CHRONOLOGICAL HISTORY OF HORACE WELLS DISCOVERER OF ANESTHESIA

BY

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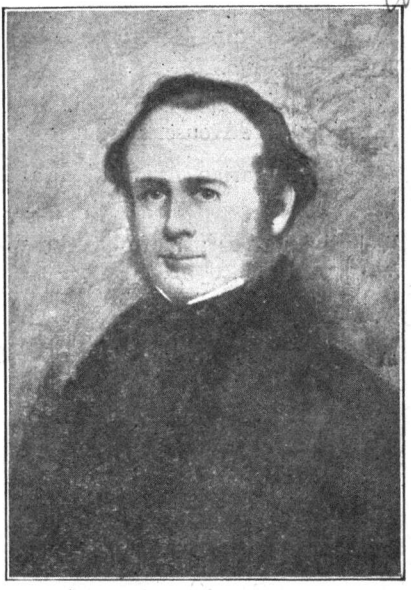
With the compliments of the author



READ BY TITLE AT THE 17TH GENERAL MEETING OF THE INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH, CLEVELAND, OHIO, MARCH 18, 19, 1939.
ABSTRACTED IN JOURNAL OF RESEARCH, VOL. 18, NO. 3, JUNE 1939.

Preface

That this article contains much material which heretofore has never been published, except in the original sources long since forgotten, is due to the invaluable assistance of:

Miss Alice McCann, Librarian of the School of Dentistry, University of Pittsburgh. (This library is one of the three outstanding libraries of its kind in the world, and has a collection of historical documents and books dealing with the discovery of anesthesia and the controversy which followed, that is second to none.)

Mr. Albert C. Bates, Librarian, and Mr. Thompson R. Harlow, Assistant Librarian of the Connecticut Historical Society, Hartford, Connecticut.

Mr. Richard G. Hensley, Chief Librarian of the Reference Division, and his assistant, Mr. Thomas J. Manning, of The Public Library of the City of Boston.

Mr. Donald A. Wing, Assistant Reference Librarian, Yale University Library, New Haven, Connecticut.

Mr. Dennis A. Dooley, State Librarian, The Commonwealth of Massachusetts State Library, State House, Boston.

Col. Harold W. Jones, Librarian Army Medical Library, Washington, D. C.

The help of these individuals is gratefully acknowledged.

The author is also indebted to Dr. Chas. J. Wells, Buffalo, N. Y. for his generous loan of the cuts used in this article.

This article was written to supply the need of a factual Chronological history of Dr. Horace Wells.

W. H. A.

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CHRONOLOGICAL HISTORY OF HORACE WELLS

DISCOVERER OF ANESTHESIA[1,2]

W. HARRY ARCHER, B. S., D. D. S., F. I. C. A., F. A. C. D.

1815

January 21. Born at Hartford, Windsor County, Vermont[3]. First child of three born to Horace and Betty Heath Wells. (1) (2) (3) (6)

1817

Brother Charles was born. (3)

1818

Family moved to Bellows Falls. (1) (3)

1819

Sister Mary was born. (3)

1821-1834

Attended select schools for 12 years; boys private school for one year wi h Mr. Ballard, at Hopkinton, New Hampshire; Academies at Amherst, Massachusetts and Walpole, New Hampshire.

He was a teacher for one district and many Writing Schools and at one time contemplated entering the ministry. (1) (2)

1834-1836

Studied dentistry in Boston by association with leading dentists. No dental college at this time.

Practiced briefly in Boston. (1) (2)

1836

Started practice in Hartford. Connecticut. Soon head of his profession. (2)

April 4, 1836. In the Connecticut Courant, Vol. 72, No. 3715, page 3 is the following ad:

> Dr. H. Wells, from Boston, would inform the Citizens of Hartford, and the adjoining Towns, that he has at length acceded to the wishes of numerous friends in this section of the country, by making arrangements for spending a short time in this City, with a view of becoming a final resident, should present patronage be sufficient to warrant future success.
>
> He offers himself as a professional Dentist, and all work in the line of his profession will be thankfully received and faithfully executed. As he has embraced the new and much improved style of inserting Teeth as recently introduced into London and Paris, He pledges himself to give an acknowledged satisfaction in the most difficult cases. In soliciting a share of patronage, Dr. W. would avoid boasting of his own skill, or derogating that of others—but Ladies and Gentlemen are respectfully invited to call and examine his method of Inserting Mineral Teeth on Gold Plate. Particular attention paid to the preservation of Natural Teeth, by a process of cleansing and filling with gold.
>
> Office in Main-street, nearly opposite the Connecticut Hotel, 2d door from State-street, April 4.
>
> * * * *
>
> This certifies that I the subscriber, a citizen of Hartford, employed Dr. Wells, while in Boston, in an operation on my teeth, and I am happy to say that it has answered my most sanguine expectations.
>
> Joseph S. French.

In the same paper for April 11, (page 3) and April 18, 1836 (page 1) appeared this ad:

> Horace Wells, Dentist. Office in the Exchange-Buildings, on Main-street, two doors from State-street. April 11.

August. Admitted by letter to the First Church of Christ in Hartford. (4)

1838

Published a small volume, "An Essay on Teeth: Comprising a Brief Description of

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[1] *Read by title at the 17th General Meeting of the International Association for Dental Research, Cleveland, Ohio, March* 18, 19, 1939.

[2] *Abstracted in Journal of Dental Research, Vol.* 18, *No.* 3, *June* 1939.

[3] *Mr. William S. Pingree, Town Clerk of Hartford, Vermont, informs me "that the record of our vital statistics of this town do not cover any birth or deaths prior to* 1854. *There was no law in Vermont concerning the records of vital statistics prior to that date." Hence the date of birth was obtained from his first biographer* (1) *and checked with replies from descendents and the data on Horace Wells' grave marker.*

their Formation, Disease, and Proper Treatment". Case, Tiffany & Co., Hartford, 1838.

Notice in the first volume of the Hartford Directory: "Wells, Horace, dentist, 162½ Main Street". (5)

Married to 20 year old Elizabeth Wales on July 9, 1838. (14) (Elizabeth Wales, born April 9, 1818, died July 17, 1889) (6) (21)

1839

August 26. Only child, Charles Thomas Wells was born. (Died June 8, 1909) (6) (21)

December 31. Patent #1450 issued to Horace Wells for Coal Sifter.[4] (7)

1840

Discussion with Linus P. Brockett, Hartford, Conn., showed Wells "Deeply impressed with the idea that some discovery would yet be made by which dental and other operations might be performed without pain." (14)

1841

May 13. First entry in Day Book. (12)

Records of first five years of practice probably lost. (8)

William T. G. Morton of Farmington, Conn., recited to and studied Dentistry under Dr. Wells. (9)

Busy practicing his profession.

1842

William T. G. Morton continued his study of dentistry under Wells. (9)

Practice flourished. (1) (2)

1843

Interesting entry in Day Book, September 10, 1843: "Mr. Morton, Dr. Solder . . . and spiral springs—$1.32." (8)

Wells and Morton enter into an agreement for the promotion of an "enterprise" in Boston, concerning which, under the date line of November 22, 1843, the following letter from Wells to Morton is printed in Dr. N. P. Rice's book: "to show the good feeling which existed between them, and the cause which really induced their separation". (15) [Dissolution of partnership]

> "Dr. Wells wrote: 'We can both of us see at a glance that it is madness for us to go ahead under present circumstances, for the reason that our receipts will barely pay the cost of materials used, even if we had ever so much work at the prices you have taken those jobs now on hand. . . [Unfortunately part of the letter was deleted]. . .
>
> 'I am satisfied in my own mind that our enterprise will be a total failure. So let us give it up and jog along here at home as usual; in case you do not give up the enterprise, I, of course am ready, and do give you notice that I wish to get out of it as soon as our agreement will permit. I wish you to understand that I have not the least fault to find with you; I have the utmost confidence in you as a gentleman, and one who will ever aim to act your part well in accordance with the strictest honor and integrity; we have both exerted ourselves to the utmost, and I believe that our ill-success cannot be attributed to either of us so far as 'goaheaditiveness' is concerned' ". (15)

1844

Morton apparently convinced Wells to continue this strange relationship, because on January 30, 1844 this ad appeared in the American Traveller (Vol. 19, No. 61).

DENTISTS

> Messrs. Wells & Morton, Dentists, No. 19 Tremont Row, are determined to make their valuable invention extensively known, and duly appreciated in the shortest time possible; with this in view we now propose to insert teeth on gold (until further notice) without compensation until the expiration of one year; then if the patient is perfectly satisfied that our invention is really valuable and superior to any other mode of constructing gold plates, we shall expect a small compensation which may be previously agreed on, otherwise we will ask nothing. All we shall require when the teeth are inserted, will be just enough to pay for the materials used, which will be but a trifle. If by this means we are enabled to introduce our improvement more extensively than in the ordinary way, our object will be attained.
>
> All persons can have the benefit of this proposition, whether living at a distance or in town, by calling or sending us word

[4] *It has erroneously been reported that no patents were issued to Horace Wells. Mr. J. A. Brearley, Chief Clerk, Department of Commerce, United States Patent Office, Washington writes: "You are advised that the Index of Inventors from 1790 to 1847 shows two patents issued in the name of Horace Wells of Hartford, Connecticut, No. 4836 for Shower Bath issued November 4, 1846 and No. 1450 for Coal Sifter issued December 31, 1839."*

within one week after the publishment of this notice, so long as it may be continued.

N. B.—Dr. Charles T. Jackson's certificate respecting this invention to be seen at our office.

Wells & Morton,
No. 19 Tremont Row.

Nov 4—Wly

This co-partnership was apparently in name only, as Wells remained in Hartford. (8) Wells describes this relationship in these words: "I—assisted in establishing him in the city of Boston—." (9)

Wells had quite a number of coal sifters made by Col. Thomas Roberts, Manufacturer. (10)

March 4th. Entry in Horace Wells' Day Book: "Dr. Wm. T. G. Morton, to operations on teeth and instructions in the art of dentistry *as per agreement* $50.00 (8) (12)

Entries on May 4th, 17th, 21st, 27th, June 11, August 30, September 2nd, show charges for work done for Morton or his patients. (8) (12)

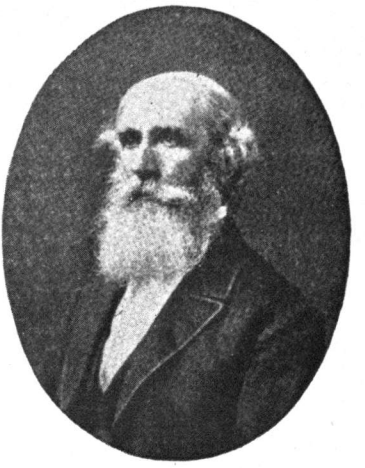
October 24. The following appeared in the Boston Daily Atlas (Vol. 13, No. 100).

COPARTNERSHIP NOTICE. This certifies that the co-partnership of WELLS & MORTON has been dissolved by mutual consent.

Oct. 18, 1844 Horace Wells
ep3t 023

December 10, attended G. Q. Colton's lecture on chemical phenomenon where the idea of inhalation anesthesia crystallized

GARDNER Q. COLTON



DR. JOHN M. RIGGS

in Wells' mind. (9) (11)

December 11, inhaled nitrous oxide gas administered by Colton and had an aching third molar painlessly extracted by his friend and former pupil Dr. John Riggs, later of Riggs' disease fame. This was the first operation performed under nitrous oxide inhalation anesthesia. (11)

Experimented with administration of nitrous oxide to his patients to prevent pain while teeth were being extracted.

1845

January, entries in Day Book for charges for work done on patients were made on the 6th, 7th, 11th, 15th, and 16th. (12)

The last of January—Wells lectured before Dr. John C. Warren's class on "The Use of Nitrous Oxide for the Prevention of Pain" and demonstrated anesthesia for extraction before Harvard medical students in Boston. (13) Dr. Wm. T. G. Morton was present and loaned Wells the necessary extracting instruments. (9) (10)

February 4th, 6th, 7th and 17th entries made in the Day Book. No more entries until Sept. 10th. (12) Wells states, "the excitement of this adventure, [the demonstration in Boston] brought on an illness from which I did not recover for many months, being thus obliged to relinquish, entirely, my professional business." (9)

February 5, 1845, in the Hartford Courant, Vol. 9, No. 30, page 3, appears:

COTTAGE TO LET—H. WELLS, wishing to give up house-keeping, will let his Cottage on Lord's Hill at a very low rent, to one who will pay some attention to the shrubbery and trees on the premises. Possession given on the 1st of April. Enquire at his office between the hours of 10 and 12 A. M. tf feb 4

April 7, 1845, The Hartford Courant, this date, Vol. 9, No. 81, page 3, has the following notice:

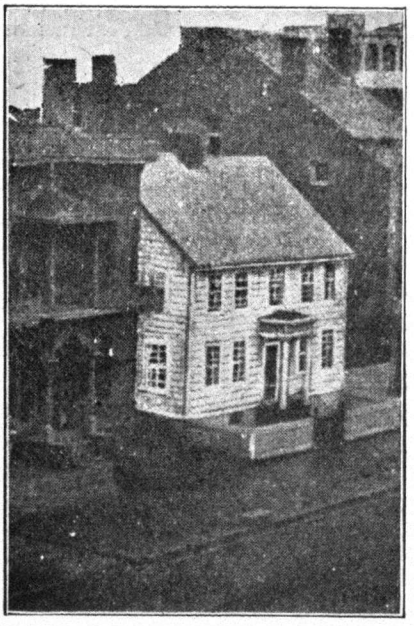
DENTAL NOTICE—Having relinquished my professional business for the present, in consequence of ill health, I do with pleasure refer those who have confidence in me, to Dr. J. M. Riggs, whose professional qualifications in my opinion are not surpassed by any Dentist in the country. This is strong language, but it is said solely for the benefit of my friends who may require any operations on the teeth in my absence.

H. Wells.

Hartford, April 5, 1845. 13wd&w86

This arrangement lasted, according to Riggs' day book, from April 1, 1845 to September 1, 1845. Riggs allowed Wells $25.00. (10 Appendix)

April-May. Arranging a "Panorama of Nature" which was exhibited for some time in the City Hall, Hartford. (10)



HORACE WELLS COTTAGE

May. Conversations with Hon. James Dixon regarding his discovery of the pain relieving properties of nitrous oxide. (10 Appendix)

June 2, 1845, This ad in the Hartford Courant, Vol. 9, No. 129, page 3, announced the opening of:

WELLS' PANORAMA OF NATURE

H. WELLS will give a series of Entertainments, embracing the subject of Natural History, at the CITY HALL, commencing THIS EVENING, Monday, June 2d.

Major Hamilton's Brass Band will be in attendance.

Single tickets 25 cents. Tickets admitting a Lady and Gentleman, 37 1/2. Children under 12 years of age at half price.

Doors open at 7 1/2—commence at 8 o'clock.

Hartford, June 2, 1845. dtf

(This notice was repeated June 3, 4, 5, 1845.)

June 18, 1845, P. W. Ellsworth, M. D. published an article in the Boston Medical & Surgical Journal, Vol. XXXII, No. 2, "On the Modius Operandi of Medicine". On pages 396 and 397 he says: "The nitrous oxyd gas has been used in quite a number of cases by dentists, during the extraction of teeth, and has found by its excitement, perfectly to destroy pain; the patients appear very merry during the operation, and no unpleasant effects follow." Dr. Ellsworth lived in the same house with Dr. Wells at this time.

July. Morton travelled to Hartford and conferred with Wells and Riggs concerning the manufacture and use of nitrous oxide and also to settle financial accounts with Wells. (10)

Morton states Wells was arranging an exhibition of birds at the time of this visit. This was probably part of the "Panorama of Nature". (10)

August 29, 1845. This notice was published in the Hartford Courant, Vol. 9, No. 205, page 3:

DENTIST

H. Wells, Dentist, having taken rooms at No. 14 Asylum Street, a few doors from Main Street, will resume his professional business on Monday, September 8, 1845.

d&wtf 6

September 8. Resumed practice in Hartford, at 14 Asylum Street. Entries in Day

Book for Sept. 10th, 11th, 12th, 15th, 16th, 23rd, and 26th. (12)

October 9th, 10th, and 12th, entries in Day Book. (12)

November 5th. Entry in Day Book. (12)

Winter, Wells invents shower bath and tub. Applied for patent. (10)

Controversey over this invention with Col. Thos. Roberts, a stove dealer, tin and sheet iron manufacturer. (10) Settled by arbitration with Francis Parson Esq. in favor of Wells.

1846

March. Entered into partnership with Col. Thos. Roberts for manufacture and sale of shower baths. (10)

Spring. Actively engaged in shower bath business. (10)

April 4. The last entry was made by Dr. Wells in his Day Book. (12)

Summer. On a visit to New York Wells called on Dr. Valentine Mott, ". . . and made the fact known . . . of the influence of the Nitrous Oxyd or Sulphuric Ether to obliterate all consciousness of pain in surgical operations. . ." (14)

Oct. 19, Morton wrote to Wells concerning his new "compound" for putting patients to sleep. (10) (16)

Boston, October 19, 1846

Friend Wells:

Dear Sir:—I write to inform you that I have discovered a *preparation* by inhaling which a person is thrown into a sound sleep. The time required to produce sleep is only a few moments, and the time in which persons remain asleep can be regulated at pleasure. While in this state the severest surgical or dental operations may be performed, the patient not experiencing the slightest pain. I have *patented* it, and am now about sending out agents to dispose of the right to use it. I will dispose of a right to an individual to use in his own practice alone, or for a town, county or state. My object in writing you is to know if you would not like to visit New York and the other cities to dispose of rights upon shares. I have used *the compound* in more than one hundred and sixty cases in extracting teeth, and I have been invited to administer it to patients in the Massachusettes General Hospital, and have succeeded in every case.

The Professors Warren and Hayward have given me certificates to this effect. I have administered it in the hospital in the presence of the students and physicians—the room for operations being full as possible. For further particulars I will refer you to extracts from the daily journals of this city which I forward to you.

Respectfully yours,

Wm. T. G. Morton

Oct. 20. Sent letter to Morton in reply to Morton's announcement of a "new compound".

"Hartford, Connecticut, Oct. 20, 1846

"Dr. Morton—Dear Sir:

"Your letter, dated yesterday is just received. and I hasten to answer it, for fear you will adopt a method in disposing of your rights, which will defeat your object. Before you make any arrangements whatever, I wish to see you. I think I will be in Boston the first of next week, probably Monday night. If the operation of administering the gas is not attended with too much trouble, and will produce the effect you state, it will undoubtedly be a fortune to you, provided it is rightly managed.

"Yours, in haste,

H. Wells."

October 24. Saturday, Dr. and Mrs. Wells arrived in Boston.

Wells visited Morton and observed the administration of the "compound" to several patients for the extraction of teeth. On his return, Mrs. Wells details the following conversation: "I asked him", she says, "whether Morton had discovered anything new?" He replied: "No! it is my old discovery and he does not know how to use it." (14)

October 26. Monday—Dr. Wells and his wife returned to Hartford.

November. Wells sold out his shower bath business to Col. Thos. Roberts. (10)

December 9, 1846. Published claim as discoverer of anesthesia in Hartford Courant, as follows:

Hartford, Dec. 7, 1846.

Mr. Editor:—You are aware that there has been much said of late respecting a gas, which, when inhaled, so paralizes the system as to render it insensible to pain. The Massachusettes General Hospital have adopted its use, and amputations are now being performed without pain. Surgeons generally throughout the country, are anxiously waiting to know what it is, that they may make a trial of it, and many have already done so with uniform success. As Drs. Charles T. Jackson and W. T. G. Morton, of Boston, claim to be the originators of this invaluable discovery, I will

give a short history of its first introduction, that the public may decide to whom belongs the honor.

While reasoning from analogy, I was led to believe that the inhaling of any exhilarating gas, sufficient to cause a great nervous excitement, would so paralize the system as to render it insensible to pain, or nearly so; for it is well known, that when an individual is very much excited by passion, he scarcely feels the severe wounds which may at the time be inflicted, and the individual who is said to be "dead drunk", may receive severe blows, apparently without the least pain, and when in this state, is much more tenacious of life than when in the natural state. I accordingly resolved to try the experiment of inhaling an exhilarating gas myself, for the purpose of having a tooth extracted. I then obtained some nitrous oxide gas, and requested Dr. J. M. Riggs to perform the operation at the moment when I should give the signal, resolving to have the tooth extracted before losing all consciousness. This experiment proved to be perfectly successful—it was attended with no pain whatever. I then performed the same operation on twelve or fifteen others with the same results.

I was so much elated with this discovery, that I started immediately for Boston, resolving to give it into the hands of proper persons, without expecting to derive any pecuniary benefit, therefrom. I called on Doctors Warren and Hayward, and made known to them the result of the experiments I had made. They appeared to be interested in the matter and treated me with much kindness and attention. I was invited by Dr. Warren to address the Medical Class upon the subject, at the close of his lecture. I accordingly embraced the opportunity, and took occasion to remark that the same result would be produced, let the nervous system be excited sufficiently by any means whatever; that I had made use of nitrous oxide gas or protoxide of nitrogen as being the most harmless. I was then invited to administer it to one of their patients, who was expecting to have a limb amputated. I remained some two or three days in Boston for this purpose, but the patient decided not to have the operation performed at the time. It was then proposed that I should administer it to an individual for the purpose of extracting a tooth. Accordingly a large number of students, with several physicians, met to see the operation performed—one of their number to be the patient. Unfortunately for the experiment, the gas bag was by mistake withdrawn much too soon, and he was but partially under its influence when the tooth was extracted. He testified that he experienced some pain, but not as much as usually attends the operation. As there was no other patient present, that the experiment might be repeated, and as several expressed their opinion that it was a humbug affair, (which in fact was all the thanks I got for this gratuitous service), I accordingly left the next morning for home.—While in Boston, I conversed with Drs. Charles T. Jackson and W. T. G. Morton upon the subject, both of whom admitted it to be entirely new to them. Dr. Jackson expressed much surprise that severe operations could be performed without pain, and these are the individuals who claim to be the inventors. When I commenced giving the gas, I noticed one very remarkable circumstance attending it, which was, that those who sat down resolving to have an operation performed under its influence, had no disposition to exert the muscular system in the least, but would remain quiet as if partially asleep. Whereas, if the same individuals were to inhale the gas under any other circumstances, it would seem impossible to restrain them from over exertion.

I would here remark, that when I was deciding what exhilarating agent to use for this purpose, it immediately occurred to me that it would be best to use nitrous oxide gas or Sulphuric Ether. I advised with Dr. Marcy, of this city, and by his advice I continued to use the former, as being the least likely to do injury, although it was attended with more trouble in its preparation. If Drs. Jackson and Morton claim, that they use something else, I reply that it is the same in principle if not in name, and they cannot use anything which will produce more satisfactory results, and I made those results known to both of these individuals more than a year since.

After making the above statement of facts, I leave it for the public to decide to whom belongs the honor of this discovery.

Yours truly,
Horace Wells, Surgeon Dentist.

December 10. Wrote to Morton as follows:

Dear Morton:

I have just seen a copy of your claim, and find that it is nothing more than what I can prove priority of discovery (to) by at least eighteen months. When in Boston, at your room, I was well satisfied that the principal ingredient was ether, and, to all appearances, it had just the effect of this alone on the patient to whom I saw it administered in your office. Now, I do not wish, or expect, to make any money out of this invention, nor to cause you to be the loser; but I have resolved to give a history of its introduction, that I may have what credit belongs to me. Although it is in my power to invalidate your patent, by a word, yet, as long as we remain on good terms, I shall not aim to do it. . ." (17)

The balance of this letter was deleted.

December 18. Wrote to Hon. James Dixon for a passport for his trip abroad. (8) The object of this trip was to purchase paintings for resale in the United States and to present his claims as the discoverer of anesthesia.

December 19, passport # 1485 issued to Horace Wells by State Department, U. S. A. (8)

December 22, in the Hartford Daily Times, (No. 1854, p. 3) appears a partnership notice of Horace Wells and J. B. Terry.

DENTISTS

Hartford, Dec. 19, 1846

The subscribers having associated themselves in the business of Dental Surgery, respectfully invite all who may require the service of Dentist to call at their rooms, 180 1/2 Main Street, where all operations will be performed in a faithful and workmanlike manner.

Copartnership Notice — Horace Wells
dec 22 eodsmw 3m66 — J. B. Terry

December. Sailed for Paris from New York.[5]

1847

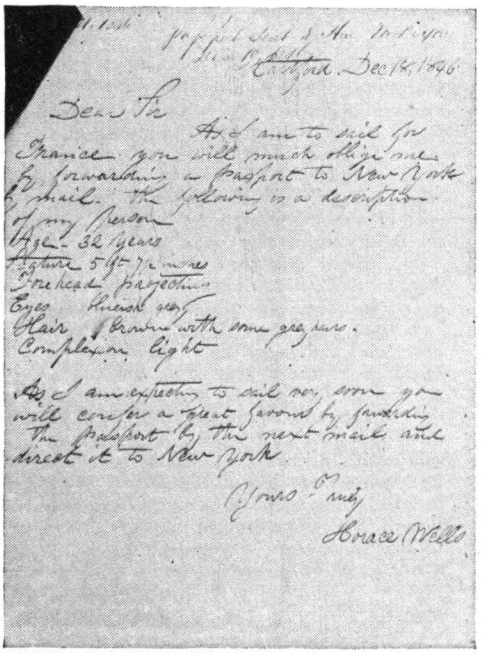
Hon. James Dixon protests to a select committee of the House of Representatives against that committee rendering a favorable decision regarding Morton's claims as the discoverer of anesthesia until he had an opportunity to present Wells' claims. (10)

February. Presented "his claim to the discovery of performing operations without pain" to the "Academie de Sciences" and the "Academie de Medecine" and the "Parisian Medical Society". (See Brewsters letter under March 26, 1847 dateline)

February 17. Published this article in Galignanis' Messenger while in Europe. (This article was reprinted in The Boston Atlas, April 2, 1847, columns two and three, page 2.)

"Paris, Feb. 17, 1847.

Sir:—As you have recently published an extract from the Boston Medical and Surgical journal, which recognises me as the discoverer of the happy effects produced by the inhalation of exhilarating gas or vapor for the performance of surgical operations, I will now offer some suggestions in reference to this subject. Reasoning from analogy, I was led to believe that surgical operations might be performed without pain, by the fact that an individual, when much excited from ordinary causes, may receive severe wounds without manifesting the least pain; as, for instance, the man who is engaged in combat may have a limb severed from his body, after which he testifies that it was attended with no pain at the time; and so the man who is intoxicated with spirituous liquor may be treated severely without his manifesting pain, and his frame seems in this state to be more tenacious of life than under ordinary circumstances. By these facts I was led to inquire if the same result would not follow by the inhalation of some exhilarating gas, the effects of which would pass off immediately, leaving the system none the worse for its use. I accordingly procured some nitrous oxide gas, resolving to make the first experiment on myself, by having a tooth extracted, which was done without any painful sensations. I then performed the same operation for twelve or fifteen others, with the like results; this was in November, 1844. Being a resident of Hartford, Connecticut, (U. S.,) I proceeded to Boston the following month, (December), in order to present my discovery to the



Dr. Wells Letter to Hon. James Dixon Requesting a Passport

[5] *Exact date of departure is unknown. Mr. Byron H. Uhl, District Director, U. S. Department of Labor, Immigration and Naturalization Service, Ellis Island, New York Harbor, N. Y., advises me that; "No records of departing passengers are available prior to March,* 1929."

medical faculty—first making it known to Drs. Warren, Hayward, Jackson and Morton, the two last of whom subsequently published the same, without mention of our conference. Since this discovery was first made I have administered nitrous oxide gas and the vapor of ether to about fifty patients, my operations having been limited to this small number in consequence of a protracted illness which immediately ensued on my return home from Boston, in January, 1845. Much depends on the state of mind of the patient during the inhalation of gas or vapor. If the individual takes it with a determination to submit to a surgical operation, he has no disposition to exert the muscular system; whereas, under other circumstances, it seems impossible to restrain him from over exertion; he becomes perfectly uncontrollable. It is well to instruct all patients of this fact before the inhalation takes place. The temperament and physical condition of the patient should be well marked before administering the vapor of ether; persons whose lungs are much affected should not be permitted to inhale this vapor, as serious injuries have resulted from it in such cases. Nitrous oxide gas, or protoxide of nitrogen, is much less liable to do injury, and is more agreeable to inhale, producing at the same time equal insensibility to all painful sensations. It may be taken without the least inconvenience by those who become choked almost to strangulation with ether; in fact, I have never seen or heard of a single instance where this gas has proved in the least detrimental. This discovery does not consist in the use of any one specified gas or vapor; for anything which causes a certain degree of nervous excitement is all that is requisite to produce insensibility to pain. Consequently, the only question to be settled is, which exhilarating agent is least likely to injure the system. The less atmospheric air admitted into the lungs with any gas or vapor the better—the more satisfactory will be the result of the operation. Those who have been accustomed to use much intoxicating beverage cannot be easily affected in this manner. With cases of dislocated joints, the exhilarating gas operates like a charm; all the muscles become relaxed, and but a very little effort will serve to replace the limb in its socket, and while the operation is being performed the muscles do not contract as when in the natural state, but are as easily managed as those of a corpse. Allow me to add that I have had no opportunity of reading any of the French professional reports or discussions on this subject. I shall remain in Paris until the 27th inst., and in the interval I should be pleased to impart such information as I may have acquired by a close observation of the various phenomena connected with this interesting subject.

Horace Wells."

February 27. Left Paris for London. (10)

March 4. Sailed from Liverpool in the Hibernia for Boston. (10)

March 8. Wells' Memoir was read before the Academy in Paris. (10)

March. Returned from England.* Had conferences in Boston with Warren and Hayward. (15)

March 26. The Boston Transcript copied, in column one, page 4, by request, Dr. Brewster's letter from the column of the foreign correspondent of the New York Journal of Commerce:

> Paris, March 1st, 1847. The all absorbing topic of conversation in the Saloons of Paris, and the all engrossing discussions in the learned and scientific Societies here, as in most of Europe, is our "American discovery" of performing surgical operations without pain. All the nations, I might almost say, all the individuals, are trying to claim the merit of the discovery.
>
> Numberless communications are published from persons who knew all these things long ago, 20, 30 and 40 years since, yet to the present moment, they have not succeeded in wresting the honor of this discovery (the greatest ever given to man since the days of "Jenner,") from the western world.
>
> I have seen in your paper of the 30th December last, a letter from Doctor Marcy, which gives the whole honor to Horace Dr. Wells, dentist of Hartford. I have also seen in the 6th January, Dr. Jackson's reply, and the rejoinder of Dr. Marcy, in the 8th. In the "Boston Medical and Surgical Journal" I see a letter which gives the discovery to Dr. Wells. These are things which I hope you will settle fairly on your side of the water, and let "Caesar have the things which are Caesar's."
>
> Dr. Wells has been for the last few days in Paris. His claims to the discovery of performing operations without pain, have been presented to both the "Academie des Sciences," and the "Academie de Medecine," where they are under consideration. He has likewise been before the "Parisian Medical Society," and related the history, progress, and final result of his discovery; I was present; the Society were of opinion, that if Dr. Wells brought forward proofs that he had performed the extraction of teeth in 1845 without pain, then he would be entitled to the merit of being the discoverer.

**Exact date not known. Mr. John H. Jensen, Inspector in charge of Immigration and Naturalization, U. S. Department of Labor, East Boston, Mass., writes; ". . . please be informed, our records go back only to* 1848."

Imagine to yourself, Messrs Editors, a man to have made this *more than brilliant discovery,* visiting Europe without bringing with him the proofs. Dr. Jackson acted much more wisely, when he claimed the discovery; for he wrote to the "French Institute," his letter bore the Boston, Liverpool, and the French post-marks, then it was sealed by the Institute, its receipt recorded, and left sealed until ordered to be opened. Had Dr. Wells done the same thing in Nov. 1844 his claim would not now admit of a doubt. Whether he used the nitrous oxyde gas, or sulphuric ether, matters but little, inasmuch as their results are the same, and he seems after having tried them both, to have given the preference to the gas, as being more agreeable to inhale. Other kinds of ether have since been tried here, but none pretends to claim the merit of the discovery by using a new substitute. Though there are some persons skeptical as to its ultimate value, I have used it in many cases with perfect success, and have seen some of the most painful operations in surgery performed in our hospitals without the patients feeling the slightest pain. No country in the world offers the same facilities as France for testing the value of any discovery in the medical science. Here man and beast are made subservient to the rigors of experimental proof. When this discovery was first mooted, some feared danger from fire, that the breath would ignite and the lungs explode; but the many experiments made at Alfoet upon horses who had been made to inhale the ether, prove that when the lamp is applied to the mouth immediately after inhalation, a blue flame burns exteriorly, but soon expires without the slightest harm or danger.

As an American I feel proud that this discovery originated in my native land, and regret that any efforts should have been made to rob the rightful discoverer of his just due.

Very truly yours,

Brewster.

March 30. Published "History of the Discovery of the Application of Nitrous Oxide Gas, Ether, and other Vapors, to Surgical Operations." J. Gaylord Wells, Hartford, 1847.

March 30, Forwarded the original testimonials and affidavits and other papers contained in the above volume to Dr. C. S. Brewster, No. 11 Rue de la Paix, Paris to be presented by him to the scientific and medical societies of Europe in order that Wells priority in the discovery of anesthesia could be established. (9)

April 2, Article in Galignani's Messenger republished in the Boston Atlas bearing a Paris Feb. 17, 1847 date line.

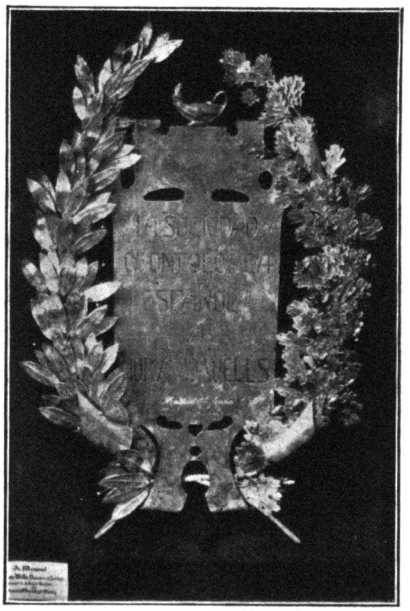
April 22. Letter written by Wells to the Editor of the Boston Post, Vol. 30, No. 95, page 1, referring to a long article which appeared in the April 7th 1847 issue and signed E. W. (Probably Edward Warren, Morton's representative):

TO THE EDITOR OF THE
BOSTON POST

Hartford, April 19, 1847

I have just seen a long article in your paper of the 7th inst. signed E. W., which I will answer in one word. The letter which is there introduced with my signature was written in answer to one which I received from Dr. Morton, who represented to me that he had discovered a "compound," the effects of which as described by him, entirely eclipsed those produced by nitrous oxide gas or sulphurate ether, he stating that his "compound" would *invariably* produce a sound sleep, the length of which was wholly optional with the operator; that he had not made a single failure in one hundred and sixty cases, &c., &c. He also stated that he had obtained a patent for this "compound". I accordingly started for Boston to learn more of this improvement on my discovery, with which I had made him acquainted long before.

While at his office I saw the (so called)



SILVER MEMORIAL WREATH AND PLAQUE. PRESENTED BY THE ODONTOLOGICAL SOCIETY OF MADRID, SPAIN TO THE CITY OF HARTFORD, CONN. JAN. 14, 1907.

compound administered to a patient; it apparently had the same effect as the gas, which I had many times administered for the same purpose. Before I left for home the gas was given to several other patients with but partial success—at least so said the patients with whom I conversed. I then enquired about his patent, and found to my surprise that he had not obtained one, nor even made an application for one, this being done at a subsequent period, as the date of his specifications and patent clearly show. Respecting the interview which E. W. had with the Hon. James Dixon at Washington, I am informed by Mr. Dixon that the statement of E. W. in the article referred to, is a gross misrepresentation of the truth, and if necessary, he will sign a certificate to that effect.

Respectfully,

HORACE WELLS

April. Wells went to New York and with his attorney went to the Custom House to get the paintings purchased in Paris. He also arranged with a manufacturer to have frames made. (10 Appendix.)

May. The General Assembly of the State of Connecticut passed resolutions stating that Wells was the discoverer of anesthesia.

May 12. Published the following article in the Boston Medical and Surgical Journal, Vol. 36, p 298, 1847, dealing with the contents of the October 20, 1846 letter:

THE DISCOVERY OF ETHEREAL INHALATION

To the Editor of the Boston Medical and Surgical Journal.

Sir,—Having seen an article, by Edward Warren, in the Medical Journal of the 28th April, which has special reference to myself, with your permission I will answer through the same medium, as briefly as possible.

Mr. Warren, who is a gentleman in the office of Dr. Morton, seems to exult in the possession of a letter with my signature, which he has published. I am much surprised that Dr. Morton, for his own sake, should have permitted that letter to be published, for when *his* letter is read, to which mine was an answer, it places the whole matter in quite a different light. Dr. Morton, in his letter dated 19th October, 1846, gave me to understand that he had made a discovery which would entirely eclipse the one I had made. He says:

"I have discovered a *preparation*, by inhaling which a person is thrown into a sound sleep; the time in which persons remain asleep *can be regulated at pleasure*. While in this sleep the severest surgical or dental operations may be performed, the patient not experiencing the slightest pain. I have patented it, and am now sending agents to dispose of the right to use it. I have used this *compound* without a single failure in over one hundred and sixty cases, in extracting teeth. My object in writing you is to know if you would not like to visit New York and the other cities, and dispose of rights.

Respectfully yours,

W. T. G. Morton."

Now I would ask all who have made use of ether since its first introduction, on perusing the above letter, if they would for a moment imagine the discovery, as above described, to consist in the use of this article ether? On receiving the above letter, I went to Boston to learn the nature of this improvement on my discovery; I there saw Dr. Morton administer his (so-called) compound, and the patient, instead of going quietly to sleep, to be aroused at pleasure, as I had been informed would be the case, became exhilarated, succeeded by a stupor, the same as is produced by the inhalation of nitrous oxide gas. While at Dr. Morton's office, three or four other patients inhaled the "compound," two of whom informed me that it was an entire failure. I thought this remarkable after his operating on one hundred and sixty patients "without a single failure." I then inquired about his patent, which the letter stated had been obtained for the compound, and learned, to my surprise, that he had not obtained one, nor even made an application for one; as will be seen by the date of his letter to me, and the date of his application for a patent, the specification bearing date October 27th, 1846, and the date of his letter being 19th October, 1846. Mr. Warren states that I "returned home, determined to have nothing to do with the business." Now is it at all strange, after the above development of facts, that I acted thus? In the first place, what could I do in reference to his patent, for he had got none; and in the next place, after what I had seen, it was evident that this "preparation" was no improvement upon my discovery (with which I had made him acquainted more than eighteen months before), even allowing it to be a "compound." In November, 1844, I made this discovery, and applied it with perfect success, as is proved by affidavits of the very first character. I have also proved that I went to Boston at that time to make my discovery known to the medical faculty, and addressed Dr. Warren's class upon the subject, and endeavored to establish the principle that the nervous system, when wrought up to a certain degree of nervous excitement by any means whatever, would become insensible to pain; then stating that I was using nitrous oxide gas for this purpose, considering it the most harmless. When I first made the discovery, rectified

ether was used, as well as nitrous oxide gas. This is clearly proved by affidavit; but I preferred the latter as being more agreeable to inhale, and less liable to do injury.

It is truly astonishing to see with what pertinacity Drs. Jackson and Morton adhere to their pretended priority of discovery, simply because I gave the preference to the nitrous oxide, after having tried both the vapor and the gas. It has been said that the rectified sulphuric ether vapor acts as a sedative merely, while the nitrous oxide gas only operates as a stimulant. This is a mistake, and no man who has ever made experiments with both the gas and vapor will make such an assertion. When I first administered the nitrous oxide for a surgical operation, I was astonished that the patient did not exert the muscular system, as is generally the case when taken merely for pleasure, and this proved to be the case in subsequent operations. That this is a remarkable phenomenon, is acknowledged by all who have made use of it for this purpose, and it is precisely so with the vapor of ether; both at first stimulate, then, when continued to excess, act as a sedative, producing a stupor. Several gases of this nature are now being used in Europe with perfect success. Does it follow that every one who makes use of a different gas is to be entitled to the credit of this discovery; or is it the one who first proved, by actual experiment, that one of these gases would have this wonderful effect? Every reasonable man will at once say that the *principle*, when fully demonstrated, constitutes the discovery. Both Drs. Jackson and Morton admit that they were fully aware that I had used nitrous oxide for this purpose long before the date they give as the time of their discovery. Suppose *A* makes the discovery that a certain degree of compression of the limb, with a cloth bandage, will so paralyze the limb that it may be amputated without pain, and he proves this beyond a doubt, presenting his discovery to the world. Soon after, we hear of *B*, proclaiming that he has made a wonderful discovery, which consists in the use of a leather strap to produce this compression, and he insists that it is nothing like the discovery of *A*, who uses the cloth bandage. Now these are parallel cases, and if each gas or vapor which may be used for this purpose is a distinct and independent discovery, then allow me to ask, where will it end? I informed Drs. Jackson and Morton of this discovery in November, 1844, both admitting that the idea was entirely new to them. Dr. Jackson particularly seemed inclined to ridicule the whole thing.

Mr. Warren states that my experiment before the medical class in 1844, was a failure, and all pronounced it a "humbug." Now this is perfectly true. The gas bag was removed too soon, and the patient experienced some pain, and I was denounced as an impostor; no one seeming inclined to assist in further experiments. The excitement of this adventure immediately brought on a protracted illness, which compelled me to relinquish my professional business entirely. For this reason, and because I did not wish to incur the responsibility of administering this powerful agent without the co-operation of the medical faculty, my operations have been somewhat limited, but perfectly successful. I had operated on something like fifteen patients with the gas before having the interview with Drs. Jackson and Morton in November, 1844. After relinquishing my professional business in consequence of this illness, Dr. Morton requested me to prepare some of the gas for him. I told him to go to Dr. Jackson, as he was a chemist, and get it. The sequel is already known. In due time we heard of surgical operations being performed at the Hospital, without pain, by means of a secret "compound", and Drs. Jackson and Morton announced as the discoverers. Ere long my discovery, which I designed should be free to all, is trammelled with a patent.

Mr. Warren speaks of an interview which he had with the Hon. James Dixon. To show him that his memory sometimes proves treacherous, I will here give a copy of a letter which I have just received from Mr. Dixon.

"Hartford, May 5th, 1847.

Dear Sir,—The communication of Mr. Edward Warren, of Boston, to which you have called my attention, is incorrect in several particulars. Mr. Warren, it seems, misunderstood my conversation with him. The person whom I consulted with, in regard to the use of your discovery, was Dr. Riggs, of Hartford, and not yourself, and I so informed Mr. Warren.

Yours respectfully,

James Dixon."

Dr. Horace Wells, Hartford."

With the foregoing statement of facts, I close, wishing, in all sincerity, to receive no more credit for this discovery than what in justice I am entitled to.

Respectfully,

Horace Wells.

Hartford, May 5, 1847.

July 3, 1847. This announcement appeared in the Hartford Daily Courant (Vol. 11, No. 157, Whole No. 2917)

DENTISTS

Hartford, Dec. 19, 1864

"The subscribers having associated themselves in the business of Dental Surgery, respectfully invite all who may require the services of a dentist to call at their rooms, 180 1/2 Main Street, where

all operations will be performed in a faithful and workman-like manner.

Horace Wells
J. B. Terry."

May 27 d&wtf 97

August 21, Wells gave nitrous oxide for removal of testicle by Dr. E. E. Marcy. (This case was published in Boston Medical and Surgical Journal of Sep't. 1st, 1847, No. 5, Vol. 37.)

August 28, 1847. The Hartford Daily Courant carried this notice:

DENTISTS

Notice:—Having associated with me in business, Dr. J. B. Terry, I cheerfully recommend him to my friends and patrons who may require dental operations in my absence. Those employing him may depend on having dental operations performed in a faithful and workmanlike manner.

Horace Wells.

Hartford, Aug. 28, 1847.

November 4, Patent # 4836 issued to Horace Wells for a Shower Bath. (7)

1848

January 1, Wells administered nitrous oxide to Henry A. Goodale for the amputation of his leg. Operation was performed by Dr. P. W. Ellsworth. (Case reported by Dr. Ellsworth in The Boston Medical and Surgical Journal, June 17, 1848, Vol. 37, (No. 25, p 498)

January 4, Wells administered nitrous oxide to Mrs. Mary Gabriel for the "removal of a fatty tumor from her right shoulder weighing six and a half ounces. This was performed by Dr. L. B. Bernsford, assisted by Drs. Grant and Crary". (14)

January 17, 1848 Notice in New York Evening Post:

H. Wells, Surgeon Dentist, the discoverer of the "Letheon", having removed to New York, will give gratuitous advice respecting the use of Chloroform, Nitrous Oxide Gas, and "Letheon", as applied to the extracting of teeth from 10 o'clock A. M. until 3 o'clock P. M. Residence 120 Chambers Street, west of Broadway.

January 17, 1848, The New York Herald carried the following notice:

TEETH EXTRACTED WITHOUT PAIN.—H. Wells, Surgeon Dentist, who is known as the discoverer of the wonderful effect of ether and various stimulating gases in annulling pain, would inform the citizens of New York, that he has removed to this city, and will for the present attend personally to those who may require his professional services. It is now over three years since he first made this valuable discovery, and from that time to the present, not one of his numerous patients has experienced the slightest ill effects from it; the sensation is highly pleasurable. Residence, 120 Chambers Street, West of Broadway.

January 21, Friday—33 years old this date.

While mentally deranged, due to the effects of constant self experimentation with chloroform, Dr. Wells was arrested because of annoyances committed on Broadway. (19) Police records apparently lost. (20)

January 22, Saturday—Permitted to go to his rooms on Chambers Street where he secured his razor, other necessities and unknown to his guard, a bottle of chloroform. (19)

January 23, Sunday—Attending church services in the Tombs. Seemed to be in good spirits, but profoundly affected by the sermon. Wells was a sensitive, very religious individual. Feeling that he was guilty of what he thought to be a terrible crime he committed suicide. (19)

January 24, Monday—Body discovered by the guard. "Dr. Walters, the coroner, was called to hold an inquest, and the jury rendered a verdict, 'that the deceased came to his death by suicide, by inflicting a wound in the left thigh with a razor, while laboring under an aberration of mind' ". (19)

January 25, 1848, Tuesday: The Evening Post carried the following story and letters:

Melancholy Suicide.—Dr. Horace Wells, who was arrested last Friday, under circumstances which are fully explained in the following letter, and with apparent truthfulness, committed suicide on Sunday night last, in his cell at the Tombs. By his side were found, on his bed, an empty vial, labelled "Chloroform", the contents of which he had doubtless taken, preparatory to taking life. A pen-knife and a razor were also on the bed; with the latter he had lacerated the flesh of the left thigh quite to the bone, severing the femoral artery . . . In one corner of his cell were found his watch and the following letters:

New York, Jan. 23, 1848.

To the Editors of the Journal of Commerce:

Gentlemen:—I wish, through the medium of your journal, to make a plain statement respecting the unhappy circumstances in which I am at present placed. My real name is now before the public as a miscreant, guilty of a most despicable act, that of wantonly destroying the property of those girls of the town who nightly promenade Broadway. The facts, so far as I am concerned, are briefly these:—On Tuesday evening last a young man with whom I had recently formed an acquaintance, went with me to my office in Chambers St., and while there, he said a woman of bad character had spoiled a garment for him while walking in the street, by throwing something like vitriol upon him; that he knew who it was, and would pay her back in the same coin. As I had some sulphuric acid in my office, which I was using in some chemical experiments, he requested the liberty of taking some of it, for this purpose. He accordingly cut a groove in the cork of a phial, so that a small quantity only might excape when it was suddenly thrust forward. He then said that he might get it upon his own clothes. I told him that I had an old cloak, which could not be much injured by the acid, as it was good for nothing.—By his request I walked into the street with him, he wearing my old cloak, and I having on my ordinary over-coat. We proceeded up Broadway, and when about opposite the theater, he said that he saw the girl he was in pursuit of, and he soon gave her shawl a sprinkling: we then turned down Broadway, when my friend proposed to sprinkle some of the other girls, I immediately objected, and told him that what he had already done was not in accordance with my own feelings, although it was done in revenge; and when we arrived at Chambers St., I took my phial and cloak; at the same time two of his friends came up and I left him, supposing that I had dissuaded him from doing the mischief he proposed, which is as foreign to my nature as light is opposed to darkness. I then regretted exceedingly that I had countenanced in any manner the first act. On getting home I found that my cloak had apparently received the principle part of the acid which had escaped from the phial as the wind was blowing towards us when the act was done. On meeting with my acquaintance the next day, he said that himself and his two friends, whom I met the previous evening, had resolved to drive all the bad girls out of Broadway by sprinkling them with acid. I in vain reasoned with him against committing so much injury when he had not been harmed. This was the last interview which I have had with him to the present time.

I wish now to state as well as I am able what influenced me to do this act on Friday evening, which I confess was done with my own hands; and this was the only one of which I am guilty and which resulted in my arrest. I had during the week been in the constant practice of inhaling chloroform for the exhilarating effect produced by it; and on Friday evening last I lost all consciousness before I removed the inhalor from my mouth. How long it remained there I do not know; but on coming out of the stupor I was exhiliarated beyond measure, exceeding anything which I had ever before experienced, and seeing the phial of acid (which had been used a few evenings previous as above described) standing on the mantel, in my delirium I seized it and rushed into the street and threw it at two females. I may have thrust it at others, but I have no recollection further than this. The effect of this inhalation continued very much longer than ever before, and did not entirely pass off until sometime after my arrest. I do not make this statement expecting to free myself from all blame in this matter; yet I have been induced to make a minute statement of facts, that the public may better judge of this misdemeanor so far as I am concerned. I state, unhesitatingly, that I would no sooner, deliberately, in cold blood, go into the street and commit the gross acts of wantonness which have been committed for the last few evenings, than I would cut my right hand from my body. No, I am not prone to do mischief, as all can testify who have ever known me. But now I am placed in circumstances where I am obliged to bear the reproaches of the world for the most contemptible acts in which I have not participated. Because I have done this one act in a moment of delirium, I must bear the brunt of the whole. Some of the papers disbelieved my statement about others being concerned in this business; but I am informed to day that while I was in close confinement last evening, the same acts were being committed in Broadway; several were sprinkled with acid. However, my character which I have ever prized above everything else is gone—irrevocably gone—and I am now in the most miserable condition in which it is possible for man to be placed. One of those abandoned females who were examined yesterday, stated that I had often addressed her in Broadway. Now I do most solemnly assert that the statement of the girl is utterly false; I never have, on any occasion, had anything to say to these miserable creatures. If myself alone was the only one to suffer by all the false statements, which may be or have been made respecting me, it would be nothing compared to the injury to my dear-dear wife and child. Oh! may God protect them! I cannot proceed, my hand is too unsteady, and my whole frame is convulsed in agony. My brain is on fire.

Sunday evening, 7 o'clock.

I again take up my pen to finish what

I have to say. Great God! has it come to this? Is it not all a dream? Before 12 o'clock this night I am to pay the debt of nature. Yes, if I was to go free tomorrow, I could not live and be called a villain. God knows I am not one. O, my dear mother, brother, and sister, what can I say to you? My anguish will only allow me to bid you farewell. I die to-night, believing that God, who knoweth all hearts, will forgive the dreadful act. I shall spend my remaining time in prayer.

Oh! what misery I shall bring upon all my near relatives, and what still more distresses me is the fact that my name is familiar to the whole scientific world, as being connected with an important discovery; and now, while I am scarcely able to hold my pen, I must bid all farewell! May God forgive me! Oh! my dear wife and child, whom I leave destitute of the means of support—I would still live and work for you, but I cannot—for were I to live on, I should become a maniac. I feel that I am but little better than one already. The instrument of my destruction was obtained when the officer who had me in charge kindly permitted me to go to my room yesterday.

Horace Wells.

To The Editors

My last request to Editors is, that they will, while commenting on this unhappy affair, think of my poor wife and child—also my mother, brother and sister, all of whom are numbered among the most respectable members of society.

H. Wells.

To My Dear Wife

I feel that I am fast becoming a deranged man, or I would desist from this act. I can not live and keep my reason, and on this account God will forgive the deed. I can say no more.

Farewell H.

To Mr. Dwyer

Dear Sir: When you receive this I shall be no more. I wish you would take my watch and present it to my dear wife, together with the trifle I have already given you. Please to see to my burial: let me be interred here in the most secret manner possible. I wish you or Mr. Barber would go immediately to Hartford, and reveal this misfortune to my wife in the most inobjectionable manner possible, and attend to the business which we spoke of this morning, when you little thought of this occurrence.

Yours,

H. Wells.

To Messrs. Dwyer and Barber,
Weston Hotel.

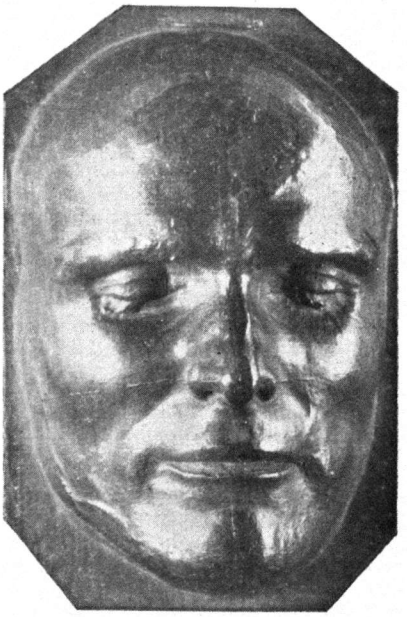
N. B. Please tell Mr. James to write to Mr. F. W. Stowon, No. 19 Rue du Fauxbourg Possonier, Paris and tell him of my death.

* * * *

As some papers connect the name of Dr. Wells with the "discovery of ether or chloroform", it may be proper to state that to the deceased is due the original discovery of "ether" now in use by dentists and others; but that Dr. Morton, of Boston, first successfully applied it, after its use had been suggested by Dr. Wells. Chloroform is an entirely different thing, discovered, we believe, by Dr. Simpson, of Edinburgh.

* * * *

January—. Death mask made.[7]



DEATH MASK OF HORACE WELLS

January 26, 1848, Wednesday: The Daily Hartford Courant had the following:

EDITORIAL

THE LATE HORACE WELLS

The death of this gentleman has caused a profound and melancholy sensation in this community. He was an upright and estimable man, and had the esteem of all who knew him. Of undoubted piety, simplicity and generosity of character,

[7] *The date on which the mask was made or by whom is unknown. It hangs at present in the Boston Medical Library. Mr. James F. Ballard, Director, advises me that he has "been unable to find any reference to the Library's acquisition of Horace Wells' Death Mask. It has been in the Library for a great many years, as I remember seeing it even in the old building at* 19 *Boylston Place. I suppose that we have had it for sometime previous to* 1892".

enthusiastic in the pursuits of science, and having just been acknowledged as the discoverer of etherization in surgical operations, he was regarded with the highest respect and regard by all our citizens, and there was no one who seemed less likely to meet the sad fate that has befallen him.

In the letters which were found in his cell he speaks of himself as having formed a habit of taking ether for its exhilerating effects. There is no reason to suppose that he did this deliberately. The probability is that his mind was somewhat unsettled by the frequency with which he inhaled it in trying experiments in order to satisfy himself on the feasibility and propriety of employing it in surgical operations. Being of an excitable temper, the effects of this course, added to the agitation which he felt in consequence of the attempt to gain the credit of his important discovery for rivals, and the intensity with which he watched the proceedings in Paris on this subject, till he was formally acknowledged as the real discoverer, further unbalanced his mind so that he was peculiarly in danger of mischief. When in this disturbed state it is not to be wondered at that he betook himself to the inhaling of chloroform, that in the madness occassioned by it he should have engaged in the acts for which he was arraigned, or that under the pressure of his misery he should have put an end to his own life. He committed the fatal act by cutting open his thigh, completely severing the femoral artery, having first inhaled chloroform to deaden the pain. Before doing this he wrote the letters which we copy below, expressive of his desperate intentions and the mental suffering which led to the rash consummation.

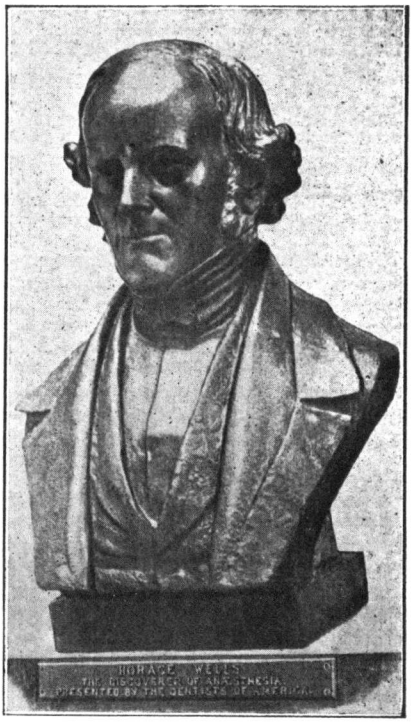
By a melancholy coincidence, Dr. J. B. Terry, his late partner, was bereaved of a son under most afflicting circumstances on Saturday. We are informed that Mrs. Wells wrote to her husband to avoid writing to Dr. Terry on business, as he was not in a state of mind to receive such correspondence. Little did any think how great an affliction awaited her at that very time!

(The letters referred to in this editorial are printed under date line of New York, Jan. 25th, 1848.)

January 27, 1848. In the Hartford Courant, Vol. 12, No. 23, Whole No. 3093, is the following notice under deaths (page 3.)

> The Funeral of Dr. Horace Wells will take place at his late residence, No. 117 Main St., this (Thursday) P. M. at half past 2 o'clock.

Buried in the Old North Burying Ground. (On May 18, 1908 Dr. & Mrs. Wells' bodies were removed and brought to Cedar Hill for burial). (21)



PORTRAIT BUST OF HORACE WELLS, PRESENTED BY THE DENTISTS OF AMERICA. NOW LOCATED IN ARMY MEDICAL LIBRARY, WASHINGTON, D. C.

January 27, 1848. In the Hartford Daily Courant, Vol. 12, No. 23, Whole No. 3093, on page 2, is an editorial copied from the New Haven Journal.

THE SUICIDE OF DR. WELLS.

The statement of this unhappy event as given in another column, is by no means in our judgment calculated to give the public mind the exact morale of this affair. It is the belief of medical men here who know all the facts, that he was utterly irresponsible in a moral view for all he did, and that his whole conduct was the dictate of insanity. Indeed, those who knew him, know that his whole conduct was utterly irreconcilable with his firm and established character.

He spent some days in this city last summer—called at our office—and we were struck with the intellectual merit as well as modesty of the man. There was something peculiar in him. He remarked to us the extreme pain he suffered from the course of some medical gentlemen in reference to his discovery, and we formed the opinion that he was subject to great mental depression, amounting almost to

disease—a fact his friends say was true of him.

He was however, a high minded gentleman, utterly incapable, while in his right mind, of the low and boyish mischief which he committed in New York, and there is no doubt whatever that that which some of our public presses refer to as a fault, was only a misfortune, and all the more dreadful because of its awful effects on himself. He was a man to whom the world owes public thanks for taking the lead in the most wonderful discovery in human history. and we are pained to see any of the public press, almost without examination, stigmatize as a "monster", the man who had laid humanity under such an obligation. We witnessed but the other day a surgical operation in this city under the influence of ether, or that which grew out of Dr. Wells' discovery. We felt then how much the world owed him. This and such facts known to all, should make us slower in condemnation.

"Tis well
To speak the best we can of
human kind."

March 15, F. A. Brown & C. L. Covell, appraisers under oath submitted to the Probate Court this:

Inventory & appraisal of estate of
Horace Wells
Late of Hartford Deceased

Exhibited & Accepted
March 20th, 1848.

Recorded Book 49 page 229 . . .

* * * *

Office Furniture

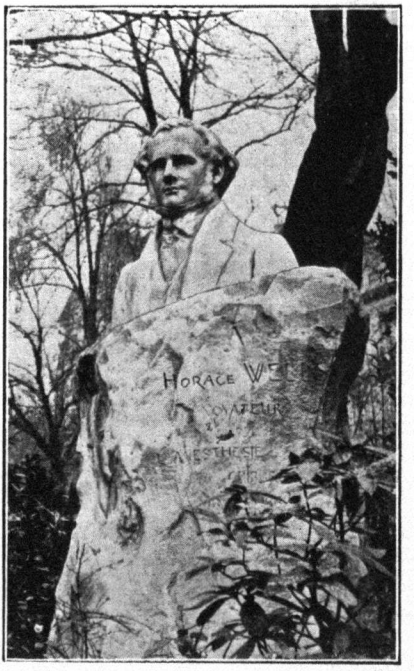
1	Sofa (castors broken off)	13.00	
1	Rocking Chair (red)	1.25	
1	Center Table	5.00	
1	Dentist Chair	3.00	
1	Carpet (say 16 yds) @ .50	8.00	
1	Looking Glass	2.50	
1	Stove & Pipe	9.00	
	Lot of Shells	15.00	
1	Show Case containing do	5.00	

Tools, etc.

	Murite of Ammonia, say 6 lbs. 15c	.90	
2	Pairs Forceps (new) 1.50	3.00	
6	Pairs Forceps .75	4.50	
1	Pair Forceps	.50	
1	Pair Forceps	.25	
3	Pairs Forceps .50	1.50	
24	Files 1.00 per doz.	2.00	
	Lot Gold	1.00	
2	Glasses	.25	
35	Excavators & Burrs (Square Finish) 1.50 doz.	4.25	
24	Excavators & Burrs (Round finish) 1.00 doz.	2.00	
23	Excavators & Burrs (Ivory handle 1.00 doz.	1.92	
21	Pluggers, etc. (Ebony & ivory handle) 4.50 doz.	7.87	
1	Spring Saw	.50	
1	Drawing Plate	1.00	
3	Files	.50	
978	Teeth (plate & pivot) 6c	58.68	
2	Cases for tools 2.—	4.00	94.62
47	Bells, etc.		10.00

* * * *

The fact that there does not exist any of the personal effects, instruments or equipment of Horace Wells was something I couldn't understand. However through the kindness of Miss A. Louise Blair of Hartford, I have received copies of the papers in the Horace Wells' file at the Probate Court. which show that his estate was insolvent and the office furniture, tools and household furniture were sold at auction.



MEMORIAL TO HORACE WELLS IN THE PLACE DES ETATS-UNIS, PARIS

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2. McManus, James, "Notes on the History of Anesthesia;" the Wells' Memorial Celebration at Hartford, 1894; Early Record of Dentists in Connecticut. Clark and Smith, Hartford, 1896.

3. Personal Communications from Arthur Wells Cole in 1937 & 1938, Nephew of Horace Wells.

4. Records of The First Church of Christ in Hartford. Through the courtesy of Miss Alice Hildebrand, Secretary.

5. Hartford Directory 1838. Through the courtesy of Mr. Albert C. Bates, Librarian of the Connecticut Historical Society.

6. Data on grave markers. Through the courtesy of Mr. Gerald S. Scrivener, Supt. Cedar Hill Cemetery, Hartford, Conn.

7. Index of Inventors—1790 to 1847.

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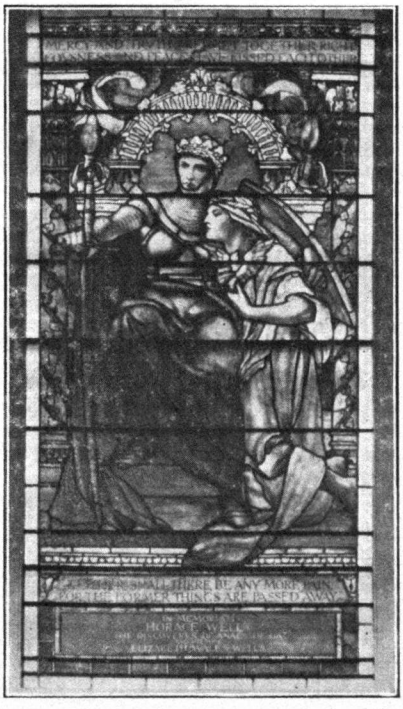
17. Warren, Edward—Some Account of Letheon; or, Who is the Discoverer? Third Edition, Revised, Enlarged. Dutton and Wentworth, Boston 1847.

18. New York Herald, Tuesday Morning, Jan. 25, 1848.

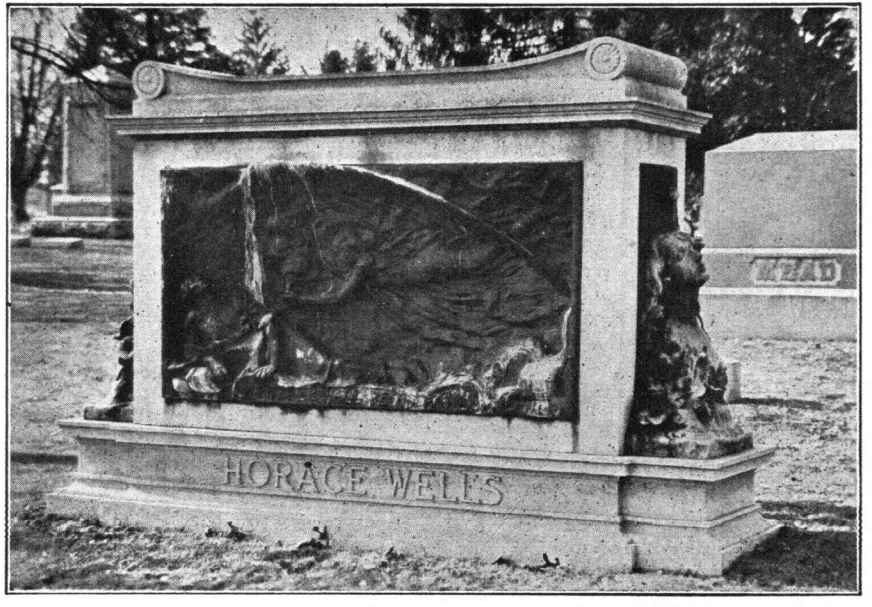
19. Personal communication from Alexander C. Anderson, Chief Inspector of the Police Dept., City of New York.

20. Personal communication from Mr. Gerald C. Scrivener, Superintendent, Cedar Hill Cemetary, Hartford, Conn.

21. Personal communication from Miss F. L. Gerrity, Bureau of Vital Statistics of Hartford Board of Health.



MEMORIAL WINDOW IN CENTER CHURCH, HARTFORD, CONN.



Monument Erected by Chas. T. Wells on the Wells Family Burial Plot in Cedar Hill Cemetery. Buried Here are Dr. Horace Wells, his wife Elizabeth Wales Wells and son Chas. T. Wells.

HISTORICAL NOTES ON HORACE WELLS

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March, 1939

HISTORICAL NOTES ON HORACE WELLS

W. H. ARCHER, B.S., D.D.S., F.I.C.A., F.A.C.D.

I.

AUTHORSHIP OF OLD PAMPHLET CLAIMING WELLS THE DISCOVERER OF ANESTHESIA ESTABLISHED

DISCOVERY by the late Dr. Horace Wells of the Applicability of Nitrous Oxyd Gas, Sulphuric Ether and Other Vapors in Surgical Operations, Nearly Two Years Before the Patented Discovery of Drs. Charles T. Jackson and W. T. G. Morton (Press of Case, Tiffany and Co., Hartford, Conn., 1850) is one of the most powerfully written pamphlets in existence presenting Horace Wells' case as the true discoverer of anesthesia. Yet this pamphlet, which contains many affidavits from leading dentists, physicians, and citizens of Hartford, carries no author's name. The Congressional Library card attributes the authorship to J. Wales, citing as authority Richard Manning Hodges, who, in the bibliography of his narrative of events connected with the introduction of sulphuric ether[1] thus credits the authorship.

On a visit to the Connecticut Historical Society in Hartford, to investigate their collection of material dealing with the discovery of anesthesia, the librarian placed before me, among other items, a large manila envelope on which was written in what is said to be the handwriting of Charles T. Wells (the son and only child of Horace Wells), the following: "Chas. T. Wells, Ms. of Pamphlet by Isaac Toucey" (Fig. 1). The name Toucey was a strange one, one which I had never seen on any documents supporting Wells. Hence it was with considerable surprise when on opening the envelope the original manuscript of the well known pamphlet mentioned in the opening paragraph of this article was discovered (Fig. 2). On acquainting Dr. Max E. Soifer, Librarian of the Hartford Dental Society with this find, he offered to attempt to identify Isaac Toucey. Subsequently, he advised me that I would find complete information concerning Isaac Toucey in Frederich C. Norton's "The Governors of Connecticut, 1635 to 1905." Albert C. Bates, Librarian of the Connecticut Historical So-

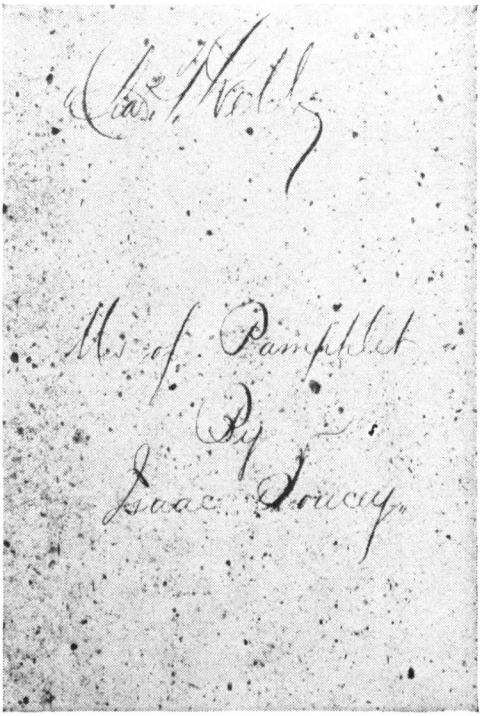


Fig. 1.—The envelope in which manuscript was found. The handwriting is that of Charles T. Wells.

[1] This book by Dr. Hodges, a former surgeon of the Massachusetts General Hospital, was published by Little, Brown and Company of Boston in 1891. It contains a history of the use of ether in surgical practice, an Appendix dealing with the "operations at Massachusetts General Hospital between October 18 and December 31, 1846," which includes those in which ether was used and also a Bibliography which is "a fairly thorough enumeration of all the important literature bearing on the History of Surgical Anaesthesia, and especially of the Ether controversy."

ciety, very kindly had the following information photostated from the book:

> Isaac Toucey was born in Newton on November 5, 1796, and was a descendant of Rev. Thomas Toucey, the first Congregational minister of the town. He received a good education, but never attended college, as he commenced studying law with the Hon. Asa Chapman of Newton, who was afterwards judge of the Supreme Court of Errors.
>
> In 1818, at the age of twenty-two years, Toucey was admitted to the bar in Hartford, and began practice in that city. Possessing an unusual knowledge of the law for so young a man and being untiring for his clients' interests, Toucey soon gained prominence and secured a large and lucrative practice. Four years after being admitted to the bar he was chosen state's attorney for Hartford county, which office he held for the next thirteen years.
>
> In 1835 Toucey became the choice of his party for representative in Congress, and was elected to that position during the year. Toucey remained in Congress four years, retiring in 1839, with an honorable record of service. He was elected governor of Connecticut in 1846, and remained in office one year. At this time Governor Toucey was considered to be one of the ablest lawyers in Connecticut and his fame reached far outside of the state.
>
> President Polk appointed Governor Toucey attorney-general of the United States, and he served as such from June 21, 1848, to March 3, 1849. During a portion of this period Toucey was acting secretary of state. After retiring from the office of attorney-general Toucey returned to Connecticut and was elected a member of the United States Senate, and held the office during the full term of six years.
>
> When James Buchanan was inaugurated President on March 4, 1847 [incorrect, should be 1857] Isaac Toucey was named as secretary of the navy to succeed the Hon. James C. Dobbins of North Carolina. Commencing his duties as the head of the navy department March 6, 1857, Toucey served throughout the administration, retiring from office March 3, 1861. . . .
>
> . . . . Governor Toucey returned to this state and resumed the practice of his profession, to which he was intensely devoted. Several offices were offered to him at this period: among these was a place on the bench of the United States Supreme Court.
>
> Living at Hartford the remaining years of his life, he was the recipient of many honors at the hands of his fellow townsmen. He died on July 30, 1869, aged 73 years.
>
> Of his professional ability the "Judicial and Civil History of Connecticut" says: 'He justly ranked among the ablest lawyers in the state. He was a very accurate lawyer, learned and exact in pleading, and clear and orderly in the presentation of his case.'
>
> The same article continues, in referring to his personal characteristics: 'He was tall in person, and though of slender figure, he had fine features and a commanding presence. He spoke slowly, but with great precision. His diction was strong and clear, but without a particle of ornament. His private character was without a stain. He was a consistent and devout member of the Episcopal church. In his convictions he was firm, and held to them with a strength and tenacity of will that were never surpassed. His self-possession never forsook him, and on all occasions he exhibited the bearing of a high-toned gentleman.'

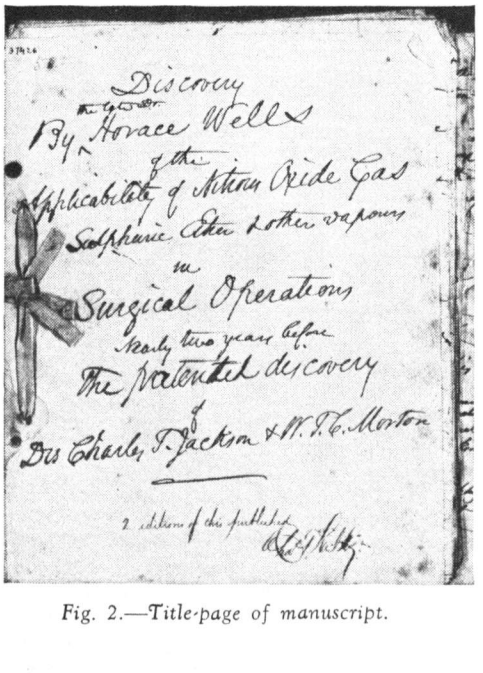
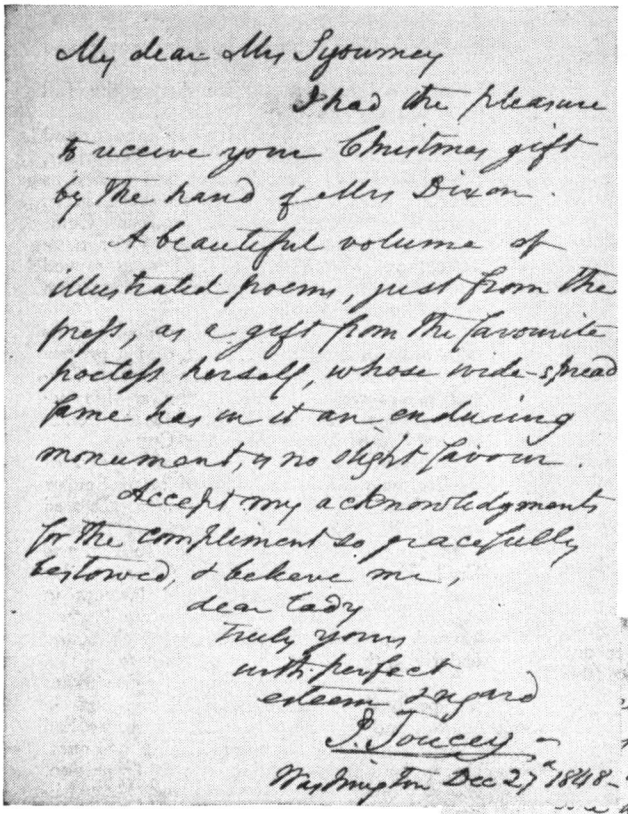


Fig. 2.—Title-page of manuscript.

Isaac Toucey, it would seem, was an important figure in the affairs of his state and country, and certainly in the affairs of his city—Hartford—and his opinions and writings naturally would be of value. Therefore, if it could be established that Toucey was the author of this pamphlet crediting Wells with the discovery of anesthesia, another strong supporting argument in the controversy concerning Wells' place in this event could be advanced.

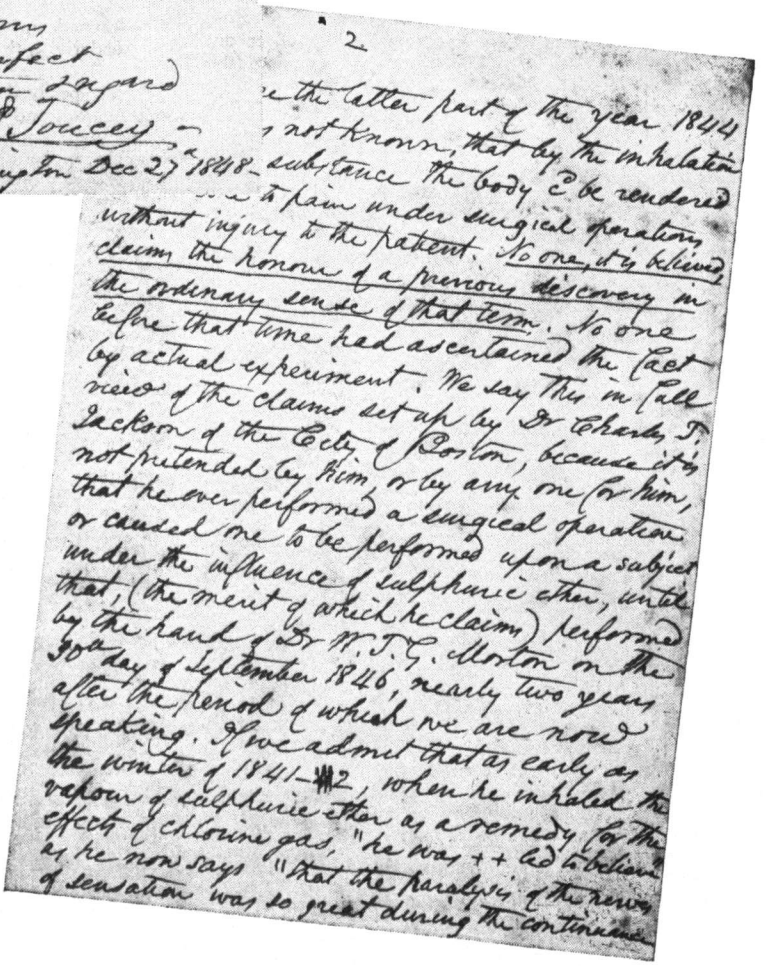
The one way of establishing beyond doubt the authorship would be to compare Toucey's handwriting with the handwriting of the manuscript in question. This has been done (Figs. 3-4). I obtained a copy of a let-



My dear Mrs Sigourney

I had the pleasure
to receive your Christmas gift
by the hand of Miss Dixon.
A beautiful volume of
illustrated poems, just from the
press, as a gift from the favourite
poetess herself, whose wide-spread
fame has in it an enduring
monument, a no slight favour.
Accept my acknowledgments
for the compliment so gracefully
bestowed, & believe me,
dear Lady
Truly yours
with perfect
esteem & regard
I. Toucey
Washington Dec 27th 1848

Fig. 3.—A letter written by Isaac Toucey to the poet, Mrs. Sigourney.



2

the latter part of the year 1844
not known, that by the inhalation
substance the body to be rendered
a pain under surgical operation
without injury to the patient. No one, it is believed,
claim the honour of a previous discovery in
the ordinary sense of that term. No one
before that time had ascertained the fact
by actual experiment. We say this in full
view of the claims set up by Dr Charles T.
Jackson of the City of Boston, because it is
not pretended by him, or by any one for him,
that he ever performed a surgical operation
or caused one to be performed upon a subject
under the influence of sulphuric ether, until
that, (the merit of which he claims) performed
by the hand of Dr W. T. G. Morton on the
30th day of September 1846, nearly two years
after the period of which we are now
speaking. If we admit that as early as
the winter of 1841–42, when he inhaled the
vapour of sulphuric ether as a remedy for the
effects of chlorine gas, "he was ++ led to believe
as he now says "that the paralysis of the nerves
of sensation was so great during the continuance

Fig. 4.—The second page of the manuscript. The similarity of this handwriting with that of Toucey's (see above) can be noted easily.

ter by Toucey (written when he was attorney-general of the United States to the poet, Mrs. Sigourney) and have had this compared with the pamphlet in question by several handwriting experts. They were all *of the opinion* that the two specimens were written by the same hand. However, since the original documents were not available in Pittsburgh, and these handwriting analysts could study the photostatic copies only, a written statement could not be obtained from them.

The fact that Toucey was the author is supported further by finding the original manuscript still extant and *contained* in an envelope on which Wells' son has written "Ms. of Pamphlet by Isaac Toucey." Also, it is noted that Wells' son has written "2 editions of this published" on the title page (Fig. 2). He must have known Toucey to be the author.

It would seem then, in view of these facts, that the pamphlet in question which definitely indicates that Wells was the discoverer of anesthesia, was written by Isaac Toucey—a man whose character, ability, training, and general information, show him to be a proponent of truth and fairness. The statements and opinions of Toucey, therefore, are of value, and carry weight. What he has said of Wells deserves consideration by all those interested in seeing the name of Horace Wells given its proper and rightful place in the history of anesthesia.

The photostatic copies of the original manuscript and the letter by Toucey were made available through the kindness of Albert C. Bates, Librarian of the Connecticut Historical Society.

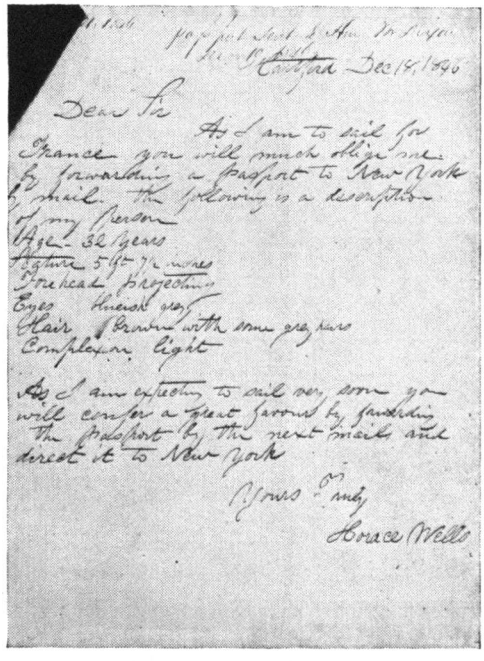
II.

LETTER IN WELLS' HANDWRITING LOCATED

Original documents, such as letters, account books, and so on, in Wells' handwriting are rare. As far as I can discover there are at present but two known documents in his handwriting.

One is a Day Book in which he kept the charge accounts of his patients, beginning on May 13, 1841, and with regular entries up to January 17, 1845. Wells started to practice in Hartford in 1836, but the records of the first five years of his practice either have been destroyed or have been lost. This record book is now in the Walter R. Steiner Memorial Library at Hartford, Connecticut.

The second document I was able to locate through the courtesy of R. B. Shipley, Chief of the Passport Division, Department of State, Washington, D. C. It is a letter written by Wells on December 18, 1846, to the Hon. James Dixon, Congressman from Connecticut, asking him to obtain a passport for


Hartford Dec 18 1846

Dear Sir

As I am to sail for France you will much oblige me by forwarding a passport to New York by mail. The following is a description of my person

Age 32 years
Stature 5 ft 7½ inches
Forehead Projecting
Eyes Hazel grey
Hair Brown with some grey hairs
Complexion light

As I am expecting to sail very soon you will confer a great favour by forwarding the Passport by the next mail and direct it to New York

Yours &c &c
Horace Wells

Fig. 5.—Letter written by Horace Wells to obtain a United States passport for his trip to France.

a proposed trip to France (Fig. 5). This trip was for the dual purpose of presenting his claims in Europe as the discoverer of anesthesia and to purchase oil paintings for resale in America.

It is interesting to note Wells' description of himself in this letter. He gives his age as 32 years when actually he would not be 32 until five weeks later, January 21, 1847. On receipt of Wells' letter, Dixon sent it with one of his own to the Hon. James Buchanan, Secretary of State. An error enters here because of the duplication and addition of information by Dixon: Wells' age is given incorrectly as 35, and his profession as physician. This error on the part of Dixon explains why U. S. Government Passport No. 1485, issued on December 19, 1846, to Horace Wells, M.D., contains these inaccuracies, although the M.D. has been marked out with crosses. The passport now hangs in the Hartford Dental Library.

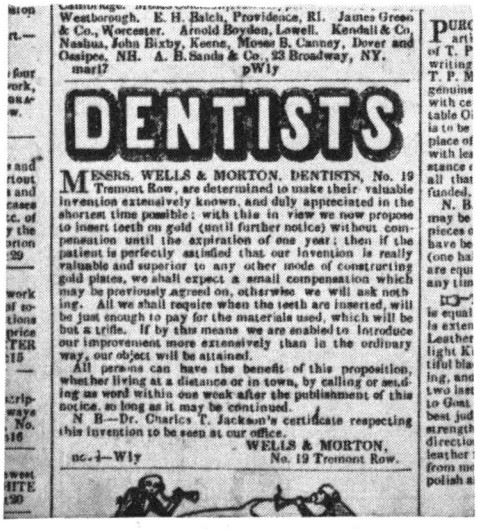
III.

WELLS' PARTNERSHIP WITH MORTON IN BOSTON WAS IN NAME ONLY

All writers on the history of anesthesia mention the partnership of Wells and Morton in Boston. As evidence that this partnership existed, an advertisement which appeared in the *American Traveller* (Volume 19, Number 61, January 30, 1844), a semi-weekly newspaper of Boston, is cited (Fig. 6). Also, as evidence, there is submitted a notice of the dissolution of the partnership by Wells himself some nine months later (Fig. 7). This appeared in the *Boston Daily Atlas* (Volume 13, Number 100, October 24, 1844).

This partnership apparently was in name only. When I examined Wells' Day Book, which dated from May 13, 1841, to January 17, 1845, I found that Wells was practicing continuously in Hartford during 1844—the year of the partnership with Morton in Boston!

The following selected entries from the Day Book, printed for the first time, show that Wells not only was still giving Morton "instructions in the art of dentistry, as per agreement," but did considerable of Morton's work in Hartford.



Westborough. E. H. Balch, Providence, RI. James Green & Co., Worcester. Arnold Boyden, Lowell. Kendall & Co, Nashua, John Bixby, Keene, Moses B. Canney, Dover and Ossipee, NH. A. B. Sands & Co., 23 Broadway, NY.
mar17 pWly

DENTISTS

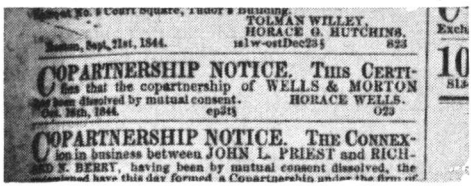
MESSRS. WELLS & MORTON, DENTISTS, No. 19 Tremont Row, are determined to make their valuable invention extensively known, and duly appreciated in the shortest time possible; with this in view we now propose to insert teeth on gold (until further notice) without compensation until the expiration of one year; then if the patient is perfectly satisfied that our invention is really valuable and superior to any other mode of constructing gold plates, we shall expect a small compensation which may be previously agreed on, otherwise we will ask nothing. All we shall require when the teeth are inserted, will be just enough to pay for the materials used, which will be but a trifle. If by this means we are enabled to introduce our improvement more extensively than in the ordinary way, our object will be attained.

All persons can have the benefit of this proposition, whether living at a distance or in town, by calling or sending us word within one week after the publishment of this notice, so long as it may be continued.

N B—Dr. Charles T. Jackson's certificate respecting this invention to be seen at our office.

WELLS & MORTON,
No. 19 Tremont Row.
oc4—Wly

Fig. 6.—Boston newspaper advertisement announcing the partnership of Wells and Morton.



TOLMAN WILLEY,
HORACE G. HUTCHINS.
Boston, Sept. 21st, 1844. s1w-ostDec23 823

COPARTNERSHIP NOTICE. THIS CERTIFIES that the copartnership of WELLS & MORTON
HORACE WELLS.
Oct. 26th, 1844. op3t§ 023

COPARTNERSHIP NOTICE. THE CONNEXION in business between JOHN L. PRIEST and RICHARD F. BERRY, having been by mutual consent dissolved, the

Fig. 7.—Notice by Wells in Boston newspaper stating that his partnership with Morton was dissolved.

Sept. 10th, 1843—Mr. Morton, Dr.
Solder . . . and spiral springs $1.32

March 4th, 1844—Dr. Wm. T. G. Morton.
To operations on teeth and instructions in the art of dentistry, *as per agreement* $50.00

May 4th, 1844—Dr. Morton, Dr.
Gold foil used in filling teeth for self, 7 sheets $17.09
Also *specimen work* $7.00

May 17th, 1844. Specimen, set of teeth, Dr. Morton $7.00
Inserting 2 teeth for specimen $3.00

May 21st, 1844—Dr. Morton, Dr.
Inserting teeth for Mrs. Smith, $16.00
Difference in weight of gold, $ 1.00—$17.00
May 27th . . . Dr. Morton.
14 teeth at 37½ cents.....$5.25
June 11, 1844.
Repaired Mrs. Smith's teeth for Morton...$2.00
August 30th, Dr. Morton.
1 set of teeth at 37½ cents.....$5.25
Sept. 2, 1844—Dr. Morton.
To inserting teeth for Mrs. Phelps.....

It seems difficult to explain the advertisement which infers that Wells was in Boston with Morton when these entries show otherwise. It is possible that Morton told Wells of his intention of opening an office in Boston at the time he was taking instruction in dentistry from Wells, which most writers state as in 1841 and 1842. Apparently he continued because on March 4, 1844, an entry indicates that Wells charged Morton $50.00 for instruction.

A plausible explanation seems to be that Wells, who was quite an inventor, had discovered about this time a new solder which he felt had great possibilities. It is likely that he entered into the partnership with the plan that Morton would open the office in Boston under both names, but until it was well established there, he would continue the excellent practice he had in Hartford. The hope apparently was that his soldering invention, which Charles T. Jackson had approved, would be of great use to them. Jackson had given them a certificate (see the advertisement) in connection with the invention, and Wells had paid him $40.00—this entry is in the back of the Day Book. Jackson was a well known physician, chemist, and geologist, and later was one of the claimants for the title of discoverer of anesthesia.

Wells apparently decided that the Boston venture was a failure because he announced the dissolution of the partnership himself.

IV.

WELLS FAILED TO MAKE DAY BOOK ENTRY ABOUT NITROUS OXIDE INHALATION, DECEMBER 11, 1844

It was a distinct disappointment when I discovered that Wells made no entry in his Day Book on December 11, 1844, concerning his inhalation of nitrous oxide, administered by C. Q. Colton, for the extraction of an aching wisdom tooth. His friend and former pupil, Dr. John M. Riggs (of Riggs' Disease fame) performed the operation. The entries for this date are:

Governor Ellsworth—To filling teeth for Mrs. Ellsworth	
G. W. Corning—Extraction for daughter	$ .50
Thos. Jones, East Hartford—Filling 2 teeth	2.00
Daniel Seymour—Ext. tooth for daughter	.25
Rev. Mr. Richmond—Filling 3 teeth for wife	3.00
Two visits to house	1.50

Of course this book was for the recording of work *not paid for*; I am told that it was the custom in those days to keep records only of that type of work. No record of work *paid for* at the time of completion was kept. Yet it is strange that having made such a momentous discovery Wells did not make some notation concerning it in his Day Book.

There were no further entries in this book from December 11 to 21, and then none until December 30 and 31. So Wells' Day Book proves his statement: "On making the discovery I was so elated respecting it that I expended my money freely, and devoted my whole time for several weeks, in order to present it to those who were best qualified to investigate and decide upon its merits, not asking or expecting anything for my services, well assured that it was a valuable discovery. I was desirous that it should be as free as the air we breath . . ."[2]

In 1845 entries were made for January 6, 7, 11, 15 and 16, and then there was a lapse until February 4. This is probably the time Wells went to Boston "resolving to give it [the discovery] into the hands of proper persons without expecting to derive any pecuniary benefit therefrom."[3]

[2]Wells, Horace. *A History of the Discovery of the Application of Nitrous Oxide Gas, Ether, and other Vapors, to Surgical Operations.* J. Gaylord Wells, Hartford, 1847.

[3]Wells, Horace. Letter to Editor of *Hartford Courant,* December 7, 1846, setting forth his discovery.

V.

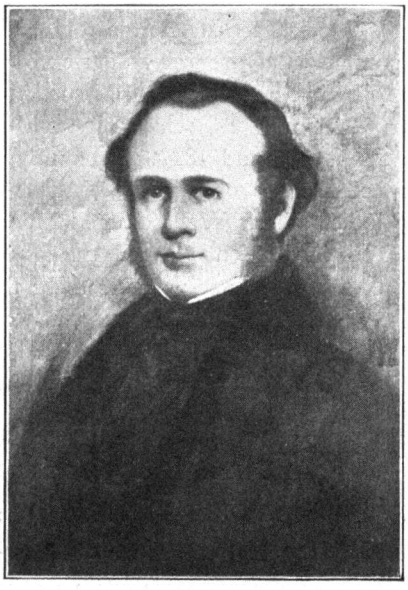
LONDON DENTISTS HONOR WELLS IN 1873

At the conclusion of a campaign to raise a testimonial fund for the benefit of Mrs. Horace Wells, as an "expression of English gratitude for the benefit conferred upon humanity by the labors of Horace Wells,"[4] the following was engrossed on vellum and was forwarded to Mrs. Wells accompanied with the amount subscribed:

> At a meeting held 25th March, 1873, at 6, Cavendish Place, London, W.
>
> It was resolved that the sum of money subscribed by several Members of the Medical and Dental Profession and others in England, be forwarded to Mrs. H. Wells as a slight testimonial to the merits of her late husband Horace Wells (of Hartford, Connecticut, U.S.) to whom the world is indebted not only for the introduction of Nitrous Oxide as an Anesthetic but also for giving that impetus to the study of Anaesthesia which has resulted in the introduction of ether, chloroform, and various other agents for effecting that object.
>
> Signed in behalf of the Committee
>
> John Eric Erichsen . . . Chairman.

Dr. Frederic T. Murlless, Secretary of the Horace Wells Club of Hartford, and his secretary, Miss H. Louise Blair, whose cooperation has been invaluable, advise me that this certificate hangs in the Hartford Dental Library and that the following signatures are also on the original: Joseph T. Clover and N. Woodhouse Braine, Treasurers; Charles James Fox and Edwin Sercomb, Secretaries.

It is of interest that the list of subscribers comprised "the name of nearly every dentist of note, especially in the metropolis; and this list, as showing the recognition by gentlemen of high professional position of the merits of her late husband, cannot but afford gratification to Mrs. Wells; but, however highly such a compliment must be valued, a more tangible evidence of the sincerity of English feeling would not be less appreciated."[5]



HORACE WELLS
(This engraving loaned to the author by Charles J. Wells, M.D.)

[4] [5]From notices which appeared in the *British Journal of Dental Science* (**16**: 115, 391, March, 1873).

CHRONOLOGICAL HISTORY OF HORACE WELLS

DISCOVERER OF ANESTHESIA

BY

W. HARRY ARCHER

[Reprinted from *Bulletin of the History of Medicine*, Vol. VII, No. 10, December, 1939.]

CHRONOLOGICAL HISTORY OF HORACE WELLS DISCOVERER OF ANESTHESIA [1,2]

W. HARRY ARCHER
Assistant Professor, Department of Anesthesia and Exodontia, School of Dentistry, University of Pittsburgh

1815

January 21. Born at Hartford, Windsor County, Vermont.[3] First child of three born to Horace and Betty Heath Wells. (1) (2) (3) (6)

1817

Brother Charles was born. (3)

1818

Family moved to Bellows Falls. (1) (3)

1819

Sister Mary was born. (3)

1821-1834

Attended select schools for 12 years; boys private school for one year with Mr. Ballard, at Hopkinton, New Hampshire; Academies at Amherst, Massachusetts and Walpole, New Hampshire.

He was a teacher for one district and many Writing Schools and at one time contemplated entering the ministry. (1) (2)

1834-1836

Studied dentistry in Boston by association with leading dentists. No dental college at this time.

Practiced briefly in Boston. (1) (2)

1836

Started practice in Hartford, Connecticut. Soon head of his profession. (2)

[1] Read by title at the 17th General Meeting of the International Association for Dental Research, Cleveland, Ohio, March 18, 19, 1939.

[2] Abstracted in *Journal of Dental Research*, vol. 18, No. 3, June 1939.

[3] Mr. William S. Pingree, Town Clerk of Hartford, Vermont, informs me "that the record of our vital statistics of this town do not cover any birth or deaths prior to 1854. There was no law in Vermont concerning the records of vital statistics

April 4, 1836. In the *Connecticut Courant*, Vol. 72, No. 3715, page 3 is the following ad:

Dr. H. Wells, from Boston, would inform the Citizens of Hartford, and the adjoining Towns, that he has at length acceded to the wishes of numerous friends in this section of the country, by making arrangements for spending a short time in this city, with a view of becoming a final resident, should present patronage be sufficient to warrant future success.

He offers himself as a professional Dentist, and all work in the line of his profession will be thankfully received and faithfully executed. As he has embraced the new and much improved style of inserting Teeth as recently introduced into London and Paris, He pledges himself to give an acknowledged satisfaction in the most difficult cases. In soliciting a share of patronage, Dr. W. would avoid boasting of his own skill, or derogating that of others—but Ladies and Gentlemen are respectfully invited to call and examine his method of Inserting Mineral Teeth on Gold Plate. Particular attention paid to the preservation of Natural Teeth, by a process of cleansing and filling with gold.

Office in Main-street, nearly opposite the Connecticut Hotel, 2d door from State-street, April 4.

* * * *

This certifies that I the subscriber, a citizen of Hartford, employed Dr. Wells, while in Boston, in an operation on my teeth, and I am happy to say that it has answered my most sanguine expectations.

JOSEPH S. FRENCH.

In the same paper for April 11 (page 3), and April 18, 1836 (page 1) appeared this ad:

Horace Wells, Dentist. Office in the Exchange-Buildings, on Main-street, two doors from State-street. April 11.

August. Admitted by letter to the First Church of Christ in Hartford. (4)

1838

Published a small volume, "An Essay on Teeth: Comprising a Brief Description of their Formation, Disease, and Proper Treatment." Case, Tiffany & Co., Hartford, 1838.

Notice in the first volume of the Hartford Directory: "Wells, Horace, dentist, 162½ Main Street." (5)

prior to that date." Hence the date of birth was obtained from his first biographer (1) and checked with replies from descendants and the data on Horace Wells' grave marker.

Married to 20 year old Elizabeth Wales on July 9, 1838. (14) (Elizabeth Wales, born April 9, 1818, died July 17, 1889) (6)

1839

August 26. Only child, Charles Thomas Wells was born. (Died June 8, 1909) (6)

December 31. Patent #1450 issued to Horace Wells for Coal Sifter.[4] (7)

1840

Discussion with Linus P. Brockett, Hartford, Conn., showed Wells " Deeply impressed with the idea that some discovery would yet be made by which dental and other operations might be performed without pain." (14)

1841

May 13. First entry in Day Book. (12)

Records of first five years of practice probably lost. (8)

William T. G. Morton of Farmington, Conn., recited to and studied Dentistry under Dr. Wells. (9)

Busy practicing his profession.

1842

William T. G. Morton continued his study of dentistry under Wells. (9)

Practice flourished. (1) (2)

1843

Interesting entry in Day Book, September 10, 1843: " Mr. Morton, Dr. Solder . . . and spiral springs—$1.32." (8)

Wells and Morton enter into an agreement for the promotion of an " enterprise " in Boston, concerning which, under the date line of November 22, 1843, the following letter from Wells to Morton is printed in Dr. N. P. Rice's book: " to show the good feeling which

[4] It has erroneously been reported that no patents were issued to Horace Wells. Mr. J. A. Brearley, Chief Clerk, Department of Commerce, United States Patent Office, writes: " You are advised that the Index of Inventors from 1790 to 1847 shows two patents issued in the name of Horace Wells of Hartford, Connecticut, No. 4836 for Shower Bath issued November 4, 1846 and No. 1450 for Coal Sifter issued December 31, 1839."

existed between them, and the cause which really induced their separation." (15) (Dissolution of partnership)

> " Dr. Wells wrote: ' We can both of us see at a glance that it is madness for us to go ahead under present circumstances, for the reason that our receipts will barely pay the cost of materials used, even if we had ever so much work at the prices you have taken those jobs now on hand . . . (Unfortunately part of the letter was deleted). . . .
>
> ' I am satisfied in my own mind that our enterprise will be a total failure. So let us give it up and jog along here at home as usual; in case you do not give up the enterprise, I, of course am ready, and do give you notice that I wish to get out of it as soon as our agreement will permit. I wish you to understand that I have not the least fault to find with you; I have the utmost confidence in you as a gentleman, and one who will ever to aim to act your part well in accordance with the strictest honor and integrity; we have both exerted ourselves to the utmost, and I believe that our ill-success cannot be attributed to either of us so far as ' goaheaditiveness ' is concerned.' " (15)

1844

Morton apparently convinced Wells to continue this strange relationship, because on January 30, 1844 this ad appeared in the *American Traveller* (Vol. 19, No. 61):

DENTISTS

Messrs. Wells & Morton, Dentists, No. 19 Tremont Row, are determined to make their valuable invention extensively known, and duly appreciated in the shortest time possible; with this in view we now propose to insert teeth on gold (until further notice) without compensation until the expiration of one year; then if the patient is perfectly satisfied that our invention is really valuable and superior to any other mode of constructing gold plates, we shall expect a small compensation which may be previously agreed on, otherwise we will ask nothing. All we shall require when the teeth are inserted, will be just enough to pay for the materials used, which will be but a trifle. If by this means we are enabled to introduce our improvement more extensively than in the ordinary way, our object will be attained.

All persons can have the benefit of this proposition, whether living at a

distance or in town, by calling or sending us word within one week after the publishment of this notice, so long as it may be continued.

N. B.—Dr. Charles T. Jackson's certificate respecting this invention to be seen at our office.

WELLS & MORTON,
No. 19 Tremont Row.

nov 4—Wly

This co-partnership was apparently in name only, as Wells remained in Hartford. (8) Wells describes this relationship in these words: "I—assisted in establishing him in the city of Boston—." (9)

Wells had quite a number of coal sifters made by Col. Thomas Roberts, Manufacturer. (10)

March 4th. Entry in Horace Wells' Day Book: "Dr. Wm. T. G. Morton, to operations on teeth and instructions in the art of dentistry as per agreement ———————— $50.00 (8) (12)

Entries on May 4th, 17th, 21st, 27th, June 11, August 30, September 2nd, show charges for work done for Morton or his patients. (8) (12)

October 24. The following appeared in the *Boston Daily Atlas* (Vol. 13, No. 100):

COPARTNERSHIP NOTICE. This certifies that the co-partnership of WELLS & MORTON has been dissolved by mutual consent.

Oct. 18, 1844 HORACE WELLS

ep3t 023

December 10, attended G. Q. Colton's lecture on chemical phenomenon where the idea of inhalation anesthesia crystallized in Wells' mind. (9) (11)

December 11, inhaled nitrous oxide gas administered by Colton and had an aching third molar painlessly extracted by his friend and former pupil Dr. John Riggs, later of Riggs' disease fame. This was the first operation performed under nitrous oxide inhalation anesthesia. (11)

Experimented with administration of nitrous oxide to his patients to prevent pain while teeth were being extracted.

1845

January, entries in Day Book for charges for work done on patients were made on the 6th, 7th, 11th, 15th, and 16th. (12)

The last of January—Wells lectured before Dr. John C. Warren's class on "The Use of Nitrous Oxide for the Prevention of Pain" and demonstrated anesthesia for extraction before Harvard medical students in Boston. (13) Dr. Wm. T. G. Morton was present and loaned Wells the necessary extracting instruments. (9) (10)

February 4th, 6th, 7th, and 17th entries made in the Day Book. No more entries until Sept. 10th. (12) Wells states, "the excitement of this adventure, (the demonstration in Boston) brought on an illness from which I did not recover for many months, being thus obliged to relinquish, entirely, my professional business." (9)

February 5, 1845, in the *Hartford Courant*, Vol. 9, No. 30, page 3, appears:

COTTAGE TO LET—H. WELLS,
wishing to give up house-keeping, will let his Cottage on Lord's Hill at a very low rent, to one who will pay some attention to the shrubbery and trees on the premises. Possession given on the 1st of April. Enquire at his office between the hours of 10 and 12 A. M.
tf feb 4

April 7, 1845, The *Hartford Courant*, this date, Vol. 9, No. 81, page 3, has the following notice:

DENTAL NOTICE—Having relinquished my professional business for the present, in consequence of ill health, I do with pleasure refer those who have confidence in me, to Dr. J. M. Riggs, whose professional qualifications in my opinion are not surpassed by any Dentist in the country. This is strong language, but it is said solely for the benefit of my friends who may require any operations on the teeth in my absence.

H. WELLS.
Hartford, April 5, 1845. 13wd&w86

This arrangement lasted, according to Riggs' day book, from April 1, 1845 to September 1, 1845. Riggs allowed Wells $25.00. (10 Appendix)

April-May. Arranging a "Panorama of Nature" which was exhibited for some time in the City Hall, Hartford. (10)

May. Conversations with Hon. James Dixon regarding his discovery of the pain relieving properties of nitrous oxide. (10 Appendix)

June 2, 1845, this ad in the *Hartford Courant*, Vol. 9, No. 129 page 3, announced the opening of:

WELLS' PANORAMA OF NATURE

H. WELLS will give a series of Entertainments, embracing the subject of Natural History, at the CITY HALL, commencing THIS EVENING, Monday, June 2d.

Major Hamilton's Brass Band will be in attendance.

Single tickets 25 cents. Tickets admitting a Lady and Gentleman, 37½. Children under 12 years of age at half price.

Doors open at 7½—commence at 8 o'clock.

Hartford, June 2, 1845. dtf

(This notice was repeated June 3, 4, 5, 1845.)

June 18, 1845, P. W. Ellsworth, M. D. published an article in the *Boston Medical & Surgical Journal*, Vol. XXXII, No. 2, "On the Modius Operandi of Medicine." On pages 396 and 397 he says: "The nitrous oxyd gas has been used in quite a number of cases by dentists, during the extraction of teeth, and has found by its excitement, perfectly to destroy pain; the patients appear very merry during the operation, and no unpleasant effects follow." Dr. Ellsworth lived in the same house with Dr. Wells at this time.

July. Morton travelled to Hartford and conferred with Wells and Riggs concerning the manufacture and use of nitrous oxide and also to settle financial accounts with Wells. (10)

Morton states Wells was arranging an exhibition of birds at the time of this visit. This was probably part of the "Panorama of Nature." (10)

August 29, 1845. This notice was published in the *Hartford Courant*, Vol. 9, No. 205, page 3:

DENTIST

H. Wells, Dentist, having taken rooms at No. 14 Asylum Street, a few doors from Main Street, will resume his professional business on Monday, September 8, 1845.

d&wtf 6

September 8. Resumed practice in Hartford, at 14 Asylum Street. Entries in Day Book for Sept. 10th, 11th, 12th, 15th, 16th, 23rd, and 26th. (12)

October 9th, 10th, and 12th, entries in Day Book. (12)

November 5th. Entry in Day Book. (12)

Winter. Wells invents shower bath and tub. Applied for patent. (10)

Controversy over this invention with Col. Thos. Roberts, a stove dealer, tin and sheet iron manufacturer. (10) Settled by arbitration with Francis Parson Esq. in favor of Wells.

1846

March. Entered into partnership with Col. Thos. Roberts for manufacturing and sale of shower baths. (10)

Spring. Actively engaged in shower bath business. (10)

April 4. The last entry was made by Dr. Wells in his Day Book. (12)

Summer. On a visit to New York Wells called on Dr. Valentine Mott, ". . . and made the fact known . . . of the influence of the Nitrous Oxyd or Sulphuric Ether to obliterate all consciousness of pain in surgical operations. . . ." (14)

Oct. 19, Morton wrote to Wells concerning his new " compound " for putting patients to sleep. (10) (16)

Boston, October 19, 1846

Friend Wells:

Dear Sir:—I write to inform you that I have discovered a preparation by inhaling which a person is thrown into a sound sleep. The time required to produce sleep is only a few moments, and the time in which persons remain asleep can be regulated at pleasure. While in this state the severest surgical or dental operations may be performed, the patient not experiencing the slightest pain. I have patented it, and am now about sending out agents to dispose of the right to use it. I will dispose of a right to an individual to use in his own practice alone, or for a town, county or state. My object in writing you is to know if you would not like to visit New York and the other cities to dispose of rights upon shares. I have used the compound in more than one hundred and sixty cases in extracting teeth, and I have been invited to administer it to patients in the Massachusetts General Hospital, and have succeeded in every case.

The Professors Warren and Hayward have given me certificates to this effect. I have administered it in the hospital in the presence of the students and physicians—the room for operations being full as possible. For further particulars I will refer you to extracts from the daily journals of this city which I forward to you.

Respectfully yours,

Wm. T. G. Morton

Oct. 20. Sent letter to Morton in reply to Morton's announcement of a " new compound."

" Hartford, Connecticut, Oct. 20, 1846

" Dr. Morton—Dear Sir:

" Your letter, dated yesterday is just received, and I hasten to answer it, for fear you will adopt a method in disposing of your rights, which will defeat your object. Before you make any arrangements whatever, I wish to see you. I think I will be in Boston the first of next week, probably Monday night. If the operation of administering the gas is not attended with too much trouble, and will produce the effect you state, it will undoubtedly be a fortune to you, provided it is rightly managed.

" Yours, in haste,

H. WELLS."

October 24. Saturday, Dr. and Mrs. Wells arrived in Boston.

Wells visited Morton and observed the administration of the " compound " to several patients for the extraction of teeth. On his return, Mrs. Wells details the following conversation: " I asked him," she says, " whether Morton had discovered anything new? " He replied: " No! it is my old discovery and he does not know how to use it." (14)

October 26. Monday—Dr. Wells and his wife returned to Hartford.

November 4, Patent #4836 issued to Horace Wells for a Shower Bath. (7)

November. Wells sold out his shower bath business to Col. Thos. Roberts. (10)

December 9, 1846. Published claim as discoverer of anesthesia in *Hartford Courant*, as follows:

Hartford, Dec. 7, 1846.

Mr. Editor:—You are aware that there has been much said of late respecting a gas, which, when inhaled, so paralizes the system as to render it insensible to pain. The Massachusetts General Hospital have adopted its use, and amputations are now being performed without pain. Surgeons generally throughout the country, are anxiously waiting to know what it is, that they may make a trial of it, and many have already done so with uniform success. As Drs. Charles T. Jackson and W. T. G. Morton, of Boston, claim to be the originators of this invaluable discovery, I will give a short history of its first introduction, that the public may decide to whom belongs the honor.

While reasoning from analogy, I was led to believe that the inhaling of any exhilarating gas, sufficient to cause a great nervous excitement, would so paralize the system as to render it insensible to pain, or nearly so; for it is well known, that when an individual is very much excited by passion, he scarcely feels the severe wounds which may at the time be inflicted, and the individual who is said to be "dead drunk," may receive severe blows, apparently without the least pain, and when in this state, is much more tenacious of life than when in the natural state, I accordingly resolved to try the experiment of inhaling an exhilarating gas myself, for the purpose of having a tooth extracted. I then obtained some nitrous oxide gas, and requested Dr. J. M. Riggs to perform the operation at the moment when I should give the signal, resolving to have the tooth extracted before losing all consciousness. This experiment proved to be perfectly successful—it was attended with no pain whatever. I then performed the same operation on twelve or fifteen others with the same results.

I was so much elated with this discovery, that I started immediately for Boston, resolving to give it into the hands of proper persons, without expecting to derive any pecuniary benefit, therefrom. I called on Doctors Warren and Hayward, and made known to them the result of the experiments I had made. They appeared to be interested in the matter and treated me with much kindness and attention. I was invited by Dr. Warren to address the Medical Class upon the subject, at the close of his lecture. I accordingly embraced the opportunity, and took occasion to remark that the same result would be produced, let the nervous system be excited sufficiently by any means whatever; that I had made use of nitrous oxide gas or protoxide of nitrogen as being the most harmless. I was then invited to administer it to one of their patients, who was expecting to have a limb amputated. I remained some two or three days in Boston for this purpose, but the patient decided not to have the operation performed at the time. It was then proposed that I should administer it to an individual for the purpose of extracting a tooth. Accordingly a large number of students, with several physicians, met to see the operation performed—one of their number to be the patient. Unfortunately for the experiment, the gas bag was by mistake withdrawn much too soon, and he was but partially under its influence when the tooth was extracted. He testified that he experienced some pain, but not as much as usually attends the operation. As there was no other patient present, that the experiment might be repeated, and as several expressed their opinion that it was a humbug affair, (which in fact was all the thanks I got for this gratuitous service), I accordingly left the next morning for home.—While in Boston, I conversed with Drs. Charles T. Jackson and W. T. G. Morton upon the subject, both of whom admitted it to be entirely new to them. Dr. Jackson expressed much surprise that severe operations could be performed without pain, and these are the individuals who claim to be the inventors. When I commenced giving the gas, I noticed one very remarkable circum-

stance attending it, which was, that those who sat down resolving to have an operation performed under its influence, had no disposition to exert the muscular system in the least, but would remain quiet as if partially asleep. Whereas, if the same individuals were to inhale the gas under any other circumstances, it would seem impossible to restrain them from over exertion.

I would here remark, that when I was deciding what exhilarating agent to use for this purpose, it immediately occurred to me that it would be best to use nitrous oxide gas or Sulphuric Ether. I advised with Dr. Marcy, of the city, and by his advice I continued to use the former, as being the least likely to do injury, although it was attended with more trouble in its preparation. If Drs. Jackson and Morton claim, that they use something else, I reply that it is the same in principle if not in name, and they cannot use anything which will produce more satisfactory results, and I made those results known to both of these individuals more than a year since.

After making the above statement of facts, I leave it for the public to decide to whom belongs the honor of this discovery.

Yours truly,

HORACE WELLS, Surgeon Dentist.

December 10. Wrote to Morton as follows:

Dear Morton:

I have just seen a copy of your claim, and find that it is nothing more than what I can prove priority of discovery (to) by at least eighteen months. When in Boston, at your room, I was well satisfied that the principal ingredient was ether, and to all appearances, it had just the effect of this alone on the patient to whom I saw it administered in your office. Now, I do not wish, or expect, to make any money out of this invention, nor to cause you to be the loser; but I have resolved to give a history of its introduction, that I may have what credit belongs to me. Although it is in my power to invalidate your patent, by a word, yet, as long as we remain on good terms, I shall not aim to do it. . . . (17)

The balance of this letter was deleted.

December 18. Wrote to Hon. James Dixon for a passport for his trip abroad. (8) The object of this trip was to purchase paintings for resale in the United States and to present his claims as the discoverer of anesthesia.

December 19, passport #1485 issued to Horace Wells by State Department, U. S. A. (8)

December 22, in the *Hartford Daily Times* (No. 1854, p. 3) appears a partnership notice of Horace Wells and J. B. Terry.

DENTISTS

Hartford, Dec. 19, 1846

The subscribers having associated themselves in the business of Dental Surgery, respectfully invite all who may require the service of Dentist to call at their rooms, 180½ Main Street, where all operations will be performed in a faithful and workmanlike manner.

Copartnership Notice — HORACE WELLS
dec 22 eodsmw 3m66 — J. B. TERRY

December. Sailed for Paris from New York.[5]

1847

Hon. James Dixon protests to a select committee of the House of Representatives against that committee rendering a favorable decision regarding Morton's claims as the discoverer of anesthesia until he had an opportunity to present Wells' claims. (10)

February. Presented " his claim to the discovery of performing operations without pain " to the " Académie de Sciences " and the " Académie de Médecine " and the " Parisian Medical Society " (See Brewster's letter under March 26, 1847 dateline).

February 17. Published this article in Galignani's Messenger while in Europe. (This article was reprinted in *The Boston Atlas,* April 2, 1847, columns two and three, page 2.)

" Paris, Feb. 17, 1847.

Sir:—As you have recently published an extract from the Boston Medical and Surgical journal, which recognises me as the discoverer of the happy effects produced by the inhalation of exhilarating gas or vapor for the performance of surgical operations, I will now offer some suggestions in reference to this subject. Reasoning from analogy, I was led to believe that surgical operations might be performed without pain, by the fact that an individual, when much excited from ordinary causes, may receive severe wounds without manifesting the least pain; as, for instance, the man who is engaged in combat may have a limb severed from his body, after which he testifies that it was attended with no pain at the time; and so the man who is intoxicated with spirituous liquor may be treated severely without his manifesting pain, and his frame seems in this state to be more tenacious of life than under ordinary circumstances. By these facts I was led to inquire if the same result would not follow by the inhalation of some exhilarating gas, the effects of

[5] Exact date of departure is unknown. Mr. Byron H. Uhl, District Director, U. S. Department of Labor, Immigration and Naturalization Service, Ellis Island, New York Harbor, N. Y., advises me that: " No records of departing passengers are available prior to March, 1929."

which would pass off immediately, leaving the system none the worse for its use. I accordingly procured some nitrous oxide gas, resolving to make the first experiment on myself, by having a tooth extracted, which was done without any painful sensations. I then performed the same operation for twelve or fifteen others, with the like results; this was in November, 1844. Being a resident of Hartford, Connecticut, (U. S.,) I proceeded to Boston the following month, (December), in order to present my discovery to the medical faculty—first making it known to Drs. Warren, Hayward, Jackson and Morton, the two last of whom subsequently published the same, without mention of our conference. Since this discovery was first made I have administered nitrous oxide gas and the vapor of ether to about fifty patients, my operations having been limited to this small number in consequence of a protracted illness which immediately ensued on my return home from Boston, in January, 1845. Much depends on the state of mind of the patient during the inhalation of gas or vapor. If the individual takes it with a determination to submit to a surgical operation, he has no disposition to exert the muscular system; whereas, under other circumstances, it seems impossible to restrain him from over exertion; he becomes perfectly uncontrollable. It is well to instruct all patients of this fact before the inhalation takes place. The temperament and physical condition of the patient should be well marked before administering the vapor of ether; persons whose lungs are much affected should not be permitted to inhale this vapor, as serious injuries have resulted from it in such cases. Nitrous oxide gas, or protoxide of nitrogen, is much less liable to do injury, and is more agreeable to inhale, producing at the same time equal insensibility to all painful sensations. It may be taken without the least inconvenience by those who become choked almost to strangulation with ether; in fact, I have never seen or heard of a single instance where this gas has proved in the least detrimental. This discovery does not consist in the use of any one specified gas or vapor; for anything which causes a certain degree of nervous excitement is all that is requisite to produce insensibility to pain. Consequently, the only question to be settled is, which exhilarating agent is least likely to injure the system. The less atmospheric air admitted into the lungs with any gas or vapor the better—the more satisfactory will be the result of the operation. Those who have been accustomed to use much intoxicating beverage cannot be easily affected in this manner. With cases of dislocated joints, the exhilarating gas operates like a charm; all the muscles become relaxed, and but a very little effort will serve to replace the limb in its socket, and while the operation is being performed the muscles do not contract as when in the natural state, but are as easily managed as those of a corpse. Allow me to add that I have had no opportunity of reading any of the French professional reports or discussions on this subject. I shall remain in Paris until the 27th inst., and in the interval I should be pleased to impart such information as I may have acquired by a close observation of the various phenomena connected with this interesting subject.

HORACE WELLS."

February 27. Left Paris for London. (10)

March 4. Sailed from Liverpool in the Hibernia for Boston. (10)

March 8. Wells' Memoir was read before the Academy in Paris. (10)

March. Returned from England.[6] Had conferences in Boston with Warren and Hayward. (15)

March 26. The *Boston Transcript* copied, in column one, page 4, by request, Dr. Brewster's letter from the column of the foreign correspondent of the *New York Journal of Commerce:*

Paris, March 1st, 1847. The all absorbing topic of conversation in the Saloons of Paris, and the all engrossing discussions in the learned and scientific Societies here, as in most of Europe, is our "American discovery" of performing surgical operations without pain. All the nations, I might almost say, all the individuals, are trying to claim the merit of the discovery.

Numberless communications are published from persons who knew all these things long ago, 20, 30 and 40 years since, yet to the present moment, they have not succeeded in wresting the honor of this discovery (the greatest ever given to man since the days of "Jenner.") from the western world.

I have seen in your paper of the 30th December last, a letter from Doctor Marcy, which gives the whole honor to Horace Dr. Wells, dentist of Hartford. I have also seen in the 6th January, Dr. Jackson's reply, and the rejoinder of Dr. Marcy, in the 8th. In the "Boston Medical and Surgical Journal" I see a letter which gives the discovery to Dr. Wells. These are things which I hope you will settle fairly on your side of the water, and let "Caesar have the things which are Caesar's."

Dr. Wells has been for the last few days in Paris. His claims to the discovery of performing operations without pain, have been presented to both the "Académie des Sciences," and the "Académie de Médecine," where they are under consideration. He has likewise been before the "Parisian Medical Society," and related the history, progress, and final result of his discovery; I was present; the Society were of opinion, that if Dr. Wells brought forward proofs that he had performed the extraction of teeth in 1845 without pain, then he would be entitled to the merit of being the discoverer.

Imagine to yourself, Messrs Editors, a man to have made this more than brilliant discovery, visiting Europe without bringing with him the proofs. Dr. Jackson acted much more wisely, when he claimed the discovery; for he wrote to the "French Institute," his letter bore the Boston, Liverpool, and the French post-marks, then it was sealed by the Institute, its receipt

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[6] Exact date not known. Mr. John H. Jensen, Inspector in charge of Immigration and Naturalization, U. S. Department of Labor, East Boston, Mass., writes: ". . . please be informed our records go back only to 1848."

recorded, and left sealed until ordered to be opened. Had Dr. Wells done the same thing in Nov. 1844 his claim would not now admit of a doubt. Whether he used the nitrous oxyde gas, or sulphuric ether, matters but little, inasmuch as their results are the same, and he seems after having tried them both, to have given the preference to the gas, as being more agreeable to inhale. Other kinds of ether have since been tried here, but none pretends to claim the merit of the discovery by using a new substitute. Though there are some persons skeptical as to its ultimate value, I have used it in many cases with perfect success, and have seen some of the most painful operations in surgery performed in our hospitals without the patients feeling the slightest pain. No country in the world offers the same facilities as France for testing the value of any discovery in the medical science. Here man and beast are made subservient to the rigors of experimental proof. When this discovery was first mooted, some feared danger from fire, that the breath would ignite and the lungs explode; but the many experiments made at Alfoet upon horses who had been made to inhale the ether, prove that when the lamp is applied to the mouth immediately after inhalation, a blue flame burns exteriorly, but soon expires without the slightest harm or danger.

As an American I feel proud that this discovery originated in my native land, and regret that any efforts should have been made to rob the rightful discoverer of his just due.

Very truly yours,

BREWSTER.

March 30. Published " History of the Discovery of the Application of Nitrous Oxide Gas, Ether, and other Vapors, to Surgical Operations." J. Gaylord Wells, Hartford, 1847.

March 30. Forwarded the original testimonials and affidavits and other papers contained in the above volume to Dr. C. S. Brewster, No. 11 Rue de la Paix, Paris to be presented by him to the scientific and medical societies of Europe in order that Wells' priority in the discovery of anesthesia could be established. (9)

April 2. Article in Galignani's Messenger republished in the *Boston Atlas* bearing a Paris Feb. 17, 1847 date line.

April 22. Letter written by Wells to the Editor of the *Boston Post,* Vol. 30, No. 95, page 1, referring to a long article which appeared in the April 7th 1847 issue and signed E. W. (Probably Edward Warren, Morton's representative):

TO THE EDITOR OF THE BOSTON POST

Hartford, April 19, 1847

I have just seen a long article in your paper of the 7th inst, signed E. W., which I will answer in one word. The letter which is there introduced with my signature was written in answer to one which I received from Dr. Morton, who represented to me that he had discovered a " compound," the effects of which as described by him, entirely eclipsed those produced by nitrous oxide gas or sulphurate ether, he stating that his " compound " would invariably produce a sound sleep, the length of which was wholly optional with the operator; that he had not made a single failure in one hundred and sixty cases, &c., &c. He also stated that he had obtained a patent for this " compound." I accordingly started for Boston to learn more of this improvement on my discovery, with which I had made him acquainted long before.

While at his office I saw the (so called) compound administered to a patient; it apparently had the same effect as the gas, which I had many times administered for the same purpose. Before I left for home the gas was given to several other patients with but partial success—at least so said the patients with whom I conversed. I then enquired about his patent, and found to my surprise that he had not obtained one, nor even made an application for one, this being done at a subsequent period, as the date of his specifications and patent clearly show. Respecting the interview which E. W. had with the Hon. James Dixon at Washington, I am informed by Mr. Dixon that the statement of E. W. in the article referred to, is a gross misrepresentation of the truth, and if necessary, he will sign a certificate to that effect.

Respectfully,

HORACE WELLS

April. Wells went to New York and with his attorney went to the Custom House to get the paintings purchased in Paris. He also arranged with a manufacturer to have frames made. (10 Appendix.)

May. The General Assembly of the State of Connecticut passed resolutions stating that Wells was the discoverer of anesthesia.

May 12. Published the following article in the *Boston Medical and Surgical Journal,* Vol. 36, p. 298, 1847, dealing with the contents of the October 20, 1846 letter:

THE DISCOVERY OF ETHEREAL INHALATION

To the Editor of the Boston Medical and Surgical Journal.

Sir,—Having seen an article, by Edward Warren, in the Medical Journal of the 28th April, which has special reference to myself, with your permission I will answer through the same medium, as briefly as possible.

Mr. Warren, who is a gentleman in the office of Dr. Morton, seems to exult in the possession of a letter with my signature, which he has published. I am much surprised that Dr. Morton, for his own sake, should have permitted that letter to be published, for when his letter is read, to which mine was an answer, it places the whole matter in quite a different light. Dr. Morton, in his letter dated 19th October, 1846, gave me to understand that he had made a discovery which would entirely eclipse the one I had made. He says:

"I have discovered a preparation, by inhaling which a person is thrown into a sound sleep; the time in which persons remain asleep can be regulated at pleasure. While in this sleep the severest surgical or dental operations may be performed, the patient not experiencing the slightest pain. I have patented it, and am now sending agents to dispose of the right to use it. I have used this compound without a single failure in over one hundred and sixty cases, in extracting teeth. My object in writing you is to know if you would not like to visit New York and the other cities, and dispose of rights.

Respectfully yours,

W. T. G. MORTON."

Now I would ask all who have made use of ether since its first introduction, on perusing the above letter, if they would for a moment imagine the discovery, as above described, to consist in the use of this article ether? On receiving the above letter, I went to Boston to learn the nature of this improvement on my discovery; I there saw Dr. Morton administer his (so-called) compound, and the patient, instead of going quietly to sleep, to be aroused at pleasure, as I had been informed would be the case, became exhilarated, succeeded by a stupor, the same as is produced by the inhalation of nitrous oxide gas. While at Dr. Morton's office, three or four other patients inhaled the "compound," two of whom informed me that it was an entire failure. I though this remarkable after his operating on one hundred and sixty patients "without a single failure." I then inquired about his patent, which the letter stated had been obtained for the compound, and learned, to my surprise that he had not obtained one, nor even made an application for one; as will be seen by the date of his letter to me, and the date of his application for a patent, the specification bearing date October 27th, 1846, and the date of his letter being 19th October, 1846. Mr. Warren states that I "returned home, determined to have nothing to do with the

business." Now is it at all strange, after the above development of facts, that I acted thus? In the first place, what could I do in reference to his patent, for he had got none; and in the next place, after what I had seen, it was evident that this "preparation" was no improvement upon my discovery (with which I had made him acquainted more than eighteen months before), even allowing it to be a "compound." In November, 1844, I made this discovery, and applied it with perfect success, as is proved by affidavits of the very first character. I have also proved that I went to Boston at that time to make my discovery known to the medical faculty, and addressed Dr. Warren's class upon the subject, and endeavored to establish the principle that the nervous system, when wrought up to a certain degree of nervous excitement by any means whatever, would become insensible to pain; then stating that I was using nitrous oxide gas for this purpose, considering it the most harmless. When I first made the discovery, rectified ether was used, as well as nitrous oxide gas. This is clearly proved by affidavit; but I preferred the latter as being more agreeable to inhale, and less liable to do injury.

It is truly astonishing to see with what pertinacity Drs. Jackson and Morton adhere to their pretended priority of discovery, simply because I gave the preference to the nitrous oxide, after having tried both the vapor and the gas. It has been said that the rectified sulphuric ether vapor acts as a sedative merely, while the nitrous oxide gas only operates as a stimulant. This is a mistake, and no man who has ever made experiments with both the gas and vapor will make such an assertion. When I first administered the nitrous oxide for a surgical operation, I was astonished that the patient did not exert the muscular system, as is generally the case when taken merely for pleasure, and this proved to be the case in subsequent operations. That this is a remarkable phenomenon, is acknowledged by all who have made use of it for this purpose, and it is precisely so with the vapor of ether; both at first stimulate, then when continued to excess, act as a sedative, producing a stupor. Several gases of this nature are now being used in Europe with perfect success. Does it follow that every one who makes use of a different gas is to be entitled to the credit of this discovery; or is it the one who first proved, by actual experiment, that one of these gases would have this wonderful effect? Every reasonable man will at once say that the principle, when fully demonstrated, constitutes the discovery. Both Drs. Jackson and Morton admit that they were fully aware that I had used nitrous oxide for this purpose long before the date they give as the time of their discovery. Suppose A makes the discovery that a certain degree of compression of the limb, with a cloth bandage, will so paralyze the limb that it may be amputated without pain, and he proves this beyond a doubt, presenting his discovery to the world. Soon after, we hear of B, proclaiming that he has made a wonderful discovery, which consists in the use of a leather strap to produce this compression, and he insists that it is nothing like the discovery of A, who uses the cloth bandage. Now these are parallel cases, and if each gas or vapor

which may be used for this purpose is a distinct and independent discovery, then allow me to ask, where will it end? I informed Drs. Jackson and Morton of this discovery in November, 1844, both admitting that the idea was entirely new to them. Dr. Jackson particularly seemed inclined to ridicule the whole thing.

Mr. Warren states that my experiment before the medical class in 1844, was a failure, and all pronounced it a "humbug." Now this is perfectly true. The gas bag was removed too soon, and the patient experienced some pain, and I was denounced as an imposter; no one seeming inclined to assist in further experiments. The excitement of this adventure immediately brought on a protracted illness, which compelled me to relinquish my professional business entirely. For this reason, and because I did not wish to incur the responsibility of administering this powerful agent without the co-operation of the medical faculty, my operations have been somewhat limited, but perfectly successful. I had operated on something like fifteen patients with the gas before having the interview with Drs. Jackson and Morton in November, 1844. After relinquishing my professional business in consequence of this illness, Dr. Morton requested me to prepare some of the gas for him. I told him to go to Dr. Jackson, as he was a chemist, and get it. The sequel is already known. In due time we heard of surgical operations being performed at the Hospital, without pain, by means of a secret "compound," and Drs. Jackson and Morton announced as the discoverers. Ere long my discovery, which I designed should be free to all, is trammelled with a patent.

Mr. Warren speaks of an interview which he had with the Hon. James Dixon. To show him that his memory sometimes proves treacherous, I will here give a copy of a letter which I have just received from Mr. Dixon.

"Hartford, May 5th, 1847.

Dear Sir,—The communication of Mr. Edward Warren, of Boston, to which you have called by attention, is incorrect in several particulars. Mr. Warren, it seems, misunderstood my conversation with him. The person whom I consulted with, in regard to the use of your discovery, was Dr. Riggs, of Hartford, and not yourself, and I so informed Mr. Warren.

Yours respectfully,

JAMES DIXON."

Dr. Horace Wells, Hartford."

With the foregoing statement of facts, I close, wishing, in all sincerity, to receive no more credit for this discovery than what in justice I am entitled to.

Respectfully,

HORACE WELLS.

Hartford, May 5, 1847.

(Dr. Wells was confused about dates. His discovery was made in December 1844. His trip to Boston was made in January 1845).

July 3, 1847. This announcement appeared in the *Hartford Daily Courant* (Vol. 11, No. 157, Whole No. 2917).

DENTISTS

Hartford, Dec. 19, 1846

"The subscribers having associated themselves in the business of Dental Surgery, respectfully invite all who may require the services of a dentist to call at their rooms, 180½ Main Street, where all operations will be performed in a faithful and workmanlike manner.

HORACE WELLS
J. B. TERRY."

may 27 d&wtf 97

August 21, Wells gave nitrous oxide for removal of testicle by Dr. E. E. Marcy. (This case was published in *Boston Medical and Surgical Journal* of Sept. 1st, 1847, No. 5, Vol. 37.)

August 28, 1847. The *Hartford Daily Courant* carried this notice:

DENTISTS

Notice:—Having associated with me in business, Dr. J. B. Terry, I cheerfully recommend him to my friends and patrons who may require dental operations in my absence. Those employing him may depend on having dental operations performed in a faithful and workmanlike manner.

HORACE WELLS.

Hartford, Aug. 28, 1847.

1848

January 1, Wells administered nitrous oxide to Henry A. Goodale for the amputation of his leg. Operation was performed by Dr. P. W. Ellsworth. (Case reported by Dr. Ellsworth in *The Boston Medical and Surgical Journal,* June 17, 1848, Vol. 37) (No. 25, p. 498)

January 4, Wells administered nitrous oxide to Mrs. Mary Gabriel for the "removal of a fatty tumor from her right shoulder weighing six and a half ounces. This was performed by Dr. L. B. Bernsford, assisted by Drs. Grant and Crary." (14)

January 17, 1848. Notice in *New York Evening Post:*

H. Wells, Surgeon Dentist, the discoverer of the "Letheon," having removed to New York, will give gratuitous advice respecting the use of Chloroform, Nitrous Oxide Gas, and "Letheon," as applied to the extracting of teeth from 10 o'clock A. M. until 3 o'clock P. M. Residence 120 Chambers Street, west of Broadway.

January 17, 1848, The *New York Herald* carried the following notice:

TEETH EXTRACED WITHOUT PAIN.—H. Wells, Surgeon Dentist, who is known as the discoverer of the wonderful effect of ether and various stimulating gases in annulling pain, would inform the citizens of New York, that he has removed to this city, and will for the present attend personally to those who may require his professional services. It is now over three years since he first made this valuable discovery, and from that time to the present, not one of his numerous patients has experienced the slightest ill effects from it; the sensation is highly pleasurable. Residence, 120 Chambers Street, West of Broadway.

January 21, Friday—33 years old this date.

While mentally deranged, due to the effects of constant self experimentation with chloroform, Dr. Wells was arrested because of annoyances committed on Broadway. (19) Police records apparently lost. (20)

January 22, Saturday—Permitted to go to his rooms on Chambers Street where he secured his razor, other necessities and unknown to his guard, a bottle of chloroform. (19)

January 23, Sunday—Attending church services in the Tombs. Seemed to be in good spirits, but profoundly affected by the sermon. Wells was a sensitive, very religious individual. Feeling that he was guilty of what he thought to be a terrible crime he committed suicide. (19)

January 24, Monday—Body discovered by the guard. "Dr. Walters, the coroner, was called to hold an inquest, and the jury rendered a verdict, 'that the deceased came to his death by suicide, by inflicting a wound in the left thigh with a razor, while laboring under an aberration of mind.'" (19)

January 25, 1848, Tuesday: *The Evening Post* carried the following story and letters:

Melancholy Suicide.—Dr. Horace Wells, who was arrested last Friday, under circumstances which are fully explained in the following letter, and with apparent truthfulness, committed suicide on Sunday night last, in his cell at the Tombs. By his side were found, on his bed, an empty vial, labelled "Chloroform," the contents of which he had doubtless taken, preparatory to taking life. A penknife and a razor were also on the bed; with the latter he had lacerated the flesh of the left thigh quite to the bone, severing the femoral artery. . . . In one corner of his cell were found his watch and the following letters:

New York, Jan. 23, 1848.

To the Editors of the Journal of Commerce:

Gentlemen:—I wish, through the medium of your journal, to make a plain statement respecting the unhappy circumstances in which I am at present placed. My real name is now before the public as a miscreant, guilty of a most despicable act, that of wantonly destroying the property of those girls of the town who nightly promenade Broadway. The facts, so far as I am concerned, are briefly these:—On Tuesday evening last a young man with whom I had recently formed an acquaintance, went with me to my office in Chambers St., and while there, he said a woman of bad character had spoiled a garment for him while walking in the street, by throwing something like vitriol upon him; that he knew who it was, and would pay her back in the same coin. As I had some sulphuric acid in my office, which I was using in some chemical experiments, he requested the liberty of taking some of it, for this purpose. He accordingly cut a groove in the cork of a phial, so that a small quantity only might escape when it was suddenly thrust forward. He then said that he might get it upon his own clothes. I told him that I had an old cloak, which could not be much injured by the acid, as it was good for nothing.—By his request I walked into the street with him, he wearing my old cloak, and I having on my ordinary over-coat. We proceeded up Broadway, and when about opposite the theater, he said that he saw the girl he was in pursuit of, and he soon gave her shawl a sprinkling; we then turned down Broadway, when my friend proposed to sprinkle some of the other girls, I immediately objected, and told him that what he had already done was not in accordance with my own feelings, although it was done in revenge; and when we arrived at Chambers St., I took my phial and cloak; at the same time two of his friends came up and I left him, supposing that I had dissuaded him from doing the mischief he proposed, which is as foreign to my nature as light is opposed to darkness. I then regretted exceedingly that I had countenanced in any manner the first act. On getting home I found that my cloak had apparently received the principle part of the acid which had escaped from the phial as the wind was blowing towards us when the act was done. On meeting with my acquaintance the next day, he said that himself and his two friends, whom I met the previous evening, had resolved to drive all the bad girls out of Broadway by sprinkling them with

acid. I in vain reasoned with him against committing so much injury when he had not been harmed. This was the last interview which I have had with him to the present time.

I wish now to state as well as I am able what influenced me to do this act on Friday evening, which I confess was done with my own hands; and this was the only one of which I am guilty and which resulted in my arrest. I had during the week been in the constant practice of inhaling chloroform for the exilarating effect produced by it; and on Friday evening last I lost all consciousness before I removed the inhalor from my mouth. How long it remained there I do not know; but on coming out of the stupor I was exhiliarated beyond measure, exceeding anything which I had ever before experienced, and seeing the phial of acid (which had been used a few evenings previous as above described) standing on the mantel, in my delirium I seized it and rushed into the street and threw it at two females. I may have thrust it at others, but I have no recollection further than this. The effect of this inhalation continued very much longer than ever before, and did not entirely pass off until sometime after my arrest. I do not make this statement expecting to free myself from all blame in this matter; yet I have been induced to make a minute statement of facts, that the public may better judge of this misdemeanor so far as I am concerned. I state, unhesitatingly, that I would no sooner, deliberately, in cold blood, go into the street and commit the gross acts of wantonness which have been committed for the last few evenings, than I would cut my right hand from my body. No, I am not prone to do mischief, as all can testify who have ever known me. But now I am placed in circumstances where I am obliged to bear the reproaches of the world for the most contemptible acts in which I have not participated. Because I have done this one act in a moment of delirium, I must bear the brunt of the whole. Some of the papers disbelieved my statement about others being concerned in this business; but I am informed to day that while I was in close confinement last evening, the same acts were being committed in Broadway; several were sprinkled with acid. However, my character which I have ever prized above everything else is gone—irrevocable gone—and I am now in the most miserable condition in which it is possible for man to be placed. One of those abandoned females who were examined yesterday, stated that I had often addressed her in Broadway. Now I do most solemnly assert that the statement of the girl is utterly false; I never have, on any occasion, had anything to say to these miserable creatures. If myself alone was the only one to suffer by all the false statements, which may be or have been made respecting me, it would be nothing compared to the injury to my dear-dear wife and child. Oh! may God protect them! I cannot proceed, my hand is too unsteady, and my whole frame is convulsed in agony. My brain is on fire.

Sunday evening, 7 o'clock

I again take up my pen to finish what I have to say. Great God! has it

come to this? Is it not all a dream? Before 12 o'clock this night I am to pay the debt of nature. Yes, if I was to go free tomorrow I could not live and be called a villain. God knows I am not one. O, my dear mother, brother, and sister, what can I say to you? My anguish will only allow me to bid you farewell. I die to-night, believing that God, who knoweth all hearts, will forgive the dreadful act. I shall spend my remaining time in prayer.

Oh! what misery I shall bring upon all my near relatives, and what still more distresses me is the fact that my name is familiar to the whole scientific world, as being connected with an important discovery; and now, while I am scarcely able to hold my pen, I must bid all farewell! May God forgive me! Oh! my dear wife and child, whom I leave destitute of the means of support—I would still live and work for you, but I cannot—for were I to live on, I should become a maniac. I feel that I am but little better than one already. The instrument of my destruction was obtained when the officer who had me in charge kindly permitted me to go to my room yesterday.

HORACE WELLS.

To The Editors

My last request to Editors is, that they will, while commenting on this unhappy affair, think of my poor wife and child—also my mother, brother and sister, all of whom are numbered among the most respectable members of society.

H. WELLS.

To My Dear Wife

I feel that I am fast becoming a deranged man, or I would desist from this act. I can not live and keep my reason, and on this account God will forgive the deed. I can say no more.

Farewell H.

To Mr. Dwyer

Dear Sir: When you receive this I shall be no more. I wish you would take my watch and present it to my dear wife, together with the trifle I have already given you. Please to see to my burial: let me be interred here in the most secret manner possible. I wish you or Mr. Barber would go immediately to Hartford, and reveal this misfortune to my wife in the most inobjectionable manner possible, and attend to the business which we spoke of this morning, when you little thought of this occurrence.

Yours,

H. WELLS.

To Messrs. Dwyer and Barber,
Weston Hotel.

N. B. Please tell Mr. James to write to Mr. F. W. Stowon, No. 19 Rue du Fauxbourg Possonier, Paris and tell him of my death.

* * * *

As some papers connect the name of Dr. Wells with the "discovery of ether or chloroform," it may be proper to state that to the deceased is due the original discovery of "ether" now in use by dentists and others; but that Dr. Morton, of Boston, first successfully applied it, after its use had been suggested by Dr. Wells. Chloroform is an entirely different thing, discovered, we believe, by Dr. Simpson, of Edinburgh.

January.—Death mask made.[7]

January 26, 1848, Wednesday: The *Daily Hartford Courant* had the following:

EDITORIAL

THE LATE HORACE WELLS

The death of this gentleman has caused a profound and melancholy sensation in this community. He was an upright and estimable man, and had the esteem of all who knew him. Of undoubted piety, simplicity and generosity of character, enthusiastic in the pursuits of science, and having just been acknowledged as the discoverer of etherization in surgical operations, he was regarded with the highest respect and regard by all our citizens, and there was no one who seemed less likely to meet the sad fate that has befallen him.

In the letters which were found in his cell he speaks of himself as having formed a habit of taking ether for its exhilerating effects. There is no reason to suppose that he did this deliberately. The probability is that his mind was somewhat unsettled by the frequency with which he inhaled it in trying experiments in order to satisfy himself on the feasibility and propriety of employing it in surgical operations. Being of an excitable temper, the effects of this course, added to the agitation which he felt in consequence of the attempt to gain the credit of his important discovery for rivals, and the intensity with which he watched the proceedings in Paris on this subject, till he was formally acknowledged as the real discoverer, further unbalanced his mind so that he was peculiarly in danger of mischief. When in this disturbed state it is not to be wondered at that he betook himself to the inhaling of chloroform, that in the madness occasioned by it he should have engaged in the acts for which he was arraigned, or that under the pressure of his misery he should have put an end to his own life. He committed the fatal act by cutting open his thigh, completely severing the femoral artery, having first inhaled chloroform to deaden the pain. Before doing this he wrote the letters

[7] The date on which the mask was made or by whom is unknown. It hangs at present in the Boston Medical Library. Mr. James F. Ballard, Director, advises me that he has "been unable to find any reference to the Library's acquisition of Horace Wells' Death Mask. It has been in the Library for a great many years, as I remember seeing it even in the old building at 19 Boylston Place. I suppose that we have had it for sometime previous to 1892."

which we copy below, expressive of his desperate intentions and the mental suffering which led to the rash consummation.

By a melancholy coincidence, Dr. J. B. Terry, his partner, was bereaved of a son under most afflicting circumstances on Saturday. We are informed that Mrs. Wells wrote to her husband to avoid writing to Dr. Terry on business, as he was not in a state of mind to receive such correspondence. Little did any think how great an affliction awaited her at that very time!

(The letters referred to in this editorial are printed under date line of New York, Jan. 25th, 1848.)

January 27, 1848. In the *Hartford Courant,* Vol. 12, No. 23, Whole No. 3093, is the following notice under deaths (page 3):

The funeral of Dr. Horace Wells will take place at his late residence, No. 117 Main St., this (Thursday) P. M. at half past 2 o'clock.

Buried in the Old North Burying Ground. (On May 18, 1908 Dr. and Mrs. Wells' bodies were removed and brought to Cedar Hill for Burial). (21)

January 27, 1848. In the *Hartford Daily Courant,* Vol. 12, No. 23, Whole No. 3093, on page 2, is an editorial copied from the *New Haven Journal.*

THE SUICIDE OF DR. WELLS.

The statement of this unhappy event as given in another column, is by no means in our judgment calculated to give the public mind the exact morale of this affair. It is the belief of medical men here who know all the facts, that he was utterly irresponsible in a morale view for all he did, and that his whole conduct was the dictate of insanity. Indeed, those who knew him, know that his whole conduct was utterly irreconcilable with his firm and established character.

He spent some days in this city last summer—called at our office—and we were struck with the intellectual merit as well as modesty of the man. There was something peculiar in him. He remarked to us the extreme pain he suffered from the course of some medical gentlemen in reference to his discovery, and we formed the opinion that he was subject to great mental depression, amounting almost to disease—a fact his friends say was true of him.

He was however, a high minded gentleman, utterly incapable, while in his right mind, of the low and boyish mischief which he committed in New York, and there is no doubt whatever that that which some of our public presses refer to as a fault, was only a misfortune, and all the more dreadful because of its

awful effects on himself. He was a man to whom the world owes public thanks for taking the lead in the most wonderful discovery in human history, and we are pained to see any of the public press, almost without examination, stigmatize as a "monster," the man who had laid humanity under such an obligation. We witnessed but the other day a surgical operation in this city under the influence of ether, or that which grew out of Dr. Wells' discovery. We felt then how much the world owed him. This and such facts known to all, should make us slower in condemnation.

"Tis well
To speak the best we can of
human kind."

1848

March 15, F. A. Brown & C. L. Covell, appraisers under oath submitted to the Probate Court this:

Inventory & appraisal of estate of
Horace Wells
Late of Hartford Deceased
Exhibited & Accepted
March 20th, 1848.
Recorded Book 49 page 229. . .

* * * *

Office Furniture

1 Sofa (castors broken off)		13.00
1 Rocking Chair (red)		1.25
1 Center Table		5.00
1 Dentist Chair		3.00
1 Carpet (say 16 yds.) @ .50		8.00
1 Looking Glass		2.50
1 Stove & Pipe		9.00
Lot of Shells		15.00
1 Show Case containing do		5.00
Tools, etc.		
Murite of Ammonia, say 6 lbs. 15c		.90
2 Pairs Forceps (new)	1.50	3.00
6 Pairs Forceps	.75	4.50
1 Pair Forceps		.50
1 Pair Forceps		.25
3 Pairs Forceps	.50	1.50

24	Files 1.00 per doz.	2.00	
	Lot gold	1.00	
2	Glasses	.25	
35	Excavators & Burrs (Square Finish) 1.50 doz.	4.25	
24	Excavators & Burrs (Round Finish) 1.00 doz.	2.00	
23	Excavators & Burrs (Ivory handle) 1.00 doz.	1.92	
21	Pluggers, etc. (Ebony & ivory handle) 4.50 doz.	7.87	
1	Spring Saw	.50	
1	Drawing Plate	1.00	
3	Files	.50	
978	Teeth (plate & pivot) 6c	58.68	
2	Cases for tools 2.—	4.00	94.62
47	Bells, etc.		10.00

* * * *

The fact that there does not exist any of the personal effects, instruments or equipment of Horace Wells was something I couldn't understand. However through the kindness of Miss A. Louise Blair of Hartford, I have received copies of the papers in the Horace Wells' file at the Probate Court, which show that his estate was insolvent and the office furniture, tools and household furniture were sold at auction.

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21. Personal communication from Miss F. L. Gerrity, Bureau of Vital Statistics of Hartford Board of Health.

The fact that this article contains much material which heretofore has never been published, except in the original sources long since forgotten, is due to the invaluable assistance of:

Miss Alice McCann, Librarian of the School of Dentistry, University of Pittsburgh. (This library is one of the three outstanding libraries of its kind in the world, and has a collection of historical documents and books

dealing with the discovery of anesthesia and the controversy which followed, that is second to none.)

Mr. Albert C. Bates, Librarian, and Mr. Thompson R. Harlow, Assistant Librarian of the Connecticut Historical Society, Hartford, Connecticut.

Mr. Richard G. Hensley, Chief Librarian of the Reference Division, and his assistant Mr. Thomas J. Manning, of The Public Library of the City of Boston.

Mr. Donald A. Wing, Assistant Reference Librarian, Yale University Library, New Haven, Connecticut.

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To Dr Bernard W. Weinberger
With the compliments of the author
W. Harry Archer

THE HISTORY OF ANESTHESIA

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Pittsburgh, Pennsylvania

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PART I

From the beginning of time man has suffered from painful injuries and disease, and continuously he has sought for the perfect method of freeing himself from pain.

Approximately five hundred thousand years ago early man, or sub-man, Pithecanthropus erectus, struggled with nature, wild beasts, and his fellow "sub-men" for existence. Somewhere around fifty thousand years ago the Neanderthal man appeared on the scene. Living alone at first like his ancestors, he soon joined with other individuals to form packs for mutual help in hunting and in battling with other groups for their women (1).

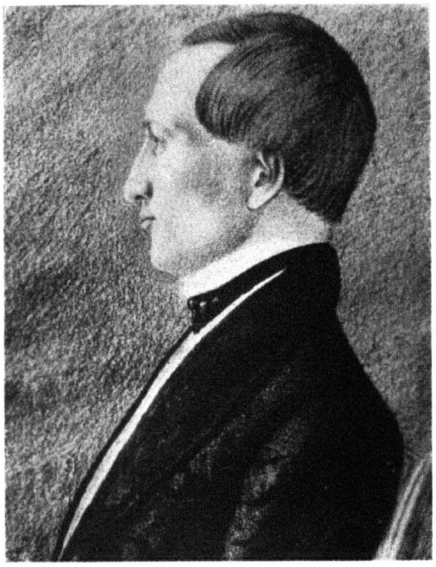
What these early people did to assuage the pain of their injuries we do not know. Certainly it was a case of "every man for himself," because injured or ill members of the pack were liabilities. We can surmise they discovered that bruises and sprains felt better when the injured part was held in a cold stream or lake. Other painful wounds felt better when exposed to the sun's heat and, as a result, the radiant heat from fires and warm stones was probably used. If the injuries were severe, early man either suffered and died, or suffered and got well without help.

About twenty-five to forty thousand years ago the first true man, the Cro-Magnon man, developed. The groups traveled less and, becoming more settled, formed villages. In each village there evolved one person who developed greater skill in the treatment of injuries and disease, the Cro-Magnon medicine man (2).

The medicine man, grotesquely dressed to frighten away the evil spirits who were blamed for the unfortunate victim's plight, treated his suffering patients by building smoky fires in

which his various "therapeutic agents" were burned, at the same time moaning mysterious incantations. The patient, flat on his back where the heavy smoke was thickest, became semi-asphyxiated. This might be termed the first form of "inhalation anesthesia."

The first materia medica was formed from the herbs and flowers of the field, and so the narcotic properties of certain plants were early discovered. The benumbing or intoxicating effect of the juices of the poppy, mandragora, henbane, deadly nightshade, and indian hemp were utilized by inhaling vapors from these drugs or taking them into the stomach in various vile mixtures.



CRAWFORD W. LONG

The first description of the use of an agent to relieve pain during the first operation on man is contained in Genesis, II: 21: "And the Lord God caused a deep sleep to fall upon Adam, and he slept; and he took one of his ribs, and closed up the flesh instead thereof." However, what the Lord accomplished so easily and safely is still being sought by man.

Through the ages an overdose of alcohol has been a convenient and often employed agent to produce a state in which pain of surgery was relieved. The first record of an unconscious state being produced in this manner is in the Bible, Genesis, IX: 21, where we find that Noah drank an excess of grape wine, and while unconscious he was taken to his tent, and there by his kin, was disrobed and allowed to remain nude until he would wake, and thus suffer shame by his nakedness. This occurred in the year 2347 B.C.

Œsculapius, the god of medicine, about 1200 B.C. was supposed to have used a potion from the herb called nepenth to produce insensibility in his surgical patients.

Hippocrates about 450 B.C. mentions in his works that he produced perfect narcosis by having his patient inhale the vapor of bangue.

Scribonius in 47 A.D. recommended the following procedure:

> . . . When a tooth which is loose or painful, is to be extracted, the nose of the patient should be rubbed with brown sugar, ivy and green oil; he is advised to hold his breath, a stone is then placed between his teeth, and he is made to close his mouth. The fluid which causes the pain is then seen to flow from the mouth in such quantity as frequently to fill three pots; after having cleansed the nose with pure oil, and rinsed the mouth with wine, the tooth is no longer painful, and may easily be extracted. (3)

Hua Tua, Chinese court physician, about 150 A.D. performed a wide range of operations, first rendering his patients insensible to pain by the administration of an anesthetic mixture known as "Ma Fu Shuan."

Galen, the Greek physician and philosopher about 165 A.D. used as his anesthetic agent for the extraction of teeth the application of "pirethrin root and strong vinegar, from the action of which, the remaining teeth may be preserved by covering them with a layer of wax. At the expiration of an hour, the tooth becomes so loosened, as to be easily removed." (4)

The Peruvian Indians chewed coca leaves and allowed the saliva laden with the extract to drop on the injured part. A modification of this technique is practiced by natives in Africa today. The patient chews the bark of the enklovidi tree, swallowing the saliva to deaden pain.

The Egyptians practiced compression, and many surgeons from time to time reintroduced this practice of long continued mechanical compression to produce numbness in the part to be operated on.

Hugh of Lucca, who was the teacher of Theodoric, used the "spongia somnifera" or sleeping

ball to prevent pain about 1250 A.D. It was prepared as follows:

> Take opium and juice of unripe mulberry, of hyoscyamus, of the juice of the leaves of the mandragora, of the juice of the wood ivy, of the juice of forest mulberry, of the seeds of lettuce, of the seed of the burdock, which has large and round apples, and of the water hemlock, each one ounce; mix the whole of these together in a brazen vessel, and then in it place a new sponge, and let the whole boil, and as long as the sun on dog days, till it (the sponge) consumes it all, and let it be boiled away in it. As often as there is need of it, place this same sponge into warm water for one hour, and let it be applied to the nostrils till he who is to be operated on has fallen asleep; and in this state let the operation be performed. When it is finished, in order to rouse him, place another dipped in vinegar, frequently to his nose, or let the juice of the roots of ferrigreek, be squirted into his nostrils. Presently he awakes. (3)

During the fourteenth, fifteenth, and sixteenth centuries, it was the custom of some jailers to give criminals about to undergo torture a compound of narcotics which deadened their pain (5). In spite of the fact that these means were commonly employed to deaden the sensibility of tortured criminals, they were not often used to relieve the pain of operations. Most likely the reason they were withheld from patients was because of the deadly effect which often occurred from the administration of large doses of the narcotics.

Guy de Chauliac and Brunus are the only surgeons who mention in their medical work of this period (1350) the use of narcotics, mostly opium, and the "sleeping sponge" to relieve pain during surgical procedures (6) (7). However, they emphasize the bad effects—the danger of producing asphyxia, congestions, and death. This naturally tended to discourage the use of analgesics.

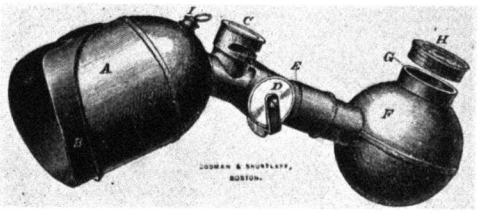
Dominique Jean Larry, Surgeon in chief, Napoleon's Army, at the battle of Eylau, noticed when operating on wounded soldiers who were half-frozen from the intense cold that they felt very little pain. From this discovery arose refrigeration anesthesia, which, however, had so many disadvantages that it was dropped only to recur again.

In 1784 Moore reintroduced compression anesthesia in a new form, an attempt to produce a local anesthesia by compressing and obtunding main nerves previous to operation. The compressing of vessels of the neck to produce insensibility was employed but soon stopped after a few fatalities occurred.

Rapid and excessive bleeding until the patient became faint or lost consciousness as a result of anoxemia was advocated and used by some surgeons.

In the year 1786 Frederick Anton Mesmer settled in Paris and used what he believed to be "magnetic emanations" to produce what he claimed to be the perfect state of insensibility to surgical pain (8). Some very remarkable results were witnessed, but it soon became apparent that the high hopes entertained for this method were groundless. The effects were by no means certain or uniform, and in most cases there wasn't any effect at all.

The first truly modern experimental note is struck in 1799, when Sir Humphrey Davy published an account of his researches and experiments with various vapors or gases. In this



1874—Codman & Shurtleff Ether Inhaler

work occurs the following passage: "As nitrous oxide, in its extensive operation, appears capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place." (9) Davy arrived at this conclusion when he observed that the pain caused by an erupting "wisdom tooth" was relieved when he inhaled nitrous oxide. However, Davy was no more impressed with the idea of surgical anesthesia than Long, and neither of them demonstrated or proclaimed their observations or experiments. Twenty-four years later, when a young physician, Henry Hill Hickman, tried unsuccessfully to interest the Royal Society in his experiments on "suspended animation" to make surgical operations painless using "Carbonic Acid Gas," Sir Humphrey Davy was president of this society. It seems reasonable to believe that if Davy's original observation on the effect of

nitrous oxide for relieving pain had made any real impression on him, he would have been anxious to learn more about Hickman's work in this direction. Sir Humphrey Davy is classed among the pioneers of anesthesia by some authors, but in view of the foregoing statements, this seems to be without justifiable foundation.

Henry Hill Hickman, though, who follows Davy in a history of anesthesia, seems to have had a strong realization of the clinical potentialities of gases as anesthetics. In 1824 he performed many surgical operations on animals which he had rendered unconscious with carbon dioxide. When the Royal Society and his brother medical men ignored him, he printed a public letter on his experiments, and failing again to arouse any interest, he presented in 1828 a memorial to King Charles X of France. However, his researches were also coldly received by the French. Hickman, a disappointed man, returned to England, where he died a short time afterwards (10). Truly, Hickman "hovered on the brink of the great discovery." Here, with Hickman's futile efforts to interest either the British or the French Medical professions in the immediate possibilities of surgical anesthesia, we come to the close of the first modern period in the history of anesthesia. It was not too happy or promising a chapter.

THOMAS W. EVANS

Possibly the skepticism of the medical profession can be excused on the grounds that all the methods and drugs which had been suggested heretofore for the relief of pain during surgery had been proved ineffectual and, in most instances, definitely injurious. The attitude of the surgeons during the first half of the nineteenth century was summed up by Alfred Louis Marie Velpeau, one of the greatest French surgeons, when he wrote:

> To escape pain in surgical operations is a chimera which we are not permitted to look for in our days. A cutting instrument and pain in operative medicine are two ideas which never present themselves separately to the mind of the patient, and it is necessary for us surgeons to admit their association. (11)

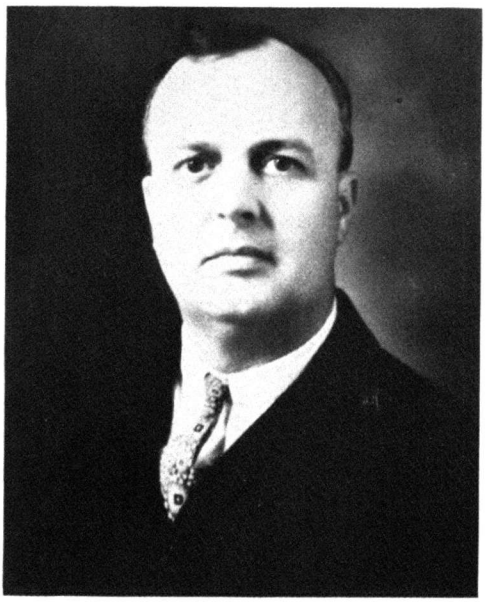
PART II

Let us now turn to the new world for new ideas. American physicians, dentists and chemists had not been inactive. It is a strangely lively turn to find the sources of new ideas for anesthesia stemming from rather hilarious parties or demonstrations. What were called "ether frolics" or "laughing gas demonstrations" had long been a form of amusement among the young people of the eighteenth and nineteenth centuries here. At one of these ether parties in 1842 a young physician, Crawford W. Long, of Georgia, conceived the idea that possibly he could give a patient sufficient ether to inhale so that he could operate without pain. Selecting as his patient an acquaintance whom he knew to be a frequent participant in ether parties, he removed a tumor from his neck while the patient was under the influence of ether, just as physicians and dentists had used whiskey as a preparation for surgery for those known to be addicted to its use. This year Long claims three administrations of ether, and, "Since '42 . . . performed one or more surgical operations annually on patients in a state of etherization" (12). This was written in 1849. It is quite apparent that Long was not impressed with the idea that he had made a discovery of great importance for he made no effort to introduce the method into his

general practice, nor did he write on the subject, demonstrate it or lecture on it before any medical society, until after Wells and Morton had made their demonstrations. So far as making any contribution towards anesthesia is concerned, Long may as well never have lived.

But if Long were unimpressed about the use of ether to relieve pain, Horace Wells, of Hartford, Connecticut, a young, sympathetic, conscientious dentist, was more alert. Wells was a very sensitive individual, and the suffering he caused when he extracted teeth troubled him greatly. Tooth extraction was so excruciatingly painful that again and again in history, teeth were deliberately "pulled" as a form of torture or punishment. Saint Appolonia was persecuted because of her Christian faith, and in punishment for her refusal to renounce her religion, her teeth were torn out, one at a time (13).

Horace Wells gave considerable thought to the subject of pain relief during extractions. In 1838 he wrote "An Essay on Teeth; Comprising a Brief Description of their Formation, Diseases, and Proper Treatment" (14). He was a profound student far advanced in what was then an embryonic profession. Constantly enlarging his knowledge, he attended a lecture on chemical phenomena by G. Q. Colton, traveling chemist, on December 10, 1844. As part of his demonstration, Colton manufactured some nitrous oxide, known as "laughing gas," and to amuse the crowd invited spectators from the audience to come forward and inhale the "laughing gas fumes." When this part of the lecture was reached, Wells, in the audience, observed that no sign of pain was exhibited when the volunteers under the "laughing jag" of the gas stumbled around the stage and scraped their shins on heavy benches. Immediately there crystallized in the mind of Wells the idea of inhalation anesthesia. Wells, it is thought, was unacquainted with the suggestion of Sir Humphrey Davy some forty-four years prior. After the lecture Wells talked with Colton and persuaded him to bring a bag of the gas to his office the next day. Wells had an aching tooth and felt that by inhaling sufficient nitrous oxide he could have his tooth removed painlessly. Colton objected, as he was fearful that the inhalation of such a large quantity of gas might result fatally. Wells, however, had the courage of his convictions and persuaded Colton to bring the gas. On December 11, 1844, Wells sat in his operating chair and held the bag of gas which he inhaled until he lost consciousness. Then his friend and former pupil, John Riggs, stepped forward and extracted the aching wisdom tooth. On recovering consciousness, Wells exclaimed, "A new era in tooth pulling!" For several weeks following his discovery, Wells experimented with the gas, and, desiring to acquaint the world with this release from surgical pain, he hastened to Boston, the medical center of the New England States. There he arranged through a former pupil and partner, Wm. T. G. Morton, to lecture and demonstrate nitrous oxide



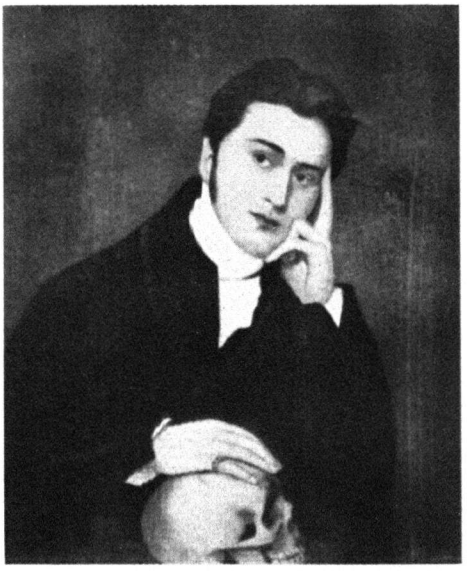
HARVEY S. COOK

before the senior medical students of John C. Warren. Unfortunately, the demonstration was not completely successful, as Wells, being somewhat nervous, withdrew the gas bag too soon, and the student cried out when the tooth was extracted. Later he admitted, however, that he had had no pain. Wells returned to Hartford, where he continued to use nitrous oxide in his practice and taught other dentists to use it. When friends urged Wells to patent his discovery he said, "No! Let it be as free as the air we breathe!" (15) (16) (17)

W. T. G. Morton received the idea of inhalation anesthesia from Wells' demonstration and

after some experimental work with ether, he continued to use ether at the suggestion of Charles T. Jackson, physician and chemist of Boston, in place of nitrous oxide. Finally he was ready to try to extract teeth while a patient was under the influence of a disguised ether compound. On this day Morton wrote as follows:

> Toward evening a man residing in Boston came in, suffering great pain, and wishing to have a tooth extracted. He was afraid of the operation, and asked if he could be mesmerized. I told him I had something better, and saturating my handkerchief, gave it to him to inhale. He became unconscious almost immediately. It was dark, and Dr. Hayden held the lamp while I extracted a firmly-rooted bicuspid tooth. There was not much alteration in the pulse and no relaxing of the muscles. He recovered in a minute and knew nothing of what had been done for him. He remained for some time talking about the experiment. This was the 30th of September 1846. (16)



HENRY HILL HICKMAN

W. S. HALSTED

In other words, it was approximately two years after Wells first discovered, demonstrated, and proclaimed the blessings of surgical anesthesia.

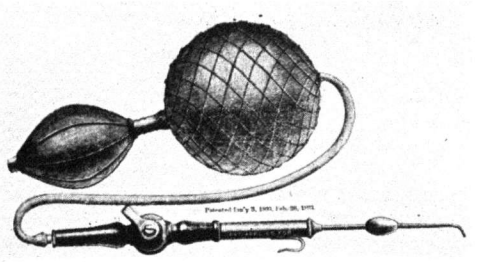
Morton then proceeded to obtain an opportunity for the public demonstration of the practicability of anesthesia. This was furnished him in the surgical amphitheater of the Massachusetts General Hospital in Boston, on October 16, 1846. The Harvard Medical Class was present, as well as several prominent surgeons and physicians. The surgeon in charge was Dr. John C. Warren, to whom great credit is due for giving Wells and Morton the opportunity to publicly demonstrate their anesthetic agents. The operation was the removal of a tumor from the left side of the neck of a young man who was described in the records as "Gilbert Abbott, aged twenty-single, painter." The exhibition of the anesthetic was such a complete success, that Dr. Warren turned to those present and said, "Gentlemen, this is no humbug" (18).

The ether was administered with a modified hollow glass ball. A sponge inside the ball was saturated with ether, the nostrils were closed with one hand, and the mouth piece placed between the patient's lips, who then breathed through his mouth, the incoming air passing over the ether saturated sponge, this becoming charged with ether vapor.

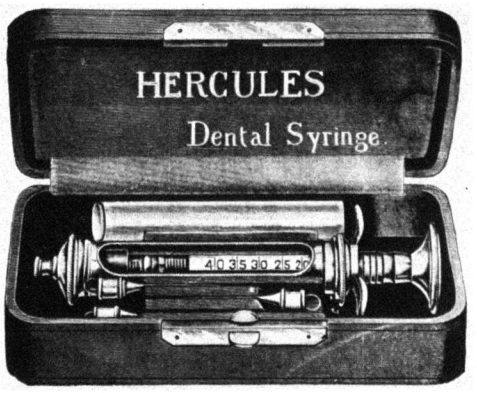
The fame of the wonderful new agent and of its discoverer spread rapidly and then came Jackson, jealous of the fame of Morton and anxious to participate in the benefits of the discovery, with a claim as to his rights in the discovery. He had suggested the drug to Morton, and claimed he had advised him about its nature and about the best methods of its administration (19).

A terrific controversy now arose between Drs.

Wells, Jackson, Morton, and later Long for the title of discoverer of anesthesia. Unfortunately, Morton refused to concede priority to his former teacher and partner, Horace Wells, claiming that nitrous oxide was not an anesthetic. Furthermore, to keep Jackson quiet Morton entered into a secret agreement with him which was soon broken. The agreement stated that Morton was to patent the secret compound now called Letheon and pay a percentage of the royalties



1893—Richmond's Automatic Pain Obtunder
Alcohol, ether and chloroform put in medicine chamber



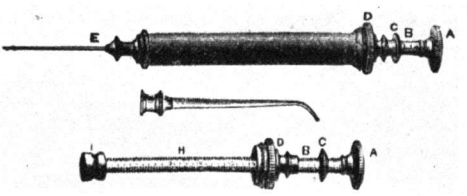
1911—Hercules Expanding Plunger Syringe

from the use of the Letheon to Jackson. Jackson, the wealthiest of the claimants, published pamphlets for many years setting forth his claims. Morton gave up the practice of dentistry and devoted all his time to anesthesia. He was the first specialist in the administration of anesthetics and the first manufacturer of anesthetic equipment. In the heat of this battle Wells, mentally deranged by self-experimentation with chloroform, committed suicide in 1848.

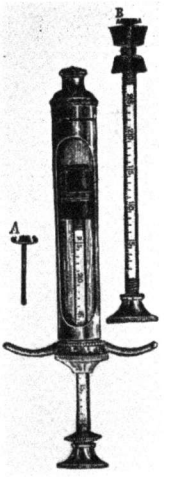
For years the controversy raged in the newspapers, dental and medical journals and through the halls of Congress. Finally after five years of congressional majority and minority reports, demonstrations and law suits, Congress dropped the whole matter (20) (21) (22) (23).

The American Dental Association, at its fourth annual meeting at Niagara Falls in 1864 adopted the following resolution:

Whereas . . . , Whereas—— . . . , *Therefore Be It Resolved,* by the American Dental Association,



1874—New Hypodermic and Dental Syringe



1897—Expanding Plunger Hypodermic Syringe

that to Horace Wells, of Hartford, Connecticut, (now deceased) belongs the credit and honor of the introduction of anesthesia in the United States of America, and we do firmly protest against the injustice done to truth and the memory of Dr. Horace Wells, in the effort made during a series of years and especially at the last session of Congress, to award the credit to other persons or person. (24)

This resolution was reaffirmed in 1872 (25).

In spite of the efforts of the supporters of Morton, Jackson, and Long, The American Medical Association in 1870 at its twenty-first

annual meeting, held in the city of Washington, approved the following resolution:

> On motion of Dr. H. R. Storer, of Massachusetts, it was Resolved, that the honor of the discovery of practical anesthesia is due to the late Dr. Horace Wells, of Connecticut. (26)

PART III

The early days of the discovery and first use of anesthesia end in this ugly cloud of squabbling. But in recompense, the brighter days lie just ahead—the pioneering days of exploring new anesthetics, of mastering new techniques for its

1886—Ormsby's Ether Apparatus

administration, of perfecting accurate equipment for its application. The first physician to specialize in the administration of anesthetics was John Snow of London. Having previously made experimental studies on respiration and asphyxia, he was particularly well trained to carry out many experiments with ether on animals and himself, finally perfecting an improved inhaler. With his improved inhaler, Snow asked to be allowed to give ether at St. Georges Hospital. He obtained permission to administer it, using his water heated apparatus, to the out patients in cases of tooth extraction. One of the surgeons standing by was surprised to see the excellent results obtained by the proper administration of ether vapor and so on January 28, 1847, six weeks after the first use of ether in England, John Snow started his speciality of administering anesthetics for major surgery (27) (28).

Colleagues were not slow in following Snow. James Y. Simpson of Scotland immediately adopted ether in his obstetric practice, using it successfully for the first time on January 19, 1847. He soon discovered the difficulties which attended its administration, and began experimenting in order to find a better agent. The unpleasant odor which ether gave to his clothes also induced Simpson to try other agents. He wrote:

> I have found that no busy obstetric practitioner could extensively employ sulphuric ether without inevitably carrying about with him, and upon his clothes, an odor so disagreeable to many other patients, and other houses, as to make his presence there aught but desirable. (29) (30)

For ten long months Simpson gave what few spare minutes he had to constant self-experimentation with numerous drugs and liquids. Finally, at the suggestion of Mr. Waldie, physician and chemist (31), Simpson and his associates Keith and Duncan, began to experiment upon themselves with chloroform. One evening in November, 1847, these three gathered around the table in the dining room of Simpson's home. In front of each was a tumbler of chloroform, and each inhaled the vapors which rose from the fluid. They became exhilarated, the liveliest conversation ensued, and then the three suddenly fell insensible. Well satisfied that this new drug was superior to ether, Simpson immediately started to use chloroform to relieve the sufferings of women during childbirth (32). Was this great boon to women received with joy and immediate adoption? It was not! Instead Simpson's work precipitated a violent controversy over the propriety of abolishing the pains of childbirth. Simpson was a man of tireless energy and a born fighter. No man could have been found better suited than Simpson to enter the battle as the champion for women. Simpson and his use of chloroform in childbirth were denounced from the pulpit and by his fellow physicians. The arguments used by the clergy against anesthesia varied, but all centered

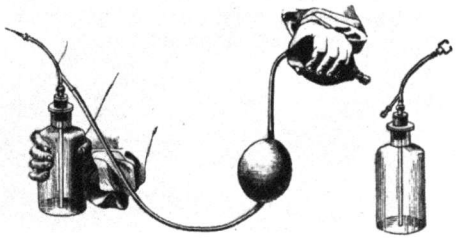
around the theme that pain, particularly the pain of childbirth, was the ordained lot of mankind; to prevent it was a sacrilege. The authority claimed for these ecclesiastical attacks lay in the Biblical curse placed upon mankind in Genesis, III: 16); "Unto the woman he said, I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children; and thy desire shall be to thy husband, and he shall rule over thee." It was the portion "in sorrow thou shalt bring forth children," which was the crux of the matter. According to the prevailing interpretation, pain (sorrow) was ordained in childbirth, and the prevention of pain during childbirth "was contrary to religion and the express command of Scripture."

Simpson replied to these accusations in a series of papers taking their weapons for his own use. He says:

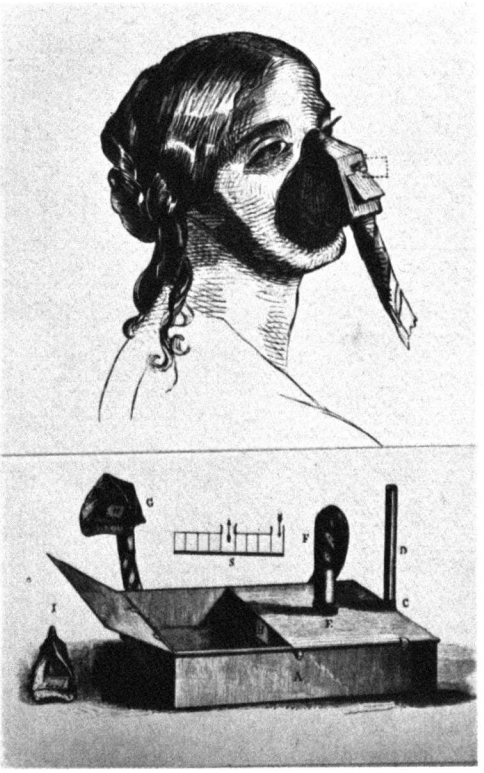
> Besides, those who urge, on a kind of religious ground, that an artificial or anesthetic state of unconsciousness should not be induced merely to save frail humanity from the miseries and tortures of bodily pain, forget that we have the greatest of all examples set before us for following out this very principle of practice. I allude to that most singular description of the preliminaries and details of the first surgical operation ever performed on man which is contained in Genesis II: 21, "And the Lord God caused a deep sleep to fall upon Adam and he slept; and he took one of his ribs, and closed up the flesh instead thereof." In this remarkable verse the whole process of a surgical operation is briefly detailed. But the passage is principally striking as affording evidence of our Creator himself using means to save poor human nature from unnecessary endurance of physical pain. The first surgical operation was thus shown to have been performed with the patient under anesthesia. (33)

At the same time that Simpson was fighting the objections raised by the clergy and medical men in England, Channing of Boston was waging a similar battle to introduce ether for a similar purpose. Even as late as 1921, in the revival of "Twilight Sleep" objections were raised against the use of anesthesia in childbirth. One objection then offered was that to use anesthesia during childbirth lessened maternal love, because it was claimed "the very suffering which a woman undergoes in labor is one of the strongest elements in the love she bears for her offspring!" (34) Hence to reduce woman's suffering was to reduce her love for her child!

But in April, 1853, the cause of anesthesia was to enlist an unexpected champion of greatest weight. Queen Victoria accepted chloroform for her seventh confinement. This exerted a greater influence on popular acceptance of anesthesia at childbirth not only in Great Britain, but in America as well, than all the efforts of Simpson and Channing.



1867—Apparatus for Producing Local Anesthesia by Narcotic Spray, Using Ether or "Rhigolene"

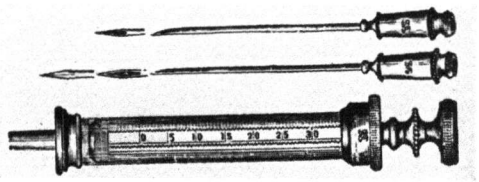


1847—John Snow's Ether Apparatus

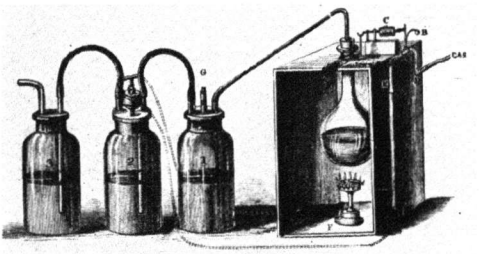
In the United States, too, the use of anesthesia in dental surgery was also bitterly opposed and ridiculed.

It is of interest to read what a special committee of the American Society of Dental Surgeons had to say on the subject of anesthesia in 1848. They reported in part as follows:

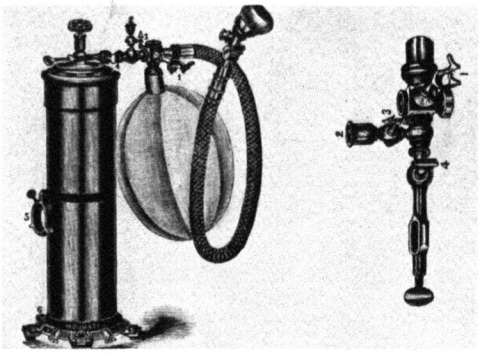
. . . your report would refer to the introduction, in the practice of the profession, of sulphuric ether, chloroform, and a similar agent, known as



1876—S. S. W. Hypodermic Syringe



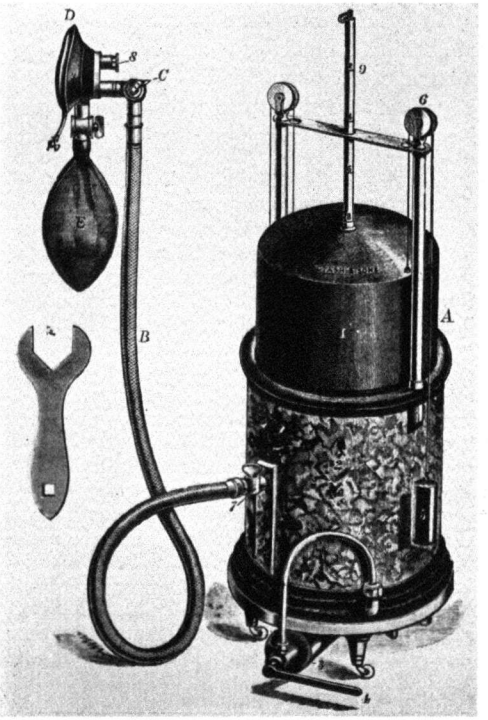
1875—Apparatus for Generating Nitrous Oxide



1889—Dr. G. H. Hurd's Chloroform Mixer or Vitalized Air Cup Attachment

aldehyde,—for the purpose of subdueing pain and sensibility during the extraction of teeth, and the performance of other surgical operation. . . .

No sooner was it known that an anesthetic agent existed which could be exclusively secured to individual members of the profession by letters patent, than a host of men rushed to purchase superiority, which education and talents forbid, and indolence and qualities denied; [footnote, it may be proper to remark, lest a false impression be made, that Dr. Morton has, with commendable magnanimity, annulled, so far as he is interested, the patent above referred to.] and the eye of the honorable dental surgeon was dimmed by honest indignation, at the injury done the profession, as his gaze met in the public prints, *fulsome* advertisements, headed, "Dentistry without pain"; ". . . More chloroform" . . . and various other advertisements of like character, . . . thus every montebank, who digs out a corn, and dignifies himself with the title of chiropodist; every itinerating dentist, who gouges out a tooth or fills a cavity with amalgam; or anything that can creep, or crawl or sneak into any of the unguarded



1892—Gasometer for Liquid Gas with Clover's Face Piece

sanctuaries of medicine, can arm himself with an inhaling apparatus, and a bottle of an anesthetic material, with which he expects to prey on the public. . . .

Your report desires it to be distinctly understood that the point of discussion rests on the abuse of anesthetic agents, and the consequent disgrace brought on the profession generally. . . .

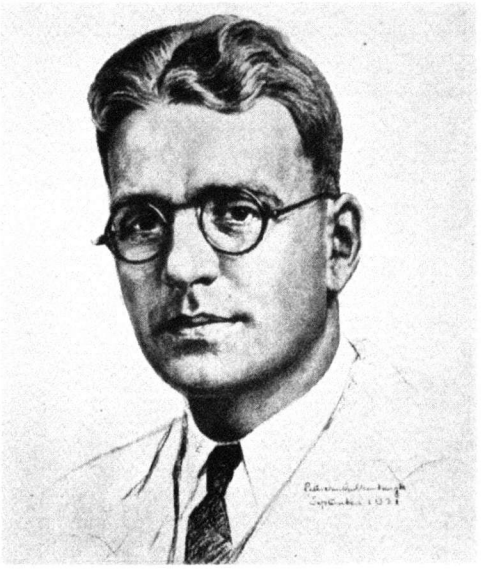
The value of sulphuric ether and chloroform as a narcotic and a therapeutical agent, can hardly be estimated. However . . . your report is of opinion, that the greatest and as yet unanswered objection to the employment of anesthetic agents, is its narcotic influence, and one that applies with

equal force against its indiscriminate application, and even its employment at all, except in very painful surgical operations. . . .

Hence, in all minor operations in surgery, their administration is forbidden; and that their demand in the practice of dental surgery is small . . . (35)

The Baltimore Editors, Harris, Westcott, and Dwinelle wrote in 1847,

For so simple an operation as the extraction of a tooth we have never been a very warm advocate for the inhalation of the vapor of sulphuric ether, the anesthetic agent hither-to employed, for the purpose of producing insensibility. (36)



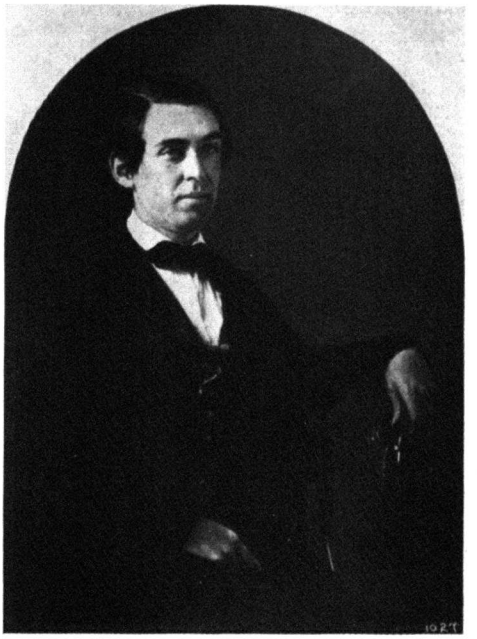
CHAUNCEY LEAKE

It was claimed that the use of ether encouraged charlatinism.

In the *Boston Daily Advertiser* of December 12, 1846, a committee of the leading dentists of that city headed by J. F. Flagg published their report which damned the use of ether with faint and carefully qualified praise. The report bitterly criticised the patenting of the "anodyne vapor." It called for an investigation of the use of ether by a committee from the Massachusetts Medical Society. Flagg though, was later to become one of the outstanding users and advocates of ether and then of chloroform anesthesia (37) (38).

Because of the bitter opposition raised by both the medical and dental professions, the use of anesthesia was astoundingly slow in adoption. For example, in July, 1849, in the *Dental News Letter* we read: " . . . the Letheon is still used to considerable extent in Boston, for extraction of teeth; while in this city [Philadelphia] and in most other places, so far as we have been able to learn, it has been generally abandoned."

In the meanwhile chemists and pharmacists, here and in England, were struggling to better the anesthetic agent and perfect its commercial manufacture, while dentists and physicians were experimenting with new means of its administration.



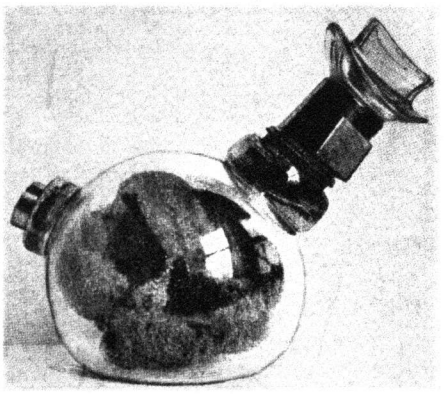
E. R. SQUIBB

Up to 1853 ether was manufactured by the dangerous openfire, intermittent distillation method. This involved the problems of fire hazard and the selection of the proper fraction of the distillate to be used for anesthesia. This year Edward R. Squibb, while Assistant Director at the United States Naval Laboratory, manufactured ether by the revolutionary method of continuous steam heat through lead coils (39).

In 1856 a Philadelphia dentist, J. B. Francis, announced a new use for electricity, the alleviation of pain during the extraction of teeth.

The application is somewhat as follows: The negative pole or wire of the ordinary electro-magnetic machine, which is a graduated battery, is attached to the forceps, or to one handle of it, and then placing the metallic handle of the other pole in the hand of the patient; by this means a current is at once formed on the forceps coming in contact with the tooth . . . and the extraction is made at once. (40)

Shortly after Francis patented his discovery his right to the discovery was disputed by Oliver of Buffalo (41) and by Morrison in Edinburgh (42). However the Board of Managers of the Franklin Institute of the State of Pennsylvania awarded to Francis "the Scott's Legacy Medal and premium of twenty dollars, for his process of removing teeth without pain" (40).



1846—Morton's Inhaler

Chapin A. Harris found this method quite satisfactory in his private practice (43).

In 1858 J. D. White, as a member of a subcommittee of the Franklin Institute's Scientific Committee, in his report on the use of electro-galvanism anesthesia in the extraction of teeth, as first used by J. B. Francis, dentist, said: "we have conducted our experiments against prejudice; but what we have witnessed so far, we are satisfied with, and would recommend it to the consideration of dentists" (44). The next year Sass (45) published several case reports of the satisfactory use of "Electro-Galvanic Anesthesia" for tooth extraction.

From 1850 to 1860 more chloroform was being used for dental, as well as major surgical operations (46). Chloroform was also used as a local anesthetic by placing chloroform in a container, shaped like an impression tray, half full of cotton wool and then placing this tray over the part to be operated, the evaporation of the chloroform acting as a refrigerant on the tissues. In the mouth cotton wool saturated with chloroform or ether was held to the buccal and lingual tissues with a small tray-like device (47).

Refrigeration for local anesthesia was advocated by M. Fournier (48), who exposed the part to be operated to a spray of acetic acid and chloroform. He called this process Chloracetization.

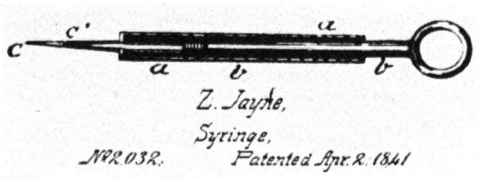
A new apparatus appeared in 1867 which was used for producing local anesthesia by narcotic spray. It was applicable to general and dental surgery. Ether or other fluid was placed in a bottle and sprayed on the gum and tooth to be extracted until the tissue was frozen. However, the pain during and after the production of local anesthesia was greater than the extraction of the tooth. Cases of marked sloughing of tissue also were observed after the use of this method.

In the late 1860's, mixtures of ether and chloroform were suggested and used for inhalation anesthesia, and nitrous oxide, which for twenty years had been practically ignored, because of the difficulties in making and storing it, was reintroduced by G. Q. Colton (49) in his various "Dental Institutes." The enormous extracting practice built by Colton and his associates gave a great impetus to the use of nitrous oxide for extraction. At this time nitrous oxide was made in small quantities and a small india rubber bag filled with sufficient gas to anesthetize one or two patients. The nose was held shut by the operator's fingers, or None's nose compress was used. Then Goodwille introduced his inhaler which permitted the mixture of air with the gas and covered the nose as well as the mouth. The necessity for the production of large quantities of nitrous oxide as well as increased storage space, prompted Bean to design a 50-gallon apparatus. A "streamlined model" of this apparatus was popular in 1867. In 1868 Edmund Andrews, surgeon of Chicago, made one of the greatest contributions to anesthesia, the mixture of oxygen with nitrous oxide (50). However, it was not until thirty years later that Frederick W. Hewitt, more than any other, made nitrous oxide and oxygen anesthesia practical.

In addition to ether, chloroform, nitrous

oxide, a wide variety of agents were experimented with which were claimed to be valuable anesthetics. A few employed during this period were amylene, keroseline, carbonic acid, bisulphide of carbon, tetra-chloride of carbon and spirits of turpentine. Animal magnetism, hypnotism, and compression of the carotid artery were again reintroduced. Richardson (51) made great claims for a mixture of methylic ether and sulphuric ether.

In 1868 Professor W. W. Green, of the Maine Medical School, advised the "Hypodermic Use of Morphia during Anesthesia" (52). He made a subcutaneous injection of from $\frac{1}{2}$ to 1 grain of morphine while the patient was under the influence of ether. His reasons for the use of morphine were "in anticipating all pain, preventing shock, shortening the anesthetic influence and in preventing delirium and nausea." This is the first mention I have found of the hypodermic administration of drugs with inhalation anesthesia, although Lafargue of France, in 1836 deposited morphine paste through a needle trocar he invented (53). Up to that time the drugs were rubbed into a previously made incision. In 1839 Taylor and Washington (54) of New York used for the first time a solution of morphine in the Anel syringe. This syringe is the real progenitor of the present hypodermic instrumentarium. It was a small sterling silver leather piston syringe with a fine elongated tapering nozzle that was originally intended for the lachrymal duct. A small incision had to be made in the skin to allow the nozzle to be inserted.



In 1841 Jayne patented his syringe which is very similar to the Anel but the tapering nozzle tapers down to a sharp point, eliminating the necessity of making a skin incision first.

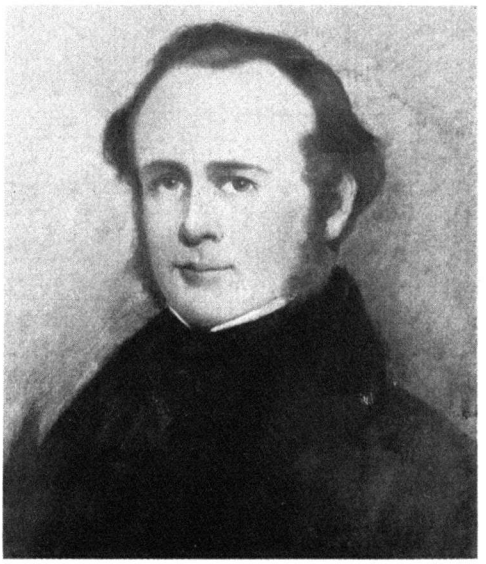
Alexander Wood of Edinburgh began in 1843 the use of a crude syringe, similar to the Anel, with which he injected a solution of morphia through an opening previously made in the skin (53).

In 1853 Pravaz of France first employed a separate needle with the slip joint.

In 1856, Fordyce Barker of New York, while in Edinburgh, learned of Wood's work. Professor Simpson presented him with a Ferguson Syringe and from this model George Tieman and Company of New York, produced the first syringes that were made in the United States (53).

All these early users of the hypodermic syringe used it to deposit morphine along or near the course of the affected nerve in cases of neuralgia.

The first syringes were made of sterling silver, glass, hard rubber, celluloid and German silver. The pistons were solid or had leather tips.



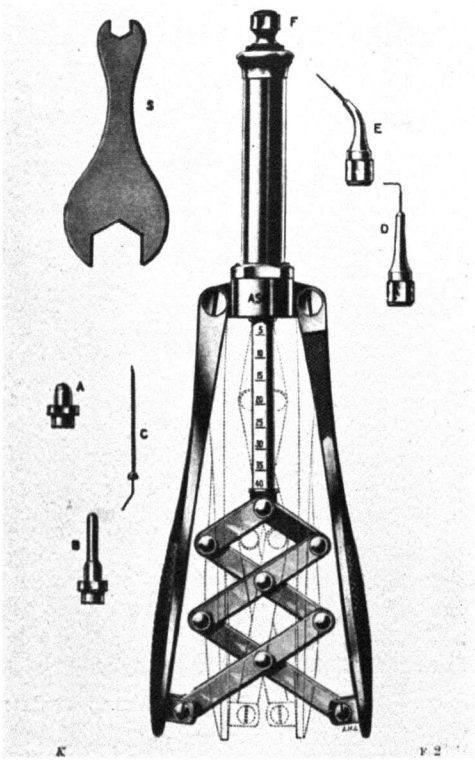
Copy of Portrait of Horace Wells by James McManus

An American model was put on the market in 1874. In 1876 a combination glass and metal syringe was introduced to the dental profession.

In 1869 Thomas W. Evans, outstanding dental surgeon of Paris, spent much time and money in introducing nitrous oxide anesthesia in Europe. He encountered violent objections including those of Richardson, a leading figure among English anesthetists. Evans exhibited a working nitrous oxide apparatus at the Paris Exposition. He gave exhibitions at his office in the presence of large numbers of "scientific gentlemen." He brought it up before meetings of medical societies and presented the Dental Hospital in London

with one hundred pounds to be expended in experimenting with the gas (55). He was finally rewarded by seeing the successful introduction of the use of nitrous oxide as an anesthetic into England and the continent.

As evidence of the spreading interest in surgical anesthesia, articles began to appear more frequently in the literature. Spessa, of Italy, reported in 1872 that he succeeded in preventing pain during the slitting of a fistulous tract by injecting a solution of morphine into the tract before the use of the knife (56). This was probably the first recorded attempt to produce local anesthesia by injecting drugs with a syringe.



1912—Gunthorpe's Hypodermic Syringe
For dense tissue and interseptal alveolar injections

New advances in the perfection of the anesthetic agent were quickly followed by improvements in the instruments for its administration. Shifts and experiments both with anesthetics and techniques came with encouraging, but to the historian, confusing rapidity. In England liquid nitrous oxide was made available to the profession in 1872. The first suggestion to compress the gas to a liquid form so that it might easily be transported and stored, appeared in *The British Medical Journal* in 1868. Four years later Johnson Brothers began the production of liquified nitrous oxide. Up until this time each of the dentists, who were the principal users of gas, made his own nitrous oxide.

The paraphernalia for this purpose was quite cumbersome, and considerable trouble was necessary to manufacture the gas. While it could be stored for a short time, there was no means of preserving the gas for any length of time. This meant that fresh gas had to be made continually. The favorite equipment for this purpose in 1876 was the S. S. White model which was no improvement worth mentioning over the models of ten years previous.

Five years later S. S. White of Philadelphia also began supplying the liquified form of nitrous oxide and put a new gas outfit on the market to administer nitrous oxide from the cylinder. This innovation revolutionized the administration of gas and tremendously increased its use.

Castle, in 1872, who "never used or countenanced the use of ether, chloroform, or nitrous oxide for the extraction of teeth," claimed to have been extracting teeth painlessly for the past thirty-two years by "obtunding or benumbing the extremities of the temporal nerves." He used ice to the temples or had his "assistant press for one minute with persistent firmness into the fossa or hollow behind the ridge of the temporal bone which forms the external bone circle orbit of the eye (57)." Here we see the reintroduction of so-called compression anesthesia, practiced centuries ago by the Egyptians, and refrigeration anesthesia, first noted by Larry eighty years before.

Ether was used almost as extensively as nitrous oxide at this time. Codman and Shurtleff's ether inhaler had a large sale in 1874. Ormsby's ether apparatus was popular in England.

In 1877 Edmund Andrews (58) being cognizant of the fact the pain of a wound diminishes with the velocity of the body producing it, made the further observation that at a certain velocity, the pain disappears altogether. For example workmen in lumber mills who accidentally brought their hands in contact with circular

saws whose circumferences ran at a velocity of twelve thousand feet a minute, testified that they felt no pain when they had fingers or the whole hand amputated.

It seemed feasible to Dr. Andrews to employ these high velocities in certain cases of surgery to effect a kind of mechanical anesthesia and so he had constructed first an instrument which shot forward a wide blade like Smith's scarificator. This proved a failure, because it had not the requisite velocity. Andrews also thought the instrument dangerous, "because, if a velocity of twelve thousand feet per minute were obtained in an instrument which shoots out in a straight line, the sudden stops would ultimately snap off the end of the blade and throw the detached piece of steel, like an arrow, deep into the body."

"To avoid this danger, [he] had one constructed, in which the knife revolves in a circle and is stopped by the more gradual action of a spring and chain. . . ." (58) This instrument produced many incisions absolutely without pain while in others slight suffering was experienced. Andrews thought the failures were due to the slow velocity of the knife, it only reaching a speed of three thousand feet per minute which was only one-fourth the speed thought to be necessary for painless incisions. Hence Dr. Andrews had an improved instrument made to increase the speed of the blade.

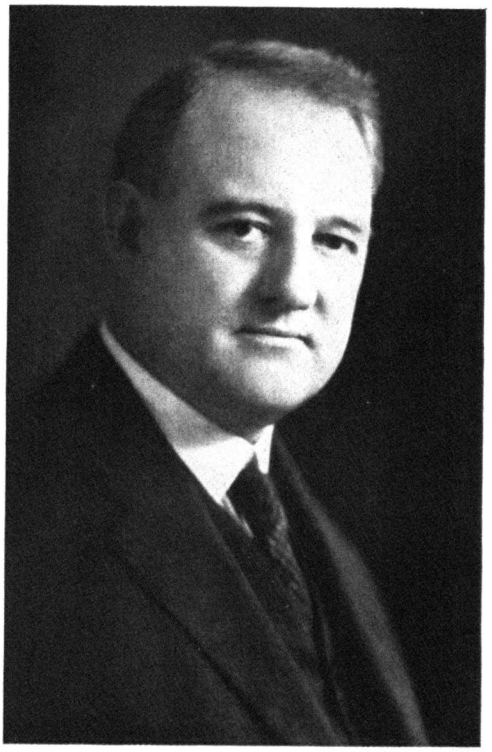
Thinking that perhaps a thin circular saw might be the best form of instrument, Dr. Andrews experimented with "the portable treadle engine of the dentist" to see if it could be modified so as to give the required speed. Whether or not Dr. Andrews reported further on this work is not known.

In 1881 Alexander Crombil, surgeon at the Calcutta Medical College Hospital, strongly advocated the injection of morphin before the administration of chloroform. He felt that it was the employment of this drug which prevented chloroform deaths in his hands. This was probably the first pre-anesthetic medication (59).

Bromide of ethyl was used in 1880 for major surgery only to be quickly discarded. However it was thought that bromide of ethyl would be satisfactory for short operations and so in 1883 G. V. Black lectured and gave a practical clinic on "Bromide of Ethyl as an Anesthetic for Dental Purposes or any Very Short Operation (60)." Black's first public demonstration, like Horace Wells', was a failure.

Hayes, a dentist of Pittsburgh, a caustic condemner of nitrous oxide anesthesia, in 1882 patented an apparatus for generating and applying anesthetics. Ether and chloroform mixtures were heated by means of a water bath and air pumped through the mixture was charged with the anesthetic vapor (61).

From out of all this welter of trial-and-some-error experimenting, though, comes a new anes-



E. I. McKesson

thetic destined to be of major significance—cocaine. Local anodynes had been in use for some time to deaden the pain of drilling carious teeth. The local anesthetic effect of cocaine hydrochloride had been discovered by Schraff in 1862, when he noted the local analgesic properties of this substance when it was placed on the tongue. However, it was not until twenty-two years later, in 1884, a young interne and house surgeon, Koller (62), first announced the use of cocaine to anesthetize the eye. The same year William L. Halsted (63), surgeon at Johns

Hopkins Hospital, showed that the injection of a nerve trunk in any part of its course is followed by local anesthesia in its entire peripheral distribution. The nerve he first "blocked" was the mandibular.

On April 1, 1922, the Maryland State Dental Association honored Dr. Halsted, and at a dinner presented to him a gold medal inscribed on the back as follows: "To Dr. William S. Halsted from The National Dental Association in Grateful Recognition of His Original Researches and Discoveries upon Which the Technic of Local and Neuro-Regional Anesthesia

Alfred Einhorn

in Oral and Dental Practice Now Rests. August 18, 1921."

One year after Koller's discovery and Halsted's application in nerve blocking, Leonard Corning (64), of New York, presented a paper on spinal anesthesia with cocaine.

The new anesthetic was immediately subjected to clinical tests as a local anesthetic to sensitive dentine (65). Conflicting reports were made on its efficacy. When applied topically to the gum around a tooth to be extracted, feeling in the gum was destroyed, but there was not any relief from the pain of extraction.

In the meanwhile, in 1885 Daniel Moliere revived the technique of producing anesthesia by introducing ether vapor into the intestine through the rectum (66). This method was first described by Pirogoff in 1847 (67), at which time it stimulated Roux (68), Y'Yhedo (69) and Duprey (70) to use this method as well as the injection of liquid ether into the lower bowel.

Chloroform was mixed with nitrous oxide in 1889 by means of Hurd's "Chloroform Mixer or Vitalized Air Cup Attachment." Highly decorative gasometers with the generator displaced by a tank of liquid nitrous oxide appeared in the late eighties and early nineties. The Nevius

Charles K. Teter

in America and in England Ash's with Clover's face piece are typical examples.

But in 1890 cocaine injections into the gum for pain relief during extractions was the accepted practice. From four to six injections in the gum around the neck of the tooth to be extracted was the recommended technique. An example of a cocaine syringe of this period is the Farny. However, now began a series of articles warning about the promiscuous use of cocaine. Extensive sloughing was seen following its employment. Severe systemic effects and even deaths were recorded. Now there sprang up hundreds of new formulas to ward off the dangerous effects of cocaine. These proprietary anesthetic solutions contained either cocaine, in spite of claims

to the contrary, menthol, carbolic acid, or creosote.

In 1894 Carlson (71), a dentist in Gothenburg and in 1896 Thiesing, a dentist in Hildesheim, when producing local anesthesia by spraying ethyl chloride on the gums observed that several patients became unconscious (72). This observation prompted Thiesing to make experiments on animals and then to employ ethyl chloride as a general anesthetic for human patients. In 1896 it passed from the dentist's chair to the operating theater in the hospitals. It is interesting to note that here again we find that although Flourens (73) in 1851 recognized the anesthetic power of ethyl chloride, and an English Commissioner Richardson (74) in 1877, and Steffen (75) in 1872 gave the results they had with ethyl chloride in a small number of cases, it was not used in major surgery until the dentists began using it in their offices.

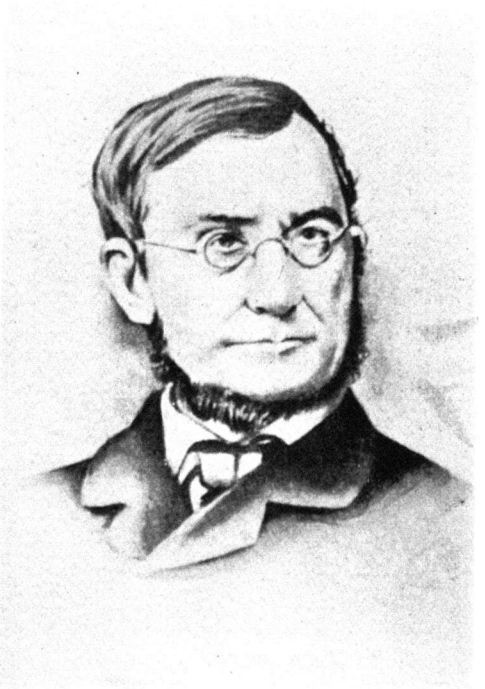
J. A. Heidbrink

The following is a typical 1899 local anesthetic formula for painless extraction of teeth:

> Inject a solution of cocaine 15 grs., glycerine 15 drachims, nitroglycerine $\frac{1}{100}$ gr., morphia sulphate 1 gr., atropia sulphate 1 gr., carbolic acid 3 drops, and distilled water to make two ounces.

In 1898 the first devices for delivering both nitrous oxide and oxygen for anesthetic purposes was placed on the market. Sir Frederick W. Hewitt designed his model first and shortly afterwards the S. S. White Company patented their model.

In the 1890s, there were further revivals of older methods of anesthesia and additional experiments with new discoveries, but we begin to see a recurring trend to cocaine derivatives. Pressure anesthesia was introduced into dentistry by Edward C. Briggs (76), of Boston, in 1890.



Charles T. Jackson

Many high pressure obtunding syringes charged with 4 per cent cocaine solution were advocated for desensitizing teeth for cavity preparation and pulpal anesthesia. A small hole was first drilled into the dentine, into this hole the needle of the syringe was supposed to fit snugly. Then great pressure was generated in the syringe in an attempt to force the cocaine solution through the dentinal tubules. The Flarety Pressure Machine came out in 1894, The Wilcox-Jewett in 1905, and the Meyers in 1921. Another pain obtunder was Richmond's automatic syringe. Alcohol, ether and chloro-

form were placed in the medicine chamber, the metal ball heated and the warm mixture was sprayed into the cavity.

The all metal syringe for gum injections and the expanding plunger syringe made their appearance in the late nineties.

Again we have at this time the reintroduction of a method of anesthesia used and discarded forty years ago, namely cataphoresis. This method was used for obtunding sensitive dentine, for lancing alveolar abscesses, and in extracting teeth. The technique was to saturate a piece of cotton with cocaine and apply the cotton containing electrode to the part to be influenced, a weak current being turned on in

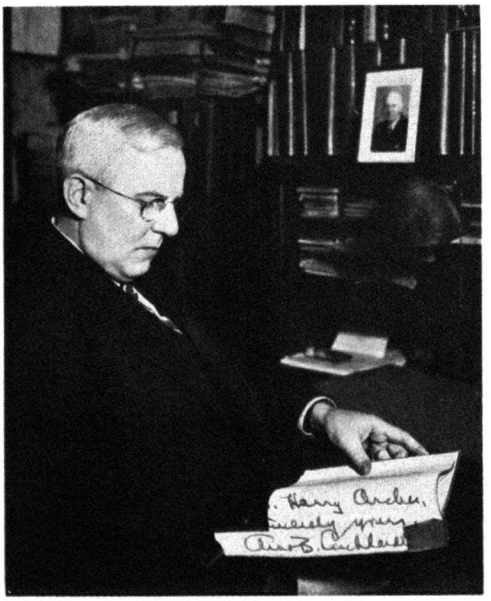
Frederic W. Hewitt

the meantime. In from one and a half to ten minutes the part was supposed to become "obtunded" or "benumbed" (77).

In other cases the electrode was connected to the forceps. At a discussion on cataphoresis an unknown dentist said:

> he had held back from the active recognition of cataphoresis in dentistry . . . because while . . . the extraction of teeth by electricity was common as far back as 1856, the real cause of any merit in that method was that the shock produced a diversion of the will force by causing a sudden and violent inhalation into the lungs. While the lungs remained inflated the effect was excellent, for the senses were for the instant submerged or subjugated. He discovered that the actual insensibility to pain arose from the sudden inhalation of air, and thenceforth abandoned the use of electricity and depends upon rapid breathing alone. (78)

W. G. A. Bonwill of Philadelphia on November 17, 1875, read a paper on "The Air An Anesthetic" before the Franklin Institute (79). He continued his researches and published his results in 1890 in a paper titled "Rapid Breathing as a Pain Obtunder in Minor Surgery, Obstetrics, General Practice of Medicine and of Dentistry." In all probability this anonymous discusser was Bonwill (80).



Arno B. Luckhardt

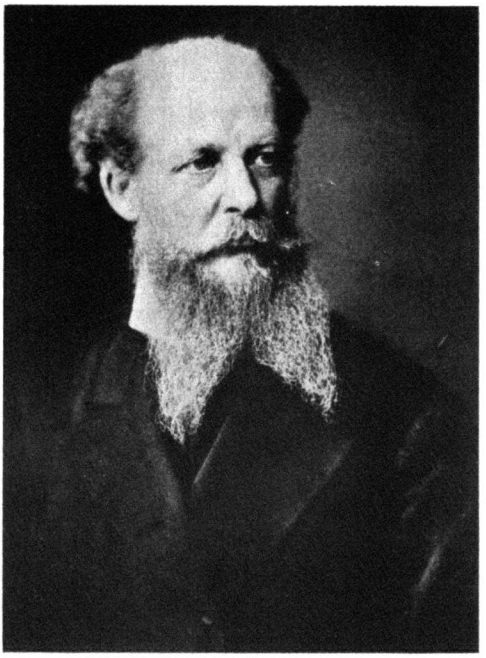
In 1900 Legrand (81) mixed gelatine with his cocaine solution, claiming "the special value . . . for this solution is the absence of the secondary vaso-motor dilation following the primary vaso-motor contraction produced by the cocaine. Gelatin acts as a hemostatic." It had long been recognized that the danger of cocaine poisoning could be lessened by controlling the circulation in the injected area. Hence, cold was applied for its vaso-constricting action, or a tourniquet was placed around an extremity. However, with the demonstration of the action of adrenalin when mixed with solution of cocain, as brought out by Elsberg, Barber, and Braun, a great advance was made. It displaced the need for the

physical aids cold and pressure, and it effectively limited circulation, thus definitely retarding the absorption of the cocain, thereby acting as a safeguard against poisoning.

Further experiments outside of cocaine derivatives were being conducted here and abroad.

In 1897 reports on the use of eucaine in place of cocaine appeared in literature.

George B. Haycock in 1901 using beta-eucaine as a base produced his "Eucaine Compound" in tablet form. It was claimed to be superior to cocaine in that it wasn't toxic, it could be



S. S. White

sterilized by boiling, and solutions would keep indefinitely. The Hercules syringe appeared.

In 1902 C. H. Oakman (82) described the preanesthetic use of Chloretone with nitrous oxide gas. He administered 5 grs. one-half hour before operation. He found "it much easier to anesthetize a patient who has a dose of chloretone, and only one-half to two-thirds the usual amount of gas is necessary to produce insensibility." This was probably the first use of preanesthetic medication.

The same year cataphoresis again was introduced in a different technique for block anesthesia. Satisfactory results were claimed by Thornton (83) in animal experimentation when cocain was placed on the positive electrode and applied on the tissues over the entrance of the nerve in the jaw of a dog.

G. Rolland, director of the Bordeaux Dental School, in 1899 combined ethyl chloride, methyl chloride and ethyl bromide in a mixture which he called "Somnoform." At the Congress of the Association Francaise pour l'Avancement des Sciences held in 1901, Rolland presented for the first time an essay on somnoform, accompanied by clinical demonstrations. In 1904 this new combination of drugs was demonstrated at the

Edmund Andrews

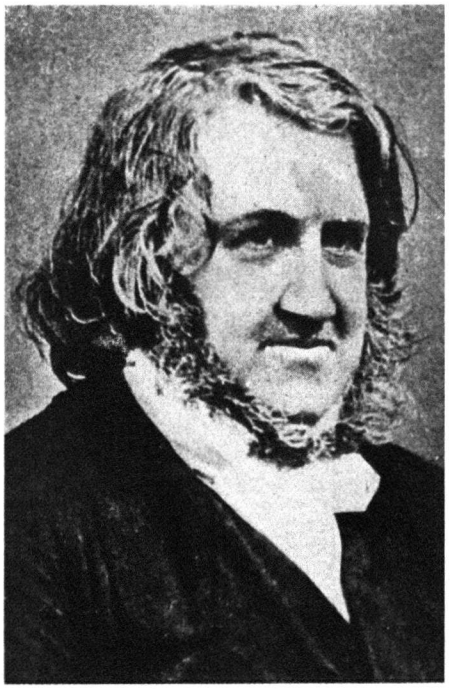
Fourth International Dental Congress in St. Louis by Dr. Florestan Aguilar of Madrid (84). Several different breathing appliances for the administration of Somnoform were marketed. The most popular were the Stark and the DeFord. This irrational mixture was found not acceptable by the Council of Therapeutics in 1931.

Kelene and Narcotile, purified forms of ethyl chloride, became popular as anesthetics in 1902 (85).

Charles K. Teter, dentist of Cleveland, brought out the second machine in this country for the administration of nitrous oxide and oxygen in 1902. Teter is one of the few living pioneer

anesthetists in this country. Author of many papers on anesthesia, he has been honored by being invited to give courses in many outstanding clinics, hospitals, and teaching institutions both here and abroad.

In 1909 E. Blane (86) prophesied that "electrical narcosis will replace anesthetics." The Burge's (87) are today "interested in decreasing the negative potential of the brain cortex by electrical means, and in this way hope to produce electrical anesthesia. . . ."



James Y. Simpson

Redard, of Geneva, in 1904, placed an incandescent light with a globe of intense blue about six inches from the eyes of a patient about to have an extraction. A screen of blue cloth was then thrown over both the light and the head of the patient. Perfect insensibility was procured in from two to three minutes and continued for about thirty seconds, or sufficiently long for the extraction of the tooth (88).

In 1906, E. I. McKesson, physician of Toledo, first became interested in anesthesia. As associate professor of physiology and physiological chemistry at the Toledo Medical College he pursued his investigations in anesthesia. In 1910 he perfected the first "intermittent flow" nitrous oxide and oxygen anesthesia apparatus with an accurate percentage control for the two gases. McKesson was an undisputed internationally known authority on nitrous oxide and oxygen anesthesia, and a leader in the progress of anesthesia.

Although "timed anesthesia," employing a mixture of ethyl chloride and nitrous oxide and an apparatus for the administration of anesthesia by this technique, was originated by W. Grey, Dean of the Dental College of Edinburgh in 1908 and strongly advocated by Wright (89) of Australia, the best known exponent of this technique is J. A. Heidbrink of Minneapolis who used nitrous oxide and oxygen instead of nitrous oxide and ethyl chloride. Heidbrink's interest in anesthesia stemmed from having been tortured for the removal of impacted lower third molars without anesthesia while a dental student. In the early days of his practice he devoted his spare time to experimenting with the Teter machine and finally built an entirely new machine in 1908. This was

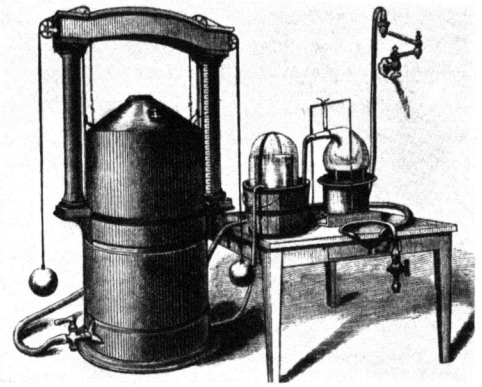
> a rather complicated machine intended to operate automatically to open and close tanks, to equalize gas pressures in bellows and to release them to the breathing bag. Valves were operated by three sets of solenoid motors with multitudinous electrical makes and breaks . . . from this developed in about 1910 or 1911 a quite simple commercial machine . . . (90).

Teter, Heidbrink and McKesson by their many articles, lectures and clinical demonstrations were largely instrumental in bringing about the use of nitrous oxide and oxygen anesthesia for major surgical operations in this country.

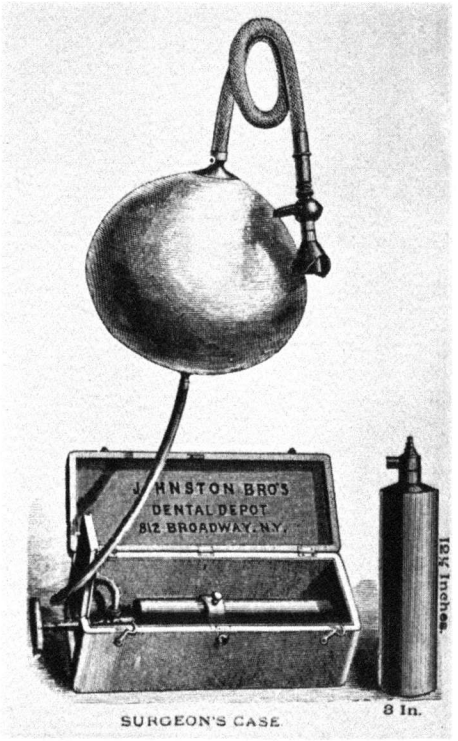
In 1914 the most complete treatise on "Anesthesia" published so far, authored by James T. Gwathmey, medical anesthetist of New York, in collaboration with outstanding authorities on various phases and techniques of both general and local anesthesia, came off the presses. Gwathmey has made many original researches in anesthesia, contributing much to the literature of this subject. His work on "An Attempt to Abolish Inhalation Anesthesia" by placing a mixture of ether and oil on the lower bowel is well known, as is his introduction with Captain Howard T. Karsner of the method of giving ether and oil by mouth for painful dressings.

With Asa B. Davis he instituted obstetrical anesthesia at the Lying-In Hospital in 1923.

In any history of anesthesia the pioneering work in this country of Thomas Bennett of Kansas City, probably the first real anesthetist of the mid-west, of Orville Cunningham at the University of Kansas, of L. W. Harding of the University of Iowa and of Prince in Chicago, in furthering anesthesia, should be recorded.



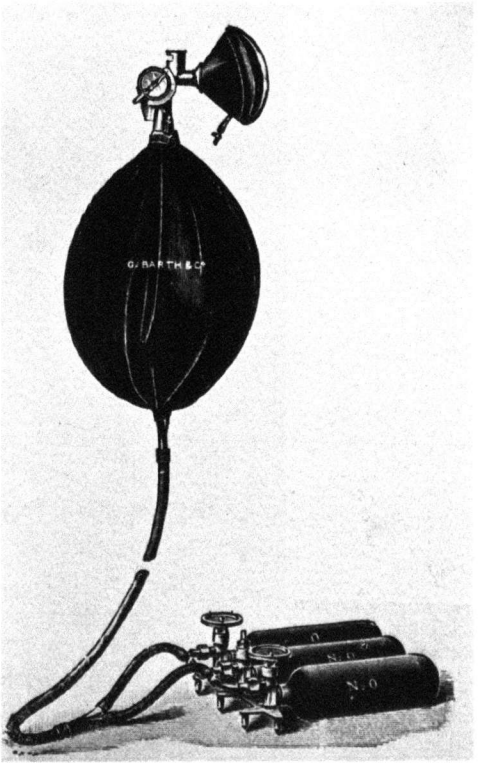
1867—Bean's Nitrous Oxide Gas Apparatus



1872—Johnson's Liquid Nitrous Oxide Apparatus

In England the intra-osseous injections were introduced, using novocain as the anesthetic agent (91). This was an improvement on the multiple gum injection technique. A high pressure syringe, such as Gunthorpes was necessary for this procedure.

Because of the toxicity and irritating qualities of cocaine, resulting in extensive sloughing of tissue in many cases, a search was made for a better local anesthetic.

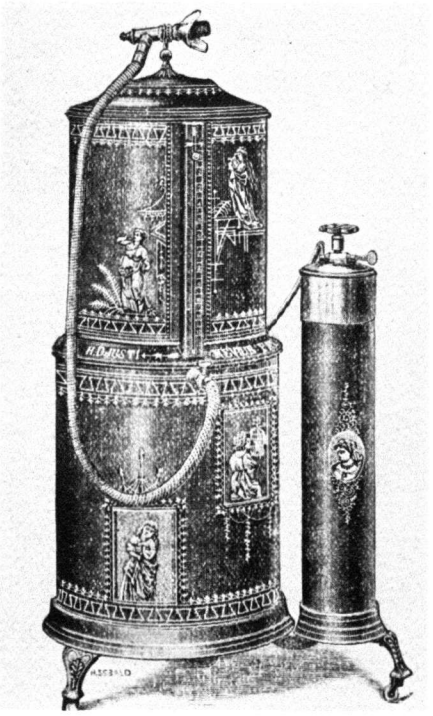


1912—Hewitt's Simplified Portable Apparatus for Administering Nitrous Oxide and Oxygen

The first step in the development of the newer types of local anesthetics was the determination of the chemical structure of cocaine. This was accomplished by the researches of Liebermann, Willstaetter, and particularly by Einhorn. It was found that the anesthetic property of cocaine depended upon the esterification of a basic alochol with benzoic acid, and after many

years of study in this field, starting from this observation, Einhorn stated the definite principle that all esters of aromatic acids produce a greater or lesser degree of local anesthesia. Acting on this principle, chemists have produced many hundreds of such esters, and, in fact, the few typical substances which have survived belong to this class of chemical substances.

The first attempts to supply synthetic substitutes for cocaine were confined to substances closely allied in chemical structure, and as a result the eucaines were synthetically prepared



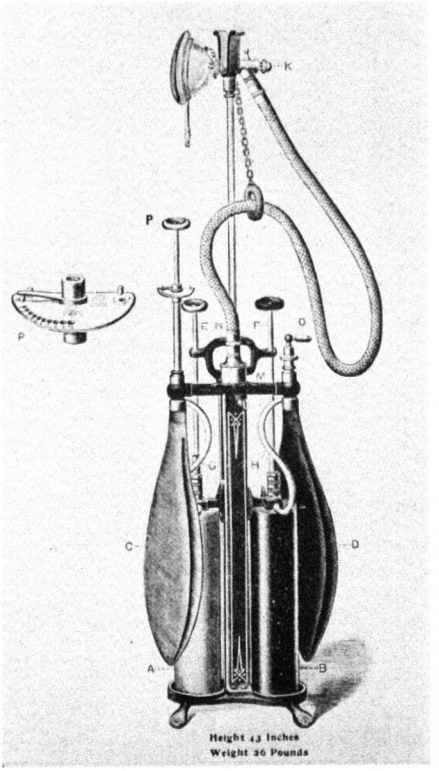
1883—Nevius Gasometer

by Merling. Alpha and beta eucaine were introduced into practice. The eucaines were soon practically discarded on account of their irritant action, increased toxicity, and less intense anesthetic action.

A more simple class of synthetic local anesthetics of which stovaine is the most important representative, was prepared by Fourneau in 1904. Alypin, prepared by Hoffmann, is chemically very closely related to stovaine.

By slightly varying the chemical groups contained in the molecule, a large of number substances of the stovaine-alypin type was prepared. Either on account of their toxicity or their irritating action on the tissues these substances have proved themselves not wholly suitable for local anesthesia, and at the present time their use is very limited.

Novocain was introduced into the practice of medicine by Professor Braun in 1905 (92). It fulfilled his requirements for a cocaine substitute in a very satisfactory manner.

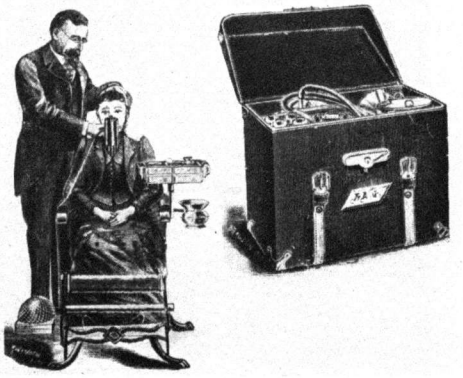


1898—S. S. White Nitrous Oxide and Oxygen Machine

The first paper in English on the use of novocain in local anesthesia was that of J. Shepley Part (93) in 1906. The following year W. S. Schley (94) reported his experiences with novocain in this country. Early reports on the use of novocain in dentistry came from B. Sachse (95), A. Cieszynski (96), Euler (97), and G. Fischer (98).

At first the drug was supplied commercially in powder or in tablet form. The dentist mixed his solution as he needed it. This was a cumber-

some, time consuming, and inaccurate method. Stock solutions deteriorated and left much to be desired as far as sterility of solutions was concerned. The idea of using anesthetic solutions and drugs in cartridges, so far as we know, was first developed by Harvey S. Cook, physician, of Valparaiso, Ind. During the World War, Cook was an army surgeon attached to one of the training units, and since his unit was under-staffed, the problem of administering to his troops without undue delay worried him. The idea of the cartridge used in the army rifles was his inspiration for the cartridge used in present day syringes, and he made up the first cartridges himself and would spend each evening sterilizing and filling those which he would be using the following day (99).



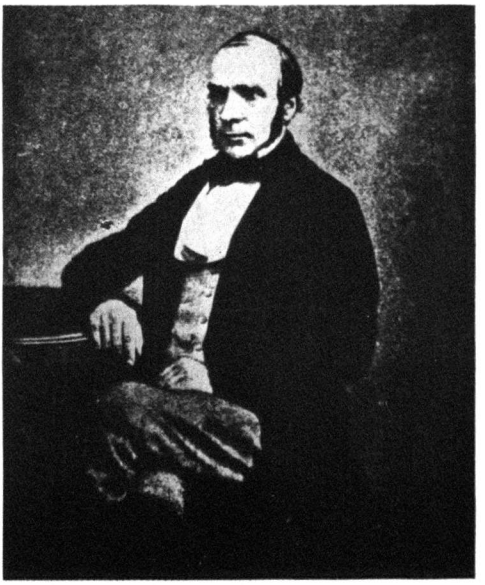
1882—Hayes Improved Apparatus for Generating and Applying Anesthetics

At that time he used a syringe which he had personally turned out of brass and which locked a double pointed needle in place. The glass tubes he cut himself, and the rubber stoppers he used were erasers from pencils.

The rapidity with which he worked in inoculating the men was startling, and it was believed that if the syringe, needles, and glass tubes could be mechanically perfected so that they would be acceptable to the dental and medical fraternities, a new idea might be introduced which would be of genuine benefit to the professions. The present day use of the cartridge attests to its acceptance.

To complete a history of anesthesia, one must finally review the most recent agents—ethylene, vinyl ether, cyclopropane, and intravenous barbiturates. Ethylene was called olefiant gas by early investigators and is generally assumed to have been discovered by Ingenhouss, the Dutch chemist, in 1779, although some references state that Becker preceded him. It was soon found that olefiant and chlorine gases united readily to form an oily, colorless liquid which was called chloride of olefiant gas, Dutch oil, etc. Most of the earliest experiments were actually conducted with that instead of Ethylene owing to the greater convenience in storing and handling it.

During the period of zealous research which followed the discovery of general anesthetics,

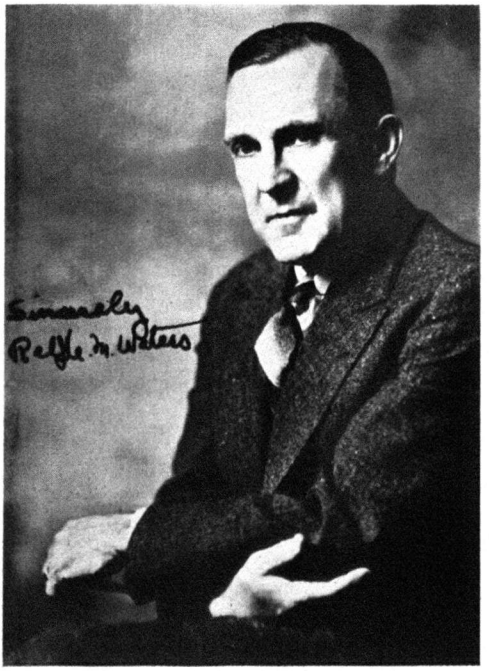


John Snow

Thomas Nunneley, a distinguished surgeon of Leeds, England, investigated the anesthetic effects of many volatile liquids and gases, including both olefiant and chloride of olefiant gas, the results of which were published with his other experiments in 1849 (100). He considered chloride of olefiant gas a most valuable anesthetic, equal to chloroform in every respect and superior to it in many regards. A small number of cases in which he administered it to patients proved completely successful.

Other investigators conducted limited experi- with Ethylene periodically. In 1864 Ludimar Hermann (101) observed a mild and intoxicating

action on himself but failed to follow up his intended investigations. Davy and Muller reported toxic effects which were denied by Eulenberg, in 1876, who had some success with it (102). Lussem, in 1885 (103), was able to anesthetize animals successfully but was unable to accomplish a like result on himself with an 80 per cent mixture after eighteen minutes of inhalation, an amount, or percentage, which robs most persons of consciousness in three quarters to one minute with the quality of Ethylene used today.

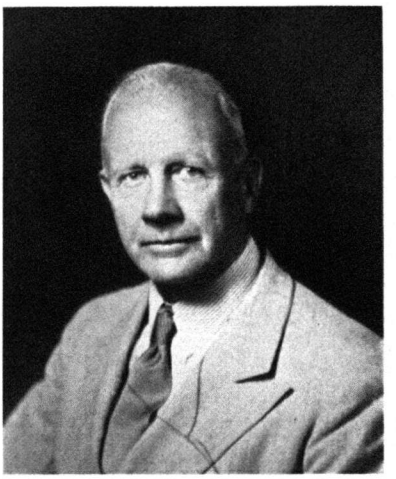


RALPH M. WATERS

Because of large losses sustained by commercial carnation growers when their plants were placed in Chicago greenhouses, Crocker and Knight (104) were asked to investigate and in 1908 reported that ethylene, which forms approximately 4 per cent of illuminating gas, was responsible for the death of these buds and flowering carnations. This work stimulated A. B. Luckhardt and R. C. Thompson in Chicago, in 1918, to determine if the toxicity of illuminating gas for animals was due to its ethylene content rather than its carbon monoxid content.

This work revealed the anesthetizing properties of ethylene and in 1922 A. B. Luckhardt and J. B. Carter verified the previous work and carried on extensively further experiments on various laboratory animals. On the basis of this work Luckhardt and Carter decided to test out the analgesic and anesthetizing properties of ethylene on the human subject. Large quantities of the gas were an essential for this phase of the investigation.

After a long search a firm was located that had a large stock of the gas in tanks which they had generated during the World War, for the purpose of sending it to Europe where it was to be mixed with another chemical to form the deadly non-explosive mustard gas for use at the front.



J. T. GWATHEMY

With this supply of ethylene a series of human experiments were carried out to test its properties with oxygen. A Clark gas apparatus was used. The first human subjects were the investigators themselves, Luckhardt and Carter who alternated as the anesthetist or subject.

Having gone as far as possible in the laboratory, these men arranged a private demonstration at the University of Chicago, on March 14, 1923, on the use of ethylene and oxygen as an anesthetic; once more using themselves as patients. The audience consisted of a group of physicians, surgeons and professional anesthetists. Within several days of this demonstration ethylene and oxygen was used as the anesthetic agent for a major surgical operation in the Presbyterian Hospital of Chicago (105)

(106) (107). So favorable were the reports that within the year the anesthesias with ethylene numbered several hundred thousand (108). The first dental extractions under ethylene and oxygen anesthesia, numbering approximately 100 cases, were performed by Charles Dodd at the Salvation Army Clinic in Chicago with Luckhardt supervising the anesthetics.

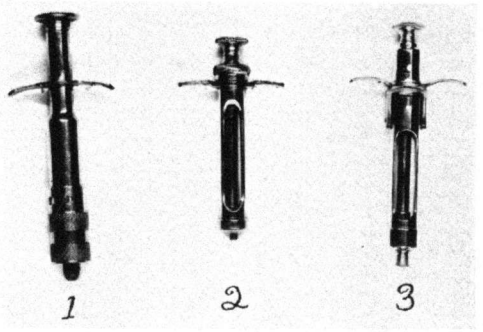
Meanwhile, W. Easson Brown (109), of Toronto, had conducted an independent study of Ethylene on a few animals with considerable success and intended the scope of his work to include human beings. His work was conducted without knowledge of the other investigation and was published just prior to that of Luckhardt and Carter who at that time had data of its value as an anesthetic in one hundred surgical cases (110).

Experiments on carbon dioxide absorption were reported by Renault and Reiset (111) in 1849, by Professor Schwann before the Academic des Leunas de Belgique in Brussels in 1853 (112), by Benedict in 1909 (113), by Professor D. E. Jackson for animal experimentation with anesthetics in 1915 (114), the first time it had been used in connection with anesthesia since Andrews mention of it in 1868 (115).

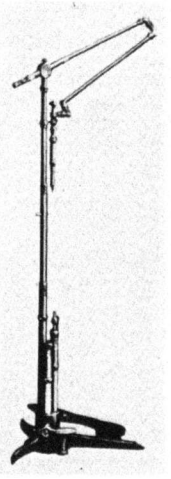
Because of the expense of maintaining prolonged nitrous oxide anesthesia in laboratory animals, Jackson called attention to the application of a closed respiratory system for the economical administration of anesthesia (114). Jackson's closed respiratory system provided for the absorption of carbon dioxide and for the addition of oxygen, the unchanged nitrous oxide being rebreathed over and over. However it was not until 1923 that Ralph M. Waters adopted this system to the administration of nitrous oxide oxygen anesthesia for surgical anesthesia human subjects (116). The "absorption technique" is standard practice today with all the gaseous anesthetics.

The second of the most recently discovered anesthetics, vinyl ether, was first suggested by C. D. Leake of the University of California Medical School in 1930 (117). W. L. Ruigh and R. T. Major of Princeton University and later of the Research Laboratory of Pure Research of Merck and Company, synthesized the first pure vinyl ether in 1931 (118).

Irving R. Bell anesthetized the first human subject with vinyl ether, his partner Samuel Gelfan in 1932 (119). Goldschmidt, Ravdin, Lucke, Muller, Johnston and Ruigh did extensive experimental work on animals and humans and used it for major surgical operations (120) and on November 6, 1933, Thomas J. Cook performed the first dental operation under vinyl ether at Hospital of The University of Pennsylvania (121).



1917—The First Cook Syringes



1894—The Flaherty Pressure Machine for Obtunding Dentine and for Pupal Anesthesia

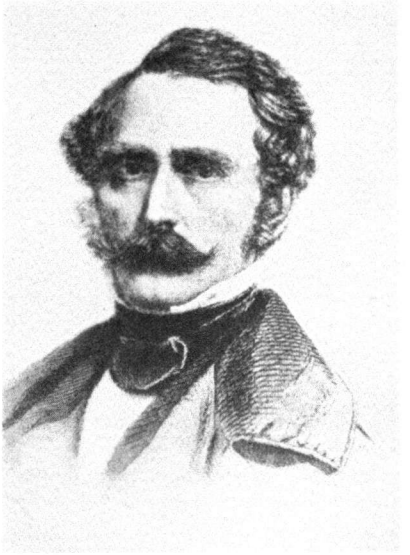
The last of the three newest inhalation anesthetics, cyclopropane was first prepared by August Freund in 1882 (122).

Henderson and Lucas in 1929 (123) published a laboratory study of the anesthetic properties of cyclopropane on animals. After further studies by Henderson and Lucas (124) and Seevers et al. (125) the very favorable reports

by these men stimulated the interest of Ralph M. Waters, Chief of the Department of Anesthesia, University of Wisconsin. A small supply of cyclopropane was purchased and after satisfactory results were obtained in further animal experimentation, Waters and his staff began the administration of cyclopropane for surgical operations on humans in 1933 (127), Stiles et al. making the first clinical report in 1934 (126).

And the latest anesthetic to enter the field of surgical anesthesia is the intravenous injection of barbituric acid derivatives. Since 1875, when chloral hydrate was used to produce anesthesia intravenously, a great many drugs were

Gardner Q. Colton



William Thomas Green Morton

experimented with in an attempt to find a satisfactory agent to produce anesthesia by this route. However little real progress was made until 1926 when experimental work in animals was reported by Shonle and Moment (128), and Page and Edwards (129) (130). By 1929 sodium amytal was being used clinically as an intravenous anesthetic. Zerfas et al. (131) reported at that time 300 cases. Lundy in 1930 (132) studied this action of sodium amytal, dial Pernocton, and Neonal. He concluded at that time that intravenous anesthesia by means of barbiturates was not justified because of untoward results incident to their use. The intravenous administration of these drugs continued for a few years, but were in general employed, not for surgical anesthesia, but in the treatment of severe convulsions and other conditions where deep hypnosis and sedation were desirable in patients to whom the inhalant anesthetics could not be administered.

In 1932 Weese (133) reported the use of a new barbituric acid derivative, Evipal. This compound had a markedly rapid hypnotic action. It was very quickly detoxicated by the liver and its time of action was short. A sodium salt of evipal, Evipal Soluble, was first reported by Weese in 1933 (134) as an intravenous anesthetic agent. Because of the rapid destruction within the body Evipal Soluble was found of value in those surgical and dental procedures requiring anesthesia for only 15 or 20 minutes. In August 1934 Evipal Soluble was first introduced in the United States by the Winthrop Chemical Company. Since then a rectal form of Evipal Soluble for basal anesthesia has been introduced. Another barbituric acid derivative, Pentothal Sodium, was introduced by the Abbott Laboratories in the United States in 1935. At the present time intravenous anesthesia is widely used in surgery and in dentistry in selected cases and certain procedures requiring short general anesthesia.

In 1933 a new ischemic agent, cobefrin, for use in local anesthetic solutions was introduced in the dental profession by Leo Winter (135). Corbasil, the original name for cobefrin, which is the American name, was first prepared by W. Gruettefien and was first reported in the application for German patent on July 11, 1911. Tiffeneau (136) published the first pharmacological work on cobefrin. However the most complete study was carried out much earlier, but not published at the time, on which patent claims were based. This work by Schaumann was finally reported in 1930 (137).

The first clinical tests with corbasil, or cobefrin, alone and in combination with novocaine and other local anaesthetics, were carried out by Schaumann in 1933. The first official report of such combinations claiming results largely free of undesirable side effects of epinephrine novocaine combinations appeared in a German patent application, filed April 20, 1933, and supplemented on October 11, 1933.

Goldberg and Whitmore hoping to find a compound whose anaesthetic efficiency would be increased without unduly increasing the toxicity decided to investigate the para-amino-benzoic acid esters of monalkylamino alcohols (138). As a result of this research a new local anesthetic, Monocaine Hydrochloride, chemically known as mono-isobutyl amino ethyl para amino benzoate hydro chloride, was introduced at the Dental Clinic of the Ocean Hill Memorial Hospital on May 25, 1936 by Mendel Nevin (139).

It should be a source of everlasting pride to the dental profession that Horace Wells first discovered, demonstrated and proclaimed the blessings of surgical anesthesia and William Thomas Green Morton two years later successfully introduced ether anesthesia.

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The Discovery of Anesthesia: Analysis of the Contributions of Davy, Faraday, Hickman, Long, Wells, Morton and Jackson.

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The Discovery of Anesthesia: Analysis of the Contributions of Davy, Faraday, Hickman, Long, Wells, Morton and Jackson.*

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SIR HUMPHREY DAVY, Michael Faraday, Henry Hill Hickman, Crawford W. Long, Horace Wells, William T. G. Morton and Charles T. Jackson have been accorded varying degrees of credit in connection with the discovery and introduction of anesthesia. It is the purpose of the author in this paper to set forth briefly and objectively the part played by each so that the reader may judge the merits of each.

Early Pioneers

HUMPHREY DAVY at seventeen years of age became apprenticed to John Bingham Borlase, a prominent surgeon of Penzance. At this time the many newly-discovered gases were being used in medicine for the treatment of diseases and hence furnished the most frequent topic of conversation among Borlase and his associates, to all of which young Davy was an attentive listener. His interest was particularly aroused by the discussion on nitrous oxide which had been branded as dangerous by the American chemist and physician, Dr. Lantham Mitchell. The element of mystery and danger surrounding this gas intrigued Davy and he began experimenting with it secretly. He first discovered that nitrous oxide induced a feeling of well-being and cheerfulness which increased until he became convulsed with laughter. Hence the origin of the term "laughing gas."

Davy's experimental work, in his spare time, on gases was brought to the attention of Dr. Beddoes, head of the Pneumatic Institute of Clifton, who promptly offered him the post of superintendent at the Institute, which Davy joyfully accepted. It was here that he did the work that culminated in 1800 with the publication of his book, "Chemical and Philosophical Researches Mainly Concerning Nitrous Oxide and Its Inhalation." Several times during his experimental inhalation of nitrous oxide Davy noted that headaches were temporarily eased and that the pain of an erupting wisdom tooth was allayed. It was these observations which led him to write in his book on Medical Vapors: "As nitrous oxide, in its extensive operation, appears capable of destroying physical pain, it may be used with advantage during surgical operations in which no great effusion of blood takes place."

With this statement the matter rested, neither Davy nor anyone else pursued the subject any further. This is Sir Humphrey Davy's rather remote connection with the discovery of anesthesia.

Michael Faraday, a one time paper boy and journeyman bookbinder, became greatly interested in chemistry, and appealed to Sir Humphrey

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Davy for a position. Davy, about to leave on a continental tour, took Faraday along as his bottle washer, valet and secretary. From this unimpressive beginning Faraday soon matched his master in knowledge and surpassed him in independent chemical discoveries. Faraday, in comparing gases and vapors, discovered that ether vapor produced unconsciousness. In the *Quarterly Journal of Science and the Arts,* Faraday wrote in 1818: "When the vapor of ether is mixed with common air and inhaled, it produces effects very similar to those occasioned by nitrous oxide. By the incautious breathing of ether vapor, a man was thrown into a lethargic condition which, with a few interruptions, lasted for thirty hours." Like Davy, Faraday made this casual observation and promptly forgot the whole matter, nor did any of the surgeons seize upon this idea to relieve the daily tortures they were inflicting. Faraday's wording, "the incautious breathing of ether" implied danger. It is difficult to ascertain where Faraday's work aided in the discovery of anesthesia.

Henry Hill Hickman, an unknown village doctor, was often called upon to perform various painful operations. The suffering he inflicted wrung his heart. Becoming acquainted, through a temporary stay in Dr. Beddoes birthplace, with pneumatology, Hickman decided to learn something about this subject in the hope that possibly he might find the answer to pain relief during his surgical operations. He studied the works of Priestly, Davy and Faraday and then experimented with the effects of carbon dioxide on mice, dogs and chickens, rendering them unconscious and then performing amputations painlessly before they recovered. Hickman, satisfied from his experimental work on carbon dioxide that his method was ready to be tried on human subjects, gave a full account of his investigations in a letter to his friend T. A. Knight, asking him to present his work for consideration of the Royal Society of Medicine. Knight was also a personal friend of Sir Humphrey Davy, who was President of the Royal Society at this time. Hickman's plea for the support of this society in further investigation of what Hickman called "Suspended Animation," with the view of ascertaining its probable utility in surgical operations on the human subject, was never brought to the attention of the members of the society at a meeting. It seems reasonable to believe that if Davy's original observation on the effect of nitrous oxide for relieving pain had made any real impression on him, he would have been anxious to learn more about Hickman's work in this direction. It is difficult to understand why some authors classify Sir Humphrey Davy as one of the pioneers of anesthesia.

When this society and his medical brethren ignored him, Hickman printed a public letter on his experiments, and again failing to arouse any interest, he went to Paris and there presented in 1828 a memorial to King Charles X, of France. Again his researches were coldly received, Hickman, a grievously disappointed man, returned to England where he died a short time afterward.

Truly Hickman was the first to conceive the idea of inhalation anesthesia but he failed to carry out his ideas to their ultimate conclusion, practical demonstration of the alleviation of human pain during surgery.

For the next twenty years no one made any definite attempt to find a way of stilling the screams of tortured man. Pain in surgical operations was accepted by the surgeon as being inescapable, and so he attempted to perfect his skill that his operations might be completed in the shortest possible time.

Early American Contributors

NOW THE SCENE shifts to the new world, where we find the sources of new ideas for anesthesia stemming from rather hilarious parties. What were called "ether frolics" had long been a form of amusement among the young people of the 18th and 19th centuries. At one of these parties, in 1842, a young physician, *Crawford W. Long,* of Georgia, conceived the idea that possibly he could give a patient sufficient ether to inhale so that he could operate without pain. Selecting as his patient an acquaintance whom he knew to be a frequent participant in ether parties, he painlessly removed a tumor from his neck while the patient was under the influence of ether, just as physicians and dentists had used whiskey as a preparation for surgery for those known to be addicted to its use. In the next four years Long administered ether four different times, and then stopped. It is quite apparent that Long was not impressed with the idea that he had made a discovery of great importance, for he made no effort to introduce the method into his general practice, nor did he write on the subject, demonstrate it or lecture on it before any medical society.

Horace Wells, of Hartford, Connecticut, a young, sympathetic, conscientious dentist, was a very sensitive individual, and the suffering he caused when he extracted teeth troubled him greatly. Tooth extraction was so excruciatingly painful that again and again in history, teeth were deliberately pulled as a form of torture or punishment.

Horace Wells gave considerable thought to the subject of pain relief during extractions and discussed this subject with chemists and physicians of his town. He was a profound student, far advanced in what was then an embryonic profession. Constantly enlarging his knowledge, he attended a lecture on chemical phenomena by G. Q. Colton, traveling chemist, on December 10, 1844. As part of his demonstration, Colton manufactured some nitrous oxide, and to amuse the crowd, invited spectators from the audience to come forward and inhale the "laughing gas fumes." When this part of the lecture was reached, Wells, in the audience, observed that no sign of pain was exhibited when the volunteers under the "laughing jag" of the gas stumbled around the stage and scraped their shins on heavy benches. Immediately there crystallized in the mind of Wells the idea of inhalation anesthesia. Wells, it is thought, was unacquainted with the suggestion of Sir Humphrey Davy some forty-four years previously, nor did he know of Hickman's experiments. After the lecture Wells talked with Colton and persuaded him to bring a bag of the gas to his office the next day. Wells had an aching tooth and felt that by inhaling sufficient nitrous oxide he could have his tooth removed painlessly. Colton objected, as he was fearful that the inhalation of such a large quantity of

gas might result fatally. Wells, however, had the courage of his convictions and persuaded Colton to bring the gas. On December 11, 1844, Wells sat in his operating chair and held the bag of gas which he inhaled until he lost consciousness. Then his friend and former pupil, John Riggs, stepped forward and extracted the aching wisdom tooth. On recovering consciousness, Wells exclaimed, "A new era in tooth pulling!"

For several weeks following his discovery, Wells experimented with the gas, and desiring to acquaint the world with this release from surgical pain, he hastened to Boston, the medical center of the New England States. There he arranged through a former pupil and partner, Wm. T. G. Morton, to lecture on and demonstrate nitrous oxide before the senior medical students of Dr. John C. Warren. Unfortunately, the demonstration was not completely successful, as Wells, being somewhat nervous, withdrew the gas bag too soon, and the student cried out when the tooth was extracted. Later he admitted, however, that he had had no pain. Wells returned to Hartford, where he continued to use nitrous oxide in his practice and taught other dentists to use it. When friends urged Wells to patent his discovery he said, "No! Let it be as free as the air we breathe!"

William T. G. Morton studied dentistry under Horace Wells and subsequently they formed a partnership for the practice of dentistry in Boston. This partnership was soon dissolved, Wells resuming his practice in Hartford. Morton also studied medicine for two years, one of his teachers being Charles T. Jackson, a chemist, physician and geologist. Following the lecture and demonstration by Wells on nitrous oxide, Morton gave considerable thought to the subject of pain relief and began to experiment with ether for this purpose. Finally he was ready to try to extract teeth while a patient was under the influence of a disguised ether compound. On September 30, 1846, he successfully anesthetized one of his patients and extracted an aching tooth.

Morton then proceeded to obtain an opportunity for the public demonstration of the practicability of anesthesia. This was furnished him in the surgical amphitheater of the Massachusetts General Hospital in Boston, on October 16, 1846. The surgeon in charge was Dr. John C. Warren, to whom great credit is due for giving Wells and Morton the opportunity to publicly demonstrate their anesthetic agents. The operation was the removal of a tumor from the left side of the neck of a young man who was described in the records as "Gilbert Abbott, aged twenty, single, painter." The Harvard Medical Class was present, as well as several prominent surgeons and physicians. The exhibition of the anesthetic was such a complete success, that Dr. Warren turned to those present and said, "Gentlemen, this is no humbug."

The fame of the wonderful new agent and of its discoverer spread rapidly and then came *Charles T. Jackson,* jealous of the fame of Morton and anxious to participate in the benefits of the discovery, with a claim as to his rights in the discovery. He had suggested the drug to Morton, and claimed he had advised him about its nature and about the best methods of its administration.

A terrific controversy now arose between Drs. Wells, Jackson, Morton and later Long for the title of discoverer of anesthesia. A prominent businessman of Boston, desiring to honor the discoverer, was unable to reach any decision as to the true discoverer and so erected simply an "Ether Memorial" in the Public Gardens in Boston.

Unfortunately, Morton refused to concede priority to his former teacher and partner, Horace Wells, claiming that nitrous oxide was not an anesthetic. Furthermore, to keep Jackson quiet, he entered in a secret agreement with him which was soon broken. The agreement stated that Morton was to patent the secret compound now called letheon and pay a percentage of the royalties from the use of the letheon to Jackson. Jackson, the wealthiest of the claimants, published pamphlets for many years setting forth his claims.

Jackson based his claim on the fact that as early as 1841 he had discovered that the antidote for the accidental inhaling of chlorine fumes was the inhalation of ether. Having had to resort to this ether treatment on several occasions he "discovered that the nerves of sensation could be and were paralyzed to all sensations temporarily and safely, by the inhalation of ether vapor." This discovery Jackson claims to have communicated to fifteen gentlemen from 1841 to 1846 and in this list was William T. G. Morton.

In the heat of this battle Wells, mentally deranged by self experimentation with chloroform, committed suicide in 1848. He was buried in Cedar Hill Cemetery in Hartford.

Early Controversies and Resolutions

FOR YEARS the controversy raged in the newspapers, dental and medical journals, and through the halls of Congress. Finally, after five years of congressional majority and minority reports, demonstrations and law suits, Congress dropped the whole matter.

The American Dental Association, at its 4th Annual Meeting at Niagara Falls, in 1864, adopted the following resolution: "Whereas . . ., Whereas . . ., Therefore be it RESOLVED, By the American Dental Association that to Horace Wells, of Hartford, Connecticut, (now deceased) belongs the credit and honor of the introduction of anesthesia in the United States of America, etc. . . ." This resolution was reaffirmed in 1872.

In spite of the efforts of the supporters of Morton, Jackson and Long, The American Medical Association in 1870, at its 21st Annual Meeting, held in the City of Washington, approved the following resolution: "On motion of Dr. H. R. Storer, of Massachusetts, it was Resolved, that the honor of the discovery of practical anesthesia is due to the late Dr. Horace Wells, of Connecticut."

It is a source of everlasting pride to the dental profession that two dentists, Horace Wells and W. T. G. Morton, gave mankind one of its greatest discoveries, surgical anesthesia.

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