BULLETIN OF ANESTHESIA HISTORY

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VOLUME 26, NUMBER 1 APRIL 2008

The Abajian Scales
John Abajian, Ed Brazell, and the University of Vermont's 1956 to 1959 Halothane Research

by Joseph M. Kreutz, M.D.
Associate Professor of Anesthesiology and Pediatrics
University of Vermont College of Medicine

This article has been peer reviewed for publication in the April 2008 issue of the Bulletin of Anesthesia History.

Gino Dente leans back in his favorite chair and thinks back to a conversation over a half-century ago. "We had a student visiting us from England, and he mentioned a Dr. Raventós and asked if I had ever used halothane. Well, I told him that I had never even heard of it," recalls Dente, then a 39-year-old Assistant Professor of Anesthesiology at the University of Vermont (UVM). "That piqued my curiosity though, so I decided to write a letter to Dr. Raventós and ask him some questions, and a short time later he sent me two bottles of halothane. We had absolutely no idea how to use it. I gave one bottle to Ernie Mills at the DeGoesbriand (Bishop DeGoesbriand Hospital, Burlington, VT) and kept one bottle for myself at the Fletcher (Mary Fletcher Hospital, Burlington, VT) and we tried it."

So began UVM's halothane research study in November 1956. One of a handful of centers in the United States studying the agent, by mid-1959 UVM anesthesiologists and CRNAs had performed over 5,000 halothane anesthetics and perfected its delivery with an innovative modification of the copper kettle. The publication of their experience in an October 1959 *JAMA* article, emphasizing the then-controversial importance of precision vaporization, contributed to the acceptance of halothane into clinical practice in the United States.[1]

"An unusual medical student: apparently, he knows everything"

The driving force behind the halothane study, behind everything that went on in UVM's Anesthesia Division in the 1950's, was its outspoken Chairman, "Big John" Abajian. (Figure 1) He was a man with a keen intellect, innate curiosity, and boundless energy. He was also opinionated and volatile. "I don't keep my problems and frustrations bottled up inside," Abajian said. "Like a safety valve, I blow off steam easily. Maybe some of the patient souls around me get singed now and then, but it sure prevents ulcers!"[2]

Fig 1. John Abajian MD. Photo from the Mary Fletcher Gauzette, *August 1958.*

The son of Armenian immigrants, Abajian was born and raised in Providence, Rhode Island and attended Long Island University and New York College of Medicine.[3] He was an undistinguished student whom his classmates described as "an unusual medical student: apparently, he knows everything – at any rate, he always has a logical answer to the problems besetting us."[4] But one of his professors, James Gwathmey, took a liking to him and mentored him during his 1938-1939 "preceptorship-type" anesthesia residency at New York's Gotham and Lennox Hill Hospital.[5] With Gwathmey's strong support – and after Henry Beecher reportedly declined the position – Abajian was named UVM's first Anesthesia Division Chairman in December 1939.[6] In his early years in Burlington he earned the respect of UVM surgeons for his use of innovative regional techniques, especially peridural anesthesia, a skill he had learned from New Orleans surgeon Charlie Odom.[7]

In 1942 Abajian enlisted in the Army and, to his dismay, was sent to Tilton General Hospital at Fort Dix, New Jersey for additional anesthesia training – a twelve-week course designed to prepare medical officers for wartime anesthesia service.[8] He became a "90-day wonder," assigned to train with Emery Rovenstine at Bellevue Hospital in New York City. Abajian was humiliated by the decision and blamed John Lundy, then the Civilian Consultant in Anesthesia to the Surgeon General.[9] But he made the best of the assignment, learning from Rovenstine and enjoying the city nightlife with him, claiming later, "They wanted to punish me, but the only thing that suffered was our livers!"[10] Finally in early 1944, at the request of General George Patton's Surgery Consultant – Charlie Odom – Abajian, then only 31 years old, was named the Consultant Anesthetist for the U.S. Third Army.[5] He played a key role in the medical planning for the invasion of Europe, and after D-day trav-

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Pittsburgh, PA
May 8-10, 2008

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Preliminary Schedule

Thursday, May 8, 2008

Pre-Program
8:00 AM – 10:00 AM
Guide Walking Tour of Oakland with Storyteller *(optional)*

10:30 AM – 4:00 PM
Frick Art and Historical Center Tour *(optional)*

4:30 PM – 7:00 PM
Self-Guided Tours *(optional)*

Program
5:00 PM – 6:00 PM
AHA Council Meeting
Holiday Inn Select – University Center

7:00 PM
Dinner at the home of Dr. Doris Cope

Friday, May 9, 2008

6:45 AM – 7:30 AM
Meeting Registration
Twentieth Century Club

7:30 AM – 8:00 AM
Welcome and Announcements
Twentieth Century Club

Arthur S. Levine, M.D.
Senior Vice Chancellor for the Health Sciences
Dean, School of Medicine
University of Pittsburgh

John P. Williams, M.D.
Safar Professor and Chair
Department of Anesthesiology
University of Pittsburgh School of Medicine

Douglas R. Bacon, M.D., M.A.
AHA President
Professor of Anesthesiology and History of Medicine
Mayo Clinic College of Medicine

8:00 AM – 9:30 AM
Free Papers

9:30 AM – 9:45 AM
Break

9:45 AM – 11:45 AM
Free Papers

11:45 AM – 1:30 PM
Luncheon
Tea Room, Twentieth Century Club

Special Speaker

1:30 PM – 3:30 PM
C. Ronald Stephen Essay Award Finalists

Moderator
William D. Hammonds, M.D., M.P.H.
Chair, C. Ronald Stephen Award Committee
Professor, Anesthesiology & Perioperative Medicine
Medical College of Georgia

3:30 PM – 3:45 PM
Break

3:45 PM – 5:45 PM
Free Papers

6:30 PM – 8:30 PM
Banquet Dinner
Twentieth Century Club

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Saturday, May 10, 2008

Post-Program
Self-Guided Tours *(optional)*

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Bulletin of Anesthesia History (ISSN 1522-8649) is published four times a year as a joint effort of the Anesthesia History Association and the Wood-Library Museum of Anesthesiology. The *Bulletin* was published as *Anesthesia History Association Newsletter* through Vol. 13, No. 3, July 1995.

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Bulletin of Anesthesia History
200 Delafield Avenue, Suite 2070
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Abajian. . . *Continued from Page 1*

eled to field and evacuation hospitals educating anesthesiologists, medical officers, and nurses in various anesthesia techniques, with a focus on regional anesthesia.[11] "It was work that earned him General Patton's recommendation for the Legion ofMerit."[12]

Abajian returned to Burlington in 1946 and began building his Anesthesia Division, adding new faculty, establishing an anesthesia residency training program, and spending increasing amounts of time in his lab. Over the next ten years, he conducted research and published articles on a variety of topics including oximetry, curare, hypothermia, blood preservation, cardiac monitoring, and blood volume.[3] It was considered solid but relatively obscure work. He organized the Vermont-New Hampshire Red Cross Blood Bank, the second of its kind in the country, and even started his own cable TV company.[13,14] But Abajian's restless mind remained unsatisfied and he continued to search for a research project that would enhance his reputation.

"John said that halothane was just another damn chloroform"

John Mazuzan is the man who knew Abajian best. The two first met in the mid-1950s when Mazuzan was a medical student at UVM. In 1958 Mazuzan, then a Massachusetts General Hospital anesthesia resident, arranged a rotation in Burlington to work with Abajian and get a close look at the new anesthetic agent he was hearing about. He must have made a presentation of the halothane study (at the October 1957 ASA "Work in Progress" program), "three cardiac arrests and frequent severe hypotension from overdosage of Fluothane" had been encountered in UVM's first hundred halothane anesthetics.[15] "I had forgotten to ask Dr. Raventós for the instructions," jokes Dente. "Initially we tried to give it open-drop, like ether, and that was a mistake." Abajian confirmed this in a 1958 presentation in Manchester, Vermont.[16] "Friends," he began, "this is the most potent of all known anesthetic agents. Now this potency can be the blessing, but also the curse of the agent … I can tell you this. The first one hundred cases of Fluothane, we used improperly. As a matter of fact, we had three cardiac arrests during the first hundred cases, and we nearly quit. We were using the conventional techniques, and it just doesn't work."

Abajian, recognizing halothane's potential, pushed ahead anyway. He realized that control of the potent new agent with precision vaporization was the key to its safe use and searched for the right delivery system. Abajian thought that a semi-closed circuit with Lucien Morris' copper kettle might work, but there was no published experience of the kettle's use with halothane. Originally designed for administration of chloroform but primarily used with diethyl ether, the copper kettle was relatively thermostable but wasn't temperature-correcting, and no one knew precisely how temperature changes would affect its output of halothane.

Fig. 3. John Abajian and Ed Brazell in their lab. Photo courtesy of the University of Vermont Archives, Bailey/Howe Library, UVM.

Fig. 2. Ed Brazell, M.D. Photo from the Mary Fletcher Gauzette, *January 1958.*

Abajian turned to his new Director of Anesthesiology Research for help.

"You know the Abajian scales, they're really the Brazell scales"

Ed Brazell was quite different from Abajian – he was introverted, cerebral, and patient. (Figure 2) One of his hobbies was grinding telescope lenses. Born in Iron River, Michigan, Brazell was interested in a career in medicine while in high school, but got sidetracked after graduation, lured to Florida for thirteen dollars, a free bus ticket, and a chance to play trumpet in a band.[17] Three years later, in 1941, he graduated from the University of Florida with a Physics degree and a Phi Beta Kappa key. During World War II, Brazell worked on radar at the M.I.T. Radiation Laboratory and then in 1946, as government funding for military research was drying up, migrated to California and spent two years as an electronics engineer in the Navy's new guided missile program.[18]

At a meeting in New York in early 1948, Brazell made the acquaintance of another wartime radar researcher, Henry Abajian – John's brother. After a year working for John Abajian as a research assistant on a cardiac muscle project, he finally realized his dream and was accepted into UVM College of Medicine.[19] "Ed was a genius, one of these oddball guys that John convinced to go to medical school," recalls Mazuzan. "He was an engineer too and John really liked engineers. John was a frustrated engineer himself." Not surprisingly, Abajian hired Brazell when he finished his anesthesia residency in July 1956 and named him Director of Anesthesiology Research. (Figure 3)

Brazell put his physics and engineering background to work on the halothane project.[20] In the laboratory, using a deceptively simple system with an oxygen flowmeter, copper kettle, and burette, he measured halothane gas volumes at different temperatures, and was thus able to predict exact halothane outputs and concentrations at various kettle flow rates. With an infrared spectrophotometer and the formulas he had derived, Brazell then measured the halothane and oxygen uptake of fifty patients and was able to control inspired halothane concentrations in a semi-closed circuit with a copper kettle to within 0.1%. Finally, Brazell concocted a set of temperature-corrected flowmeter markings for the copper kettle, calibrated for halothane and based on a five liter total gas flow. These flowmeter markings were later marketed by Foregger as the "Thermal Percentage System," but are remembered at UVM as the "Abajian scales."[21] (Figure 4) It was a system so simple that even an anesthesiologist with no experience with the kettle could precisely control a halothane anes-

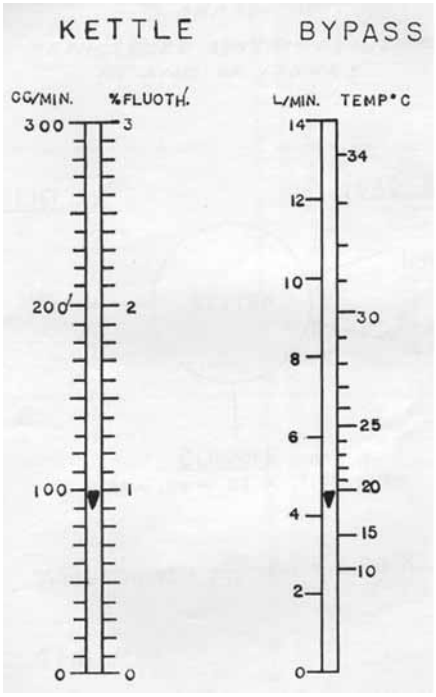

Fig. 4. The Abajian scales.

thetic. "You know the Abajian scales, they're really the Brazell scales," says Mazuzan. "Ed did most of the work on that and figured it out. It was pretty damned ingenious."

"Fluothane … approaches the ideal anesthetic more closely than any of the agents previously and presently used for general anesthesia"

Abajian now had the precision vaporization system that he wanted and halothane became the standard anesthetic agent at UVM. From May 1957 through March 1958, 41% of all anesthetics in Burlington - virtually all the general anesthetics – were performed with a pure halothane-oxygen technique.[22] (Figure 5)

Fig. 5. Betty Wells, CRNA, administering halothane with a copper kettle. Photo from the Mary Fletcher Gauzette, *October 1957.*

"John didn't use Pentothal for induction and he didn't use nitrous oxide," remembers Mazuzan. "He wanted to test halothane in isolation, without other agents, which made some sense. John always contended that he did this because he wanted to see what halothane as an agent would do, could do, and could it be done safely?" Or as Abajian put it in 1958: "Now just so there won't be any controversy, we have to define our weapons. I want to say that we use Fluothane-oxygen, period … We find now that the need for an IV barbiturate induction doesn't seem to be great … We have never been able to justify the use of nitrous oxide, because that is just like taking along your BB gun with your heavy duty rifle, when you go on a safari in India."[16]

By March 1958, Abajian and his colleagues had given over 1,500 halothane anesthetics and presented their findings at the New England Assembly of Nurse Anesthetists.[23] In his lecture, Abajian stated "Fluothane, with oxygen, in concentrations of 2% or less, approaches the ideal anesthetic more closely than any of the agents previously and presently used for general anesthesia … Fluothane anesthesia was safely administered to poor risk patients and patients of all ages for all types of surgery … No arrhythmias of any note were observed even with the routine use of epinephrine on neurosurgical cases … No alterations of kidney or liver function have been observed … Emergence from anesthesia was rapid and uneventful, with full consciousness and orientation returning in most patients within ten minutes … There was no problem of hypotension with carefully controlled administration … It cannot be overemphasized that it is vital for the concentration of Fluothane vapor to be known at all times and be adjustable within limits of 0.1%."

"John never invited him into the inner circle"

The halothane study began to wind down in the summer of 1959, with over 5,000 halothane anesthetics – some sources say 7,000 – performed at UVM by then.[24] Ed Brazell wasn't there to see it. In November 1958 he left for Sutter Hospital in Sacramento, California for reasons that are unclear to this day.[25] "I don't know why Ed left, I really don't," says Dente. "I know there was a disagreement between him and John, there was some antagonism there, but it seemed none of my business." Mazuzan is also unsure, but offers a clue: "I don't really know what happened. When I went back to Boston, Ed was in good stead, and all of a sudden a few months later I got a call saying that he had decided to go to California. But Ed was a young guy with a family and John never invited him into the inner circle, never made him an offer to become a full partner. I don't know why." It's possible that Brazell simply wanted to escape the brutal Vermont winters and have more opportunity to sail, one of his favorite pastimes. Unfortunately, two years after leaving Vermont, he was diagnosed with acute leukemia. Brazell died a few months later on July 16, 1961 at age 43.

Fig. 6. John Abajian with the Abajian scales in late-1959. Photo from J. Christian Abajian, M.D.

"Why don't you describe halothane as a wild stallion"

In October 1959 John Abajian, Gino Dente, Ernie Mills, and Ed Brazell published their article "Experience with Halothane (Fluothane) in More Than Five Thousand Cases" in *JAMA*.[1] Although more detailed than their earlier reports, their conclusions were not appreciably different than those of the 1958 lecture. Again they stated, "We want to emphasize that there is a definite need for precise knowledge of the exact concentration administered at all times … We place this safe (maximum) value at 2%. However, it is

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Abajian. . . *Continued from Page 5*

possible that we may, in the future, revise this upward if experience permits." A discussion of delivery systems, emphasizing semi-closed circuits and including one of Brazell's uptake diagrams, was included in the paper, as well as the statement "In order to deliver known concentrations of this agent, it is necessary to have special equipment and employ special techniques. A subsequent paper will deal with this aspect of the subject." But the promised article on the Abajian scales never appeared.

Abajian presented the halothane study at the 1959 ASA meeting in Miami, winning second prize for his scientific exhibit.[26] (Figure 6) Afterwards, he received numerous invitations to speak about the work and achieved minor celebrity status within the U.S. anesthesia community, but his emphasis on precision vaporization was controversial. "It was interesting how so many anesthesiologists objected to this idea of measuring what they're giving somebody," says Mazuzan. "A lot of people said the patient is the final arbiter of the dose. Well, that's true, but it doesn't mean that you shouldn't have a precise way of giving the dose. If you want to argue that, why don't you take all the markings off syringes! I told John 'Why don't you describe halothane as a wild stallion? It's a beautiful horse running around out in the pasture, but it's wild. Once you get a harness on this horse, you can probably win the Kentucky Derby.'"

Abajian's presentation style was also a problem. Mazuzan again: "His talk was a great talk. He was like some preacher going out on the stump. He was part showman, hidden amongst this great brainpower that he had. But John, as he often did, would carry things one step too far. He felt that some people objected to precision vaporization because they were afraid to learn a new agent and he would insult his audience." Mazuzan suggested that Abajian change the tone of his lecture, soften it, and incorporate a discussion of John Snow's work with chloroform over a century earlier. "John said 'Well Mazu, I like that idea, using that history stuff,'" says Mazuzan.

The biggest problem, though, was Abajian's contention that the copper kettle – with the Abajian scales, of course – was the most precise and thus safest halothane delivery system. In 1958 the temperature-compensated, individually-calibrated Fluotec (Cyprane) Mark II vaporizer had been introduced and the copper kettle was increasingly considered old-fashioned.[27] "People bought Fluotecs," remembers Mazuzan. "John said it wasn't accurate and maybe he was right, at first, but the Fluotec gradually improved and turned out to be a relatively inexpensive apparatus that you could add to any current equipment for a few hundred bucks."

"People may some day be flocking to UVM's College of Medicine to view a Fluothane Dome"

After halothane was released on the U.S. market on April 1st, 1958, it was gradually accepted into clinical practice and Abajian's invitations to speak about the UVM halothane study slowly dried up. He moved on to other projects, but the fire of ambition within him gradually died down and he spent the last years of his career playing the role of elder statesman and doing a few spinals in the cysto room at Mary Fletcher Hospital. Abajian retired in 1977 and was succeeded as Chairman of the UVM Division of Anesthesiology by his old friend and one-time protégé John Mazuzan. He died June 30, 1996, a year after a stroke had silenced "Big John."

Ten years after his death, Abajian is primarily remembered for his halothane research, even though his other major accomplishments – the U.S.Third Army anesthesia training, VT-NH Red Cross Blood Bank, and UVM's anesthesia residency – had greater long-term impact. Abajian himself, in later years, didn't seem to consider the halothane study very important – in 1969 and 1995 interviews he barely mentioned it.[5,28] But the UVM halothane study is important. Halothane became the standard of care in the United States in part due to Abajian's (and Brazell's) work, and although the "Abajian scales" was a technological dead-end, the study's emphasis on precision vaporization foreshadowed the development of the sophisticated gas delivery systems and agent monitors used today.

Fifty years ago John Abajian saw the future but, as is often the case with visionaries, his view was a little hazy. In 1959 he said, only half-jokingly, "We may not be too far off base in predicting that Fluothane could supplant ether in eight to ten years. In fact, who knows but that people may some day be flocking to UVM's College of Medicine to view a Fluothane Dome, just as thousands of visitors each year have inspected the Ether Dome at the Massachusetts General Hospital in Boston." [25]

Acknowledgement

The author wishes to thank retired UVM Anesthesia Professor Gino Dente, M.D., and retired UVM Anesthesia Chairman John Mazuzan, M.D., for sharing their memories with him – their guidance and support made this article possible. All quotes attributed to Drs. Dente and Mazuzan are excerpted from recorded interviews conducted by the author from August 2005 to January 2007.

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Choice of Anesthetic Technique for Surgery at the Front during World War I

by Anthony L. Kovac, M.D.
Kasumi Arakawa Professor of Anesthesiology
Vice Chair, Research
Department of Anesthesiology
University of Kansas Medical Center

Anesthesia techniques for World War I (WWI) surgeries depended on patient, surgery and anesthesia factors. WWI soldiers were young (18-20 years), in good physical condition and had few medical problems. Many soldiers were heavy smokers. Lung disease was common, making patients difficult to anesthetize with ether or chloroform. They were often very nervous, especially if they suffered from shell shock following life in the trenches. Most operations were short (a half hour to one hour). Local anesthesia with novocaine was used for minor operations and spinal anesthesia with stovain for operations on the pelvis or legs. Morphine and atropine were given 1M as preop meds a half hour before surgery to potentiate anesthesia, minimize secretions, and aid "quiet" postop recovery, allowing patients to sleep post-surgery.

The type of general anesthetics available were chloroform, ether, ethyl chloride and nitrous oxide/oxygen mixtures, given either by open drop mask, Clover method, Shipway warm vapor apparatus or Loosley warm inhaler. A chloroform and ether combination was often used, with chloroform first followed by ether, using two separate masks. The first (Schimmelbush) mask for chloroform had a single layer of gauze. The second mask for ether had two layers of gauze. Using two separate masks, the danger of giving a mixture of unknown strength was avoided. One administered chloroform slowly by the drop method with the mask one inch above the patient's face while quietly talking to the patient. If nervous, the patient was asked to count. After a minute or so, the first chloroform mask was lowered, resting on the face. This mask was then replaced by the second ether mask and drop ether applied until the gauze was saturated.

Another method placed a towel folded two or three times over the mask leaving a space. This increased the concentration of vapor and allowed continuous application of ether. Patients rarely struggled and were ready for surgery in three to four minutes. The combination of chloroform and ether had very quick onset and was preferable to starting with ether alone. Afterward, most patients stated that chloroform was more pleasant and less irritating than ether.

Ether was also given by the Clover method and Shipway warm vapor apparatus. Shipway was more commonly used and thought to be especially useful for long surgeries as it conserved body heat and was cost effective.

Ethyl chloride and nitrous oxide were used for short surgeries, especially joint manipulation. These agents were helpful for strong, healthy young men who lived outdoors for long periods in trenches and subject to war strain (shell shock) and nervous exhaustion. These patients were believed to have hypersensitive sympathetic nervous systems with a greater tendency for "excitability", requiring more anesthetic than other patients. Calm verbal encouragement was given during the first stage of anesthesia. It was impossible to judge solely by appearance how patients would behave under anesthesia. Some, even though quiet and sickly, took large quantities of anesthetic and became "excitable and troublesome." Other "rough looking and vigorous soldiers" needed very little anesthetic.

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The Introduction of Ether in Paris Revisited*

by Ray J. Defalque, M.D., M.S.
Professor Emeritus
Department of Anesthesiology
University of Alabama at Birmingham

A.J. Wright, M.L.S.
Associate Professor and Clinical Librarian
Department of Anesthesiology
University of Alabama at Birmingham

Summary

Modern accounts of the introduction of ether anesthesia in France are mainly based on a letter written in February 1947 to the editor of the *Boston Medical and Surgical Journal* by Francis Willis Fisher, a young Boston surgeon at that time a student in Paris. Fisher's letter hints that his efforts were the main impetus to the acceptance of ether by the French academic surgeons. The authors have reviewed the contemporary medical literature, especially the numerous French journals, relative to that event. Their review suggests that Fisher was largely ignored by the French surgeons and by his young competitors then studying in Paris. He seems to have exaggerated his role in the acceptance of ether anesthesia in France. The reviewed literature also provides some additional details and some corrections to Fisher's account.

Modern accounts of the introduction of ether in France have relied heavily on a letter sent in February 1847 to the editor of the *Boston Medical & Surgical Journal* by Francis W. Fisher, a young Boston physician then studying in Paris.[1] Fisher's report is often vague, occasionally incorrect, and probably exaggerates his role in the acceptance of anesthesia in Paris. This review attempts to complement and correct Fisher's account.

Fisher's Letter

Fisher writes that in November 1846 he received a letter from a "medical friend" and "instructer " (sic) informing him of Charles T. Jackson's discovery and its successful use in Boston. One or two days later he showed the letter to Professor Velpeau and asked his permission to try ether in surgery. Velpeau "politely" declined and so did several other surgeons, a refusal that Fisher attributed to French chauvinism. Suffering from a severe toothache at the time, Fisher, accompanied by his friend Dr. Mason, visited a dentist to have the tooth extracted. As he inhaled ether from a "rude" inhaler he had designed, Fisher became "much excited" and his friends stopped the trial.

On December 15, 1846, Dr. Jobert at the Hôpital Saint-Louis let Fisher administer ether to a patient for the excision of a cancer of the lower lip. Fisher employed an inhaler similar to that used in Boston but without valves. He judged his anesthesia "partial and insufficient" because the patient's tumor prevented full insertion of the mouth piece.

Shortly thereafter, ether was tried by several Parisian surgeons after they had received letters from J. Ware and J. C. Warren. On January 12, 1847, Malgaigne did four small operations under successful anesthesia. A few days later Fisher received from a "kind friend" a Boston inhaler with sponge and valves. Using this apparatus, on January 23, 1847, he provided complete anesthesia for the surgeons Roux at Hôtel Dieu and Velpeau at Charité. From that day on, claimed Fisher, ether was accepted and widely used in Paris. Fisher's letter never mentions Morton and refers several times to Charles T. Jackson as the discoverer of ether anesthesia.

A Question of Priority

December 15, 1846, is generally accepted as the date of the introduction of ether in Europe, preceding by several days its use by Robinson and Liston in London and Scott and Fraser in Scotland.[2,3] In fact, the first recorded successful ether anesthesia in Europe occurred on November 11, 1846, at a meeting of London Medico-Chirurgical Society when a Dr. Duncan was deeply anesthetized with a Morton inhaler and did not react to various very painful stimuli.[3]

A Critical Review of Fisher's Letter

1. Who was the medical friend and instructor who sent the November 1846 letter? According to Charles T. Jackson[4] it was John Dix Fisher, Francis' uncle, who sent him the letter and a model of the Boston inhaler. However, Fisher writes that he only received the inhaler in mid-January 1847. John Dix Fisher (1797-1850) was a renowned teacher at the Harvard Medical School.[5-8] He had studied in Paris under A. Velpeau (1795-1867), whom he greatly admired. He was a close friend and supporter of Charles T. Jackson. The several references to Jackson in Fisher's letter and the initial visit to Velpeau would bear out that John Dix Fisher was the author of the letter. That the younger Fisher would refer to his uncle as a "friend" seems strange, however, unless he wanted to protect his relative's privacy. Two other possible correspondents were J. Ware (1795-1864) and Henry J. Bigelow (1818-1890). Ware taught at the Harvard Medical School at the time.[5,6] Bigelow was not then on the teaching staff but may have been a clinical instructor at the Massachusetts General Hospital. Both were prolific writers of "Ether Letters" to their American and European colleagues.

2. How and when did the letter reach Fisher? The letter came on the Cunard steamship Caledonia, which also carried Eddy's note to his London colleague, the lawyer James Dorr.[2] The Caledonia reached Liverpool on November 15, 1846. Assuming a three or four days journey via London and Le Havre, the letter most likely

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**A version of this material was presented by the first author at the annual meeting of the Anesthesia History Association, Nashville, Tennessee, May, 2007.*

Fisher. . . *Continued from Page 9*

reached Fisher during the third week of November 1846.

3. The visit to Velpeau. Fisher writes that he met Velpeau a day or two after receiving the letter, thus during the third or fourth week of November 1846. Velpeau remembered the visit as occurring in early or mid-December 1846[9-11] although three years later he changed the date to mid-November 1846 and referred to Fisher as "Dr. Whise."[12]

   Fisher and Velpeau disagreed on the cause of Velpeau's refusal. Fisher accused Velpeau of chauvinism and distrust of a foreign discovery. Velpeau, for his part, claimed that Fisher refused to reveal the ether anesthesia for two short operations.[22,23] If this happened before January 19, 1846, he thus would be the first European to have successfully administered ether in surgery. Jobert's success was overlooked since he did not report it until February 23, 1847. By that time ether was being widely used in Paris; the academic surgeons had received letters from J. Ware and J. C. Warren and they had read Henry J. Bigelow's article and the enthusiastic reports in the American and British medical press.[24,25] On January 12, 1847, the influential J. F. Malgaigne (1806-1865) using a nasal inhaler of his design, reported doing five operations under ether, three of which were definite successes.[24,25]

4. Fisher's dental visit and attempt at self-anesthesia. Fisher's letter omits the dentist's name and the date of the visit. The dentist probably was C. S. Brewster (1799-1870) of Norwich, CT, a former friend of Horace Wells. Since 1833 Brewster had practiced in Paris, treating members of the French upper class and of Europe's royal families.[6]

   The visit occurred at the end of November or early December 1846. Dr Mason, the friend accompanying Fisher, was not J. Mason Warren, as has been suggested,[14] since the latter was in Boston at the time.[15] He most likely was Augustus Mason (1822-1883) who graduated from Harvard Medical School in 1844, one year before Fisher, and was in Paris in the fall of 1846.[16,17]

   Fisher knew no instrument maker at the time and probably designed his "rude" inhaler from directions or drawings contained in the letter. Fisher's visit may have raised Brewster's interest in ether as by January, 1847, he was using it extensively for his dental surgery.[6,18] Fisher's diseased tooth was not extracted at that visit; it was removed by Velpeau under good ether anesthesia from a Charrière inhaler towards the end of January 1847.[4,11,19]

5. The anesthesia of December 15, 1846. The surgeon A. J. Jobert (de Lamballe) (1799-1867) invited Fisher to try ether at the Hospital Saint Louis on December 15, 1846. Fisher used an inhaler similar to the Boston model but without valves. This use confirms that the letter included a description of the apparatus. The Saint-Louis inhaler presumably was made by the hospital's instrument maker under Fisher's direction.[20]

   The operation has been well described by Fisher,[1] by G. Gogue, an "interne" (house physician) at the hospital[21] and by Jobert himself.[22] The patient, P. Dihet, a 59-year-old carter, underwent the excision of a cancer of the lower lip. Fisher felt that the anesthesia had been incomplete because the patient's large tumor prevented good insertion of the mouth piece. Jobert incriminated the inhaler's poor design and a shortage of ether, whereas Gogue blamed the dilution of ether vapors by the air inspired through the nose and that exhaled in the absence of expiratory valves. After waiting eighteen minutes, Jobert quickly excised the lesion on an awake patient. Both Jobert and Gogue felt that this first trial of ether had been a failure.

   "A few days" later, Jobert, using a simple flagon with two openings, induced deep ether anesthesia for two short operations.[22,23] If this happened before January 19, 1846, he thus would be the first European to have successfully administered ether in surgery. Jobert's success was overlooked since he did not report it until February 23, 1847. By that time ether was being widely used in Paris; the academic surgeons had received letters from J. Ware and J. C. Warren and they had read Henry J. Bigelow's article and the enthusiastic reports in the American and British medical press.[24,25] On January 12,1847, the influential J. F. Malgaigne (1806-1865) using a nasal inhaler of his design, reported doing five operations under ether, three of which were definite successes.[24,25]

6. Fisher receives an inhaler from Boston. Fisher does not name the "kind Boston friend" who sent him the instrument in January 1847. As noted above, Charles T. Jackson named J. D. Fisher as the sender of both the letter and the inhaler.[4] Why then a two month interval? Was the inhaler held by the customs or the postal service? The context of Fisher's letter, however, suggests that both senders were different persons: the gift was "a surprise" and he thanked his benefactor more effusively than his November 1846 correspondent.

   The date of the inhaler's arrival is uncertain. Fisher writes that it was after the January 18, 1847 session of the Académie des Sciences. But it must have arrived earlier, during the second week of January: after getting the device Fisher immediately showed it to J. Charrière (1803-1876), the famous Parisian instrument maker.[1,26] Charrière brought out his first inhaler, a copy of the Boston Model, on January 14, 1847.[20,26] Beginning on January 20, 1847, several operations were done in Paris with a Charrière inhaler, as discussed below.

   Fisher sent a description and a drawing of the apparatus to the editor of the *Gazette des Hôpitaux* who published them (misspelling Fisher's name) on February 13, 1847.[27] The day after receiving the inhaler Fisher showed it to sev-

eral surgeons; he writes that all admired it; none, however, used it except P. J. Roux (1780-1854).[28]

7. Fisher's belated triumph. On January 23, 1847, Fisher used his inhaler to provide "with perfect success" anesthesia for P. J. Roux at Hôtel Dieu and, a few hours later, for A. Velpeau at Charité. Unfortunately, he does not name the operations. His letter strongly suggests that from that day on ether was accepted in Paris. But Fisher may have overstated his contribution:

   a) Between January 20 and 22, 1847, Roux, Blandin, Guersant, Jr., and Robert had already achieved good anesthesias with a Charrière inhaler.[28-31]

   b) In 1894 (one year before their death and seventeen years after that of Fisher), two Boston surgeons, a Dr. "C" and Dr. H. H. Williams reminisced about the introduction of ether in Paris in a letter to the *Boston Medical & Surgical Journal*.[32] Dr. "C" was Benjamin Cushing (1822-1895), a Dorchester, Massachusetts, surgeon who had been a classmate of Fisher at Harvard Medical School and had studied in Paris in 1846-7.[33] Henry H. Williams (1821-1895), a 1846 Harvard Medical School graduate, returned to Boston in 1849 after spending three years in Paris. He became a renowned eye surgeon and taught ophthalmology at Harvard. His claim to have introduced general anesthesia in eye surgery in 1849[34] is incorrect; ether and chloroform had been used in Dublin since 1848.[35]

   Cushing and Williams had witnessed what they claimed was the first successful administration of ether in Paris when Velpeau had excised a tumor from the thigh of a middle-aged man. The patient woke up from the anesthesia unaware that the operation had taken place. As Velpeau, shrugging his shoulders, silently walked out of the amphitheater, the French students gave a loud and prolonged cheer "Vive l'Amerique." Henry H. Williams had shown the patient how to inhale ether shortly before the operation. Most of the American students in Paris at the time were present, including G. H. Gray, a classmate of Fisher, but the latter is not mentioned. Neither Cushing nor Williams give the date of the event but reports by Velpeau[11,35-38] and others[20,39] clearly show that it was on January 22, 1847, the day before Fisher's exhibition. Those reports add some details of the operation: the patient was a mason in his mid-forties; his tumor had been excised twice before without anesthesia; the size of a fist, it was located on the upper posterior aspect of the left thigh; the patient lied prone; a Charrière inhaler provided surgical anesthesia in four minutes. Cushing added that on the previous day (Thursday, January 21st), P. J. Roux had excised an anal fistula after ether anesthesia had failed. This account contradicts Roux, who claimed a successful anesthesia.[28] Cushing and Williams insisted that it was the operation they had witnessed which convinced Velpeau and his doubting Parisian colleagues and led to the acceptance of ether in Paris.

8. Obstetrical anesthesia in Paris. Fisher's letter[1] and a second one[40] he sent in March 1847 show that ether had been used by the Parisian obstetricians as early as, or even before, James Young Simpson's first use for labor in Scotland on January 18, 1847. Its use in insanity had been a failure.

Conclusions

A review of the 1846-1847 literature shows that Francis Willis Fisher's role in the introduction of ether in Paris was largely ignored by the French academic surgeons and the American physicians studying in the city at that time. The often-quoted dates of December 15, 1846 and January 23, 1847, were not the milestones claimed by Fisher. He seems to have exaggerated his part in the event.

Acknowledgments

The authors thank Mr. Jack Eckert and Ms. Lucretia McClure, of the Countway Library in Boston, and Dr. Marguerite Zim.

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The C. Ronald Stephan Resident Essay Contest

The Anesthesia History Association (AHA) sponsors an annual contest for the best essay on the history of anesthesia, pain medicine or intensive care. This contest is open to all residents and fellows in anesthesiology. The purpose of the contest is to promote interest in the history of anesthesia and to advance professionalism in the specialty. Additionally this contest offers residents and fellows the opportunity to present their paper at a national meeting and to publish the results of their research. The Resident Essay Contest is named for Dr. C. Ronald Stephen an anesthesiologist who was a revered teacher, researcher, clinician and anesthesia historian. Dr. Stephen died at age 90 in 2006.

The essays must be written in English and be approximately 3,000 to 5000 words in length. Judging will be in two stages. In the first stage the finalists will be chosen. These finalists will be announced at the AHA dinner meeting during the American Society of Anesthesiologists annual meeting. From these finalists, the winners will be chosen on the basis of both content and delivery during the spring meeting of the AHA. All the finalists will present their papers in a session of the AHA attended by a panel of judges. The panel of judges will make their final decision based on originality, appropriateness of topic, quality of the research, and delivery. Because the final judging will be at the time of the presentation at the spring meeting of the AHA, all who enter must agree to attend the meeting at which the presentations are made. Essays must be submitted by the 10th of September in order to be eligible for presentation at the spring AHA meeting of the following calendar year. If not received by that date they will be considered for the next year's contest.

The first, second, a*nd* third place winners receive $500 $200 and $100 respectively. Awards will be made during the AHA spring meeting. The three winners are required to submit their essays to the peer-reviewed Bulletin of Anesthesia History for possible publication.

To enter, essays should be sent to:

William Hammonds, MD, MPH
Professor, Department of Anesthesiology and Perioperative Medicine
Medical College of Georgia
1120 15th Street
Augusta, GA 30912
whammonds@mcg.edu

Entries must be received on or before September 10, 2008

AHA and WLM Activities at the ASA 2007 Annual Meeting San Francisco, CA October 13-17, 2007

WLM Activities including Friends Tea, Board of Trustees Dinner, Forum, Laureate of Anesthesia History Ceremony and Lewis H. Wright Memorial Lecture

WLM Friiends Tea and Book Sign

Photos courtesy of Dr. Jonathan Berman and Mr. Chad Evans Wyatt.

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ASA. . . *Continued from Page 13*

AHA 2007 Annual Dinner Meeting

2007-2008 WLM Board of Trustees: (from left) Row 1: Douglas Bacon, M.D., Patrick Sim, M.L.S., Kathryn McGoldrick, M.D,, William Hammonds, M.D., Lydia Conley, M.D., George Bause, M.D., Susan Vassallo, M.D. Row 2: Jeffrey Cusick, M.D., Adolph Giesecke, M.D., John Neeld, M.D., Selma H. Calmes, M.D., Doris K. Cope, M.D., Dr. Thomas Boulton (2000 Laureate), Charles Tandy, M.D. Row 3: Jonathan Berman, M.D., Bradley Smith, M.D., (Trustee-elect), George Sheplock, M.D., (Electronic Committee Chair)

Book Review

Sykes, K. and Bunker J. Anaesthesia and the Practice of Medicine: Historical Perspectives. London, Royal Society of Medicine Press, 2007. ISBN 978-1-85315-674-8. £15-95.

by Dr. David Zuck
Former President of the History of Anaesthesia Society
United Kingdom

The lead author, Keith Sykes, explains in his foreword that the purpose of this book, as its title makes clear, is to describe the ways in which anaesthesia has contributed to the practice of medicine. It is not, then, an 'internal' history of anaesthetics, and should not be judged as such; and since the agents and techniques did not begin to have a wider impact until the end of the second world war, the introductory chapters sensibly are designed only to show how the specialty got to where it was in the mid-1940s.

There follows an exploration of what was needed to establish the specialty, any specialty, on a firm foundation of professionalism, and an explanation of how this was achieved on either side of the Atlantic – by the establishment of recognised qualifications, teaching centres, and academic research departments. The authors show how much this depended on the dedication and influence of certain people, Waters, Rovenstine, Lundy, Macintosh, and the importance of benefactors such as Lord Nuffield, whose contributions to the establishment of the Oxford academic department, and the manufacture of the Both ventilator and the Oxford vaporizer, are detailed.

The clinical practice of general anaesthesia changed little between 1846 and the early 1930s. Then, what became known as 'the machine revolution' introduced the Boyle's apparatus widely into British operating theatres, but against the resistance of those who continued to favour the semi-open technique of the ethyl chloride/ether sequence on the gauze-covered wire frame mask. Intravenous induction agents were tentatively introduced in a few centres before the start of the second world war, and the impact of that global upheaval on the organization of hospital services and the training and practice of anaesthesia is described. In the UK the Emergency Medical Service and the National Blood Transfusion Service provided the foundation for the post-war National Health Service, and care of the battle-field wounded brought developments in resuscitation, and in the study of pain therapy by Beecher and Bonica. All this is interestingly described in very readable chapters. But fundamental physiological and pharmacological research into the scientific foundations of inhalational anaesthesia, in effect the resumption of the agenda formulated by John Snow a century earlier, did not get going until after the mid-century. Then, in the UK, in addition to that at Oxford, came the rapid blossoming of academic research centres, such as at the Hammersmith Postgraduate Medical School, the Royal College of Surgeons, Newcastle, Liverpool, and Leeds, and with them the younger generation of anaesthetists trained in the technical methods that linked the laboratory to the operating theatre. Foremost among these was Keith Sykes, and in a personal account he explains his participation in developments that turned general anaesthesia into a scientific discipline.

First came the introduction of curare into anaesthetic practice, and with it the ability to uncouple muscular relaxation from unconsciousness and analgesia. Some fifty pages are spent in tracing the history of curare, and the introduction of the neuromuscular blocking drugs into electro-convulsive therapy, the treatment of tetanus, and anaesthesia. This is followed by an account of the development of what has been called 'physiological trespass,' induced or controlled hypotension, the deliberate lowering of the blood pressure for the reduction of bleeding, and of body temperature for the survival of organs rendered ischaemic for the purpose of the operation. Thoraco-lumbar sympathectomy, of which this reviewer has vivid memories, having trodden in the author's footsteps at Hammersmith some years earlier, so to speak, was performed for the treatment of malignant hypertension, and could cause much bleeding. Also there was the development of intermittent positive pressure ventilation, the therapeutic application of which was demonstrated by Ibsen during the 1952 Copenhagen polio epidemic. All these advances logically led to the centralization into an intensive care unit, where the expertise could be concentrated, of the previously dispersed seriously ill being 'specialed' by individual nurses. The anaesthetist's training and experience in physiological control was an excellent foundation for this development, and this was enhanced when the biochemical complications of cardiac surgery came within the remit of the specialty. The anaesthetist, as the authors say, became a clinical scientist, and the pathway towards this metamorphosis is described with most interesting personal immediacy.

The penultimate chapters deal with the pursuit of safety, both for agents and apparatus, and with obstetric analgesia and anaesthesia, where we meet John Snow at last, together with the Minnitt apparatus and the Sellick manoeuvre, and Virginia Apgar's contributions to neonatal resuscitation. The final chapter, 'Anaesthesia yesterday, today and tomorrow,' is largely a personal summing up, concluding with the problems, nowadays more organizational than clinical, facing the specialty at the beginning of the twenty-first century.

This book could be read with great benefit by anyone, medical or lay. The style is clear, conversational and uncomplicated, and there is much information about the personalities who made major contributions to the development of the specialty. In particular it should be read by trainee anaesthetists, some of whom, as one of our most distinguished emeritus professors complained to this reviewer some years ago, 'think nothing happened before 1990.' But does it achieve its object of ensuring that the contributions of anaesthesia to medicine are not forgotten? Why do we feel the need? In Christopher Brookmyre's delightfully gory thriller 'Quite Ugly One Morning' the heroine, an anaesthetics registrar no less, explains why the British Fellowship examination has three parts as opposed to the two required by other specialties. 'Because it's the new kid on the block, with a chip on its shoulder and a point to prove.' Surely we are long past that stage.

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Book Review

Bier's Hyperemic Therapy by Willy Meyer and Victor Schmieden. Philadelphia: W.B. Saunders Co., 1909.

by Theodore A. Alston, M.D., Ph.D.
Massachusetts General Hospital
Harvard Medical School

German surgeon August Bier (1861-1949) is remembered in anesthesia for both intrathecal and intravenous regional blocks. He was a man of colorful statements, and his account of the first spinal anesthetic is an amusing comedy of errors.[1,2] He was a protégé of Friedrich von Esmarch (1823-1908) of the eponymous jaw thrust maneuver, and the Esmarch elastic bandage was applied in the Bier block.[3,4] Bier was not a bloodthirsty surgeon. He was keenly interested in homeopathic and mechanical therapeutics as alternatives to disfiguring surgery. His ideas for mechanical therapy are outlined in this book, originally priced at $3.00 but now available for free on the web as a digital file (books.google.com/books).

The authors of this edition are Willy Meyer (New York City) and Victor Schmieden (Berlin), who studied under Bier and, like him, were interested in anesthesia.[5,6] For instance, Meyer introduced to America the Sauerbruch method of positive pressure ventilation for thoracic surgery.[7-9] Meyer also blended ether, chloroform, and ethyl chloride into a popular mixture known as anesthol.[5,10]

Bier was faced with a deluge of patients whose traumatic or infectious problems were not well-suited to surgical treatment. He saw many patients with tubercular lesions. He tried to help the lesions heal by artificially mimicking the redness, swelling and heat of acute inflammation. There were three different strategies for application of his "hyperemic" therapy: the tourniquet, the suction cup, and hot air. In all three cases, increased blood, but not necessarily increased blood flow was to be brought to the lesion. The tourniquet and suction cup elicited "obstructive" hyperemia and supposedly beneficial edema, while the hot air applications caused "arterial" hyperemia. Bier was, of course, careful to emphasize that his various tourniquets were not to completely inhibit blood flow. He felt that hyperemic therapy speeded healing and reduced the size of any required surgical drainage procedures. Furthermore, unlike natural inflammation, his artificial inflammation reduced pain.

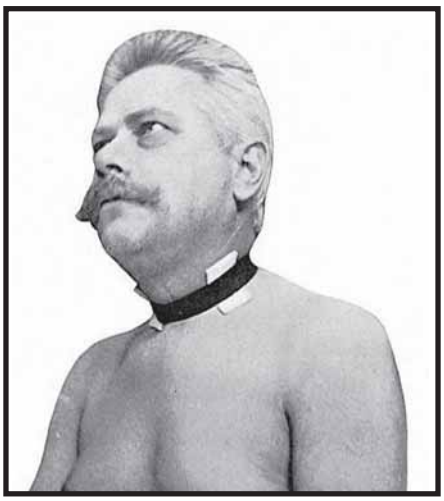

Fig. 1. Elastic bandage with jugular-compressing felt pads for production of obstructive hyperemia of the head.

The book illustrates tourniquets, suction devices, and hot air dispensers for all surfaces of the body, including the private parts. One of his three styles of neck tourniquet is shown in Figure 1. This tourniquet reduces vomiting and dizziness following ether anesthesia because it "reduces the effect of the poison on the brain." It was proposed for consideration in the case of pregnancy induced nausea. Bier also felt the neck-band, through increasing intracranial pressure, might inhibit the upper spread of spinal anesthetics. The book includes wonderfully terse case reports of tourniquet value in head trauma. For example:

"Case.—Man, laborer, forty years old, hit by a fellow-worker on right frontal bone with a hammer. Flesh wound, no fracture, semi-unconscious. Neck-band. Wide awake after two hours."

Though controversial, Professor Bier was highly respected and served as president of the German Society of Surgeons in 1910.[3] It is interesting that he advocated the venerable practice of suction "cupping" well into the 20th century. There may have been a bit to it. The hyperemia book is mentioned in the background sections of some patents for modern vacuum assisted wound healing devices ("VAC dressings").

The book leaves one with a sense of Bier as a compassionate surgeon who felt strongly that the knife was not the cure for everything. Lacking antibiotics, he relied on his intuition to provide physical therapies for many patients. There is little doubt that his charisma helped a lot of them.

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9. Dr. Meyer, surgeon, dies at meeting. *NY Times* 1932;Feb 25:28.

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Sykes. . . *Continued from Page 15*

Unlike most, we know exactly when we were born. We are one of the oldest specialties, not the youngest, and don't need to justify ourselves by anything other than our intrinsic worth.

From the Literature

by A.J. Wright, M.L.S.
Associate Professor and Clinical Librarian
Department of Anesthesiology
University of Alabama at Birmingham

Note: I have examined most of the items listed in this column. Books can be listed in this column more than once as new reviews appear. Older articles are included as I work through a large backlog of materials. Some listings are not directly related to anesthesia, pain or critical care; I interpret those categories very broadly. Some will concern individuals important in the history of the specialty [i.e., Harvey Cushing or William Halsted] who also achieved in other areas or widely-used equipment such as the stethoscope. I also include career profiles of living individuals. Non-English materials are so indicated. Columns for the past several years are available as "Recent Articles on Anesthesia History" on the Anesthesia History Association website at www.anes.uab.edu/anesthesia_history_association.htm. I urge readers to send me any citations, especially those not in English, that I may otherwise miss!

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This Month in Anesthesia History*

by A.J. Wright, M.L.S.
Associate Professor of Anesthesiology
Director, Section on the History of Anesthesia
University of Alabama at Birmingham

1578 April 1: William Harvey, the English physician who first described blood circulation, is born.

1755 April 15: Samuel Johnson's Dictionary of the English Language is published. The work is considered a landmark of its kind, but does not contain the word "anaesthesia" which was in limited use in English at the time. Used by the ancient Greek and Romans, the word did appear in several English language dictionaries before Johnson's, including Phillips, The New World of Words: or, Universal English Dictionary (6th. Ed., 1706), followed by Bailey, Universal Etymological English Dictionary (1721); James, Medical Dictionary (1743); and the New and Complete Dictionary of Arts and Sciences (1754).

1760 April 13: Thomas Beddoes is born at Shifnal, Shropshire, England. He received his M.D. from Oxford in 1786. In the late 1780s Dr. Beddoes began attempts to implement Joseph Priestley's idea for the therapeutic applications of "factitious airs" or gases. By 1798 Beddoes had established the Pneumatic Institute in Clifton, England, and hired the teenage Humphry Davy as Research Director. Their experiments with nitrous oxide and many other gases began the following year. In December 1799 Beddoes published a pamphlet which is the first extensive description of some of these experiments—the first human inhalations of nitrous oxide—and which preceded Davy's famous book by six months. Among numerous other medical and political works, Beddoes authored the classic Observations on the Nature of Demonstrative Evidence [1793], the first work in English to discuss the great German philosopher Immanuel Kant's Critique of Pure Reason. His son, Thomas Lovell Beddoes [1803-1849], was also a physician and author. Beddoes died in Clifton, near Bristol, on December 24, 1808.

1770 April 7: English poet William Wordsworth is born. In 1799 Wordsworth, when both were living in Bristol, asked

**For the full calendar, go to www.anes.uab.edu*

Humphry Davy to read and suggest revisions to the manuscript for the second edition of Lyrical Ballads, the classic collection of poetry by Wordsworth and Samuel Taylor Coleridge. During this period Davy and Thomas Beddoes were engaged in their studies of nitrous oxide and other gases. Wordsworth later became Poet Laureate and authored The Prelude among many other poems.

1790 April 17: Benjamin Franklin dies in Philadelphia. In addition to his many other achievements, Franklin participated in the first investigation of the animal magnetism claims of physician Franz Anton Mesmer. In 1781 Mesmer left Vienna and relocated in Paris, where the popularity of his claims of healing continued. Wolfgang Amadeus Mozart performed a musical play in Mesmer's honor; Queen Marie Antoinette was also a follower. However, King Louis XVI did not fall under Mesmer's spell and asked the French Academy of Sciences to investigate his therapeutic claims. Franklin was one of the many notables appointed to this commission. [See. for instance, McConkey KM, Perry C. Benjamin Franklin and Mesmerism, revisited. *Int J Clin Exp Hypn* 50(4):320-331, October 2002] Mesmer's life is depicted in the 1994 film Mesmer starring Alan Rickman.

1799 April 17: In a letter published in Nicholson's Journal, Humphry Davy announces to the world that nitrous oxide can be inhaled by humans. "I have this day made a discovery," he wrote, "which, if you please, you may announce in your Physical Journal, namely that the nitrous phosoxyd or gaseous oxyd of azote, is respirable when perfectly freed from nitric phosoxyd (nitrous gas)." This observation resulted from work on various gases done by Davy, Dr. Thomas Beddoes and others at Beddoes' Pneumatic Medical Institute in Clifton, near Bristol, England. In July of 1800 Davy published his massive book on this gas research, Researches, Chemical and Philosophical; Chiefly Concerning Nitrous Oxide, or Dephlogisticated Nitrous Air, and its Respiration.

1805 April 2: Danish author Hans Christian Andersen is born in Odense. Andersen was a frequent traveler and kept a diary during his trips. In August, 1847, he visited Edinburgh, Scotland, for several days. Several dinners were arranged by the locals for this famous author, and on the night of August 17 Andersen and numerous others dined at the house of prominent physician James Young Simpson. In his autobiography, Andersen wrote that "...in the large circle which was gathered there several experiments were made with breathing in ether. I thought it distasteful, especially to see ladies in this dreamy intoxication...there was something unpleasant about it, and I said so, recognizing at the same time that it was a wonderful and blessed invention to use in painful operations..." Simpson did not discover the anesthetic properties of chloroform until November of that year. [See Secher O. Hans Andersen and James Young Simpson. *Br J Anaesth* 44:1212-1216, 1972] Andersen died in Copenhagen on August 4, 1875.

1807 April 18: British physician and writer Dr. Erasmus Darwin dies. The grandfather of Charles Darwin, Erasmus was a member of the famed Lunar Society of scientists and industrialists who provided financial and other support to Dr. Thomas Beddoes' investigations of the medical uses of gases in the 1790s. Darwin was a prolific author on medical and scientific subjects and developed a theory of evolution decades before Charles.

1824 April: "Medical Report: Of late our city has been in some danger from another disease, which, as it must have a title, I shall take the liberty of styling an Artificial Epidemic. It has been recently ascertained that the vapour of Vitriolic Ether, when inhaled into the lungs, produces effects upon the brain and nervous system similar to those of the nitrous oxide gas. This fact was no sooner made public than a thousand experimenters started up, including all ages and both sexes. The smell of Ether prevailed every where. Even the little school boys were seen clubbing their pennies to purchase a vial of the exhilarating fluid, which put into a prepared bladder and eagerly passed from one to another, in some unfrequented spot. We might perhaps feel amused at the ridiculous capers supposed to be cut by these groups had no serious consequences resulted from it. But having ourselves witnessed the serious indisposition of several young ladies, which could be ascribed to breathing Ether, and heard of two well attested cases in which this practice proved fatal, it behoves us to condemn the use of this fluid by inhalation as highly pernicious and dangerous." —The Port-Folio April 1824, p 326 [The Port-Folio was a Philadelphia newspaper published from 1801 until 1827]

1829 April 12: Dr. Jules Cloquet amputates a breast from a woman asleep under hypnosis.

1830 April 5: Henry Hill Hickman dies. Six years earlier Hickman had attempted anesthesia in a series of experiments on animals using carbon dioxide gas. Scientists in both France and England [including Humphry Davy!] failed to recognize Hickman's achievement. "Nevertheless, he deserves the credit of having been the first of the modern investigators to prove by experimentation on animals that the pain of surgical operation could be abolished by the inhalation of a gas." [Keys TE. The History of Surgical Anesthesia. Krieger, 1978, p.19]

1847 April 7: Physician/dentist Nathan Cooley Keep administers the first obstetric anesthetic in the United States in Cambridge, Massachusetts. Dr. Keep was a prominent physician of the Boston area and the first Dean of Dentistry at Harvard. The patient was Fanny Longfellow, wife of poet Henry Wadsworth Longfellow. In his journal entry for April 1, the famed poet and scholar had noted, "Went to town the first time for several weeks and had a conversation with Dr. Keep about the sulphuric ether and its use." Under ether anesthesia, Fanny did not lose consciousness but felt no pain during the birth of her daughter. She later wrote about her experience, "I am very sorry you all thought me so rash and naughty in trying the ether. Henry's faith gave me courage...I feel proud to be the pioneer to less suffering for poor, weak womankind. This is certainly the greatest blessing of this age and I am glad to have lived at the time of its coming and in the country which gives it to the world..." [See Clark RB. Fanny Longfellow and Nathan Keep. *ASA Newsletter* 61(9), September 1997]

1852 April 29: First edition of Peter Mark Roget's famous thesaurus is published in England. After graduation from medical school in Edinburgh, Roget spent 1799 in Bristol working with Thomas Beddoes and Humphry Davy on their famous nitrous oxide research. Roget later wrote the Encyclopedia Britannica entry on Beddoes and near the end of his life created the thesaurus for which he is so well known. Roget also invented the slide rule and the pocket chessboard and did research on vision physiology later used as the basis for motion pictures.

1853 April 7: Dr. John Snow chloro-

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forms Queen Victoria for the birth of Prince Leopold. In his case book, Snow noted, "Administered chloroform to the Queen in her confinement...Here Majesty expressed great relief from the application...the Queen appeared very cheerful and well [after expulsion of the placenta], expressing herself much gratified with the effect of the chloroform." [See Ellis RH, ed. The Case Books of Dr. John Snow. Wellcome Institute for the History of Medicine, 1994, p. 271]

1856 April 12: Dr. Marshall Hall [1790-1857] describes artificial respiration in The Lancet.

1869 April 8: The great neurosurgeon Harvey William Cushing is born in Cleveland, Ohio. In 1894 Cushing and his fellow "house pup" at the Massachusetts General Hospital, E.A. Codman, developed the first anesthesia record.

1871 April 16: John Millington Synge, Irish dramatist and poet [Riders to the Sea] is born. [He died March 24, 1909]. In 1916 a fascinating account of his experiences under ether anesthesia was published posthumously: "I seemed to traverse whole epochs of desolation and bliss. All secrets were open before me...." he wrote. [Under ether. Personal experiences during an operation. *Interstate Medical Journal* 23:45-49, 1916]. Synge's account is part of a large body of literature related to anesthesia and mystical experiences.

1887 April 27: George Thomas Morton, son of William T.G. Morton, performs first appendectomy.

1898 April: Henry Hillard describes induction of nitrous oxide anesthesia with face mask and maintenance of anesthesia with nasopharyngeal insufflation.

1923 April 7: First brain tumor operation under local anesthesia performed by Dr. K. Winfield Ney at Beth Israel Hospital in New York City.

1939 April 30: The New York World's Fair opens. Included in the opening ceremonies was an address by President Franklin D. Roosevelt via a brand-new medium, television. "The 1939 New York World's Fair [also] presented a unique opportunity for the newly recognized specialty of anesthesiology to be presented to the general public. With funding supplied by the Winthrop Chemical Company of New York City and careful planning, a committee of physician-anesthetists was able to design a display that illustrated all aspects of the physician-anesthetist's role in health care: general "gas" anesthesia, regional techniques, pain management, resuscitation, and oxygen therapy. Further information was offered concerning training of physicians in the specialty, and speculation involving the future mission of anesthesiology was presented. Surprisingly, issues and discussions concerning the fashion in which anesthesia was to be presented at this exhibit remain germane to current presentations of the specialty to the general public. Although no record remains of the public's response to the exhibit, the World's Fair was an international showcase and an important opportunity for public recognition of anesthesiology." [abstract for Bacon DR, Lema MJ, Yearley CK. For all the world to see: anesthesia at the 1939 New York World's Fair. *J Clin Anesth* 5:252-258, 1993]

2005 April 17: Lt. Commander Wheeler B. Lipes dies in New Bern , North Carolina . In September 1942 Pharmacist's Mate Lipes was aboard the submarine Seadragon on patrol in the South China Sea and about a week's journey from the nearest Allied port. A young seaman named Darrell Dean Rector developed appendicitis, and Lipes, who had observed several appendectomies as a laboratory technician in a naval hospital, became the surgeon. Metal spoons were bent at right angles to use as muscle retractors, and sulfa pills were ground up and used as the antiseptic. An ether mask was made from a tea strainer covered with gauze, and the ship's communications officer, Lt. Franz P. Hoskins, became the anesthetist. The surgery was successful and one of two such operations performed aboard U.S. submarines during World War II. Seaman Rector was later one of 78 crewman lost aboard the submarine Tang when it was struck by a torpedo in October 1944. George Weller of the Chicago Daily News won a Pulitzer Prize for his article about the surgery, which was featured in such films as Destination Tokyo [1943] and Run Silent, Run Deep [1958] and on the 1950s television series, The Silent Service. This event was also featured on the Cavalcade radio program episode "Pharmacist's Mate" broadcast on May 23, 1943, and starring Will Geer. Lipes' obituary appeared in the *New York Times* on April 20, 2005.

Bulletin of Anesthesia History
Doris K. Cope, M.D., Editor
200 Delafield Road, Suite 2070
Pittsburgh, PA 15215
U.S.A.