible to procure it by that time— We have some girls in Jefferson who are anxious to see it taken

Your friend
C W Long.

This letter written to me by Dr. C. W. Long in which he ordered the Ether that he performed the first Surgical operation on a patient under the influence of that drug - a tooth was removed from the head of a young man - Mr. James Venable without giving him any pain - it was a complete success - This statement is true as I learned it from Dr C. W. Long. R. H Goodman

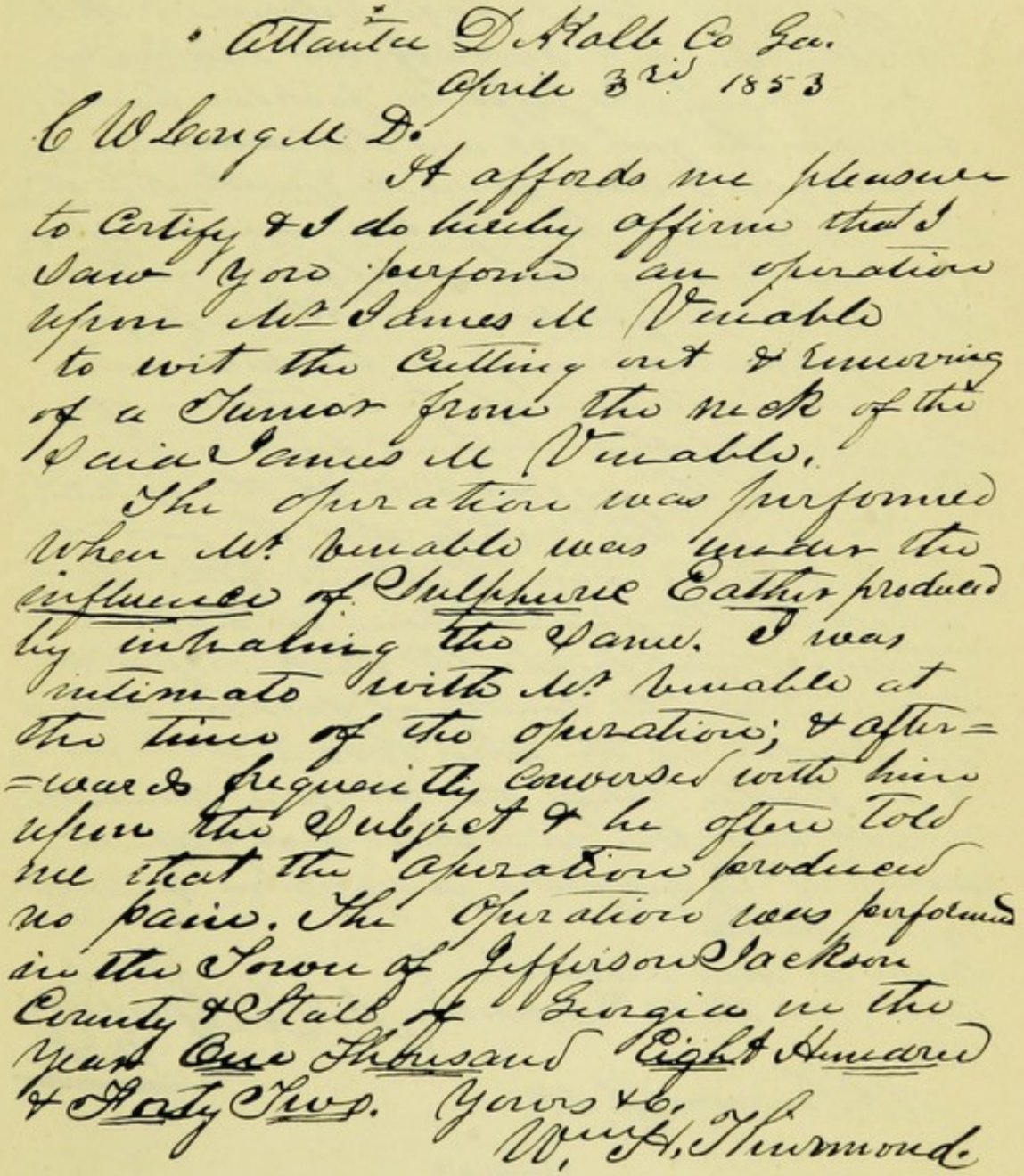
FACSIMILE 1.

Letter from Dr. C. W. Long to R. H. Goodman, ordering the ether used for the first operation done under ether, and a covering letter from R. H. Goodman.

had a medicine (sulphuric ether) which would produce equally exhilarating effects; that I had inhaled it myself, and considered it as safe as the nitrous oxide gas. One of the company stated that he had inhaled ether while at school, and was then willing to inhale it. The company were all anxious to witness its effects. The ether was introduced. I gave it first to the gentleman who had previously inhaled it, then inhaled it myself, and afterwards gave it to all persons present. They were so much pleased with the exhilarating effects of ether, that they

afterwards inhaled it frequently, and induced others to do so, and its inhalation soon became fashionable in this country, and in fact extended from this place through several counties in this part of Georgia.

"On numerous occasions I have inhaled ether for its exhilarating properties, and would frequently, at some short time subsequent to its inhalation, discover bruises or painful spots on my person, which I had



Atlanta DeKalb Co Ga.
April 3rd 1853

C W Long M D.

It affords me pleasure to Certify & I do hereby affirm that I saw You perform an Operation upon Mr James M Venable to wit the Cutting out & removing of a Tumor from the neck of the said James M Venable.

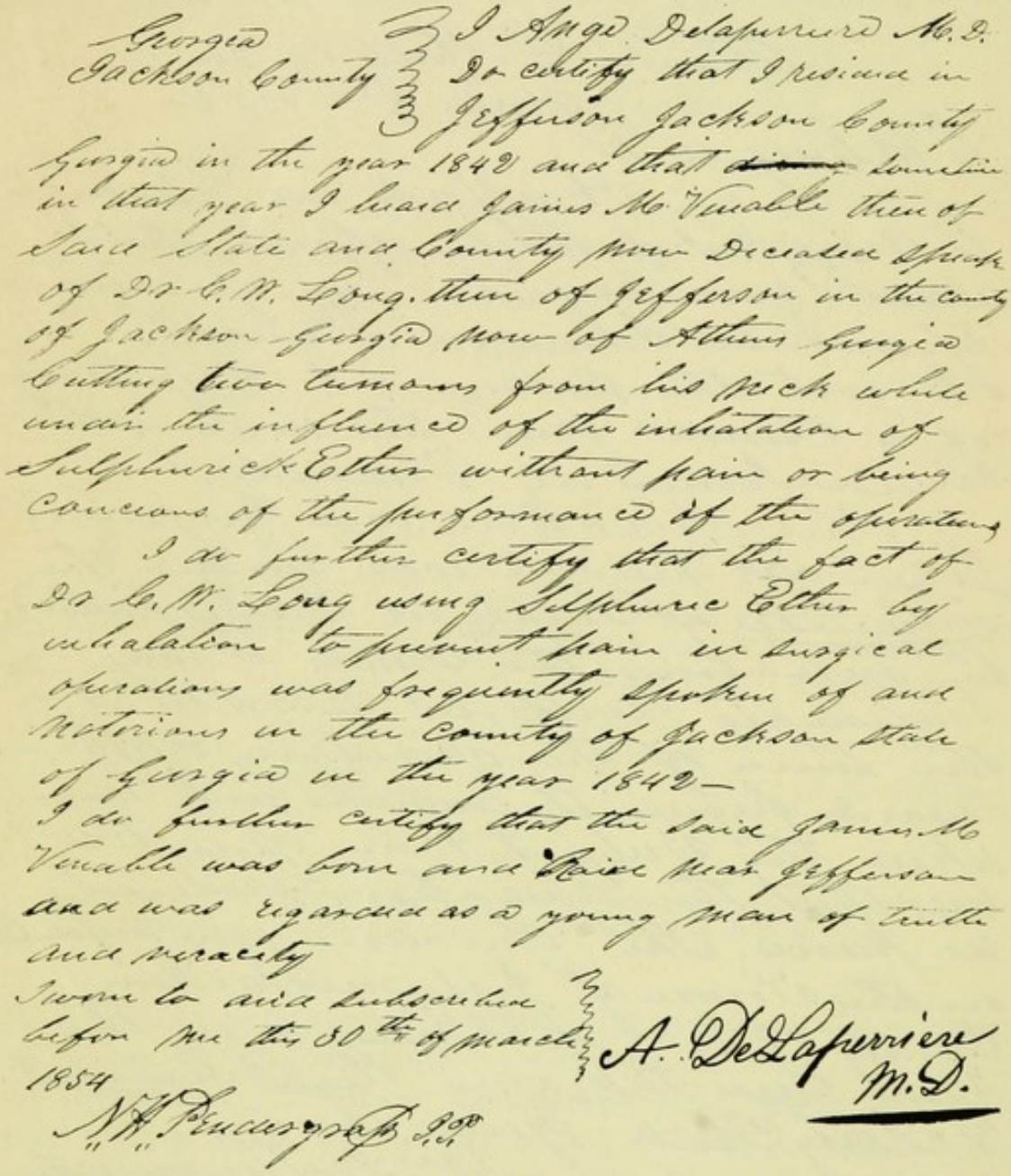
The Operation was performed when Mr Venable was under the influence of Sulphuric Æther produced by inhaling the same. I was intimate with Mr Venable at the time of the operation; & afterwards frequently conversed with him upon the Subject & he often told me that the Operation produced no pain. The Operation was performed in the Town of Jefferson Jackson County & State of Georgia in the year One Thousand Eight Hundred & Forty Two. Yours &c.

W. H. Thurmond.

FACSIMILE 2.

Statement of a witness at the first operation done under ether.

no recollection of causing, and which I felt satisfied were received while under the influences of ether. I noticed my friends, while etherized, received falls and bangs, which I believed were sufficient to produce pain on a person not in a state of anæsthesia, and on questioning them they uniformly assured me that they did not feel the least pain from



Georgia
Jackson County } I Augs. Delaperriere M.D.
do certify that I resided in
Jefferson Jackson County
Georgia in the year 1842 and that ~~during~~ sometime
in that year I heard James M. Venable then of
said State and County now Deceased speak
of Dr. C. W. Long. then of Jefferson in the county
of Jackson Georgia now of Athens Georgia
Cutting two tumors from his neck while
under the influence of the inhalation of
Sulphuric Ether without pain or being
Conscious of the performance of the operations
I do further certify that the fact of
Dr C. W. Long using Sulphuric Ether by
inhalation to prevent pain in Surgical
Operations was frequently spoken of and
Notorious in the County of Jackson State
of Georgia in the year 1842—
I do further certify that the said James M.
Venable was born and raised near Jefferson
and was regarded as a young man of truth
and veracity
Sworn to and subscribed
before me this 30th of March
1854
N. H. Pendergrass J.I.C.

A. DeLaperriere
M.D.

FACSIMILE 3.

Letter referring to the first operations done under ether, and stating that Long's use of ether as an anæsthetic was "notorious in the County of Jackson, Georgia."

these accidents. These facts are mentioned that the reasons may be apparent why I was induced to make an experiment in etherization."

The first trial of his theory was made on March 30, 1842, and the narrative is given in Protocols (*see* Protocols I, VI, VII, and X) appended to this paper. James M. Venable was etherized by Long, who poured ether upon a towel, and when the patient was profoundly

James Venable

To Dr C. W. Long Dr

1842.		
January 28th	Sulphuric Ether	25
March 30	Ether & Extracting Tumor	2.00
May 13	Sulphuric Ether	25
June 6	Extracting Tumor	2.00

Georgia
Jackson County I P. F. Hinton
Clerk of the
Superior Court of said County
do certify that the above account is a correct copy of an original
entry made in this Book for
Medical services for the year
1842.

Given under my hand
& seal of office this 21th of March
1842.
P. F. Hinton, Clerk S. C.

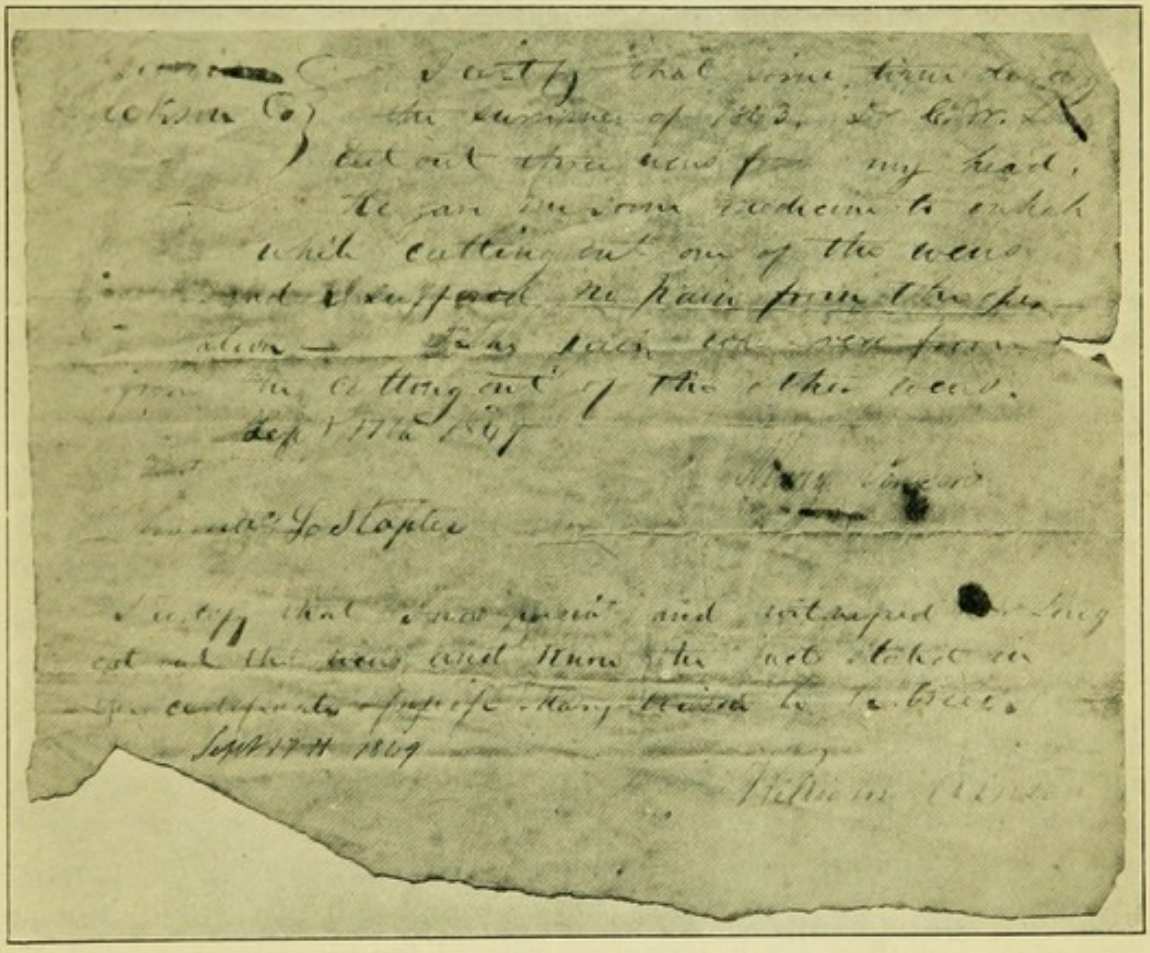
FACSIMILE 4.

Dr. Long's bill for the first operation done under ether, with the County Clerk's certificate.

unconscious he removed a cyst from the back of the patient's neck. No pain was felt. This was four and a half years before Morton's first case. Subsequently Long used ether on several occasions, eight it is said, and every case was successful. That he did not employ it more largely was due firstly to the fact that his practice was one in which operations were seldom demanded, and secondly because the older practitioners around him urged upon him the "danger" of the method and the disastrous results which would follow a fatal accident, such an accident as they were good enough to say must soon occur. Indeed, Long was more than once threatened with pains and penalties by the community in which he lived if he persisted in his ether practices! Now, although Long did not conceal his work, for it was known widely in the neighbourhood (*see* Protocol III), he took no occasion until later to read a paper before a medical society dealing with his experiments. This silence has been misconstrued. The simplest justice, however, must explain Long's reticence in a sense which redounds wholly to his credit. Long believed in his method but recognized it needed careful working out; he patiently experimented when patients seemed suitable; when they were not available he tried it on himself and on his pupils. He knew that the public were in favour of mesmerism, a system which he regarded with disfavour, and he had no surgeon of eminence in his neighbourhood to whom he could apply for extended experience. The doctors who knew of his efforts were adverse to them, and so he preferred to wait and gain experience before attempting to exploit a discovery which might have less in it than appeared at first sight. He was alive to the fact that some might believe they found in his practice a development of hypnotism, an anæsthesia by suggestion (*see* p. 38). But while he waited events were happening in the bigger world of which Long recked nothing. Horace Wells had "discovered" nitrous oxide gas, had tried it and had been successful in Hartford, Connecticut, 1844. His essay before the surgical world in the General Hospital, Massachusetts, had been a fiasco; he (Wells) had been shrieked out of the theatre with cries of "humbug." With or without the aid of Dr. Jackson, a person of scientific attainments and State geologist and chemist, Morton had administered ether vapour to himself, subsequently to one or two patients, and ultimately had been permitted by Warren, the surgeon, to administer his nostrum to a patient in the "General Hospital." "This, gentlemen," had said Warren, "is no humbug": anæsthesia by inhalation was an accepted fact.

These events occurred in 1846, but sadly enough the "ether con-

troversy," which embroiled Morton, Jackson and Wells, involves much that we would rather not dwell upon, since the details are far from pleasant reading. We must, however, refer to some points since they connect the story with that of Crawford Long. We spoke of Morton using a "nostrum"; it was sulphuric ether with flavouring additions, and was termed "Letheon." Its identity with ether was challenged, and eventually the medical profession refused to allow further public



FACSIMILE 5.

Certificate of Mary Vinson and her husband, referring to an operation on the former in 1843, done under ether.

trials without a disclosure of its nature and composition. The attempt was made to protect Letheon by a patent, and to restrict its employment unless a royalty was paid. An English patent was actually granted. W. T. G. Morton was not a medical man, and probably saw no objection to reaping a golden harvest from what he no doubt honestly believed to be his discovery. This restriction on the use of Letheon has been denied, but the protocol of the letter of Dr. Charles A. Davis appears

to substantiate the fact (*see* Protocol VIII). We know the sequel: the world awoke to the anæsthetic value of ether. There can be no question that, whatever motives actuated him, Morton's public exhibitions of ether in an important surgical centre were the direct means of publishing the discovery to all civilized communities. Failing to support the rights which he fondly hoped would protect his patent of Letheon, Morton sought to secure a grant from Congress, and to be proclaimed the discoverer of ether, and the first to apply it for the purposes of anæsthesia. Dr. Jackson advanced that he had a prior right, asserting that he had suggested the use of ether to Morton, and that the latter's employment of it was at his (Jackson's) instance. Into the merits of this controversy we need not enter, since both Morton and Jackson had been anticipated by Long.

It has been pointed out already the reasons why Long did not publish his first cases; however, when Morton's success was bruited about the duty of making a statement concerning his own cases was brought home to Long, and he put himself into communication with the editor of the *Southern Medical and Surgical Journal*. In 1849 we find in the columns of that journal the following: "A few months ago Dr. Long informed us of his early attempts at etherization in surgery. He was then informed that any claims set up at this late day to priority of discovery would be severely criticized, if not violently resisted; and that he had best, therefore, do all he could to fortify his position."

Long, in his communication to the Medical Society of Georgia (December, 1849), explains that so soon as he saw from the current medical literature (1846) that Letheon had been successfully used, he actually commenced a paper for publication detailing his own experiences with sulphuric ether; unhappily the exigencies of his practice intervened and the paper was never completed. In 1849, Morton petitioned Congress for a monetary reward for his discovery, and his claim was opposed by Jackson and Wells. In 1854, after much persuasion, Long was induced to write to Senator Dawson detailing his own work. The Senator sent Dr. Jackson, a curious choice when it is remembered that that gentleman was one of those who claimed the laurels of having discovered ether. The interview took place at Athens, Georgia, to which town Dr. Long had removed in 1851, and Long told his story simply but so effectively as to convince Jackson of its truth (*see* p. 42). The matter was ventilated in Congress by Senator Dawson, and although Morton's petition was never granted yet to Crawford Long no recognition was vouchsafed. It is significant that Dr. Jackson urged

upon Long that they, Jackson and Long, should unite interests, and as partners claim that they had respectively discovered the use of ether as an anæsthetic, and actually essayed experiments and successfully proved the safety and value of the method. Long was not tempted, he declined in words of striking dignity. He writes: "Our claims are rival, and permit me, sir, to say that although our claims are conflicting, I would not knowingly say anything in the article (he was preparing a full statement of his work in the form of an article) which would be displeasing to you. . . . Still, it becomes each one of us to use all honorable means to advance his own claims, and I know you will not blame me for attending to this matter, which so much concerns my reputation." So the matter dropped and men forgot Long or minimized his work, and on Ether Day celebrations to Morton is accorded the palm. In 1877, Dr. Marion Sims championed Long's cause, but, unfortunately, his communication so well conceived was hurriedly executed and introduced the inaccurate statement that S. C. Wilhite had suggested to Long the idea of using ether. Wilhite himself contradicted this (*see* Protocol IX); as a matter of fact he did not come to live with Long as a student until 1844.

So we come to the close of the story of Long and his great discovery, the story of a simple-minded man who, amidst the arduous labours of a scattered country practice, conceived a great idea and, in the teeth of opposition and though haunted by the fear lest disaster might arise and ruin his professional name and reputation, yet had the courage to test his theory by experiment, and so obtained proof of its accuracy. Surely such a man was worthy to be the author of so momentous a discovery, and of being called one of the greatest men brought forth by a mighty nation.

A few words will suffice to trace the closing years of Long's useful life. He took no further steps to enforce his claims, but patiently laboured for his country and his people through the troublous years of the war, and at length, when brighter days returned, he again built up his practice and ultimately died in harness, his last words being an anxious inquiry as to the welfare of a patient at whose bedside he was when his mortal sickness seized him.

There have been memorials erected to the memory of Long, the discoverer of ether anæsthesia, one in Paris and one at Jefferson, Georgia, and in Boston men see a monument in white marble bearing the inscription: "To the Discoverer of Anæsthesia." It bears no name.

Shall we not in England accord the first place to Long, and in no

unfriendly spirit claim for Morton and Wells less exalted niches in the Temple of Fame? For we may not forget that to them, and indeed to Dr. Jackson, the world owes very much, since if not the first to employ ether as an anæsthetic, they made themselves the heralds of an epoch-making discovery and they were in ignorance when they did so that Crawford Williamson Long had anticipated them.

Ether, 1842-1911.

The narrative given by Long of his first administration of ether to a patient, in 1842, that by Morton, which is more detailed, referring to his demonstration of the effects of Letheon on a patient in the General Hospital, Massachusetts (1846) and that given in great detail of the first ether operation performed in a London Hospital—viz., University College Hospital—when Liston operated, reveal the fact that very little was known about anæsthetics and less about methods. In the one case a towel was employed, in the other two a primitive inhaler consisting of an ether chamber and a series of tubes connecting it with a face-piece.

When Simpson introduced chloroform at the end of 1847, ether, at all events in this country, was neglected in favour of the newer claimant, chloroform. The perils of the latter incident to the methods adopted in its exhibition soon led to fresh attempts being made to employ ether or some mixture of it and chloroform. The Committee of the Royal Medical and Chirurgical Society in their Report published in 1864 extolled ether's safety, but pointed out as its inherent drawback that the induction of anæsthesia by it was too slow for convenience. Then came the rational attempts of Clover, Ormsby, and many more, to remove this disability by the use of closed inhalers. No practical attempt was, however, made to study a percentage method for etherization. The very safety of the drug became its chiefest danger, since etherists were so obsessed by the fact that ether does not lower blood-pressure or cause cardiac collapse through depression, that they failed to recognize the perils incident to over-stimulation, especially in asthenic persons. The dangers of post-operative chest troubles were not existent in the pioneer days of ether because the operations performed were comparatively brief and the surgeons taught in pre-anæsthetic days prided themselves on their celerity in operating, and indeed were appraised by the public for this quality. To-day there is no haste, the advance of surgery has invaded the regions once immune from the knife; if ether is adopted for this wider range of operations it is necessary that methods of using it must follow on other than the traditional lines. To

safeguard against excessive dosage we rely on mixed methods, such as the preliminary hypodermic injection of scopolamine, morphine and atropine; we adopt an open mask, evaporating from an enormously expanded area provided by many folds of gauze, and so obtain a more complete nebulation of our vapour; we introduce ether directly into the blood-stream in an artificial circulating fluid of physiological saline by intravenous infusion, with the hope of maintaining an equable and low-grade partial saturation of the neural tissue. In every case, we must remark, the supreme difference consists in the fact that we have replaced a method of excessive dosing by one of moderation and in most instances capable of rapid variation in the strength of ether employed. We have been too overborne by a priori reasoning, too obedient to traditional authority. Whether our newer methods may not introduce fresh dangers we cannot as yet say; if they do, it will be probably because our technique is at fault, and this must be amended. It is startling, when we think of the early workers, to find modern etherists safely and easily encompassing anæsthesia with ether for tongue or jaw operations. Yet such is the case. For example, through the kindness of Mr. Page I saw him accomplish this, following his adaptation of Dr. Crile's method of nasal intubation and pharyngeal blocking. By the intratracheal insufflation method now so efficiently carried out in America we find ether conveyed into the lungs without the inconveniences formerly incident to this method of introducing ether by oral inspiration. The experience gained gives promise of even more efficient plans of using ether, of saving life and enabling the modern surgeon to perform his tasks, often almost daunting in their complexity and difficulty, without the added anxiety of an anæsthesia either imperilling the patient's life or necessarily imperfect owing to the patient's reaction towards the drug employed. If Long's work was the first step towards what we have achieved to-day, and it was so, to him we owe this much that we do his memory great and abiding honour. But we must realize also that anæsthesia to-day is on its trial, it must advance and trample on tradition and rely upon experiment unless we are content to forsake the hope of founding a science, and are willing to content ourselves with a mere handicraftsman's place in the ranks of the medical profession.

I desire to express my thanks to Mrs. Long Taylor, through whose kindness I have been furnished with documentary evidence of the accuracy of the facts I have advanced about her father, Crawford W. Long, also to Dr. George Foy, of Dublin, to whose unique knowledge of this matter and collection of memorials of Crawford Long I have been most generously made welcome.

PROTOCOLS.

(I) Statement made by Dr. C. W. Long, 1849, to the Medical Society of Georgia.

For nearly three years the various medical journals have contained numerous articles on the employment of sulphuric ether by inhalation, for the purpose of rendering patients insensible to pain during surgical operations.

The first notice I saw of the use of ether, or rather of Dr. Morton's "Letheon," as an anæsthetic, was in the editorial of the *Medical Examiner* for December, 1846, in which the Editor gives the following extract from a paper by Dr. H. J. Bigelow, contained in the *Boston Journal:* "The preparation (Letheon) is inhaled from a small two-necked glass globe, and smells of ether, and is, we have little doubt, an ethereal solution of some narcotic substance."

Having on several occasions used ether, since March, 1842, to prevent pain in surgical operations, immediately after reading this notice of "Letheon" I commenced a communication to the Editor of the *Medical Examiner* for publication in that journal, to notify the medical profession that sulphuric ether, when inhaled, would of itself render surgical operations painless, and that it had been used by me for that purpose for more than four years.

I was interrupted when I had written but a few lines, and was prevented, by a very laborious country practice, from resuming my communication, until the *Medical Examiner* for January, 1847, was received, which reached me in a few days after reading the December number. It contained several articles, giving accounts of different experiments in etherization, in which surgical operations were performed without pain. On reading these articles, I determined to wait for a few months before publishing an account of my discovery, and see whether any surgeon would present a claim to having used ether by inhalation in surgical operations prior to the time it was used by me.

A controversy soon ensued between Messrs. Jackson, Morton and Wells, in regard to who was entitled to the honour of being the discoverer of the anæsthetic powers of ether, and a considerable time elapsed before I was able to ascertain the exact period when the first operations were performed. Ascertaining this fact, through negligence I have now permitted a much longer time to elapse than I designed, or than my professional friends with whom I had consulted advised: but as no account has been published (so far as I have been able to ascertain) of the inhalation of ether being used to prevent pain in surgical operations as early as March, 1842, my friends think I would be doing myself injustice not to notify my brethren of the medical profession of my priority of the use of ether by inhalation in surgical practice.

I know that my interests have suffered from not making an earlier publication, and I would not be persuaded at this late stage of the ether controversy to present my claim to being the first to use ether as an anæsthetic in surgical operations, if I were not fully satisfied of my ability to establish its justness.

In the month of December, 1841, or January, 1842, the subject of the inhalation of nitrous oxide gas was introduced in a company of young men in this village (Jefferson), and several persons present desired me to produce some for their use. I informed them that I had no apparatus for preparing or preserving the gas, but that I had a medicine (sulphuric ether) which would produce equally exhilarating effects: that I had inhaled it myself, and considered it as safe as the nitrous oxide gas. One of the company stated that he had inhaled ether while at school, and was then willing to inhale it. The company were all anxious to witness its effects. The ether was introduced. I gave it first to the gentleman who had previously inhaled it, then inhaled it myself, and afterwards gave it to all persons present. They were so much pleased with the exhilarating effects of ether, that they afterwards inhaled it frequently, and induced others to do so, and its inhalation soon became fashionable in this country, and in fact extended from this place through several counties in this part of Georgia.

On numerous occasions I have inhaled ether for its exhilarating properties, and would frequently, at some short time subsequent to its inhalation, discover bruised or painful spots on my person, which I had no recollection of causing, and which I felt satisfied were received while under the influence of ether. I noticed my friends while etherized received falls and bangs, which I believed were sufficient to produce pain on a person not in a state of anæsthesia, and on questioning them they uniformly assured me that they did not feel the least pain from these accidents. These facts are mentioned that the reasons may be apparent why I was induced to make an experiment in etherization.

The first patient to whom I administered ether in a surgical operation was Mr. James M. Venable, who then resided within two miles of Jefferson, and at present lives in Cobb County, Georgia. Mr. Venable consulted me on several occasions in regard to the propriety of removing two small tumours situated on the back of his neck, but would postpone from time to time having the operations performed, from dread of pain. At length I mentioned to him the fact of my receiving bruises while under the influence of the vapour of ether, without suffering, and as I knew him to be fond of and accustomed to inhale ether, I suggested to him the probability that the operations might be performed without pain, and proposed operating on him while under its influence. He consented to have one tumour removed, and the operation was performed the same evening. The ether was given to Mr. Venable on a towel, and when fully under its influence I extirpated the tumour. It was encysted and about $\frac{1}{2}$ in. in diameter. The patient continued to inhale ether during the time of the operation, and when informed it was over seemed incredulous, until the tumour was shown him. He gave no evidence of suffering during the operation, and assured me after it was over that he did not experience the slightest degree of pain from its performance. This operation was performed on March 30, 1842.

The second operation I performed upon a patient etherized was on June 6 1842, and was on the same person for the removal of another small tumour.

This operation required more time than the first, from the case of the tumour having formed adhesions to the surrounding parts. The patient was insensible to pain during the operation, until the last attachment of the cyst was separated, when he exhibited signs of slight suffering, but asserted after the operation was over that the sensation of pain was so slight as scarcely to be perceived. In this operation the inhalation of ether ceased before the first incision was made. Since that time I have invariably directed patients, when practicable, to continue its inhalation during the time of the operation.

Having so long neglected presenting my claim to the discovery of the anæsthetic power of ether, for the purpose of satisfying the minds of all of its justness, I have procured, I conceive, a sufficient number of certificates to establish the claim indisputably. I present, first, the certificate of James M. Venable, the patient on whom the first experiments in etherization were made, and no comments on it, I conceive, are necessary.

Mr. James M. Venable's Certificates.

I, James M. Venable, of the County of Cobb and State of Georgia, on oath, depose and say, that in the year 1842, I resided at my mother's in Jackson County, about two miles from the village of Jefferson, and attended the village academy that year. In the early part of the year the young men of Jefferson and the country adjoining were in the habit of inhaling ether for its exhilarating powers, and I inhaled it myself frequently for that purpose, and was very fond of its use.

While attending the academy, I was frequently in the office of Dr. C. W. Long, and having two tumours on the back and either side of my neck, I several times spoke to him about the propriety of cutting them out, but he postponed the operation from time to time. On one occasion, we had some conversations about the probability that the tumours might be cut out while I was under the influence of sulphuric ether, without my experiencing pain, and he proposed operating on me while under its influence. I agreed to have one tumour cut out, and had the operation performed that evening after school was dismissed. This was in the early part of the spring of 1842.

I commenced taking the ether before the operation was commenced, and continued it until the operation was over. I did not feel the slightest pain from the operation, and could not believe the tumour was removed until it was shown to me.

A month or two after this Dr. C. W. Long cut out the other tumour, situated on the same side of my neck. In this operation I did not feel the least pain until the last cut was made, when I felt a little pain. In this operation, I stopped inhaling the ether before the operation was finished.

I inhaled the ether, in both cases from a towel, which was the common method of using it.

JAMES M. VENABLE.

(Sworn to before me) ALFRED HANES, J.P.

Georgia, Cobb County, *July* 23, 1849.

Certificate of Andrew J. Thurmond.

I certify that I was a pupil in the academy in Jefferson, Jackson County, Georgia, in the year 1842. Some time during the spring of that year I was present and witnessed Dr. C. W. Long cut a small tumour from the neck of James M. Venable.

I am well acquainted with the smell of sulphuric ether, and I know that Mr. Venable inhaled it, before, and during the time of the operation. He made no sign of suffering pain during the operation; and after the tumour was cut out he asserted that he did not feel any pain from the cutting out of the tumour.

A few months after this operation, Mr. Venable informed me that Dr. Long had cut out another tumour from his neck, while he was under the effects of ether, and that he did not feel any pain from the operation. Mr. Venable was a pupil in the Academy during the year 1842, and I was intimate with him and heard him speak of the operations frequently, and he always asserted that they were performed without pain.

I know the operation was performed in the year 1842; my brother, William H. Thurmond, had charge of the Academy that year, and it was the only time I was a pupil in the Academy.

August 21, 1849. ANDREW J. THURMOND.

In addition to Mr. Venable's, I present the certificates of E. S. Rawls and Wm. H. Thurmond, who were present and witnessed one or both operations (*see* Facsimile 2).

My third experiment in etherization was made on July 3, 1842, and was on a negro boy, the property of Mrs. S. Hemphill, who resides nine miles from Jefferson. The boy had a disease of a toe, which rendered its amputation necessary, and the operation was performed without the boy evincing the least sign of pain. I present Mrs. Hemphill's statement of the report the boy gave her of the operation on his return home, which I conceive is sufficient on this point.

These were all the surgical operations performed by me during the year 1842, upon patients etherized, no other case occurring in which I believed the inhalation of ether applicable. Since 1842 I have performed one or more surgical operations annually on patients in a state of etherization.

The question will no doubt occur, why did I not publish the results of my experiments in etherization soon after they were made? I was anxious, before making my publication, to try etherization in a sufficient number of cases to satisfy my mind that anæsthesia was produced by the ether, and was not the effect of the imagination, or owing to any insusceptibility to pain in the persons experimented upon.

At the time I was experimenting with ether, there were physicians high in authority and of justly distinguished character, who were the advocates of

mesmerism, and recommended the induction of the mesmeric state as adequate to prevent pain in surgical operations. Notwithstanding thus sanctioned, I was an unbeliever in the science, and of the opinion that if the mesmeric state could be produced at all it was only on those of "strong imagination and weak minds," and was to be ascribed solely to the workings of the patients' imaginations. Entertaining this opinion, I was the more particular in my experiments in etherization.

Surgical operations are not of frequent occurrence in a country practice, and especially in the practice of a young physician, yet I was fortunate enough to meet with two cases in which I could satisfactorily test the anæsthetic powers of each. From one of these patients I removed three tumours the same day. The inhalation of ether was used only in the second operation, and was effectual in preventing pain, while the patient suffered severely from the extirpation of the other tumours. In the other case I amputated two fingers of a negro boy. The boy was etherized during one amputation, and not during the other; he suffered during one operation and was insensible during the other.

I have procured the certificates of the lady from whom the tumours were removed and of her husband, who was present and witnessed the operations (*see* Facsimile 5). These certificates were produced in preference to those establishing other operations, because they not only show that the experiments were continued from year to year, but also show that they were conducted so as to test the power of etherization.

After fully satisfying myself of the power of ether to produce anæsthesia, I was desirous of administering it in a severer surgical operation than any I had performed. In my practice, prior to the published account of the use of ether as an anæsthetic, I had no opportunity of experimenting with it in a capital operation, my cases being confined, with one exception, to the extirpation of small tumours and the amputation of fingers and toes.

I have stated that ether was frequently inhaled in this and some of the adjoining counties for its exhilarating effects, and although I am conscious that I do not deserve any credit for introducing its use for that purpose, yet as others through their friends have claimed to be the first to show its safety most of the certificates I have obtained establish the fact of its frequent inhalation for its exhilarating effects. I met with R. H. Goodman, who was present the night ether was first inhaled in Jefferson, and who removed to Athens, and introduced its inhalation in that place, and presented his certificate. All the young gentlemen who were present the night I first administered ether, with one exception, are living, and their certificates can be procured, if necessary.

I have now, in a very concise manner, presented a "plain unvarnished" account of some of my experiments in etherization, and have said nothing of the comparative methods of ether, and other anæsthetics, because that was foreign to my present subject. Had I been engaged in the practice of my profession in a city where surgical operations were performed daily, the discovery would, no

doubt, have been confided to others, who would have assisted in the experiments, but occupying a different position. I acted differently, whether justifiable or not. The result of my second experiment in etherization was such as to lead me to believe that the anæsthetic state was of such short duration that ether could only be applicable in cases in which its effects could be kept up, by constant inhalation, during the time of the performance of the operation. Under this impression, up to January, 1847, I had not used ether, but in one case, in extracting teeth, and thus deprived myself of experimenting in the only class of cases which are of frequent occurrence in a country practice.

While cautiously experimenting with ether, as cases occurred, with a view of fully testing its anæsthetic powers, and its applicability to severe as well as minor surgical operations, others more favourably situated engaged in similar experiments, and consequently the publication of etherization did not " bide my time." This being the case, I leave it with an enlightened medical profession to say whether or not my claim to the discovery of etherization is forfeited, by not being presented earlier, and with the decision which may be made I shall be content.

(II) Certificate of Entry in Dr. C. W. Long's Account Book *re* First Operation on James Venable. (*See* Facsimile 4.)

James Venable,

1842. To Dr. C. W. Long, *Dr.*

January 20, sulphuric ether	0.25 cents.
March 30, sulphuric ether and exsecting tumour	2.00 dollars.
May 13, sulphuric ether	0.25 cents.
June 6, exsecting tumour	2.00 dollars.

This entry was certified as correct.

Georgia, Jackson County.

I, P. F. Hinton, Clerk of the Superior Court of said County, do certify that the above account is a correct copy of an original entry made in his book for the year 1842. Given under my hand and seal of office this 27th of March, 1854.

(Signed) P. F. Hinton, Clerk.

(III) Certificates proving that Dr. Long's use of Ether as an Anæsthetic was Common Knowledge in the District of Jefferson and Athens where he lived. (*See* Facsimile 3.)

Georgia, Jackson County.

I, Ange de Laperriere, M.D., do certify that I resided in Jefferson, Jackson County, Georgia, in the year 1842, and that sometime in that year I heard James M. Venable, then of said County, speak of Dr. C. W. Long's cutting out two tumours from his neck while under the influence of the inhalation of sulphuric ether, without pain, or being conscious of the performance of the operation.

I do further certify that the fact of Dr. C. W. Long using ether by inhalation to prevent pain in surgical operations was frequently spoken of and notorious in the County of Jackson, Georgia, in the year 1842.

A. de Laperriere, M.D.

Sworn to and subscribed before me this 30th of March, 1854.

N. H. Pendergrass, J.P.

Athens, Clarke County, Georgia.

I, the undersigned, do certify that in May, 1843, I assisted Dr. R. D. Moore in amputating the leg of a coloured boy, Augustus, then the property of Mr. William Stroud, who resided in this County ; and that I distinctly recollect hearing Dr. R. D. Moore say : " If I had thought of it before leaving home I would have tried Dr. C. W. Long's great discovery, namely, the administration of sulphuric ether as an anæsthetic in performing the operation." Having neglected to bring the ether, Dr. Moore finally concluded to influence the patient with morphia, under which influence the operation was performed.

Jos. B. Carlton, M.D.

(IV) Letter submitted by Dr. H. H. Young of the Johns Hopkins Hospital proving Dr. Long's Method of Etherization produced Full Anæsthesia.

Cohutta, Georgia,
January 15, 1897.

Dr. Hugh H. Young.

Dear Sir,—The patient was placed in a recumbent position on a bed, with the hand to be operated on the front for convenience of the surgeon. Dr. Long poured ether on a towel and held it to the patient's nose and mouth too, to get the benefit of inhalation from both sources. Dr. Long determined when

the patient was sufficiently etherized to begin the operation by pinching or pricking him with a pin. Believing that no harm would come of its use for a considerable length of time, he profoundly anæsthetized the patient, then gave me the towel and I kept up the influence by holding it still to the patient's nose. The patient was entirely unconscious—no struggling—patient passive in the hands of the operator. After a lapse of fifty years you would hardly suppose that a man could remember every minute detail, but I have clearly in mind all the facts I have given you.

Your obedient servant,

(Signed) J. F. GROVES, M.D.

(V) CERTIFICATE FROM R. H. GOODMAN SHOWING LONG'S USE OF ETHER.

I certify that on January 1, 1842, I resided in Jefferson, Jackson Co., Georgia, and that about that time, myself, with several other young men, were in the habit of meeting at Doctor C. W. Long's shop, and other rooms in the village, and inhaling ether which he administered to us.

On January 20 of the same year I removed to Athens, where I introduced the inhalation of ether. I and several of my young associates frequently assembled ourselves together and took it for the excitement it produced. After that, I know it became very common to inhale ether in Athens, and that it was frequently taken in the college campus and on the street.

(Signed) R. H. GOODMAN,

August 4, 1849. Athens, Georgia.

(VI) CERTIFICATE CONCERNING FIRST OPERATION FROM E. S. RAWLS.

Georgia, Clarke Co.

I, Edmund S. Rawls, of Rome, Floyd Co., Ga., on oath depose and say that . . . on one occasion during the year (1842) I was present with James M. Venable in the office of Dr. C. W. Long in Jefferson, Jackson Co., Ga., and witnessed Dr. C. W. Long cut out a tumour from the side of neck of J. M. Venable while said Venable was fully under the effects of the vapour of s. ether inhaled from a towel, and without his exhibiting the least symptoms of suffering pain from the operation. J. M. Venables was so unconscious of the operation having been performed, that he would not believe the tumour was removed until it was shown him.

(Signed) E. S. RAWLS.

Sworn to and subscribed before me this 2nd November, 1853.

E. L. NEWTON, J.J.C.

(VII) Letter from Dr. Jackson.

The Boston Medical and Surgical Journal, Boston.

Thursday, April 11, 1861.

First Practical Use of Ether in Surgical Operations.

Messrs. Editors,—At the request of the Hon. Mr. Dawson, U.S. Senator from Georgia, on March 8, 1854, I called upon Dr. C. W. Long, of Athens, Georgia, while on my way to the Dahlonega gold mines, and examined Dr. Long's evidence, on which his claims to the first practical operations with ether in surgery were founded, and wrote, as requested, to Mr. Dawson, who was then in the U.S. Senate, all I learned on the subject. From the documents shown me by Dr. Long, it appears that he employed sulphuric ether as an anæsthetic agent:—

(1) March 30, 1842, when he extirpated a small glandular tumour from the neck of James M. Venable, a boy in Jefferson, Georgia, now dead.

(2) July 3, 1842, in the amputation of the toe of a negro boy belonging to Mrs. Hemphill, of Jackson, Ga.

(3) September 9, 1843, in extirpation of a tumour from the head of Mary Vincent, of Jackson, Ga.

(4) January 8, 1845, in the amputation of a finger of a negro boy belonging to Ralph Bailey, of Jackson, Ga.

Copies of the letters and depositions proving these operations with ether were all shown me by Dr. Long. . . .

I then called on Professors Joseph and John Le Conte, then of the University of Georgia, at Athens, and inquired if they knew Dr. Long, and what his character was for truth and veracity. They both assured me that they knew him well, and that no one who knew him in that town would doubt his word, and that he was an honorable man in all respects.

Subsequently, on revisiting Athens, Dr. Long showed me his folio journal, or account book, in which stand the following entries:—

James Venable.

March 30, 1842, ether and excising tumour	2.00 dollars
May 13, sul. ether	0.25 cents
June 6, excising tumour	2.00 dollars

On the upper half of the same page, several charges for ether sold to the teacher of the Jefferson Academy are recorded, which ether Dr. Long told me was used by the teacher in exhibiting its exhilarating effects, and he said the boys used it for the same purpose in the academy. I observed that all these records bore the appearance of old and original entries in the book.

On asking Dr. Long why he did not write to me or make known what he had done, he said, when he saw my dates he perceived that I made the discovery[1] before him, and he did not suppose that anything done after that

[1] Dr. Jackson's "discovery" merely amounts to his knowledge that ether was an exhilarant and narcotic; he never employed it as an anæsthetic. This knowledge was common knowledge, as has already been shown.

would be considered of much importance, and that he was awakened to the idea of asserting his claims to the first practical use of ether in operations by learning that such claims were set up by others for this merit, and consequently he wrote to the Georgia delegation at Washington, stating the facts which Senator Dawson had requested me to inquire into.

I have waited expecting Dr. Long to publish his statements and evidence in full, and therefore have not before published what I learned from him. He is a very modest, retiring man, and not disposed to bring his claims before any but a medical or scientific tribunal. . . .

Had he written to me in season I would have presented his claims to the Academy of Sciences of France, but he allowed his case to go by default, and the Academy knew no more of his claims to the practical use of ether in surgical operations than I did.

CHARLES T. JACKSON, M.D.[1]

Boston, *April* 3, 1861.

(VIII) LETTER FROM DR. DAVIS WRITTEN TWELVE YEARS AFTER A PATENT WAS GRANTED TO MORTON FOR HIS LETHEON, SHOWING THAT HE ATTEMPTED TO ENFORCE PATENT RIGHTS.

U.S. Marine Hospital, Chelsea, Massachusetts.

Dr. CRAWFORD W. LONG, Athens, Georgia. *April*, 1859.

Sir,—Hon. Judge Hyllier, Solicitor of Treasury Department, informed me about a year since, and recently repeated the same, that some years since you used sulphuric ether as an anæsthetic and had a record of the same. If it is not asking too much of you, I would be greatly obliged if at your earliest convenience you would forward me a statement of the facts.

I take the liberty to ask this of you because Mr. W. T. G. Morton, to whom in conjunction with Dr. C. T. Jackson a patent was granted in November, 1846, for using ether, has brought a suit against me as a Government Officer for an infringement of his patent.

Judge Hyllier was confident that you could furnish me with proof sufficient to satisfy a jury that you used it way before he or Jackson claimed to have made the discovery. I should have asked for these proofs through my attorney and had them properly witnessed, &c., but the Secretary of the Treasury having decided that I used the article on my own responsibility, and therefore the Government were not bound to defend me, I wish to save as much expense as possible.

Very respectfully,
(Signed) CHARLES A. DAVIS, M.D.,
Physician and Superintendent.

[1] The List of Operations as given by Dr. Jackson is not complete, as he has omitted the first operation on Venable, and a number of the later operations.

(IX) Wilhite's Letter correcting Dr. Marion Sims's Misstatement in his Paper about Long and the First Ether Experiment.

Anderson, S.C.,
June 27, 1877.

Dr. C. W. Long.

Dear Doctor,—Yours of the 22nd inst. is at hand, and I have also just received a letter from Dr. J. M. Sims, which I will answer to-day. . . .

In my statement I did make a mistake in regard to my being present at the first or second operation, which mistake I will correct. But if you still prefer I will send a certificate.

Let me know and I will give you any information or assistance in this great matter.

Yours truly, &c.,

(Signed) P. A. Wilhite.

(X) From Dr. Long's First Student.

Cohutta, Ga.,
December 13, 1894.

Mrs. Frances Long Taylor.

Dear Madam,— . . . In 1844, soon after I attained my majority, I decided to adopt medicine as my profession, and began to think where and under whom I should begin the preparatory study. My father asked me to choose from among the number of physicians whom I knew the one I preferred to act as preceptor to me.

Knowing Dr. Long so well, and believing him to be a man of no ordinary ability, I at once fixed upon him as my choice.

I entered Dr. Long's office in May, 1844, as the first student ever under his care. As I progressed with my studies he saw fit to make known to me his discovery, by the use of which he could perform surgical operations without giving any pain to his patient. (Here follows a description of the first cases.)

Not satisfied, however, that there was not more to learn about this great discovery, he proposed that we test it further personally, which we did in his office, where with closed doors we administered it to each other to prove its perfect anæsthetic effect, and also to discover any bad effect to the subject etherized. Owing to the prejudice and ignorance of the populace, Dr. Long was prevented from using ether in as many cases as he might have.

Thus in the two years preceding my entering Dr. Long's office he had had only about six cases in which to try the anæsthetic effects of ether.

The first case that came under his care where its use was applicable after my going into his office was not till January 8, 1845, which was the case of a negro boy having two fingers to amputate, caused by neglected burn. I, as

the only student still with the doctor, he had me to accompany him to see the operation, and assist in the administration of the ether. The first finger was removed while under the influence of ether, the little fellow evincing no pain; the second without ether, the child suffered extremely. This was done to prove that insensibility to pain was due to the agent used.

Soon after this, in January, Mr. J. D. Long came into the office as a fellow-student. Later, toward spring, came P. A. Wilhite, and in August came Dr. Long's brother, H. R. J. Long. We four remained there at Dr. Long's office as students until the opening of the full term of the medical colleges. .

(Signed) J. F. GROVES, M.D.

Sworn and subscribed to before me, December 15, 1894.

WM. H. WILSON, N.P.

JOHN BALE, SONS & DANIELSSON, LTD., 83-91, Great Titchfield Street, London, W.