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# BULLETIN OF ANESTHESIA HISTORY



VOLUME 21, NUMBER 4

OCTOBER, 2003

## The Introduction and Popularization of Endotracheal Intubation into Anesthesia Practice

By Henry Rosenberg, M.D. and  
Jean K. Axelrod, B.A.

*This article has been peer reviewed and accepted for publication in the Bulletin of Anesthesia History.*

*Running head: Use of endotracheal intubation in anesthesia practice*

*Summary: Developed in the late 19th century, endotracheal intubation was met with reluctance, even fear, by those administering anesthesia. The progression from its gradual acceptance to today's routine use is traced in this essay.*

When ether anesthesia was introduced into medical practice in the 1840s, it was justifiably considered one of the most significant advances in medical care of all time. In addition to producing insensibility to pain, the ease of administration of the agent was an important quality. The patient breathed the agent, and the anesthetizer merely had to insure that the agent was being poured onto a cloth or over a cone in sufficient quantities that the patient did not move and continued to breathe. For almost one hundred years, general anesthesia was conducted by the patient breathing through a device that covered the nose and mouth, with the patient breathing spontaneously. Largely overlooked, at least initially, was the importance of maintaining airway patency during the process. Aspiration of gastric contents was also not recognized to be a major problem for several decades. Not until the early part of the 20th century were these inherent problems recognized and techniques developed to prevent and treat them. However, mask anesthesia was still the predominant method for the delivery of volatile agents well into the 1930s. In the early 1940s, the technique of administration of anesthetic agents changed fairly quickly. Anesthesia providers began to practice endotracheal intu-

bation more frequently; by the early 1960s, the technique had become routine.

How did an anesthetic procedure that met with reluctance — and in many cases, fear — when first developed in the late 19th century become routine a half century later? When did practitioners accept endotracheal intubation despite its difficulty and the distinct possibility of trauma to the patient? The purpose of this essay is to explore the reasons for this change in practice.

### Early Advances in Endotracheal Intubation for Anesthesia

Intubation of the trachea was developed for purposes of resuscitation and later for artificial respiration well before its use as a way to administer anesthesia. A fine summary of the early history of endotracheal anesthesia was written by Waters, Rovenstine and Guedel in 1933.<sup>1</sup> One of the early pioneers of intubation was a Scottish physician, William Macewen. In 1880, he used oral endotracheal intubation for the treatment of severe subglottic edema by inserting a metal tube into the trachea through the mouth, using his fingers as a guide. He later utilized the method for anesthetic management during surgical procedures in the oropharynx.<sup>2</sup>

By the late 19th Century, other physicians including O'Dwyer, Eisenmenger, Head and Kuhn, were experimenting with tubes to insufflate air or anesthetics into the airway by either the orotracheal or nasal route. Expired gases flowed passively back around the tube. O'Dwyer utilized an intubation technique for diphtheria in pre-antitoxin days, inserting a small brass stent, via a metal introducer, through the mouth and into the glottis and subglottic

region for the relief of airway obstruction. A decade later, Matas wrote: "...his magical transformation of the bloody and tragic picture of tracheotomy in diphtheria into a simple, painless, and bloodless bit of technical jugglery by his perfected method of intubation, has practically closed for all time one of the most conspicuous chapters in the history of surgery."<sup>3</sup> Again, most often the tube was inserted with digital guidance or improvised instruments used to displace the tongue.

In 1909 two physiologists, Samuel Meltzer and John Auer, of the Rockefeller Institute of New York, found that when air was blown into the trachea of an animal whose respiration had been paralyzed, full oxygenation of the blood could be maintained. Their finding was "...probably the greatest impetus toward popularity of endotracheal anesthesia", according to Waters, Rovenstine and Guedel.<sup>1</sup> This technique was shortly applied to clinical anesthesia by Charles Elsberg, founder of the Neurological Institute of New York, who noted the value of intratracheal insufflation for thoracic surgery.<sup>4</sup> However, the problems with insufflation (essentially a form of CPAP) were soon apparent and the technique fell out of favor.

Despite these occasional laudatory statements, endotracheal intubation was very rarely done. This situation existed because of a lack of instruments to facilitate intubation, the necessary tubes to maintain the airway and a lack of understanding of the principles of respiration and ventilation.

### Chevalier Jackson's Contributions

The most important advance in intu-

*Continued on Page 4*

# Anesthesia History at the 2003 ASA Annual Meeting

## Overview:

**Monday, October 13, 2003**

1 - 2:30 PM

Moscone Convention Center, Room 212  
Wood Library-Museum of Anesthesiology Friends Tea and Booksigning

2 - 5 PM

San Francisco Marriott, Salon B-3  
Forum on the History of Anesthesia

6 - 9 PM

The Carnelian Room  
Anesthesia History Association Annual Dinner Meeting

**Tuesday, October 14, 2003**

9 - 11 AM

Moscone Convention Center, Hall D  
Poster Session: History, Ethics & Professionalism

12:50 - 1:50 PM

Moscone Convention Center, Rooms 124-125  
The 2002 Lewis H. Wright Memorial Lecture

2 - 4 PM

Moscone Convention Center, Room 130  
Panel on History

## Wanted: Laryngoscope Blades

The Wood Library-Museum needs your help in expanding our collection of laryngoscope blades and other historically significant equipment. If you have an interesting vintage item that you would like to donate or know of old equipment that we might obtain for our collection, please contact the Wood Library-Museum Honorary Curator. We also welcome vintage books. In the case of duplicates, we can raise needed funds by our vintage book sales. All donations are tax deductible.

George Bause, MD, MPH  
Honorary Curator, WLM  
847-825-5586

## Forum on the History of Anesthesia

*Sponsored by the Wood Library-Museum of Anesthesiology*

### Before It's Lost: Capturing the History of Subspecialization in Anesthesiology

*Date and Time: October 13, 2003 (2-5 PM)*

*Location: San Francisco Marriott, Salon B-3*

*Objectives: The attendee will understand the impetus behind the formation of subspecialty societies in anesthesiology. The attendee will also learn about the documentary evidence and means to preserve the early history of sub-specialization.*

Moderator: Douglas R. Bacon, M.D., M.A.  
Professor of Anesthesiology and the History of Medicine  
Mayo Clinic, Rochester, MN

The Perils and Pitfalls of Documenting Recent History—Can the WLM help?  
*Douglas R. Bacon, M.D., M.A.*

The Association of University Anesthesiologists  
*William K. Hamilton, M.D.*  
Professor Emeritus of Anesthesia  
University of California, San Francisco, CA

The Society of Cardiovascular Anesthesiologists  
*Roger Moore, M.D.*  
Past President, Society of Cardiovascular Anesthesiologists

Society for Education in Anesthesia—The History of Teaching?  
*Phil Liu, M.D.*  
Professor of Anesthesiology  
Harvard Medical School, Boston, MA

Society for Obstetrical Anesthesia and Perinatology—Caring for Mom and Baby  
*Gary Vasdev, M.D.*  
Assistant Professor of Anesthesiology  
Mayo Clinic, Rochester, MN

The American Society of Regional Anesthesia—Even Better the Second Time  
*David Brown, M.D.*  
Professor and Chair, Department of Anesthesia  
University of Iowa

Society of Neurosurgical Anesthesia—Focused on the Brain  
*Maurice Albin, M.D., MSc.*  
Professor of Anesthesiology  
University of Alabama at Birmingham

Society for Ambulatory Anesthesia  
*Lydia Conlay, M.D., Ph.D.*  
Professor and Chairman, Department of Anesthesiology  
Baylor College of Medicine, Houston, TX

Society for Pediatric Anesthesia  
*Mark Rockoff, M.D.*  
Professor of Anaesthesia, Harvard Medical School

Society for Critical Care Medicine  
Douglas Coursin, M.D.  
Professor of Anesthesiology and Medicine  
University of Wisconsin

## Panel on History

### APGAR at 50: A Celebration of the Remarkable Anesthesiologist Who Changed Neonatal Assessment and Obstetric Anesthesia

Date and Time: October 14, 2003 (2-4 PM)

Location: Moscone Center, Room 130

Objective: After attending this panel the learner will gain an appreciation for the development of the APGAR score. The learner will also learn about the challenges of academic practice and the social milieu of anesthesiology in the late 1940s and 50s.

The learner will also gain an understanding of a small part of the history of anesthesiology that has everyday application.

#### Moderators:

Douglas R. Bacon, M.D., M.A.  
Professor of Anesthesiology  
Mayo Clinic, Rochester, MN

Maurice Albin, M.D., M.Sc.(Anes.)  
Professor of Anesthesiology  
University of Alabama at Birmingham

1. Obstetrical Anesthesia in 1950—  
Issues without Answer?  
*David Waisel, M.D.*  
Assistant Professor of Anaesthesia  
Harvard Medical School, Boston, MA
2. Neonatal Resuscitation:  
An Historical Perspective  
*George Gregory, M.D.*  
Professor of Anesthesiology, UCSF
3. The Columbia Department:  
A microcosm of Academic  
Anesthesiology in the 1950s  
*Douglas R. Bacon, M.D., M.A.*
4. Virginia Apgar—  
Anesthesiologist Extraordinaire  
*Selma Calmes, M.D.*  
Professor and Chair  
Dept. of Anesthesiology, UCLA
5. The APGAR Score  
*Randy W. Calicott, M.D.*  
Assistant Professor of Anesthesiology  
Wake Forest University  
Winston-Salem, NC
6. I Remember Ginny  
*Frank Moya, M.D.*  
Chairman, Frank Moya Continuing  
Education Programs, Inc.  
Coral Gables, FL

## Wright Lecture

The 2003 Lewis H. Wright  
Memorial Lecture  
of the  
Wood Library-Museum  
of Anesthesiology

Tuesday, October 14, 2003  
12:50 – 1:50 PM

The Moscone Center, Rooms 124-125

### Peter L. McDermott, M.D., Ph.D.

Professor of History  
California Lutheran University  
Past President, ASA, 1993  
Thousand Oaks, California

### Fallacies and Useful Truths: An Overview of History and Science for the Anesthesiologist... or Lust, Torture and Depravity: The Anatomy of Derangement

Introduction by  
Kathryn E. McGoldrick, M.D.  
and Susan A. Vassallo, M.D.

The Lewis H. Wright Memorial Lecture of the Wood Library-Museum honors a distinguished Pioneer in American Anesthesiology who gave himself tirelessly to dignify and accredit the discipline of anesthesiology as a clinical science and medical specialty. No part of the country was too far or too remote for him to reach with his advice and support. Because he had the wisdom to envision the value of the use of curare in anesthesia, he made his most significant contribution to anesthesiology in 1940 when he first suggested and later arranged for the clinical trials of this remarkable drug which has revolutionized the practice of anesthesiology for all time. In 1955, the American Society of Anesthesiologists recognized his contributions by according him their highest honor, the Distinguished Service Award. This Lectureship will serve to remind us now, and in the years to come, of his honored place in the specialty of Anesthesiology.

Editorial Staff Note: Due to spacing issues in the July 2003 issue, we were unable to include the appendix to Dr. Adolph Giesecke's article, "Contradicting a Unitary Theory of General Anesthetic Action: a History of Three Compounds from 1901 to 2001." A copy of the appendix is available upon request.

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The *Bulletin*, formerly indexed in Histline, is now indexed in several databases maintained by the U.S. National Library of Medicine as follows:

1. Monographs: Old citations to historical monographs (including books, audiovisuals, serials, book chapters, and meeting papers) are now in LOCATORplus (<http://locatorplus.gov>), NLM's web-based online public access catalog, where they may be searched separately from now on, along with newly created citations.

2. Journal Articles: Old citations to journals have been moved to PubMed (<http://www.ncbi.nlm.nih.gov/PubMed>), NLM's web-based retrieval system, where they may be searched separately along with newly created citations.

3. Integrated History Searches: NLM has online citations to both types of historical literature -- journal articles as well as monographs -- again accessible through a single search location, The Gateway (<http://gateway.nlm.nih.gov>).

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## Intubation. . . *Continued from Page 1*

bation was made by Chevalier Jackson (figure 1), a laryngologist, who put laryngoscopy and tracheal intubation on solid scientific grounds though his development of meticulous techniques. Jackson published his first complete guide to airway endoscopy in 1907, at which time he had developed the straight-bladed laryngoscope with the O-shaped flange and a U-type handle. This instrument, still used by ENT surgeons, facilitated exposure of the larynx without applying direct pressure to the upper teeth. In 1909 he described the technique of tracheal intubation that is basically unchanged today.<sup>5</sup>

Jackson's interest was primarily in diseases of the upper airway and in removal of foreign bodies.

Even while teaching his technique to ENT practitioners he also advocated the use of his laryngoscope, in an article written in 1913 to anesthetists.<sup>6</sup> During the period from 1910 to 1925, Jackson synthesized the work of the preceding century into a systematic approach to the management of airway obstruction via direct laryngoscopy.

Writing in 1922, Jackson stated:

Endo-tracheal anesthesia is by far the safest way for the administration of ether... Operations on the nose, accessory sinuses and the pharynx, apt to be attended by considerable bleeding, are rendered free from the danger of aspiration pneumonia by endo-tracheal anesthesia. It is the safest anesthesia for goiter operations. Endo-tracheal anesthesia has rendered needless the intricate negative pressure chamber formerly required for thoracic surgery, for by proper regulation of the pressure under which the ether-laden air is delivered, a lung may be held in any degree of expansion when the pleural cavity is opened. It is indicated in operations of the head, neck, or thorax, in which there is danger of respiratory arrest by centric inhibition or peripheral pressure; in operations in which there is a possibility of excessive bleeding and aspiration of blood or secretions; and in operations where it is desired to keep the anesthetist away from the operating field.<sup>7</sup>

However, intubation of the trachea for routine procedures was rarely done, and when performed, the assistance of an oto-



*Fig. 1. Chevalier Jackson. Photograph reprinted with permission from Thomas Jefferson University Archives, Scott Memorial Library, Philadelphia.*

laryngologist was required.

### World War I Advances Intubation Techniques

The next phase of development took place during and just after World War I. Two British anesthetists at a battlefield surgical unit, Ivan Magill and Stanley Rowbotham, were faced with the necessity of providing anesthesia for operations upon the face and chest without contaminating the surgical field. Utilizing flexible rubber tubes, they first administered anesthesia via insufflation. Because the method was too expensive and time consuming to be practicable during war-time, they determined to maintain anesthesia in a less expensive and more nearly physiological fashion via the wide-bore inhalation method. Originally two tubes were employed; the narrow bore conveyed the gases to the lower end of the trachea, while the other of wider bore passed through a nostril into the pharynx only and ensured a free exit for the gases. It was noticed that sometimes the wider tube glided spontaneously into the larynx, a phenomenon further described by Magill as "blind intubation".<sup>8</sup>

In 1923, Rowbotham modified the two-tube method, both tubes now being passed into the trachea under direct vision, by fusing the tubes together.<sup>9</sup> With only one wide-bore tube being inserted in the trachea, the patient breathed in both directions. He utilized the method of to-and-

fro breathing, following the practice which had been recently popularized in the United States by Gwathmey and McKesson and in England by Boyle.

Writing in their seminal history of endotracheal anesthesia in 1933, Waters, Rovenstine and Guedel stated: "Endotracheal inhalation, with its freedom from pressure and the danger of emphysema, together with its conservation of body heat and moisture and the acid-base equilibrium, entirely supplanted insufflation." Moreover, they advanced a reason for the widespread lack of acceptance of endotracheal intubation: "...prior to twenty-five years ago very few anesthesia developments appeared under the classification of Anesthesia. They were meagerly published in surgical reports..."<sup>11</sup> In other words, the specialty of anesthesiology had not clearly separated from surgery. The first societies of practitioners devoted to anesthesiology were founded in the 1920s and 30s, and the first journal devoted to anesthesiology appeared in 1922.

Waters, with his associates, also advanced the concept of using endotracheal intubation when he popularized the use of cyclopropane anesthesia. With this hydrocarbon gas, induction was significantly faster than with ether. Because this agent was highly explosive, however, the reduction of its leakage, by utilizing a completely closed technique via an endotracheal tube, was particularly desired.

### Equipment Laryngoscopes and laryngoscope blades

Technologic developments are often a key step in popularizing a procedure. The use of the straight O-shaped Jackson blade continued for many years, with minor modifications made by others. Most notable was an instrument designed by Henry Janeway in 1913 because it was the first to have an internal light source powered by batteries contained in the handle.<sup>10</sup> One important development was the change from the U-shaped device for visualization of the glottis to the current L shape. While others followed Jackson in making changes to the laryngoscope, the modifications of the blade by Robert Miller of San Antonio, Texas, in 1941 and Sir Robert Macintosh of Britain in 1943, are those in most common use today.

Miller had recognized that existing laryngoscopes were too thick at the base, increasing the risk of trauma to the teeth. He also found that the blade tips did not always lift the epiglottis. He therefore designed a laryngoscope that was longer,

rounded on the bottom, smaller at the tip and had a shallower base and an extra curve beginning two inches from the distal tip. These changes resulted in less required opening of the mouth and allowed for freer anterior movement of the mandible so that when the small, round end of the blade pressed up against the tongue and the distal tip entrapped the epiglottis, a channel was created through which the larynx was exposed.<sup>11</sup>

Macintosh related that the development of his blade was accidental. During his observation of the use of a Davis-Boyle gag, the spatula was pushed forward, depressing the tongue, to the point where he was able to view the glottis.<sup>12</sup> To facilitate this visualization, in 1943 he introduced his sharply curved blade specifically designed not to entrap the epiglottis. The blade was introduced into the right side of the mouth by pushing the tongue to the left and then advanced until the distal tip rests in the vallecula. The larynx is exposed when the laryngoscope is lifted to elevate the epiglottis upward. He claimed that his design allowed for a lighter plane of anesthesia due to diminished contact with the severely innervated epiglottis, and he further suggested that his blade design resulted in less damage to the teeth owing to its open top section. He later stated that the degree of curve of the blade is of minor importance and that a straight blade can equally well be used, just so the blade does not go beyond or make contact with the epiglottis.<sup>13</sup> The Foregger Company was given the right to market the Macintosh laryngoscope blade in 1943.

### Endotracheal tubes

Early endotracheal tubes were primarily of metal, woven silk or rubber. Metal tubes, being rigid, could not kink and so become obstructed, and they could be easily sterilized. Efforts of placement often resulted in trauma to the respiratory mucosa, and they fell into disuse until their revival by Paluel J. Flagg in 1929. Phillip Woodbridge modified the original Flagg tube by shortening the solid metal tip so that almost the entire tube consisted of flexible coiled wire. Ivan Magill, although he advocated curved rubber tubes with a beveled tip, devised a very small tube of coiled metal wire for use in small infants.

### Inflatable Cuffs

In 1911, Dorrance created a cuffed endotracheal tube which permitted bi-directional flow of anesthetic gases, but he was unfamiliar with the management of a patient who was paralyzed. There was con-

cern that removal of the respiratory drive by artificial ventilation would lead to respiratory failure. Anesthetic equipment in most hospitals remained primitive, and many anesthetics were given by physicians, dentists and nurses with little or no formal training.

### Advances in Endotracheal Intubation Resulting from World War II

World War I had seen the launching of the profession of anesthesiology as massive trauma on the battlefield demanded that anesthesia be given by trained personnel. World War II advanced the profession further, as physicians and corpsmen alike were required to learn anesthetic techniques in mobile field hospitals. Courses of instruction in anesthesiology for medical officers in both military and civilian hospitals were initiated. Many returning veterans continued their training in the specialty, while hospitals began to increase significantly the number of residencies in anesthesiology.

Moreover, the widespread introduction of physician anesthesiologists into practice in the late 30s and 40s led to critical thinking about the advantages of endotracheal intubation over mask ventilation. The physician anesthesiologist no longer wanted to ask an otolaryngologist to help in the insertion of an endotracheal tube. The development of thoracic anesthesia, with its resultant pneumothorax, hastened the routine use of tracheal intubation. The teaching of endotracheal intubation became part of the curriculum, and the acceptance of the technique grew accordingly. Widespread acceptance of the procedure also required individuals to spread the word about the value of endotracheal intubation.

Noel Gillespie of the University of Wisconsin, a student of Ralph Waters, published the standard text on endotracheal anesthesia in 1948. Here are a few key sentences from that book that underlined the importance of endotracheal intubation: "A tube, once in place, can be treated as part of the surgical field, and remains undisturbed during the operation. In this way, endotracheal anesthesia has made a definite contribution to the recent advances in plastic and cerebral surgery...." Another advantage, he wrote:

"...is the ability to prevent the aspiration of vomitus, blood, mucus, or pus into the lower respiratory tract. In the days before intubation, 'aspiration pneumonia' was a fairly frequent sequela of any operation

upon the upper air passages. The aspiration of foreign fluids can always be prevented during operation by the skillful use of endotracheal methods."<sup>17</sup>

By the time succinylcholine became available in 1953, training and the professional stature of anesthesiologists had improved, tracheal tubes were commercially available and endotracheal intubation soon became routine. Further developments were only in refinement of equipment such as a large variety of laryngoscope blades and the double lumen tube; our article need not cover advances beyond that time.

In summary, the introduction and rapid widespread use of endotracheal intubation in the 1940s was built on the foundation of the development of laryngoscopes in the early part of the century, endotracheal tubes shortly thereafter, and the observations that endotracheal intubation can protect the patient from airway obstruction and aspiration pneumonia. The confluence of several other important factors were needed to push the technique forward.

First was the growth of the specialty, attracting physicians who began to think critically about the limitations of mask ventilation and to regard anesthesiology as a medical specialty rather than a technical procedure. Second was the introduction of the Macintosh laryngoscope blade which was less traumatic to the soft tissues by avoiding direct elevation of the epiglottis. The introduction of muscle paralysis, first by curare and then other agents, allowed the anesthesia provider to perform laryngoscopy and intubation in a more leisurely manner without requiring an inordinate length of time for the patient to enter a deep plane of anesthesia.

Finally, during the Second World War, the need to provide anesthesia care to the military personnel suffering from chest, abdominal and head and neck injuries mandated that the newly trained anesthesiologists use endotracheal intubation to avoid airway compromise, aspiration pneumonia, respiratory failure from pneumothorax and other problems.

Looking back from our vantage point in time, it is hard to recognize that of all the major innovations that have led to our modern practice of anesthesia, endotracheal intubation is arguably one of the most important and significant. The development of the procedure, including indications for its use, represents the con-

*Continued on Next Page*

## Intubation. . .Continued from Page 5

tributions of a large number of physicians from many different backgrounds. Nor is the evolution of the technique complete. A variety of newer devices to help visualize the glottis such as fiberoptic bronchoscopy, the Bullard scope, etc., as well as revolutionary new techniques for tube placement such as the intubating LMA, have also been developed recently.

Facility with endotracheal intubation was critical to the development of modern, safe anesthesia. This technique has evolved from a primitive, hazardous procedure to one remarkably free of complications that is performed on thousands of patients each day around the world. We owe thanks to the many innovators who developed and continue to perfect techniques of endotracheal intubation.

### References

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# AHA2004 Call for Abstracts

## 11th Annual Spring Meeting

SUBMISSION DEADLINE: 31 January 2004

### WHERE:

The Anesthesia History Association's 11th annual Spring Meeting will be held May 7 and 8, 2004. The venue will be the Westin O'Hare in Rosemont, Illinois.

Westin O'Hare  
6100 N River Road  
Rosemont, IL 60018  
1-800-359-4827

### WHAT:

Abstracts for twenty-minute papers are invited on historical aspects of anesthesia, critical care medicine and pain medicine. Abstracts on medical humanities or ethical topics that relate to the history of one or more of these broad areas are also invited. Abstracts should be no longer than one 8 1/2" by 11" sheet of paper; text should be in 12-point font size. If possible, abstracts should indicate the research problem, sources used, methodological approach and may contain no more than ten references. Abstracts may be submitted by regular mail, fax, or electronic mail [in plain text format]. Disc submission in Word is also permitted. Abstracts submitted in electronic format may be made available to registrants in advance of the meeting and on the AHA WWW site as decided by the Organizing Committee. ALL accepted abstracts will be included in material distributed to meeting registrants. Individuals who wish to organize a paper session around a theme should contact the committee as soon as possible.

Further updates, tentative program, and other material can be found on the conference web page at <http://www.anes.uab.edu/aneshist/aha2004.htm>

More information about the AHA can be found at [http://www.anes.uab.edu/anesthesia\\_history\\_association.htm](http://www.anes.uab.edu/anesthesia_history_association.htm)

### WHEN:

Deadline for submission of all abstracts is 31 January 2004.

### WHO:

Send abstracts, inquiries, etc., to:

A.J. Wright, MLS  
Dept of Anesthesiology Library  
School of Medicine  
University of Alabama at Birmingham  
619 19th Street South, JT965  
Birmingham AL 35249-6810  
205-975-0158  
205-975-5963 [fax]  
[ajwright@uab.edu](mailto:ajwright@uab.edu)  
<http://www.anes.uab.edu/libraryinformation.htm>

# Peter Safar (1924 – 2003): A Personal Reflection

By Doris K. Cope, M.D.  
Professor, Anesthesiology  
University of Pittsburgh

Peter Safar is perhaps the most alive man I have ever met. I speak of him in the present tense because his intense, sparkling enthusiasm must be at work somewhere in a broader galaxy. He liked to be called "just Peter" by both international dignitaries and beginning medical students whom he and his wife, Eva, would seek out at history of medicine dinners at Pitt and engage in animated conversation. His contributions to cardiopulmonary resuscitative, critical care, and anesthesiology are well known to all of us including the highest awards of the Society of Critical Care Medicine, the World Association for Disaster and Emergency Medicine, the Lewis Wright lectureship of the ASA, and the Republic of Austria's Cross of Honor. Not only did he build an anesthesiology department in which he was indirectly or directly responsible for a million anesthetics, he built a research institute from which he continued to produce original work obtaining grants from his home when his mobility was limited by cancer, extensive surgery and chemotherapy. At home, at work or even in social situations, he always wore several rubber bands around his left wrist so that he could in an instant bundle packets of papers together to either give to someone or to review at a later date.

All of his accomplishments, both struggles and successes, are detailed in his



Peter Safar, M.D.

WLM Careers autobiography. His is by far the most voluminous of the biographies mostly due to Peter's insistence that all the wonderful people who worked with him be acknowledged for their individual contributions. In his typically generous fashion, he personally funded the extra length of this work to ensure proper credit to his colleagues, and also purchased volumes himself which he distributed to his extensive network of friends and colleagues.

But, Peter himself, the man, what was he like? Peter was like a young boy who lived in an old partially collapsing house. You could see his eyes sparkle and he almost danced when thinking of a new idea or concept. The words flew out of his mouth as his neurons synapsed like lightning. Who could ever forget his Wright lecture at the 2000 ASA when he covered over 1000 years of resuscitative medicine showing two complete carousels full of slides and a historic videotape in less than 50 minutes.

Peter reminded me of the very bright kid in the class who sits in the front of the room really bursting with enthusiasm to answer all of the teacher's questions. Peter was always asking and answering questions. But he was never too busy to reflect on the meaning of his questions and the broader implications for life. At the last luncheon we had together, Peter and I were discussing the immortality of the soul. Peter was fascinated by his new cell phone, wondering how sound waves could be picked up and distinguished from all the sounds occurring simultaneously in the universe. He said that maybe after death all the energy molecules of your being are in some way pulled together like the cell phone signals, and transmitted into another plane whence you would be reconstituted. For Peter, I would like to think so.

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# Daniel G. Revell, M.D. (1904-2002)

By Lucien E. Morris, M.D., FRCA,  
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I first met and became acquainted with Daniel Revell nearly fifty years ago at the annual meeting of the American Society of Anesthesiologists held in Seattle in 1953.

I had heard of Daniel Revell several years earlier, at a University of Wisconsin seminar in anesthesia, as reported by Ralph M. Waters, M.D., who had just returned from a western regional meeting of the Canadian Anaesthetists Society in Regina, Saskatchewan, where Waters himself had been the invited speaker. He described Dan Revell's innovative application of the circulator concept to move respired gases around the patient circuit of the circle absorption anesthesia apparatus. Waters had been obviously stimulated and intrigued by the Revell paper and considered it the only noteworthy new idea to bring back from the meeting.

Daniel Revell, in his work at the Children's Hospital in Winnipeg, Manitoba, had recognized the twin problems of dead space and resistance inherent in the available adult apparatus, and in his need for better management of anesthesia in infants and neonates, devised and added two important bits of equipment, a pump to circulate the respired gases, and a divided chimney to clear the under mask dead space. This circulator system is the only anesthesia system in which the patient can be breathing spontaneously from an anesthetic mask without an increase in the work of breathing. Also the effect of both dead space and inspiratory resistance of the anesthetic apparatus is virtually eliminated by the circulating flow of mixed gases which continually supply a fresh breeze under the mask. In addition, because of avoidance of rebreathing, each inspired volume has no depletion of oxygen and no increase in carbon dioxide.<sup>1,2,3</sup> If one takes a serious look at the circulator concept<sup>4</sup> and its physiological benefits, it becomes apparent that the circulator is a completely logical addition to the ordinary anesthesia apparatus and that its practical application may be of considerable benefit to anesthetized patients of all ages.

Daniel G. Revell was born in Chicago, Illinois, on the 4th of November 1904, of Canadian parents during a time when his father was teaching in the Department of



*Daniel Revell, M.D.*

Anatomy at the University of Chicago. Three years later, the family moved to Edmonton, Alberta, where Dan's father later became Professor and Chairman of the Department of Anatomy in the Medical School of the University of Alberta. Dan grew up in a faculty family and university environment receiving all his education in Edmonton, including the M.D. degree at the University of Alberta in 1932. During his high school years, he was fortunate in having a good introduction into technical skills of drafting, woodworking, forging, and the use of machine tools. These arts, once learned, were developed and of good use throughout professional life and retirement, including during the later years the making of a xylophone, repair and renovating of antique clocks, cabinet making, and the design of artistic mobiles and wind chimes. Dan was always interested in the people around him even to the smallest detail. His inquiring mind and innovative spirit combined with an ability to recognize problems, seek solutions, and to provide innovative practical answers, most often adapting to his purposes common ordinary objects and materials at hand, were enduring characteristics.

After obtaining the M.D. degree, Dr. Revell went east for an internship at the Toronto Western Hospital where a month exposure on anaesthesia piqued his interest, so that in the subsequent year he was the first resident in anaesthesia at the Toronto Sick Children's Hospital where under the guidance of Dr. Charles Robson

he had a heavy workload and gained a lot of experience in paediatric anaesthesia. Among other things, Dr. Robson taught the easy way to intubate some children by inserting fingers into the pharynx and guiding the tube through the glottis. During this year at Children's Hospital, Dr. Revell demonstrated his inherent innovative capability and implementation of Thomas Edison's admonition, "if there is a better way of doing it, let's find it."

In that year at "Sick Kids" the most ingenious device he made for his own use was an ether dripper which could be attached to the surface of a Yankauer open drop mask, connected by tubing with a reservoir of liquid ether for either gravity or pressure feed, and with a spigot valve modified from a toy steam engine, to control rate of continuous drip. This allowed one hand to be free from holding the ether bottle and available for other uses such as recording of observed vital signs. He also made an ethyl chloride vaporizer to speed the induction for open drop ether. Some other innovations were made to solve surgical problems, including an orthopaedic hook for distraction of an impacted hip, and a head holder for use during craniotomy in paediatric patients.

In 1934, Dan traded his hospital environment for the outdoor life in the rugged mining country of northwestern Ontario. He married a graduate nurse from the Toronto Western Hospital and together they spent the next four years at Red Lake, built a two story log house and undertook a pioneer medical practice, making the rounds of seven mining areas by dog sled, skis, propeller pushed ski mobile or boat, depending on the season. After four years of an interesting life in the bush, Dan and his wife (and baby daughter) returned to the relatively more civilized life in Edmonton, having grown in maturity and self-reliance. He then limited his medical practice to anaesthesia and became certified in the specialty. Again he began to make equipment to facilitate his work, including a relatively thermo-stable and portable ether vaporizer. In 1940, Dr. Revell accepted an opportunity to be the second anaesthetist on the staff of the Winnipeg General Hospital where he continued to make innovative improvements on the existing ana-

esthesia apparatus.

With the expansion of hostilities and Canadian entry into World War II, Dr. Revell joined the Royal Canadian Army Medical Corps in 1941, and served for four years of which about half of the time was in southern England and Normandy where he used effectively in the field an improved version of his ether vaporizer.

In 1945, on return to Canada, he resumed work at the Winnipeg General Hospital. About a year later, he assumed the duties of Chief of Anaesthesia at the Winnipeg Children's Hospital. It was there in Winnipeg that in 1946, he devised the first model circulator and the divided chimney for the mask. He recalled with considerable satisfaction the first case in which the circulator and divided chimney were used in a four-year-old child anaesthetized with an adult Heidbrink circle absorption system apparatus for a laparotomy; "there was no hyperpnea." That was a striking demonstration of the fact that some of the observed changes during paediatric anaesthesia were not the effects of the anaesthetic agent per se, but rather due to the imposition of inherent deficiencies in the equipment being used. Revell had provided a different answer and indeed had found a better way! This remarkably simple concept of circulating the respired gases completely negates the adverse rebreathing effects of applying the mask to the face of a patient, and so reduces the need for assisted or mechanical ventilation.

At the time of the Regina meeting in 1948, Dr. Revell was not present. His paper was read in absentia by someone else. He was in process of moving his family to Victoria, British Columbia, where he continued his practice at St. Joseph's Hospital for the next two decades. Dan Revell retired in 1969, and enjoyed life to the fullest in the next twenty-five years with gardening and the repair of clocks while living in a lovely home at the edge of Victoria on the shores of salt water. In 1994, after the death of his wife, Bonnie, he sold the house on the water and moved to the Chilliwack/Sardis area of Vancouver city in British Columbia to be near his daughter, Margaret, and her husband, Arthur Anderson. For the next five or six years, he lived in a very pleasant retirement community and then moved into Chilliwack to an assisted living center where he remained until his death on September 12, 2002, only eight weeks before his ninety-eighth birthday.

Dan maintained throughout his life an amiable disposition and a twinkle in his

eyes, as well as an abiding interest in people and all aspects of the natural world around him. He was a beloved and much appreciated family and professional friend. We continue to miss our visits and intermittent stimulating phone conversations.

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# Stuart Cullen: My Years with Him in Iowa

By Kenneth Sugioka, M.D., F.R.C.A.

When I think of Dr. Cullen, the word equanimity comes to mind. I quote from Osler's *Aequanimitus*: "imperturbability (or equanimity) means coolness and presence of mind under all circumstances, coolness amid storm, clearness of judgment in moments of peril" end quote. My first experience with his equanimity came from a scene in the OR where all hell had broken loose and the patient was in peril. He walked into the room and "What's going on in here?" was the question he asked. Within a few minutes his actions removed the peril from the patient.



Fig. 1. Stuart Cullen, M.D.

This talk is not to cite his many accomplishments, nor is this a catalogue of his life, but it is one which describes him as a personal mentor. Having said this, I summarize his early C.V. as follows. Figure 1 is a photograph of him.

Dr. Cullen was born in Milton Junction, Wisconsin in 1909. He received both his undergraduate and M.D. degrees from the University of Wisconsin. After completing a rotating internship in Multnomah hospital in Oregon, he returned to Wisconsin for his surgical internship. He then went to serve his residency under E.A. Rovenstine at Bellevue Hospital in New York. "Rovy" was my consultant while I was an anesthesiologist in the Air Force. Among his stories about Dr. Cullen as a resident was one in which Rovy decided that Dr. Cullen's Midwestern clothing was not suitable for New York,

and he sent him to Barney's clothing store in the city. He also told me that he was a brilliant resident who never got into trouble as an anesthesiologist. I do remember Dr. Cullen telling me about purchasing his clothes at Barney's.

Upon completion of his residency, he went to Iowa in 1938 to head one of the early training programs in anesthesiology, then a division of surgery, which was later headed by Nathan Womack, and who later became chair at the University of North Carolina where I served as chair of Anesthesiology. My relationship with Dr. Cullen began while I was an intern in surgery with hopes of becoming a thoracic surgeon. He knew of my work with Jim Elam when we were both working in Evarts Graham's lab trying to further the development of the oximeter as a clinical tool. Dr. Cullen felt that oximetry had a great future in anesthesiology (he was right), and suggested that I could make a greater contribution in its development as an anesthesiologist rather than a surgeon. I did not want to give up my dreams of becoming a surgeon, but the "peril" incident in the OR stuck in my mind. I thought, "He's the kind of physician I'd like to be." So, I agreed to a residency in anesthesiology with the promise of laboratory time, which was a bit unusual for a resident to have in those times.

I was probably the first non-Caucasian house officer ever at Iowa and was subjected to many questions about my background. Once while I was anesthetizing a patient, the surgeon and I were carrying on a conversation when he suddenly asked,

"Why do you speak perfect English with a bit of a southern accent?" My reply was that my accent should not be surprising in view of the fact that my forebears were from southern Japan.

Dr. Cullen was a kind person. One of his acts of kindness was to offer a residency to a Chinese physician who had fled the communist regime in China. An amusing incident occurred when he (nicknamed Charley) was anesthetizing a patient and the surgeon repeatedly asked, "How's the patient doing, Charley?" Charley's answer was always, "Fine sir, thank you sir" which was almost the extent of knowledge of English. The surgeon then asked, "Patient's dead, isn't he, Charley?" and his reply was "Fine sir, thank you sir." When Dr. Cullen heard this, his comment was, "Ask a dumb question, and you'll get a dumb answer." Among his many kindnesses to me was when he called me at midnight at my hotel to tell me that I had passed after I had taken my oral boards that afternoon which I was sure I had failed.

Dr. Cullen was firm, but I never heard him berate a resident; nor did I ever hear him praise one profusely. The nadir of his comments on my performance as a resident came when I had really messed up and he had to bail me out. His comment to me was, "That was less than efficient, Ken." The zenith came after he had watched me successfully perform a difficult block. His comment then was, "Not bad, Ken."

The only reprimand I had from him came in an unusual form. I was chroni-



Fig. 2. Fellow Residents at Iowa

cally late getting to work in the morning and complaints were made to him about my tardiness. One morning I arrived late as usual and found Dr. Cullen in the OR with the patient prepared with an IV in his arm, labeled syringes filled with drugs, and the anesthesia machines in readiness. He greeted me by saying, "Thought I'd help you get started this morning." Needless to say I was never late after that.

I never saw him display any ego. Perhaps the closest he came to that was when someone commented that Bob Dripps had trained the most heads of anesthesiology. Dr. Cullen's comment was, "No other program than the one at Iowa ever had eight of a group of 14 residents become heads in academic anesthesiology." Those people who were trained by Dr. Cullen listed in alphabetical order are: Doug Eastwood at Washington University, Evan Frederickson at Kansas, Bruno Haid at Innsbruck, Austria, Bill Hamilton at Iowa and California, Jack Moyers at Iowa, Charles Pittinger at Vanderbilt, Kenneth Sugioka at North Carolina, and Joe White at Oklahoma. Figure 2 is a photograph of some of my fellow residents.

Dr. Cullen urged us to set goals for our future, which leads to a couple of amusing anecdotes about two of my fellow residents. Jack Moyers told me his goal was to become president of ASA, and he reached it. Bill Hamilton watched me work in my lab one day. He said he was going to let guys like me become academicians, but his goal was to find a nice town in Iowa where he could do private practice. Obviously, Bill did not reach his goal.

Dr. Cullen was possibly the most underappreciated of the greats in modern anesthesia. Even though he published 97 papers, wrote one of the first modern textbooks on anesthesia, and was honored by innumerable societies, his name rarely appears in publications dealing with historical figures in anesthesia. The reason for this might have been because in his later years he became an administrator. First as Chair at UCSF, and later dean at that institution and was not active in anesthesiology per se. However, his work as an investigator, (He published the first definitive article on the use of curare in anesthesia.) an outstanding clinician, and a great teacher would be difficult to match by anyone living or dead.

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# Scophedal (SEE) Was it a Fad or a Miracle Drug?

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## Abstract

The German firm E. Merck released in 1928, an injectable mixture of scopolamine, oxycodone, and ephedrine under the name SEE. This drug, renamed Scophedal in 1942 caused deep and prolonged analgesia, sedation, euphoria and amnesia without significant respiratory or circulatory depression. Used extensively by the German and Central European surgeons in the 1930s, Scophedal enjoyed immense popularity with the Wehrmacht's medical officers treating frontline mass casualties during World War II.

The use of Scophedal declined after 1945, and its production was discontinued in 1987. Despite the clinical enthusiasm it raised, SEE was never critically investigated. This drug may deserve a rigorous re-evaluation.

## Introduction

In 1928 the firm E. Merck (Darmstadt) released a compound combining three drugs: scopolamine, ephedrine (Ephetonin) and oxycodone (Eukodal) under the name SEE. The name was changed to Scophedal in 1942. The firm E. Merck had made extensive researches on those three components since the early 1900s. The mixture became popular in Germany and Central Europe in the 1930s and was extensively used for mass casualties by the Wehrmacht's surgeons during World War II. The drug lost popularity after 1945 and its production was discontinued in 1987.

The concept of mixing a sympathomimetic drug with sedative or analgesic compounds to prevent respiratory or circulatory depression was new in 1928. Some laboratory work and small clinical trials with similar mixtures were done in the US from 1942 through 1962 but remained experimental. Although widely used, Scophedal was never rigorously investigated. A drug which raised such enthusiasm may well deserve re-evaluation.

## The Development of the SEE Mixture

Scopolamine, discovered in the mid-

1870s was investigated by E. Merck chemists in 1893-1899 but raised no clinical interest at the time. In the early 1900s, however, it became popular in Germany after Schneiderlin reported the success of morphine-scopolamine mixtures to sedate agitated psychotics. Various combinations of morphine-scopolamine were widely used as potent analgesics in minor surgery as premedication for inhalation anesthesia, and especially for obstetrical "twilight".<sup>1,2,3</sup> Those mixtures, however, occasionally caused circulatory or respiratory collapse when used in repeated doses in psychiatry or at the onset of anesthesia.<sup>3,4</sup> For unclear reasons, some patients seemed to be abnormally sensitive to normal doses of scopolamine (idiosyncrasy).<sup>3,4</sup>

Hans Kreitmair (fig 1), a physician and brilliant chemist and pharmacologist, and head of E. Merck's Pharmacological Section, was asked to find an antagonist to scopolamine and to the morphine-scopolamine mixtures. He eventually combined ephetonin with scopolamine.<sup>4</sup> Ephetonin was the racemic form of the natural 1-ephedrine that Kreitmair had synthesized shortly before.<sup>5,6</sup> Its pharmacological action was identical to, but slightly more prolonged than, ephedrine. Ephedrine, isolated in the late 1880s, had been immediately investigated by the firm E. Merck but had found little clinical use until Chen and Schmidt showed its epinephrine-like effect in 1934.<sup>6,7</sup>

Kreitmair confirmed the ephedrine was a cardiac stimulant, vasoconstrictor, bronchodilator and stimulant of the respiratory center.<sup>8</sup> Its slow onset, moderate and prolonged action, and its lack of tissue toxicity made it vastly superior to epinephrine. Using huge lethal i.v. doses of scopolamine (100 mg/kg) in rabbits and cats, Kreitmair showed that the addition of small i.v. doses (2.5 mg/kg) of ephedrine or ephetonin maintained a normal respiration and blood pressure.<sup>4</sup> He then replaced morphine in his scopolamine-morphine mixtures with oxycodon

(Eukodal). Oxycodone (di-hydro-oxycodone) had been isolated by Freund and Speyer from the opium alkaloid thebaine in 1917<sup>9</sup> and tested in humans by Falk the same year.<sup>10</sup> The drug was marketed by E. Merck in 1919, under the trade name Eukodal. Both in laboratory animals and in humans oxycodone was found to be slightly more analgesic than morphine, and to have a more prolonged action and lesser side effects (nausea, drowsiness, circulatory and respiratory depression, and smooth muscle spasms).<sup>10</sup>



Figure 1. Hans Kreitmair, M.D.

Kreitmair showed that in cats an i.v. injection of a mixture of 40 mg/kg scopolamine, 2 mg/kg oxycodone, and 0.25 mg/kg ephetonin caused intense and prolonged sedation and analgesia while maintaining excellent vital signs. Ephetonin did not offset the sedation induced by scopolamine.<sup>4</sup>

After clinical trials,<sup>11</sup> E. Merck, in 1928, released the mixture scopolamine, eukodal and ephetonin for parenteral use under the trade name SEE. The drug SEE came in two strengths:

- a) SEE I (or Weak): each 1 ml ampul contained 0.5 mg scopolamine, 10 mg eukodal, and 25 mg ephetonin.
- b) SEE II (or Strong): each 1 ml ampul contained 1 mg scopolamine, 20 mg eukodal, and 50 mg ephetonin.

### Clinical Use of SEE in Civilian Practice (1928-1939)

As soon as it was released, the drug enjoyed an immense popularity among German, Central European and Scandinavian surgeons, as attested by their many enthusiastic reports.<sup>13</sup> They emphasized its profound analgesia, sedation, euphoria and amnesia, along with its circulatory and respiratory stability.<sup>13</sup> SEE in SC or IM injections was used alone or with local anesthesia for various minor procedures: dressing changes, wound debridements and sutures, reduction of fractures and dislocations, urological, gynecological and ENT endoscopies and small operations and dental surgery. It provided superb pain relief for biliary and renal colics.

SEE was also widely used as basal narcosis in general anesthesia. Basal narcosis was popular in Germany and Central Europe during the first half of the 20<sup>th</sup> century. Despite its esoteric name, basal narcosis was simply a very heavy premedication rendering the pre-operative patient unaware of his surroundings and allowing a rapid and smooth induction of general anesthesia, especially with ether, which was then replacing chloroform in Europe. Such sedation was produced with large doses of scopolamine, barbiturates, opiates, or avertine.<sup>14</sup>

In 1934, Martin Kirschner (fig 2) and his assistants in Heidelberg<sup>15,16,17</sup> promoted the i.v. injection of SEE II (Strong) for rapid management of the indications mentioned above and as adjunct for their new technique of segmental spinal anesthesia.<sup>15</sup> They slowly injected large doses (0.5 to 1.5 ml) of SEE II intravenously over several minutes until they induced heavy sedation. This practice was fast, efficient and generally safe although it occasionally caused respiratory depression or even arrest. This complication was immediately reversed with the i.v. injection of an analeptic (nikethamide or cardiazol).<sup>15</sup> Kirschner's reputation and the expediency of his technique help popularize the latter in surgery after 1935.<sup>17</sup>

### SEE (Scophedal) in World War II

SEE was adopted by the Wehrmacht's surgical service in 1938 or 1939. The exact date of its introduction is unknown as

the relevant E. Merck and Wehrmacht records were lost during World War II.<sup>12</sup> Kirschner, a general in the Medical Corps and an advisor to the Medical Inspectorate, may have influenced the Inspector's decision.<sup>18</sup> I.V. Scophedal was known in the Wehrmacht as "Kirschner's injection".<sup>19</sup> E. Merck sold annually over 2 million SEE ampuls to the German armed forces during the war years.<sup>12</sup>

Over 30 medical articles<sup>20-23</sup> and surgeons' personal communications<sup>24</sup> attest the immense popularity of the drug with the young surgeons treating mass casualties on the frontline. They used i.v. SEE for minor or short major procedures (wound debridements and sutures, reduction and casting of fractures, amputations, tracheostomies, etc.) and to provide pain relief in the severely wounded or moribund soldiers, as an adjunct to regional anesthesia, or to provide rapid induction to ether inhalation. Its prolonged action provided analgesia during the postoperative period and transport to the rear hospitals. Because of the drug's safety, the patients thus treated required little attention from the overburdened corpsmen. There was only rare mention of the restlessness caused by scopolamine in patients in pain, as often seen in twilight sleep.<sup>2,3</sup> Respiratory distress was not mentioned but may have occurred as several writers suggested that the drug not be given, or be used cautiously, in injuries compromising respiration (head traumas, wounds of the airway or chest).



Figure 2. Martin Kirschner, M.D.

SEE was less popular in rear hospitals, where the older, more conservative surgeons preferred morphine.<sup>19</sup> The "Consulting Surgeons" had occasionally seen seri-

ous complications from SEE.<sup>19</sup> "Consulting Surgeons" were medical authorities, generally university professors, attached to an army or an army group. They toured the frontline medical stations, observing, offering advice and lecturing. They also reported their findings to the Inspector General in Berlin. Those consulting surgeons had noticed occasional problems with scophedal: circulatory collapse in hemorrhaging patients, respiratory difficulties in patients with head or chest trauma, severe restlessness endangering the postoperative wounds, and, the commonest complaint, hypothermia and frost-bites in wounded who had received SEE before a long evacuation in the harsh Russian winters.<sup>19</sup> SEE was banned in one army. Several consultants suggested using morphine and pervitin (methamphetamine) rather than scophedal.<sup>19</sup>

The use of SEE in the Wehrmacht decreased dramatically in 1945 because of the difficulties in production and distribution caused by the Allied bombings.<sup>12</sup>

### Scophadel after World War II (1945-1987)

Scophedal continued to be used on a moderate scale by German, Austrian, Swiss and Scandinavian surgeons after World War II.<sup>12</sup> Newer analgesics and anesthetics, the adoption of American and British concepts and techniques, and the reluctance to use mixtures with fixed ratios of ingredients probably contributed to the decline of SEE. Production was discontinued in 1987.<sup>12</sup> The drug was never used in the United States or in Great Britain.

### Discussion

The addition of a sympathomimetic drug to an opiate to antagonize the latter's respiratory depression was independently investigated in the U.S. from 1942 through 1962. The work has been well reviewed elsewhere.<sup>25,26</sup> The researches were done in laboratory animals and in small groups of human volunteers but found no clinical application except in the armed forces.<sup>26</sup> Most investigators studied mixtures of morphine and amphetamine. Ephedrine was only tested by one group<sup>27</sup> and found to be much inferior to amphetamine. Amphetamine not only prevented the circulatory and respiratory depressions of morphine but also increased the latter's analgesia and decreased some of its unpleasant side-effects (nausea, vomiting, and drowsiness). A more recent, large clinical trial has confirmed those findings.<sup>28</sup> The Consultant Surgeons who recommended

*Continued on Next Page*

**SEE. . .** *Continued from Page 13*

the use of morphine and pervitin in the Wehrmacht<sup>19</sup> may have been aware of the encouraging results obtained in 1939 with opiate-pervitin mixtures<sup>29</sup> but there is no mention of the administration in the extensive literature on the use of pervitin in the Wehrmacht.<sup>30</sup>

**Acknowledgements**

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Key Words: Scopolamine, Ephedrine, Oxycodone, Analgesics, Sedatives, Sympathomimetic Drugs, Amphetamines, Surgery, Military

## Anesthesia History Association Ninth Annual Resident Essay Contest 2004

The Anesthesia History Association (AHA) sponsors an annual Resident Essay Contest with the prize presented at the ASA Annual Meeting.

Three typed copies of a 1000-3000 word essay written in English and related to the history of anesthesia, pain medicine or critical care should be submitted to:

William D. Hammonds, M.D., M.P.H.  
Professor of Anesthesia  
Director of Pain Outcomes Research  
Department of Anesthesia  
University of Iowa  
200 Hawkins Drive, 6JCP  
Iowa City, IA 53342-1079  
U.S.A.  
william-hammonds@uiowa.edu

The entrant must have written the essay either during his/her residency or within one year of completion of residency. Residents in any nation are eligible, but the essay MUST be submitted in English.

This award, which has a \$500.00 honorarium, will be presented at the AHA's annual dinner meeting to be held in October, 2004, in Las Vegas, NV. This dinner is always held during the annual meeting of the American Society of Anesthesiologists.

**All entries must be received on or before August 23, 2004.**

## Book Review

### 50 Jahre Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin. Tradition und Innovation. J. Schüttler, Editor, Springer-Verlag, 2003; Berlin, Heidelberg; XVI and 584 pp.

By Prof.dr. Joseph Ruprecht  
WFSA - Hon. Archivist  
Universities of Rotterdam and Ljubljana

Writing anaesthesia history was considered to be a proof of professional maturity by the famed anaesthesia historian Gwenifer Wilson. In 1987 she authored the enviably beautiful *Fifty Years (1934-1984) of the Australian Society of Anaesthetists*. The Dutch followed by 4 decades of similar history *Van aether naar beter (1948-1988)* but would do it really well in 1998 with *Het kan nog beter*. Doctor N. Parbhoo recorded the *Five decades* of the South African Society (1943-1993). This was followed by the grand societal work *History of the Assoc. An. Great Britain and Ireland, six decades (1932-1992)* by Thomas Boulton, which appeared in 1999. The 2002 saw appearance of the *50-Year Jubilee* book of the Swiss Society of Anaesthetists. The Scandinavians also did not fail to produce their joint 50 Years commemorative book. The *WFSA - 50 years* has been announced by The World Federation of Societies of Anaesthesiologists, planned to appear in 2004.

No two of these books are really alike; a proof that past can be recorded in many different ways. The most recent addition to the history of national anaesthesia societies is the impressive *50 Jahre Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin*, edited by J. Schüttler and superbly produced by Springer-Verlag. The subtitle qualifies the 50 years as Tradition and Development. One could add *Reunion with the many* to the subtitle because the book revived vivid memories of many distinguished German colleagues that I have had the honour and fortune to know. One recalls also the unforgettable professional events which took place in Germany.

This monumental work is intimidatingly comprehensive, beautifully produced with 574 pages, but not an easy read. Following the celebratory forewords of various institutions, the book consists of 4 thematic parts. Some attention is paid to anaesthesia in Germany before 1945. History of scientific journals is interesting to read but I failed to understand why publishing in English never became popu-

lar in Germany. The development of subdifferentiated branches of anaesthesia like intensive care, pain treatment and emergency medicine is followed by a long list of individual histories of German University departments of anaesthesia. Connecting the 66 different chapters there are lovely photographs of historical items like drugs Coramin of Sympatol, presumably from H. Stoeckel Anaesthesia History Museum, Bonn.

The book is well illustrated and overwhelmingly precise, which is amazing with the immense quantity and variety of data presented. There is a good name index but I bitterly missed the subject index. The book will certainly find many individual buyers and will have to be on each German departmental bookshelf. The 50-Year Jubilee Book testifies to the notable contributions of German medicine to anaesthesia in general. It would have been helpful to have had a chapter discussing German anaesthesia history in the global context of anaesthetic history.

To me the most important part of the book is the description of how difficult it was for anaesthesia to become an independent specialty in Germany. Sir Robert Macintosh visited Germany before the 2nd World War and the students laughed long and loud when they were told that anaesthesia had become an academic science in U.K. The same arrogant attitude, so discouragingly lacking in fantasy and the feel for novelty is also evident from the 1939 September categorical negative response from the medical establishment to Prof. Killian's request for the independency of anaesthesia. It took the shock of the war and undeniable foreign influence before German anaesthesia started its successful 50 years.

In short, the *50 Years* is so excellent that the Editor Prof. Schüttler, all contributors and the German Society should be congratulated and a wish that the publishers will make it available in English.

*Join the Greats!*

**Virginia Apgar  
(1909-1974)**

A graduate of Columbia University College of Physicians and Surgeons in 1935, Virginia Apgar trained in Anesthesiology with Wright Mason and James Brimacombe before returning to her alma mater in 1938 as Director of the Division of Anesthesia. When Anesthesiology was given department status at Columbia in 1945 and Anesthetist Apgar was named chairman, Dr. Apgar drew on *Essays on Anesthetic Anesthesia*. Her idea of a score to assess patients was his response to a medical student's question in the hospital cafeteria. It was presented at a meeting in 1952 and published in 1953. The production cover included research concerning neonatal acid-base status and the effects of maternal anesthesia on the fetus. Dr. Apgar was appointed Director of the March of Dimes in 1955.



**Join the Anesthesia History Association**

Membership information:  
[http://www.anes.uab.edu/anesthesia\\_history\\_association.htm](http://www.anes.uab.edu/anesthesia_history_association.htm)  
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This is a non-affiliated poster. Photo by Charles White. Acknowledged Special Collections, Columbia University Health Library, Division of Anesthesiology, University of Wisconsin-Madison, Madison, WI, USA.

Featured in the best Anesthesiology departments worldwide. Post yours with pride.

If you don't have a poster and would like one, please contact Mark Schroeder, M.D., at 608-263-8100.

## Book Review

### Poetry month is over; time to get psyched\*

By Alex Beam, *Globe Columnist*, 5/1/2003

#### Moving on

So goodbye to poetry month, hello to National Mental Health Month. Today also kicks off the 10th annual meeting of the Anesthesia History Association, at the Westin Copley Place. A sleepy subject, you say? Far from it! The furious scuffle over credit for the invention of anesthesia has triggered "the most destructive feud in medical history," according to Boston University professor Douglas Starr.

Three men - two dentists and a chemist - all demanded credit for the amazing results of "Ether Day," Oct. 16, 1846, when surgeon John Collins Warren painlessly removed a tumor from a patient's neck under the storied "Ether Dome" of the Massachusetts General Hospital. For years, Boston dentist William Morton, who supplied the sulfuric ether for Warren's operation, was the hero of the story. But research published three years ago by Richard Wolfe, a former curator of Harvard's Countway Library of Medicine, asserted that Morton was a "nogoodnik" who stole the idea of anesthesia from Horace Wells, a Hartford dentist, and failed to credit Boston chemist Charles Jackson for his invaluable aid.

This dispute had big consequences. Convinced he had been jobbed, Wells committed suicide, using chloroform, at age 33. Jackson supposedly happened upon Morton's grave in Mount Auburn Cemetery, saw that the headstone declared his rival to be the "inventor and revealer" of anesthesia, and lost his mind. Jackson ended his days at the McLean psychiatric hospital, although his supporters insist that he was more of a boarder than a patient.

There has been a movie about the ether kerfuffle, Preston Sturges's "The Great Moment," released in 1944, starring Joel McCrea as Morton, as well as a popular history, Julie Fenster's recent "Ether Day: The Strange Tale of America's Greatest Medical Discovery and the Haunted Men Who Made It."

Now there is a small, self-published



Photo of Dr. David Lai with Dr. Mark Schroeder, Dr. William Hammonds, and Patrick Sim at the Ether Dome in Mass General, April 30, 2003.

travel guide to the Stations of Ether in the Boston area, written by Dr. David Lai, an attending anesthesiologist at the Beth Israel Deaconess Medical Center. The confusing title, "Barrell of Lunatics: Places Associated With the First Public Demonstration of Ether Anesthesia," refers to the Barrell estate, McLean's original home in Somerville. But there are wonderful pictures, including Dr. Leroy Vandam's famous watercolors of Morton's home in Charlton, and a drawing of Morton's estate, Etherton, now Morton Park, near the present-day site of Wellesley's Town Hall.

You can order Lai's book directly from the author at [dlai@bidmc.harvard.edu](mailto:dlai@bidmc.harvard.edu).

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*This story ran on page D1 of the Boston Globe on 5/1/2003 and is excerpted here with permission from the Boston Globe.*

# MedNuggets

by Fred J. Spielman, M.D.

Professor

Department of Anesthesiology, University of North Carolina

When the attitude of the surgeon is not that of admitting and admiring the fact, when a difficult operation of great surgical magnitude is successfully completed, that no small part of the success of the operation is attributable to a nonevident but real part of it, that is, the anesthetist and his anesthetic methods, the anesthetist's value will again be compromised.

—Frank H. Lahey

*Surgery Clinics of North America* June, 621, 1950

It speaks well for the safety of the anesthetic (spinal) when we state that in this clinic the interne who administers it is changed every three months and, except for practice on the cadaver and by observing others, has had no previous experience.

—C.B. Schutz

*Surgery, Obstetrics, and Gynecology* 40:281, 1928

The history of the development of anesthesia is as brilliant and colorful as it is cautious, painstaking and protective.

—Cloyce R. Tew

*American Journal of Surgery* 27:289, 1935

The anesthetist must, in many instances undertake duties of considerable gravity, and he should be thoroughly equipped, not only by medical qualifications, but physically, by possessing perfect senses of sight and hearing, keen scent and gentleness of touch.

—H. Bellamy Gardner

*American Yearbook of Anesthesia and Analgesia* 1:115, 1915-6

The main thing in giving an anesthetic is not to feel hurried. Do not rely on any one danger signal, but carefully watch all symptoms.

—Current Medical Literature

*Journal of the American Medical Association* 32:1434, 1899

If the status of the specialty is to be improved through research, it will come about largely because anesthesiology develops a body of research which is uniquely its own.

—William E. Porter

*Anesthesiology* 25:436, 1964

The National Fire Protection Association recommends that shoes worn in hazardous locations, such as operating rooms, have a resistance to flow of electricity of less than 1 megohm. Shoes with conductive rubber soles usually meet the recommended specifications. However, the presence of dirt, wax, soap, and so forth may interfere with the conductivity. Hence it is wise to check the shoes frequently.

—James P. Hensen

*Anesthesia and Analgesia* 37:352, 1958

In general, spinal anaesthesia is to be preferred to other anaesthetics for splenectomies, nephrectomies, lumbar sympathectomies, intestinal obstructions, where complete muscular relaxation is desirable.

—C.I. Junkin

*Canadian Medical Association Journal* 28:53, 1933

There is every justification for the formation of special teams composed of anaesthetists, physicians, neurologists, surgeons, physiotherapists and nurses, and they should be suitably equipped to deal with patients with respiratory difficulties for various types of disorder.

—Editorial

*British Journal of Anaesthesia* 3:97, 1958

Whatever the method, there appears to be a definite incidence of minor sequelae which follow intubation, and it is probable that as skill decreases, so this incidence increases, and the more likely it is to become a major hazard. This does not suggest that intubation should be rarely practiced, but that there should be a reasonable indication for its use.

—W.D. Wylie

*Anaesthesia* 5:143, 1950

I am particularly against spinal anesthesia. There is a great wave of spinal anesthesia throughout the country. There is a little too much enthusiasm about it and it is bound to result in a high mortality.

—Joseph P. DeLee

*American Journal of Obstetrics and Gynecology* 20:845, 1930

During my internship I was trained by a nurse. I was given a cone, a can of ether and a few empirical tricks.

—Howard W. Haggard

*Anesthesiology* 1:1, 1940

The most cheering thing about our specialty is that no rogues enter our ranks, there being insufficient remuneration to attract them.

—Frances E. Haines

*Anesthesia and Analgesia* 6:25, 1927

Not only does good anesthesia make advanced surgery possible and practical, it also in part protects patients from poor surgery, since it gives the inept surgeon time to blunder his way to some solution.

—John B. Dillion

*Journal of the American Medical Association* 190:123, 1964

But now a change in the character of the anaesthetist's functions has occurred and, with this new development, the anaesthetist assumes heightened responsibilities, which elevate him in medical specialty. He is no longer a technician but a specialist and a consultant and obviously he must be a medical graduate.

—P.H.T. Thorlakson

*Canadian Medical Association Journal* 55:489, 1946

# From the Literature

by A.J. Wright, M.L.S.

Associate Professor of Anesthesiology  
Director, Section on the History of Anesthesia  
University of Alabama at Birmingham

*Note: In general, I have not examined articles that do not include a notation for the number of references, illustrations, etc. I do examine most books and book chapters. 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 but concern individuals important in the history of the specialty [i.e., Harvey Cushing or William Halsted]. 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" in the "Anesthesia History Files" at <http://www.anes.uab.edu/aneshist/aneshist.htm> I urge readers to send me any citations, especially those not in English, that I may otherwise miss!*

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Continued on Page 20



## History of Anaesthesia Society

### ADVANCE NOTICE

#### *Sixth International Symposium on the History of Anaesthesia Queens' College Cambridge 15<sup>th</sup> to 18<sup>th</sup> September 2005*

Substantial Cash Prize  
(To be confirmed as the John Bullough Prize)

For all persons in training on 31<sup>st</sup> December 2004, there will be the opportunity to compete for the Trainee Prize at the Sixth International Symposium on the History of Anaesthesia. Essays on any topic in the history of anaesthesia will be accepted. This includes, but is not limited to anaesthesia, analgesia, pain medicine, critical care medicine, veterinary medicine. The best five papers will be presented before an international panel at the meeting, and the prize awarded, following adjudication. Papers deemed of sufficient merit, but not the final five, will also be offered the opportunity to present during the Symposium.

All papers and presentations are to be in English which will be the language of the Symposium. All papers must be received by Dr. Adams by 11<sup>th</sup> January 2005

Further information from:

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