The Lewis H. Wright Memorial Lecture

From Symmetrical to Asymmetrical: A Historical Perspective

by Joseph F. Artusio, Jr., M.D.

October 22, 1996—New Orleans, Louisiana

We are here today to honor Dr. Lewis H. Wright, an anesthesiologist who was known by many of us as a warm, quiet, reserved physician. Lew Wright was a great collector, and much of the early collection of the Wood Library-Museum was collected by him. He was a huge man, but gentle in manner. He was always interested in what was new, and I remember him vividly, on many occasions, stopping me at meetings with a warm greeting. I distinctly remember that, in my early days as an anesthesiologist when I was attending the early meetings of the American Society and the Post-Graduate Assembly, Lew Wright was always there. He was walking the hall, greeting people, and made one feel needed in this young and growing specialty. Lew Wright, those who knew you, miss you!

In the first half of this century, anesthesia was administered by nurses or interns. However, there was a nucleus, a handful of dedicated pioneers in the 1920s, '30s, and '40s, who saw the dire need to provide safe anesthesia for surgical procedures. All of us are descendants from that fantastic nucleus. They saw the need for physician administered anesthetics and devoted most of their practice to the administration of anesthetics. They were mostly self-taught and then taught others by the apprentice system. They visited in their other hospital, from which evolved the Travel Club, now the prestigious Academy of Anesthesiology. The early anesthetists frequently transported their own machines, crude as they were by today's standards, to administer anesthesia from hospital to hospital. There was no certifying board to establish an examination system to test competence. There was no norm for quality of care, and yet thousands upon thousands of people were anesthetized with the symmetrical diethyl ether. Fortunately, this marvelous anesthetic had a sufficiently high aqueous solubility and fat solubility so that cardiac overdose was not readily produced, and usually respiration would stop associated with deep anesthesia prior to cardiac arrest. In spite of the relative safety of this drug, people died during surgery from improper administration of the anesthetic, mostly associated with airway obstruction. Today, unfortunately, the major causes of deaths associated with anesthesia, although relatively small, are still related to various forms of airway obstruction. Little was known of the detailed pharmacology of diethyl ether, other than it produced unconsciousness, analgesia and amnesia, and stimulated respiration. When patients died on the operating table, even during the most minor of surgical procedures, if no direct cause could be found the death was attributed to a vague etiology called status thymoco lymphaticus. I find that no one really knew what that diagnosis meant, other than that the heart stopped in the anesthetized patient and the patient died on the operating room table during surgery. Attempts at resuscitation were at best feeble, so to administer these pain relieving inhalants it took courage and dedication.

The anesthesia machines of the day were simple. The fail-safe systems had not arrived. The closed circle system held sway and the to-and-fro system of delivering anesthetic gases to man. He further improved on carbon dioxide absorption and completed the clinical work on the new symmetrical hydrocarbon anesthetic agent, cyclopropane, in conjunction with Emory Rovenstine and Bill Neff. This was the beginning of modern academic anesthesia. The last diethyl ether induction administered at The New York Hospital occurred in 1984. [At this time Dr. Artusio presented the video record of this anesthetic.]

There were few endotracheal tubes available prior to World War II. Various types of airways were used to maintain the patency of the airway during the anesthetized state. The first endotracheal tubes were placed for intrathoracic procedures in order that the patients' lungs could be ventilated without inflating the stomach, and incidently, to prevent the aspiration of gastric contents into the tracheobronchial tree. The early tubes had no cuffs. The pharynx was packed with saline soaked gauze to provide a fairly tight fit to maintain the closed system. The endotracheal cuff came later and most of the early cuffs were hand made.

We were taught and we taught others that the inhalational anesthetics were exhaled metabolically unchanged from the lungs, with some unchanged drug escaping in the urine. However, our research during...
 Presidential Retroprospectum

The insignia of the Association now residing on my desk at the University of Washington accentuate my trepidation at becoming president of the Association. Emblems of friendship and confidence, they challenge my determination to serve your interests as assiduously and effectively as have my predecessors. Fortunately, a dedicated Council and numerous enthusiastic members virtually guarantee the success of forthcoming meetings, to be graced by many worthwhile and thoughtful explorations of our past. There will be talks, posters, writings and feasts. What our story lacks in theorectic foundations, it more than makes up for with a sesquicentury of relief to physical and mental suffering.

But a new volume is open. On page one, technical progress presents a large and perplexing area of concern, where action or inaction involves extremely complicated considerations whose resolution can be greatly assisted by history and debate. Anesthesiologic practice increasingly involves multi-faceted dilemmas—private, public and professional—arising out of modern medical dominion over life and death: one recent example is the careful discussion by R.D. Bastro of ethical concerns in anesthetic care for patients with do-not-resuscitate orders (Anesthesiology 1996;85:1190-3).

The background and history of biomedical ethics embraces some of the most sensitive personal and societal issues of our times, where fateful decisions call alike on the mature judgment of anesthetists who are physicians and (perhaps less frequently) on that of anesthetists who are not. The information and broad experience required for judicious resolution of such matters demand careful advance study and debate, in which recent history can actually benefit from a “whiggish” approach. The ability to see today’s winning or losing side, as a culmination of a past supplied by historians such as us in the form of past and present case-studies, can provide instructive guidance to thought and deed. Who shall live—perhaps against their will? Who shall be allowed to die? Whose brain is dead enough for the rest of the body to follow? Who shall receive or be denied the vital transplant, the cardio-pulmonary resuscitation, the life-saving or life-ending prenatal or neonatal intervention? There are any number of acute problems where timely and considered responses require advance exploration and study. Bioethics is becoming a province of anesthesiology and intensive care, where digested knowledge of the past provides essential illumination for the present, and as such is of equal relevance and potential appeal to the resident in training and the qualified specialist.

Almost suddenly, we are asked to explore a new sector of history and to devise a new instrument for that purpose, a retroprospectroscope with objectives fixed simultaneously on the past, the present and the future. The territory is exciting and proclaimed recently enough for all to be equal starters. It calls for a broad perspective in the service of society, infused with history, philosophy, medical science and wide anesthesiologic know-how—a fascinating and relevant field for the Anesthesia History Association.

—B. Raymond Finn, BSc, MB, FRCA

H E L P ! !

One of our correspondents needs assistance. Although the following quotations are well-known, their original authors are not. If any of our readers can cite their origin, a great service would be done. The first quotation is:

“There is minor surgery, but there is no minor anesthesia.”

The second is:

“There is no minor surgery, there are only minor surgeons.”

Please send your replies to the Editor.

Annual Resident Essay Award

The Anesthesia History Association announces the second annual Resident Essay Award to be presented at the History Association Dinner in conjunction with the American Society of Anesthesiologists 1997 Annual Meeting in San Diego, California.

A 1500-3000 word essay related to the history of anesthesia, pain management or critical care should be submitted to: Doris K. Cope, M.D., University of South Alabama, Department of Anesthesiology, 2451 Fillingim Street/MSTN 610, Mobile, Alabama 36617 USA.

The entrant must have written the essay either during his/her residency or within one year of completion of residency. The recipient of the Resident Essay Award will receive a $500.00 honorarium and the manuscript will be presented at the Meeting of the Anesthesia History Association and subsequently published in the Bulletin of Anesthesia History.

Entries must be received on or before September 1, 1997.

PAUL M. WOOD FELLOWSHIP AWARDS

The Wood Library-Museum of Anesthesiology (WLM) each year offers four Fellowship Awards to residents in training in anesthesiology, physicians in other disciplines, historians, graduate students of the history of medicine and other individuals with a developed interest in library and museum research.

Prospective candidates may request application information from Mr. Patrick Sim, Librarian; Wood Library-Museum of Anesthesiology; 520 N. Northwest Highway; Park Ridge, IL 60068-2573. The completed application should be returned to Mr. Sim with a current curriculum vitae, reprints of no more than five prior publications and a research proposal not exceeding eight double-spaced pages. Four copies of the application and each supporting document should be returned before January 31, 1997. All applications will be judged by a committee of the Board of Trustees of the WLM. The Fellowships will be awarded before April 1, 1997.

Fellows will receive a grant of $500.00 to support their work at the WLM or elsewhere. In addition, individuals who must travel more than 100 miles to the WLM will receive funds equal to one round-trip economy class trip by air to and from their residence. Fellows who are obliged to stay near the WLM during the term of their Fellowship shall be eligible for per diem support of $125.00 for a period not to exceed fifteen working days.

The WLM Librarian will supervise the Fellow’s use of the facilities and will provide an office or appropriate working space. Archival material selected for duplication will be reproduced without cost by the library staff. The Board of Trustees requires that a Fellow present the Librarian with copy of any manuscript that incorporates information gained during the course of the Fellowship.
Annual Dinner and Meeting
Anesthesia History Association

Approximately 75 guests and members of the Anesthesia History Association had a most enjoyable meeting and dinner at the Westin Canal Plaza in New Orleans on October 22, 1996, at the Annual ASA meeting. (See photos on pages 11-14)

Guests at the dinner introduced by the President, Dr. Lucien E. Morris, included Dr. Gwenifer Wilson, 1996 Laureate of the History of Medicine of the Royal Society of Medicine, Dr. Jochon Schulte-Am-Esch, and the winner and runners-up of the First Resident Essay Award.

Dr. Schulte-Am-Esch spoke briefly about the forthcoming Fourth International Symposium on the History of Anaesthesia, to be held at the Congress Centrum in Hamburg, Germany, from April 26-29, 1997. He urged that we all plan to attend may be obtained by writing to: Prof. Dr. J. Schulte-Am-Esch, Department of Anaesthesiology, University Hospital Eppendorf, Martinistrasse 52, D-20246, Hamburg, Germany.

Dr. Doris Cope presented the First Resident Essay Award to Major Eric A. Schoenberg, M.D., Eglin Air Force Base Hospital, for his submission titled, “The Birth of Scientific Pain Control: S. Weir Mitchell and the Turner’s Lane Military Hospital.” Certificates were presented also to the two second-place winners, Dr. Mark A. Postler, Wilford Hall Medical Center, for his presentation titled, “An Historic Perspective on Opium and its Therapeutic Uses Throughout the 18th and 19th Centuries,” and to Dr. Warren S. Sandberg, Massachusetts General Hospital, for “Legends and Fish Stories: Oral History in Anesthesiology.” These and the other 13 papers submitted will be published in the Bulletin of Anesthesia History.

The first R.K. Calverley Memorial Lectures was presented by Selma H. Calmes, co-founder with Dr. Calverley of the Anesthesia History Association. She presented an excellent historical review of “The Economic Basis of Anesthesia.”

Dr. Lucien Morris announced that the incoming President of the A.H.A. is Dr. B. Raymond Fink. In his unavoidable absence from the meeting, Dr. Morris turned the gavel over to the incoming Vice-President, Dr. C. Ronald Stephen, who adjourned the meeting.

Ether and Chloroform—The First 20 Years—Sesquicentennial Meeting

On Thursday, January 16, 1997, at the Queen Elizabeth II Conference Centre, Broad Sanctuary, Westminster, London, the Association of Anaesthetists of Great Britain and Ireland, the History of Anaesthesia Society, and the Sections on Anaesthesia and History of Medicine of the Royal Society of Medicine are sponsoring a Sesquicentennial Meeting on “Ether and Chloroform—The First 20 Years.” This all-day program features outstanding presentations, culminated by a celebration dinner on Friday, January 17, at the Dorchester Hotel, Park Lane, London.

The Winter Scientific Meeting of the Association of Anaesthetists will follow the Sesquicentennial meeting on January 17 and 18, 1997.

Further information concerning these meetings may be obtained from The Ohmeda Educational Co-ordinator, Association of Anaesthetists of Great Britain and Ireland, 9 Bedford Square, London WC1B 3RA. Tel: 0171 631 1650.

Newsletters 1982–1995 of the Anesthesia History Association

Through the assiduous work of Dr. Doris Cope and under the joint sponsorship of the Wood Library-Museum (WLM) and the Anesthesia History Association (AHA), the first 13 years of the Newsletter of the AHA have been reprinted in a large volume now available at the WLM.

A comprehensive index has been prepared by Miss Sally Graham so that historical articles and references in the Newsletter may be found easily.

This valuable book may be obtained at a cost of $50.00 postpaid by writing to:

Wood Library-Museum of Anesthesiology
520 N. Northwest Highway
Park Ridge, IL 60068-2573

Annual Spring Meeting of the Anesthesia History Association

WHERE: The Anesthesia History Association’s fifth annual Spring Meeting will be held April 3, 1997, at the Woodlands Inn, Colonial Williamsburg, Virginia.

WHAT: The opening plenary address will be delivered by Audrey C. Shafer, M.D., Assistant Professor of Anesthesia, Stanford University School of Medicine and the author of “Metaphor and Anesthesia” (Anesthesiology 83:1331-1342, 1995). The title of her talk is, “Reading Between the Lines: The Language of Anesthesia.”

Abstracts for twenty-minute papers are invited on historical aspects of anesthesia, critical care medicine and pain management. Abstracts on medical humanities and/or ethical topics that relate to the history of one or more of those broad areas are also invited.

Abstracts should be no longer than one 8½" by 11" sheet of paper. If possible, abstracts should indicate the research problem, sources used, methodological approach and may contain no more than 10 references.

HOW: Abstracts may be submitted by mail, fax or electronic mail (in plain text format). Disc submission in DOS-compatible format is also permitted. Abstracts submitted in electronic format may be made available to registrants in advance of the meeting and at various Internet sites as chosen by the Organizing Committee. ALL accepted abstracts will be included in the abstract book distributed to meeting registrants.

Individuals who wish to organize a paper session around a theme should contact the committee.

WHEN: Deadline for submission of all abstracts is 31 January 1997.

Address inquiries and abstracts to: A.J. Wright, MLS, Chair; AHA97 Spring Organizing Committee; Department of Anesthesiology Library; University of Alabama at Birmingham; 619 19th Street South JTF65; Birmingham, AL 35233-6810.

205/975-5114, ext. 304 (voice); 205/975-5963 (fax); meds002@uabdpo.dpo.uab.edu OR awright@ms.jt.anes.uah.edu

Anesthesia History Association
1997 Annual Spring Meeting
Program to Date

Wednesday, April 2, 1997; Woodlands Inn, Colonial Williamsburg, Virginia, USA
Opening Reception 5:30-7:30 pm

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In 1995, under the Chairmanship of Nicolas M. Greene, M.D., the seven members of the Laureate Committee of the Wood Library-Museum of Anesthesiology—one from the United Kingdom, one from Germany, one from the Netherlands and four from the United States—received 14 nominations, six from overseas (Australia, Italy, Lebanon, Russia and the United Kingdom) and eight from the United States, to become Laureate of the History of Anesthesia. It was with great pleasure that the Laureate Committee announced at the October 1995 ASA Annual Meeting that Dr. Gwenifer C.M. Wilson was designated as the first Wood Library-Museum Laureate.

On October 22, 1996, just prior to the Annual Lewis H. Wright Memorial Lecture at the Annual A.S.A. meeting in New Orleans, Dr. Wilson was presented by Dr. Greene to an appreciative audience with the medal of the Laureate of History of Anesthesia and a scroll so designating her.

A short history of the career of Dr. Wilson was included in the brochure accompanying the presentation. It reads as follows:

Born in Australia, Dr. Wilson graduated from the University of Sydney Medical School in 1939 and started her clinical and anesthesia training at the Balmain Hospital in suburban Sydney. In 1956, she transferred to Sydney Hospital and St. George Hospital. There, she served as Honorary Anaesthetist from 1956 to 1968 and continues to serve there as Honorary Consultant Anaesthetist.

In 1961, Dr. Wilson began her study of the history of anesthesia by probing deeply into the fascinating story about how the news of anesthesia got to Australia in 1847. She also found, during her review of early Australian medical journals, that the word Anesthesia never appeared in any of the early indexes of medical literature. This she compensated for by creating her own index, later published, of citations dealing with anesthesia in all early Australian medical journals. She has presented 42 invited lectures, has published 43 articles on the history of anesthesia and, for many years, has provided a striking visual history of anesthesia on the front cover of the Australian anaesthesia journal Anesthesia and Intensive Care. Now, we have the culmination of all her studies and all her work throughout the years with the publication of the first volume of her magnum opus, the 690-page One Grand Chain, A History of Anaesthesia in Australia, 1846-1962.

In her career, Dr. Wilson has been afforded many richly deserved honors and has occupied many prestigious positions in anesthesia and related organizations. These include a Doctorate of Medicine postgraduate degree awarded by the University of Sydney in 1995 for her thesis on the history of the Australian Society of Anaesthetists 1934-1984 and her Bibliography of References to Anesthesia and Related Subjects in Australasian Medical Publications 1846-1962. This was the first postgraduate Doctorate of Medicine degree awarded in Australia for medical history. She was a founding member of the Faculty of Anaesthetists of the Royal Australasian College of Surgeons in 1952 and became a Fellow of the Faculty of Anaesthetists, Royal Australasian College of Surgeons in 1956 and a Fellow of the Australian and New Zealand College of Anaesthetists in 1992.

Dr. Wilson also served as Secretary of the Australian Society of Anaesthetists (1954-56), as a member of the Executive Committee of the Australian Society of Anaesthetists (1951-56), as Honorary Historian of the Faculty of Anaesthetists, Royal Australasian College of Surgeons (1966-92) and as Honorary Historian and then Historian Emeritus of the Australian and New Zealand College of Anaesthetists. Dr. Wilson also served as Postgraduate Lecturer in the history of anaesthesia in the Nuffield Department of Anaesthetics of the University of Sydney (1962-82).

Dr. Wilson's career reflects the thoroughness, scholarship, meticulousness and dedication needed to produce definitive studies of the history of anesthesia. We thank her for her contributions to the specialty of anaesthesia as well as for the intellectual and academic example she has set.

—Nicholas M. Greene, M.D.
Abstracted from the journal Anesthesia with permission
Vol. 85, No. 10, October 1996

There follows in the brochure some information about the genesis of the Laureate program:

The Wood Library-Museum of Anesthesiology Laureate of the History of Anesthesia was created to honor those who have made singular contributions to the history of anesthesia and to increase interest in the study of the history of anesthesia. The award is to be presented every four years. Eligible for the award are all physicians and historians, regardless of nationality, who have made seminal contributions to the history of anesthesia, as evidenced by publication of books, monographs or articles in peer-reviewed journals. Nominations for the award can be offered by anyone and are solicited by mail sent throughout the world more than a year in advance by an internationally constituted Wood Library-Museum Laureate Committee. The entire program is international in scope and design.

Details of the nomination process and how the Laureate Committee elects the Laureate can be obtained by mail: Laureate of the History of Anesthesia Committee, Wood Library-Museum of Anesthesiology, 520 N. Northwest Highway, Park Ridge, IL 60068-2573; e-mail: <wlm@ASAhq.org>; or telephone (847) 825-5586.

The Wood Library-Museum of Anesthesiology is a nonprofit foundation of the American Society of Anesthesiologists, dedicated to maintaining one of the world's largest collections of anesthesia-related publications, periodicals, rare books, equipment and artifacts. It is located in the headquarters building of the American Society of Anesthesiologists in Park Ridge, Illinois.
the development of methoxyflurane showed that in fact the inhalational anesthetics were metabolized and the nature of the metabolic fragments formed would be the key to understanding the nature of inhalation anesthetic toxicity. From that knowledge came the development of methodology to produce inhalation anesthetics of minimal toxicity.

Anesthetics were administered following the Guedel signs of anesthetic depth. The only control of respiration was depth of anesthesia, whether the patient was light and stimulated by the sensory input of the surgery, or depressed from the effect of the anesthetic on the respiratory mechanism. Assisted or controlled respiration was frowned upon as spontaneous respiration using diethyl ether was used as one of the guides to depth of anesthesia. Assisted respiration came into vogue when the respiratory depressant, cyclopropane, was introduced. With the advent of "Muscle Relaxants," controlled ventilation became a necessity. There was a time when the educated hand was favored over the "ventilator." But when the volume controlled ventilator superseded the pressure controlled ventilator, mechanical ventilation was here to stay. The only monitors of depth were the character of respiration, the blood pressure cuff, and a finger on the pulse. However, I want to impress upon you that there was constant contact with the patient to observe the color of the skin and also to determine whether the skin was wet or dry. Pupillary size and intercostal activity was watched to judge the depth of anesthesia and to provide necessary relaxation for intra-abdominal procedures.

The ECGs had not arrived in the operating room. Eventually, the cardioscope was available in the operating room, but ECG monitoring was used only for the most seriously ill. Induction of anesthesia was slow and tedious and special induction rooms were used prior to entrance into the operating room. Absolute silence was mandated during the induction of the nitrous oxide to ether sequence, as it was believed that there was great danger that hyperreflex irritability during anesthetic induction would produce ventricular fibrillation. Nitrous oxide helped smooth the induction of the ether anesthetic, using the second gas effect and the concentration effect. Often, the induction of anesthesia was associated with the so-called second stage of anesthesia, which was marked by movements of the patient, athetoid movement and sometimes severe muscle activity. Surgical anesthesia of the day was a state of so-called physiological well-being. The patient was quiet. Muscle activity had ceased and the patient's blood pressure and pulse rate, which had been elevated during the excitement stage, had returned to near pre-anesthesia levels.

Interestingly, this state of hyperactivity did not reappear during emergence from anesthesia. Suffice it to say that the anesthesiologist of that period felt quite secure with the premedicated patient. Millions of patients underwent surgery with application of these fundamental Guedel principles.

Today, we rarely look at the pupil. Most anesthetic agents today produce a pinpoint pupil which only dilates during profound depth of anesthesia. The anesthesiologist of today, using an adequate dose of a peripheral muscle relaxant, must depend on signs of depth completely limited to whether unblocked sensory input produces a systolic hypertension and tachycardia, or anesthetic overdose produces hypotension.

During that period, there were patients who were considered unfit for surgery and anesthesia. Many procedures were done in several stages. It was believed that such patients could not tolerate anesthesia and surgery. Perhaps a little of that concern might be advantageous today. The current opinion seems to be that, with judicious management, there is no patient who is in too precarious a state to receive an anesthetic, or too ill to have an extensive surgical procedure.

Curare, a symmetrical compound, through the clinical demonstration of Harold Griffith, became available to aid in tracheal intubation and to open and close the abdomen. Scott Smith allowed himself to be paralyzed, intubated and ventilated to demonstrate that, in man, curare was without central effect. The neuromuscular blockade could be antagonized by neostigmine or by edrophonium, the anti-curare that Riker, Wescoe and I developed in the 1960s known as "Tensilon." The British introduced us to the symmetrical decamethonium and Francis Folds to the symmetrical succinylcholine.

By the 1960s, studies in the animal laboratory by Brazier, Magoun and others provided the experimental setting to observe evoked potentials from implanted electrodes in various portions of the central nervous system. These studies indicated that there were areas of the brain which had specific sensitivities to depression produced by pharmacological agents. Dose-response curves were constructed and the evoked potentials were followed to electrical silence by the graded dose-response technique. Gradual recoveries of specific areas of the brain under observation would occur as the anesthetic agent was decreased. It became obvious that sensory input to the central nervous system came not only through the large spinohalamic tracts, but also through extrasensory pathways through areas of the reticular formation which, when stimulated, produced arousal, and when depressed by an anesthetic agent produced a state wherein arousal of the experimental animal was lost. The brain, previously well-described anatomically, now was being dissected physiologically.

In this lecture, I would like to review with you some clinical research done many years ago which should now be a most fertile area for more specific and definitive study with the halogenated asymmetrical ethers. Some years ago, while trying to anesthetize the early cardiorespiratory cripple for what was a rather simple cardiac procedure, mitral valvotomy, using a level of central nervous system depression that would be tolerated by these seriously ill cardiac patients, one of our patients opened her eyes while the chest was open. [Video recording shown of this patient during and after surgery.] She looked around, and then quietly closed her eyes. A very startled anesthesiologist added anesthetic to the breathing mixture to achieve unconsciousness. Questioning of the patient during the postoperative period proved that she had no recollection of the experience. She had no memory of it: amnesia; no perception of pain: analgesia; she was totally unaware that in the middle of a surgical procedure she had opened her eyes and looked around the operating room. After extensive discussion with colleagues, it was decided to see if we could reproduce this. Gingerly, we began to see if we could establish various levels of depression during which consciousness or awareness of environment was present at a time when the patient obviously was not perceiving pain from sensory input and had no recollection of the experience. By judicious use of the symmetrical general anesthetic, diethyl ether, in conjunction with topical anesthesia to the upper airway, larynx and trachea (to obliterate upper airway reflexes), a dose-response study was done. This investigation was embarked on to test the age-old concept that the neocortex was depressed first, and then the more resistant lower centers, until the only remaining functional units were the brain stem and spinal cord.

The data indicated that, at the lowest dose level, patients were not able to recall rather long question-and-answer sessions done during a surgical procedure. Some of these amnesic patients perceived pain in various degrees, and some perceived no pain. But during a level of central nervous system depression at a time when the patient was amnesic and analgesic, cerebral cognitive function was present. The patients were able to cerebrate
Symmetrical... Continued from Page 5

and do simple mathematical problems. They were not confused when misinformation was presented to them. They were able to see, and to distinguish color and taste. Interestingly, recall of recent events was depressed much earlier than memory for past events.

Let’s look at the possible areas of depression. Until the patient lost consciousness, or more precisely our ability to arouse the patient by the spoken voice was lost, many neocortical functions were active. The temporal lobe and the parietal lobe certainly were functioning in the interpretation of questions and the response. The patients understood speech and responded with appropriate nodding of the head. Unfortunately, they could not vocalize because the endotracheal tube was in place.

Speculations on these observations, beginning with the minimal dose, can only be made for diethyl ether, as it still is the only drug studied in this manner. The limbic structures appear to be the central complex most vulnerable to anesthetic depression by diethyl ether. These patients were quiet and manifested no aggressive behavior. Evidently, the limbic system had been depressed because patients showed neither fear nor rage, but had lost recent memory. Thalamic reception of noxious sensory input was also depressed at minimal levels of anesthesia. The observation that was remarkable to us was that the cortex was virtually intact. The patient had significant cognitive function, language was interpreted correctly, and the response to color and taste was correct.

The conclusion was obvious. The cortex is not the first portion of the central nervous system to be depressed. The cortex functions quite well until we can no longer arouse the patient. Communication stops only when the extra-sensory pathways throughout the reticular formation are blocked, disconnection of the old and new brain occurs and the patient can no longer be aroused to respond. It is hard for us to imagine that, during the state of unawareness that we call anesthesia, significant cerebral function must continue. Although cortical neurons continue to receive tactile, auditory and visual stimuli, we cannot follow the processing of these inputs because the reticular arousal system is blocked.

By the 1950s, the cautery had become part of operative surgery, and at that time the nonflammable asymmetrical halogenated anesthetics were introduced, first in England and then in this country. Halothane was a great advance in the nonflammable anesthetic series and out of circle vaporization became a reality with Lucien Morris “Copper Kettle.” There were also several compounds of the ether series studied, but it was not until the design, animal research and clinical use of methoxyflurane by Dr. Alan Van Poznak and myself, that the nonflammable ethers had widespread clinical use. Methoxyflurane, the first asymmetrical ether, is the parent compound of the new halogenated asymmetrical ethers—enflurane, isoflurane, desflurane and sevoflurane—which have low aqueous and low fat solubility and minimal bio-transformation, and allow us to produce a delicate balance between dose-related central nervous system depression dictated by the moment-to-moment intensity of the sensory input.

These ethers produce little cardiac irregularity, which is not true of either straight chain or cyclic hydrocarbons. Straight chain or cyclic hydrocarbons produced significant degrees of ventricular irritability and thus proved not to be ideal anesthetic agents. The ethers, however, with an oxygen bridge separating the two carbons, depress ventricular irritability. Today, it appears that the asymmetrical halogenated ethers used for inhalation anesthesia are going to be our mainstay for the foreseeable future.

We indeed have come a long way since the “rag and bottles” days of ether and chloroform anesthesia. My presentation today points out how our practice and patient management have changed in only 50 years, indicating that this is not a stagnant specialty, but a dynamic and vibrant one. I wonder what methods will be designed to produce the anesthetic state in the 21st Century. Our techniques, which we so prize today, and the anesthetic agents of which we are so proud, will appear as outdated as techniques such as blood-letting or the mustard plaster.

REFERENCES

Correspondence

The Editor, Bulletin of Anesthesia History

Dear Sir:

Re “One Grand Chain” by Gwen Wilson, launched April 15, 1996 at the World Congress in Sydney.

Having read this rather weighty tome, (certainly not a book for reading in bed!) I felt admiration for the work involved and the style, which had a bit of humour for clinically involved scanners of history, but I was slightly puzzled about the rather large sections of some chapters which did not relate directly to anaesthesia.

I therefore phoned the author, and after congratulating someone who had read all the medical publications in Australia from 1846-1962, asked my question and received my answer which was most satisfactory.

It appears that Dr. Wilson, having personally discovered the work involved, was recording for future historians, as well as current readers, in order to save them some of her struggles. The book is meant as a background, and as a starting point for research in the 21st century.

I do agree that study of the history of anaesthesia, unlike that of most medical specialties, involves many aspects of history in medicine as a whole. After all, post-graduate students of anaesthesia must attend lectures and answer examination questions on pharmacology, physiology, anatomy, monitors and monitoring and all aspects of intensive care, as well as agents and techniques involved in their future daily work. Thus, a history of the specialty must contain references to development in these areas.

I also asked why the politics of Australia were involved in anaesthetic history, although I could already see that the general history of a relatively newly established country was certainly related. The answer to my question (and the lady laughed) was, “read the newspapers and journals from 1980 to 1996, and Volume II of ‘One Grand Chain,’ and you'll realise our long battle for recognition is only just beginning to be won.”

I'll do that, if I can find the time, now that this book has performed another of its purposes. Namely, to arouse in me an interest in anaesthetic history and its uses in daily working pursuits. If I do any research, I'll certainly look up the history of my subject!

—Anonymous
Frederick Hall Van Bergen, M.D. 1914-1996

One of the anesthesiologists who contributed much to make the profession what it is today passed away quietly at his home in Minneapolis on September 11, 1996.

A graduate of the University of Minnesota Medical School in 1942, Van, as his many colleagues called him, immediately joined the Navy where he served with distinction until 1946. Returning to Minneapolis, he joined the residency training program at the University of Minnesota under the aegis of Dr. Ralph Knight. He then remained on the faculty of the anesthesia department, becoming Professor and Chairman of the Department of Anesthesiology in 1957, where he served in that capacity until his retirement in 1978.

Throughout his career he participated in numerous clinical and laboratory investigations with colleagues such as J.J. Buckley, D.S.P. Weatherhead, J.R. Gordon and J.H. Matthews. With J.W. Baird he published a clinical investigation of the combined Pentothal-Curare solution, known as Baird’s solution. A portable mass spectrometer was described for continuous alveolar gas analysis. He described a new respirator which achieved a considerable degree of success.

Van Bergen was an active member of the Association of University Anesthetists, the Academy of Anesthesiology, and for a number of years was an Associate Editor of Survey of Anesthesiology. In addition, he was an avid sportsman and delighted in wildlife photography.

He is survived by his loving wife Nancy, four sons, nine grandchildren and seven great-grandchildren.

Memorials may be sent to the Minnesota Medical Foundation or to the donor’s choice.

Grete Teutsch, M.D. 1912-1996

It is with sadness that we report the sudden death of our dear friend and esteemed colleague, Dr. Grete Teutsch, one of the first female heads of an anesthesia department with a residency training program.

Grete was born in Germany, the youngest of four accomplished sisters. Early in life she decided to become a physician. When she was ready for medical school, the political circumstances made matriculation in Italy a superior choice. After receiving her medical degree in 1939, Grete immigrated to the United States. She quickly passed the licensing exams, served an internship in Elizabeth, New Jersey, a residency in Anesthesiology at the Brooklyn Jewish Hospital, and proceeded to accept an Attending’s position at the Bronx Veterans Hospital where she remained active for the remainder of her productive life. In due time, she advanced to Assistant Chief and then Chief of the Department of Anesthesiology, a position she held until her retirement in 1988.

In recent years, Grete’s interest in the history of anesthesia prompted her to assemble an exhibit of anesthesia equipment of the 1940s and 1950s. This exhibit, which will be displayed at the 50th Postgraduate Assembly in December, 1996, will remain at the Bronx Veterans Hospital as a memorial to an outstanding physician.

— Gertie F. Marx, M.D. and Jeffrey H. Silverstein, M.D.

Robert H. Haralson, Jr., M.D. 1910-1986

Physician, anesthesiologist and community leader, Dr. Robert H. Haralson, Jr. died quietly at his home in Maryville, TN on October 22, 1996.

A native of Labanon, TN, he was born in the Wilson County Jail, where his father was sheriff, on January 3, 1910. He received his M.D. degree from the University of Tennessee School of Medicine in Memphis in 1936. While a medical student he met and married his wife of 50 years, Dora T. Haralson.

After internship at the Nashville General Hospital, he began practice in public health in Tifton, GA.

In 1939 he moved to Maryville and was a private practitioner until he enlisted in the U.S. Army Medical Corps in 1942. A crack shot, he was first in charge of riflery training at Ft. Lewis in Washington. After being assigned to the 119th Medical Battalion, he served with distinction in North Africa, the Anzio invasion of Italy, the Normandy invasion, and in France and Germany, being awarded the Bronze Star.

On his return to Maryville in 1945, he was one of the first physicians on the staff at the Blount Memorial Hospital when it opened its doors in 1947. It was his medical home for the rest of his life. Recognizing the lack of trained anesthesiologists in his area, he completed a two-year residency in this specialty in 1947 with Dr. Ralph Tovell in Hartford Hospital, CT. He became Chief of Anesthesiology at the 300 bed Blount Memorial Hospital and also through the years served as Chief of Staff and Chairman of the Credentials Committee. In 1952 he instituted the post-anesthesia Recovery Room, reputedly the first in Tennessee. He was a member of the Anesthesia History Association.

His community interests were wide and varied. He was most active in supporting the Boys Club of Blount County, organizing a benefit annual golf tournament in its support and acting as Chairman of its trust fund. He was a Trustee of Cumberland University, a member of the Maryville Kiwanis Club and served on the board of the Blount National Bank.

A valued friend of the undersigned since 1947, Dr. Haralson portrayed all the elements of character that made him a true gentleman. He will be sorely missed.

He is survived by two sons, one an orthopedic surgeon in Maryville and one who heads a Respiratory Therapy Program in Knoxville and Maryville; one daughter in Chile, nine grandchildren and two great-grandchildren.

Memorials may be sent to the Boys Club of Blount County.

— C. R. Stephen, M.D.
Residents' Essay Award

In 1995 Dr. Doris Gote initiated the idea of having an annual Resident Essay Contest, with the essays to be judged by a Committee of the Anesthesia History Association (AHA) and an award to be presented at the Annual Meeting and Dinner of the AHA. In 1996 a total of 13 essays were submitted and the most outstanding one by Dr. Eric Schoenberg received the award on October 22, 1996, at the Annual Meeting. His essay follows. Other essays submitted will be published in future issues of the Bulletin.

—Editor

The Birth of Scientific Pain Control:
S. Weir Mitchell and the Turner’s Lane Military Hospital

by Eric A. Schoenberg, M.D.

Research supported by the Wood Library-Museum the American Society of Anesthesiologists during the term of a Wood Fellowship.

The first applications of the scientific method to problems of pain management were performed during the American Civil War by a U.S. Army contract physician and his colleagues at the Turner’s Lane Hospital in Philadelphia. Their studies reflected the social and intellectual changes of the age, and their approach parallels that of pain practitioners of today.

“I most conscientiously believe that the proud mission of the physician is distinctly twofold—namely, to alleviate human suffering, as well as to preserve human life.”

—James Y. Simpson

In 1862 a young physician working under contract to the US Army initiated his research into injuries of nerves and related conditions that would lay the foundation, not only for his future as a famous clinician and the father of American neurology, but also for the practice of scientific pain control as we recognize it today. That physician, Silas Weir Mitchell, and his colleagues at the special hospitals for nerves established in Philadelphia during the American Civil War, for the first time approached pain and nervous disorders as manageable and understandable conditions amenable to medical therapy. Thus they reinforced the idea that pain might be, and should be, medically controlled. This paper explores some thoughts as to why this concept was brought forward at this time, in this fashion, and by these particular men.

The work performed by Mitchell and his principal co-investigators, George Morehouse and William W. Keen, first at the Filbert Street Hospital and then at the Christian Street and later at the Turner’s Lane Hospitals in Philadelphia, consisted largely of observing, recording and selectively intervening in numerous cases of traumatic injuries of nerves. As detailed in the initial publication of their work, Gunshot Wounds and Other Injuries of Nerves, in 1864, these cases consisted largely of injuries to peripheral nerves, but also included significant trauma to the facial and trigeminal nerves, as well as to the spinal cord itself. Detailed histories were obtained, examinations performed and, most importantly, recorded despite the laxity of the currently-prevailing system of medical record-keeping. Prolonged follow-up was actively sought and careful notes made as to the temporal progressions in patient status and complaints. Finally, the doctors attempted, through the information thus obtained, to reconstruct the mechanism and pinpoint the site of injury to specific nerves, to identify the clinically observable effects that could reasonably be attributed to that injury, to prognosticate on the likely progression of the individual patient based on their clinical experience, and to modify that progression using techniques which they adapted or developed to direct specifically at neurologic conditions. Today we might find this approach routine, but in that era it was clearly extraordinary.

The actual therapeutic procedures developed and applied at Turner’s Lane were relatively ineffective by today’s standards. Some of the theoretical bases upon which they were founded have proven wrong, but they were usually better than the absolute neglect of such conditions, which was the standard of the day. In 1822 Charles Bell had commented, “The endless confusion of the subject induces the physician, instead of taking the nervous system as the secure ground of his practice, to dismiss it from his course of study as a subject presenting too great irregularity for legitimate investigation or reliance.” Their techniques focused largely on the use of “faradization,” or the application of an electric current across the affected area, both for diagnosis and treatment. Repeated stimulations were performed with the belief that these enhanced the regeneration of damaged nerve tissue and stimulated the reversal of the frequently associated muscular atrophy.

Other forms of therapy, often applied in addition to faradization, included continuous water irrigation, various forms of physical therapy aimed at strengthening both the affected part and the whole body, local injections of morphine and atropine subcutaneously using the relatively new hypodermic needles and syringes, and the provision of a healthy environment for rehabilitation, including good wholesome food, clean air and gardens for taking exercise or meditation. Rarely an attempt at therapeutic surgery was made, but Mitchell and his colleagues recognized that these procedures, such as excision of stump neuramata and partial resection of the median nerve for neuralgia, were usually ineffective after they had observed and recorded a number of similar patients.

Why, then, would this innovative approach to neurologic problems have developed in a relatively small military hospital directed by relatively junior physicians? The answer to this question is certainly complex, but clearly involves a number of social, professional and personal factors that comprised the context of the pioneering work.

Many authors have written on the societal changes that were taking place in the early 19th century that contributed to and even allowed the introduction of surgical anesthesia. It is logical to extend some of their arguments to the efforts at providing pain control in a non-operative setting. These changes in the fabric of society, more pronounced in the United States than in Victorian England or Europe, were comprehensive and, by affecting people’s thinking, allowed altogether new views of old problems. This evolution occurred not only in medicine and science, but in literature, the arts, and everyday living for the common man. Thus the rise of humanitarianism, individualism and comprehensive egalitarianism, the softening of religious predeterminism, the influence of Romanticism in the arts, and the vast sweeping social reforms associated with the maturation of the Industrial Revolution all factor into the equation. The influence of each of these broad issues is difficult to define, but the stage was set and the players prepared to perform their roles. We may view the Civil War as the final catalyst in this sequence which dramatically and thoroughly crystallized these changes, translating them from thought into action while simultaneously changing them in subtle but practical ways.

To briefly overview the aforementioned social transitions, we can start with the shift toward an acceptance of the concept of the...
greater worth of the individual, and the corresponding feeling of absolute egalitarianism that paralleled this acceptance. As people developed their individual identities separate from the corporate and social whole, they began to lessen the social value of the experience of pain. Pain no longer had the meaning it once did as a sacrifice for the common good and thus it became acceptable to seek to control it. The egalitarian thinking which led to the creation of the abolition and labor reform movements of the period was directly in keeping with this shift, as the pain that was suffered by the whipped slaves and the indentured child laborers lost its meaning or was viewed as a clear injustice rather than as a social reinforcement. It is no coincidence that the first patent medicine marketed directly as a "pain killer" was produced in this time frame and was a huge success.

In religion there was a noticeable softening of Calvinist predeterminism, which had previously drawn strong parallels between free choice and the experience of worldly discomforts. The notion that one could be relieved of some of the adverse consequences of one's actions had previously been seen as cheapening man's free will and robbing his pain of meaning. The move toward a more benevolent divinity who had no interest in seeing His creatures suffer was thus instrumental. And in the arts the rise of Romanticism, as best exemplified by Coleridge, Shelley and Wordsworth, reflected the change in attitudes toward pain as an individual subjective experience that had little societal worth and could thus be approached with a view toward control or elimination. This concept contrasted starkly with the notions of some of the Sentimentalists and classical writers who largely held the view that pain and suffering were somehow ennobling and thus procreative; or even with the writings of John Donne, who accepted pain as an inevitable consequence of living and of man's original sin. One might use the change in political thought as an example: the move from Andrew Jackson's frontier machismo to Abraham Lincoln's simple compassion and sympathy exemplifies the subliminal alterations in thought of this period. While both choices adhere to strongly populist notions, the character of the decision has markedly changed. Finally, the Civil War, with its introduction of essentially modern technology into warfare, complete with a corresponding dehumanization of the process, further robbed the resulting pain of much of its meaning, as the glory of war was replaced largely by impersonal and methodical butchery.

The medical environment of the mid-19th century also underwent significant transformations corresponding to those of society at large. Whereas previously the medical profession had been constrained by religious connotations of disease as divinely mandated, and restricted even further by practice based on study of ancient texts, the slow progress brought about through the Enlightenment and Age of Reason eventually began to manifest itself in clinical advancement. The study of the biological sciences moved from a process of revelation of divine beneficence through natural order to a rational approach as to how that order might be understood and modified in a purely secular context. This great application of rational science to clinical practice only became truly manifest in the first half of the 19th century. The previous system of "heroic medicine," which emphasized the importance of physician interventions such as bleeding, cupping, purging and blistering, as based on the notions of all diseases being manifestations of systemic derangements was challenged, and new systems more reliant on natural healing and new physiologic concepts were becoming widely acceptable. There were clearly extremes to these new systems of medicine, ranging from the Hydropaths who advocated no artificial interventions in favor of abstinence from all worldly vices, to Eclectics who maintained many of the old heroic treatments and decried the treatment of pain as defeating the "counter irritant theory" of healing. This concept held that pain itself was a disease that, if induced strongly enough, could overcome a patient's coexistent disease. This was in direct contrast to the view of conservative medicine which had come to see pain as harmful in that it might predispose to "shock," decrease the "vital energies" of the patient, or function as a precursor to inflammation. The extremist schools of medical practice were outside the norm of medical thought, however, and allopathic medicine, as we envision it, slowly began to take shape.

The development of modern medicine, of which the efforts of Mitchell, Morehouse and Keen may be considered a part, relied on some basic investigations into the structure and function of living things, and these researches were just beginning to reach the level of clinical applicability in the mid 19th century. The pioneering work of Bichat in histology and his theory of organ specificity, the development of physical diagnosis with anatomical correlation by Laennec, and the concepts of cellular pathology as defined by Virchow, all were necessary steps toward the later work, as specifically were the neurologic investigations of Bell, Miller and others. Additionally, with the refinement of knowledge of discrete systems within the larger framework of anatomy and physiology, came an increase in specialization within the medical world. This trend was in its early stages at the time of the Civil War, but had already led to the creation of specialized hospitals for conditions such as blindness and deafness.

Further conditions necessary for the advent of the kind of work done at Turner's Lane were the technological and methodological developments of the early 19th century. From the purely technical standpoint, the experimental work, particularly as related to therapeutics, could not be envisioned without the concept of using specific drugs for specific conditions, the ability to isolate or manufacture such compounds, and the creation of effective means to deliver those compounds. The work of Sert Turner isolating morphine from opium in 1809, and the development of the first hollow metal needle by Alexander Wood in 1853, are the most obvious examples of technical advancement as it relates to pain control in the 19th century. The idea that specific agents might be used in the treatment of a particular condition could not exist until the concept of disease had changed from the whole-body "congestive" theories of heroic medicine to the more organ and system-specific maladies of allopathic medicine. This transition was a particularly difficult one, as the pharmacopoeia of the day included few compounds with real clinical potency and the techniques of physical diagnosis were largely unable to distinguish between diseases with similar clinical presentations.

The moral and professional approach to patients and disease must be examined to fully reconstruct the milieu that allowed the Turner's Lane work to be undertaken. Mainstream medical thought, as characterized in the term "professional conservatism," had recently reached a level of development that approximates that of today as regards the physician's responsibility to the patient in the professional setting. The wave of egalitarianism which dominated intellectual life, the direct effect of the Age of Revolution enhanced by the "frontier" attitudes of the United States, combined with the new scientific analyses as conceived by Pierre Louis in his work on medical statistics, created what Perrick calls "the calculus of suffering." Essentially, this amounts to the modern concept of a risk/benefit ratio, particularly as applied to the relief of pain and suffering, in which the best outcome is sought by whatever means are considered reasonable and not unduly perilous. This "nice balancing of probabilities," as Worthington Hooker phrased it, allowed physicians the middle course between completely "natural" healing and the old heroic techniques. This idea of assisting natural healing while "doing no harm" was central to the neurologic studies at Turner's Lane. Furthermore, the rational

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application of this new "calculus" on a wide scale demanded some mechanism for data collection and dissemination. The Civil War provided this mechanism, as the Army Medical Corps underwent a thoroughgoing process of bureaucratization and centralization previously unparalleled. Only through this agency could sufficient cases be collected and examined, continuing contact be assured, and the information thus gathered be codified and circulated. The practical application of the work during the actual conflict was minimal, but the possibility of "real world" clinical utility, particularly in light of the spirit of "Yankee ingenuity," was paramount.

Finally, we must examine the people involved in the research to understand their perspective and motivations. Foremost among these were S. Weir Mitchell and William W. Keen, both of whom pursued related studies for the remainder of their lives.

S. Weir Mitchell was born in 1829 into a medical family, the son of a professor of medicine at Jefferson Medical College, and received his medical degree in 1850. Subsequently, he traveled to Paris and studied with Claude Bernard, the greatest physiologist of the age. Upon his return from Paris, he established himself in general practice in Philadelphia and was functioning in that role until 1862, at which time he entered service with the US Army.

W.W. Keen, who was to become a pioneer in neurological surgery, was only 25 years old at the time of his assignment to the Turner's Lane Hospital, and had only graduated from medical school earlier that year. He had, however, distinguished himself while a student at Jefferson by working with Dr. Mitchell in his early researches, and subsequently during his first assignment as an assistant surgeon in the field with the Union Army.

Both of these men were clearly of outstanding intellect and undeniable products of the social revolutions previously discussed. Their youth, combined with their academic curiosity, allowed them to step out into previously unexplored areas without hesitation, and permitted them the energy to pursue these investigations exhaustingly despite the enormous amount of labor involved with a very limited staff. Both men were demonstrably superior administrators in an era when medical bureaucracy was in its infancy and medical record-keeping was unstandardized and often haphazard. Mitchell had antebellum professional ties with William Hammond, the Surgeon General of the Army, from whom he received full cooperation in the founding and continued support of activities at Turner's Lane. And possibly most importantly, these men had a strong sense of humanitarianism injected into their personalities which reflected itself in their later thoughts, papers and literary works. In this capacity Mitchell was particularly noteworthy, as he achieved fame as much for his literary efforts as for his medical accomplishments.

Especially revealing in this context are Mitchell's novels of realistic fiction which explore his and his patients' psychological, emotional and spiritual reactions to their conditions, as well as their physiological derangements. It is possible that Mitchell used this vehicle as a mechanism for commenting on his society as a whole and the altered morality of that society during and after the national trauma of the war. Certainly, however, no practitioner of state-of-the-art multidisciplinary pain control today can fail to see the underlying truths of his observations, or fail to validate the necessity of the recognition of such factors in the complete care of the pain patient. The progressiveness of this "whole person" approach under the guidance of Mitchell, in an era that was still attempting to reconcile ancient dogma with modern physiology, was, if not unique, clearly unusual and definitely personality-dependent.

In summary, the Turner's Lane Hospital, the neurologic studies undertaken there, the men who conceived of and performed these studies, and the American Civil War which provided the raw material of human pain and suffering, were all reflective of the vast upheavals in society that transformed the United States in the early 19th century. The great reform movements, the rationalization of science and secondarily of common thought, and the industrialization and standardization of society all provided a backdrop for the birth of scientific pain control just as they did for the introduction of surgical anesthesia. Whether we believe that these events were inevitable or not, we must acknowledge the outstanding contributions of such personalities as Mitchell and Keen, alongside Long and Morton, as pioneers in our expanding field of practice. Better yet, we should reflect on their activities and their feelings as revealed in their professional and secular writings and try to apply them to our own practices in today's rapidly evolving social context.

Bibliography

AHA Meeting... Continued from Page 3

Thursday, April 3, 1997, Woodlands Inn, Colonial Williamsburg, Virginia, USA

7:00-8:00 am: Registration and Continental Breakfast

8:00-8:30 am: Opening Plenary Session. Audrey Shafer, MD, "Reading Between the Lines: The Language of Anesthesia"

8:30-10:00 am: Concurrent Session A

8:30-10:00 am: Concurrent Session B

10:00-10:30 am: Coffee Break

10:30-Noon: Concurrent Session C

10:30-Noon: Concurrent Session D

11:00-11:30 am: Luncheon Plenary Session. "Historical Treasures from the National Library of Medicine." NLM/History of Medicine Staff Member

1:30-2:30 pm: Afternoon Plenary Session. "Doing Anesthesia History" panel

"Asking the Right Questions." Doug Bacon, MD

"Where to Find Source Material." Patrick Sim, MLS

"Secondary Source Material." Don Caton, MD

"Presenting Your Findings." A.J. Wright, MLS (7)

2:30-3:00 pm: Coffee Break

3:00-4:30 pm: Concurrent Session E

3:00-4:30 pm: Concurrent Session F
Annual Meeting and Dinner
Anesthesia History Association
October 22, 1996
Westin Canal Plaza Hotel
New Orleans, Louisiana
Photography by Miguel Colón-Morales, M.D.

Dr. Gwen Wilson and daughter, with Dr. Carlos Parsloe

Dr. & Mrs. Phillip Gordon, Mark Rockoff

Dr. Doris Cope & Dr. Schubly am Ansa

Continued on Next Page
Annual Dinner and Meeting. . . Continued from Page 11

Joan & Ron Stephen          Laureate Gwen Wilson & Daughter

Norma Jones, Alan Sessler, John Steinhaus

Ron Stephen                  President Lucien Morris

Trudy Betcher, Jean Steinhaus, Elizabeth Lee

Dr. Valencia (Medellin, Colombia), Lucien Morris, Ron Stephen

Selma Calmes

Clyde Jones, Doris Cope

Leroy Vandam
Annual Dinner and Meeting

Continued from Page 13

Dr. & Mrs. N. Valencia, Dr. & Mrs. Carlos Parsloe, Patrick Sim

Betty Bamforth, Brad Smith

Albert Betcher

Doris Cope

Bill Pender

Elliott Miller, Lucien Morris

Frank McKechnie, Dr. & Mrs Phillip Gordon

Dr. Alberto Jose DeArmenti, Dr. Nacianceno Valencia

Lucien Morris, Ron Stephen
We are much indebted to the Royal College of Physicians and Surgeons of Canada, the Editor of the Annals of the R.C.P.S.C., and to Roy Kim, a medical student, and J.R. Maltby, M.B., an anaesthetist at University of Calgary, Alberta, for their permission to republish the following historical account of Charles Waterton and the naming of the Waterton Lakes National Park, which adjoins the Glacier National Park in Montana. One should note that Dr. Maltby, a member of the Anesthesia History Association, is also somewhat of an explorer himself, having recently been in Ethiopia and having in the past established anesthesia teaching programs in Nepal.

Charles Waterton (1782-1865), Curare, and Waterton Lakes National Park

by Roy Kim; J.R. Maltby MB, FRCA, FRCPC*

Introduction
Charles Waterton was a 19th-century explorer, naturalist and taxidermist.14 He was born on June 3, 1782, at Walton Hall near Wakefield, Yorkshire in northern England, and died there on May 27, 1865. When he was sent to a Catholic boarding school at the age of nine, he was already a keen tree-climber and birds' nester. This led him into repeated conflict with the priests. While he was still a boy, his habits could be excused as youthful energy, but when he continued the activities until the age of 80, Waterton was characterized as an eccentric. At the age of 14, he moved to a newly founded Jesuit school, Stonyhurst College in Lancashire, where the priests appointed him rat-catcher and fowltaker to give him a legitimate reason for being out of bounds on his nature studies.

Waterton left England in 1804 to manage family estates in Demerara, now Guyana. After eight years, he gave up management of the estates, and travelled inland by canoe and on foot2 on his first wandering "to collect a quantity of the strongest wourali [curare] poison and to reach the inland frontier fort of Portuguese Guyana." He succeeded, although he was ill with tertian malaria on the return journey, and took three years to make a full recovery after his return to England.

Waterton left England again in 1816, 1820 and 1824 for South America,3 where he collected the skins of many birds and animals, including that of a cayman that he rode for 40 yards during its capture. He took the skins back to England and became an expert taxidermist, achieving results that were superior to those of his contemporaries. He soaked the skins in bichloride of mercury, and moulded them into lifelike poses over several days as the skins dried.4 Two examples are seen in his portrait (Figure 1), painted in 1824 by Charles Willson Peale in Philadelphia when Waterton also travelled to Montreal and Quebec City.5

Waterton's most enduring achievement was the early example he set in wildlife protection. From 1821 to 1826, he created a wildlife sanctuary by enclosing the 260-acre estate around Walton Hall with a nine-foot high wall, and by providing trees, bushes and structures for wild birds. They were never disturbed by the sound of a gun, however much they multiplied.5 Vermin, except for the brown rat, were never trapped. There had been menageries before this time to preserve game, but nothing for the protection of native wild birds. This is why Waterton has been called the father of British bird protection. He disagreed with his American contemporary, John James Audubon, about conservation. Audubon had a frontiersman's approach to nature. He participated in hunting sprees during which hundreds of birds were shot and piled in a heap. Audubon once said, "I call birds few when I shoot less than a hundred a day." In contrast, Waterton said that the rain forest had taught him mercy, and he opposed mass hunting. It is ironic that today Audubon is better remembered as a conservationist.6

Waterton also fought against industrial pollution of the environment. He won a legal action against a neighboring industrialist, whose soap factory fumes killed fish in a nearby stream, damaged trees on Waterton's estate, and almost destroyed a heronry.7

Despite many illnesses and accidents, some natural, others due to his carelessness, Waterton lived to the age of 83. He died in May 1865, and is buried in the grounds of Walton Hall.

Curare
When Waterton sailed from England in 1804, he was aware of curare's poisonous effects. Before his departure, he dined with Sir Joseph Banks, president of the Royal Society, and told him of the Indian poison and how they used it for hunting. According to the contents of a letter from Waterton to the mayor of Nottingham in 1839 (The Richard Owen Collection: Letters, British Museum of Natural History, London), Banks replied:

"I have been a great traveller; and all the investigation which I have been able to make concerning the nature of the poison, tends to convince me that it is not sufficiently strong to kill the larger animals, such as men and cattle; but it may answer very well in the ordinary pursuit of winged game and in that of minor quadrupeds. When you yourself have witnessed its deadly effects on man or cattle, we will no longer doubt its deadly virulence."

Waterton's first opportunity to take up the challenge came in 1812, when he gave up management of the family estates and embarked on his first "wandering." In a letter to Reverend Charles Wright, Stonyhurst College, in 1813 (Stonyhurst College archives), he wrote:

"...I left the town of Stabroek [now Georgetown] on the 26th of April"

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Curare. . . Continued from Page 15

[1812], . . . proceeded up the Demerara in a canoe with six savages for about 400 miles and then crossed overland to the Essequibo from which river I passed into the Apoura-Poura. From the banks of this river I had seven days march by land, thr' swamps and forests and over mountains. I then got into the river Pirarara, from that into the Tacaton, from the Tacaton to the Maon, from that into the Branco where I found Fort St. Joachim. I had tough work of it on account of the periodic rains, and intervals of intense heat. I collected a considerable quantity of the famous vegetable poison and tried it on an ox 960 lbs weight. I had no idea it was so strong and fatal. I narrowly watched all the symptoms in the ox and saw him die. . . I have also about 150 of the most rare and beautiful birds and fine blowpipes for the poisoned arrows."

The journey took four months. By the time his party reached Fort St. Joachim, Waterton was ill with malaria. ① His first experiment with curare was conducted with a small quantity obtained from an Indian who claimed to have killed several wild hogs and two tapirs with it. He tested its potency by wounding a dog in the thigh. Symptoms appeared in three or four minutes. The dog staggered, lay down, fell on its side, and in 15 minutes was inert. Its heart continued beating faintly for several minutes after its respiration had ceased.

Waterton found the Macusi Indians with their potent curare in the upper reaches of the Essequibo. He described how they went into the forest to obtain a wild vine a day or two before preparing their curare. He recognized that this was the main ingredient, but he also recorded the addition of large black ants, small red ants, snakes' fangs and peppers. Water was poured over shavings of the wourali vine into a pot, a glutinous juice was squeezed from the bulbous stalk of two plants, and the mixture boiled to form a brown syrup. A few arrows were poisoned with it to test its strength, presumably by observing its effect on a convenient animal. If it was potent enough, it was poured into a calabash and kept in the driest part of the hut.

The Indians used blowpipe arrows to kill birds. The blowpipe was made from a reed that was 10 to 11 feet long, from which an arrow, nine to 10 inches long, could be shot as far as 300 feet (Figure 2).

"The Indians have shown ingenuity in making a quiver to hold the arrows. It will contain from 500 to 600. It is generally from 12 to 14 inches long and in shape resembles a dice box used at backgammon. . . Before he puts the arrows into the quiver, he links them together by two strings of cotton, one string at each end, and then folds them around a stick which is nearly the length of the quiver. The end of the stick, which is at uppermost, is guarded by two little pieces of wood crosswise, with a hoop round their extremities, which appears something like a wheel; and this saves the hand from being wounded when the quiver is reversed in order to let the bunch of arrows drop out."

Waterton observed that birds wounded by curare-tipped blowpipe arrows fell to the ground in three minutes. He described his experiment on a fowl:

"By the termination of the third minute, it had sat down, scarce able to support its head, which nodded, and then recovered itself, and nodded again, lower and lower every time, like that of a weary traveller slumbering in an erect position; the eyes alternatively open and shut. The fourth minute brought on convulsions, and life and the fifth terminated together."

The Indians used bows and arrows to kill deer and tapirs. The arrows were four to five feet long, and made from a hollow reed. The arrow tips were curare-coated spikes of coucourite wood cut half through near their bases to break off when they entered an animal. For the experiment on the ox, Waterton used three large curare-covered wild hog arrows. The ox staggered and fell after 14 minutes, its heart continued beating after respiration had ceased, death occurred in 25 minutes, and "his flesh was sweet and savory at dinner." Waterton thought that the ox took longer to die because, allowing for its weight, it received proportionately less curare than the fowl. Thus, he recognized that curare's effect was dose-related, and that it was inactive by mouth. He also tested the traditional Indian antidotes of pouring sugar water or salt down the throat of a fowl, or holding it in water up to its neck, but they always failed.

Waterton returned to England in the spring of 1813. In 1814, an experiment was performed in London by Sir Benjamin Brodie and himself, assisted by Professor Sewell of the Veterinary College, using curare supplied by Waterton:

"A she-ass received the wourali poison in the shoulder, and died apparently in 10 minutes. An incision was then made in its windpipe, and through it the lungs were regularly inflated for two hours with a pair of bellows. Suspended animation returned. The ass held up her head and looked around; but the inflating being discontinued, she sank once more in apparent death. The artificial breathing was immediately recommenced, and continued without intermission for two hours. This saved the ass from final dissolution. She rose up and walked about; she seemed neither in agitation nor in pain. . . The kind-hearted reader will rejoice on learning that Earl Percy, pitying her misfortunes, sent her down from London to Walton Hall, near Wakefield. There she goes by the name of Wouralia. Wouralia shall be sheltered from the wintry storm, and when summer comes she shall feed in the finest pasture. No burden shall be placed upon her, and she shall end her days in peace."

A footnote in later editions of the book records that "Poor Wouralia breathed her last on Saturday, the 15th of February, 1839, having survived the operation nearly five and twenty years." ②

In 1839, Waterton was summoned to Nottingham, 40 miles from Walton Hall in
narcotic qualities" would render death calm, composed, and free from pain. He, Brodie31 and Sibson32 were all under the mistaken impression that curare produced unconsciousness with paralysis of the voluntary muscles.

The history of curare13-15 goes back to Peter Martyr d'Anghera's16 account in 1516. It was not until the early 19th century, however, that more careful observations were made. Humboldt17 provided the first eyewitness account of curare's preparation in 1807; Brodie33 showed in 1812 that artificial respiration could keep small animals alive until spontaneous respiration returned; Waterton1 provided detailed accounts of curare's effect in 1825; and Martius18 1830 recognized that plants other than the Strychnos species provided the main component in some curares. In 1856, Bernard20 proved that curare acted only at the neuromuscular junction; and in 1935, King21 isolated tubocurarine and elucidated its chemical structure.

Intermittent attempts to treat tetanus with curare were made in the 19th22 and early 20th century.34 Sibson35 observed in 1859 that artificial respiration would be essential if enough curare was used to control the convulsions. The total paralysis regime for the treatment of severe tetanus25 was eventually introduced in Denmark in the 1950s.

Waterton's curare experiments occurred before the discovery of general anesthesia in the 1840s. The modern era of neuromuscular blockade dawned in Montreal on January 23, 1942, when Harold Griffith and Enid Johnson26 introduced curare into clinical anesthesia. Since then, many neuromuscular-blocking drugs have been synthesized in the laboratory, but the d-tubocurarine has been the main component in most curares. In 1856, Bernard20 proved that curare acted only at the neuromuscular junction; and in 1935, King21 isolated tubocurarine and elucidated its chemical structure.

Waterton Lakes National Park was Canada's fourth national park. It was established in 1895 as Kootenay Lakes Forest Park and renamed Waterton Lakes Dominion (later National) Park in 1911.32 Its international border is contiguous with Glacier National Park in Montana. In 1932, after a resolution by the Rotarians of Alberta and Montana for the establishment of an international peace park the previous year, legislation was approved by the U.S. Congress and by the Canadian Parliament. Dedication ceremonies for Waterton-Glacier International Peace Park were held in East Glacier, Montana, and at the Prince of Wales Hotel, Waterton, the same summer. In 1979, Waterton Lakes National Park became the first Canadian national park to be part of a biosphere reserve. It is one of 12 such reserves in Canada, and represents the border range mountain and bunch grass prairie landscape.

Waterton Lakes is the least commercialized of the Rocky Mountain national parks. In winter, it is almost deserted except for park employees. In summer, when visitors include hikers, campers, fishermen and naturalists, most animals stay in remote areas, but deer and big-horn sheep wander in the small town, grazing or lying on the lawns. It is a wilderness sanctuary of which Charles Waterton would have approved.

References
SUBJECT: Laureate of the History of Anesthesia

The Wood Library-Museum is pleased to announce the appointment of Dr. Gwenifer Wilson as the first Laureate of the History of Anesthesia. Dr. Wilson was selected from a list of distinguished nominees by an international panel of medical historians.

Australian-born, Dr. Wilson practiced anesthesia for almost 50 years. Coincidentally she developed a distinguished list of publications dealing with the history of anesthesia, the history of medicine in Australia, and most recently, the history of the transmission of news of anesthesia from Boston to Australia in 1846. In the process of preparing this material she became a recognized expert on Australian Medical journals, as well as commercial shipping practices during the nineteenth century. In 1995 she was awarded a Doctorate of Medicine from the University of Sydney for her thesis "Fifty Years: The History of the Australian Society of Anaesthetists 1934-1984." It was the first Post-Graduate Doctorate of Medicine in Australia, awarded for medical history. Dr. Wilson has given numerous eponymous lectures and has received many awards for her work.

Dr. Wilson will be inducted as the first Laureate of the History of Anesthesia at a special ceremony following the Lewis Wright Memorial Lecture at the 1996 meeting of the American Society of Anesthesiologists in New Orleans.

References:

*Wilson G. One Grand Chain: The History of Anaesthesia in Australia, 1846-1962. Sydney: Bridge Printery Pty Ltd., 1995. (This book is Dr. Wilson's most recent work, in time for the 150th anniversary of the first successful public demonstration of a modern surgical anesthetic.)


*Loan or photocopy available from WLM

SUBJECT: Blood Gas Analysis

In 1669, Robert Boyle (1627-1691) used a vacuum pump, previously developed by Robert Hooke, to demonstrate that blood contained enormous amounts of gas. Subsequent identification of components of that gas by Joseph Black (CO₂, 1754), and by Scheele, Priestley, and Lavoisier (1772-1775), initiated two centuries of improvements in the process of preparing this material she became a recognized expert on Australian Medical journals, as well as commercial shipping practices during the nineteenth century. In 1995 she was awarded a Doctorate of Medicine from the University of Sydney for her thesis "Fifty Years: The History of the Australian Society of Anaesthetists 1934-1984." It was the first Post-Graduate Doctorate of Medicine in Australia, awarded for medical history. Dr. Wilson has given numerous eponymous lectures and has received many awards for her work.

Dr. Wilson will be inducted as the first Laureate of the History of Anesthesia at a special ceremony following the Lewis Wright Memorial Lecture at the 1996 meeting of the American Society of Anesthesiologists in New Orleans.

Books:


toring, have been re-assembled as a book, and published in celebration of the centenary of founding of Physical Chemistry.)

Other Resources:


*Severinghaus JW. Acid-base Balance Controversy. J Clin Monit. 1991; 7:274-279. (Important and interesting controversies related to blood gas analysis include debates about O₂ secretion by Ludwig and Pflüger in the 1870s; and by Krogh, Haldane and Bohr early in this century, and, most recently, the transatlantic acid base debate(s). As an outgrowth of historical confusions, recent letters engage in some light-hearted antilogarithmic jesting and jostling.)


*Loan or photocopy available from WLM

Compiled by John W. Severinghaus, M.D. Edited by Donald Caton, M.D.
The Life and Times of the Snake(s): Our Medical Heritage

by James J. Wiley, M.D., F.R.C.S.C.*

One of our Canadian colleagues, Dr. James J. Wiley, has presented in a clear manner the derivations and differences between the staff of Aesculapius and the Caduceus. We are much indebted to him and to the Editor of the Annals of the Royal College of Physicians and Surgeons of Canada for their permissions to reprint this paper in the Bulletin. It appeared originally in the Annals RCPSC 29:231-233, June 1996.

---Editor's note: The author has used both Latinized and Grecian versions of names and places, but the material is based only on Greek mythology. Either version is considered correct, the choice being the more popular or familiar.

Introduction

From ancient times, the snake has been the emblem of the medical profession. Bearing none of the current sinister reputation, the snake of antiquity was a symbol of divinity, a companion of the gods, a symbol of healing and life, even a renewal of life (not unlike the shedding of the reptilian skin–a rebirth). And so the snake became the mystical emblem in ancient medical history.

Family Tree in This Historical Background

Consider the Hippocratic oath written 2,400 years ago. Steeped in early Grecian mythology, its opening sentences refer to Apollo, Aesculapius, Hygieia, Panacea, plus "all the gods and goddesses." This introduction reveals the antiquity of our medical profession. Recorded ancient history has unveiled the emblem of the medical profession. Recorded ancient history has unveiled the ancient Grecian period (approximately 2000 BC), which had been cloaked in mythology and mysticism, to expose fact versus fiction and Greek folklore as it related to medical practices.1-7 It was the era of the gods and goddesses.

Apollo was not only the son of Jupiter, king of the gods, but he was also the god of music, light, youth and healing in the Greek pantheon. It was Apollo who gave the caduceus to Mercury, another son of Jupiter. It eventually became the symbol of ambassadorial status, even of the postal service and commerce in general (Mercury was the god of the “fat purse,” messenger to the gods, patron of merchants and travelers).

Aesculapius (Latin), or Asclepios (Greek), was the son of Apollo and Coronis, a mortal of questionable repute. Apollo arranged for the demise of the unfaithful Coronis, and transferred the care of Aesculapius to the centaur Chiron. Chiron had acquired some knowledge of medicine from Apollo, and promptly versed Aesculapius in the art of healing using herbs, potions and incantations. Aesculapius mastered these skills to such an extent that he not only saved lives but reportedly raised a man from the dead. Pluto, the god of the underworld (Hades) and enemy of the living, accused Aesculapius of diminishing the number of souls entering his kingdom. Pluto complained to Jupiter, who promptly struck Aesculapius dead with a stroke of lightning. Aesculapius was resurrected, however, to fulfill his destiny as a demi-god of healing.

Aesculapius and his wife, Epione, had five children (Figure 1), all with medical leanings—Panacea (goddess of cures, and caretaker of the sacred snakes in the Greek temples of healing), Hygieia (goddess of public health and prevention of disease), Telesphorus (god of convalescents), Machaon and Podalirius. The latter two sons achieved fame as military medics during the siege of Troy (1180 BC).

Centuries later, from the ancestral lineage of Aesculapius on one side and Hercules on the other, came Hippocrates (400 BC), the father of the golden age of scientific medicine.1,6

The Origins of the Symbolic Snake(s)

The sacred asp, called the uraeus, was a single serpent figure embodied in the crown of the Pharaohs. The Babylonians revered a single snake known as “the great earth snake” or source of life. It also symbolized the sun god, fertility, wisdom, learning and healing. With the Greco-Roman era came the true Aesculapian snake, known as Elaphe longissima. A similar species was Elaphe quatuorlineata; as the name implies, this snake had four dark stripes extending the length of its body. The snake was a constrictor that was approximately five feet long and harmless to humans. It was a mysterious sign of godliness, and thought to be the dwelling place of the soul. It was also recognized for its healing power.
Snake(s). Continued from Page 19

The caduceus was reputed to be a symbol of truce and neutrality. It is as until the 16th century that Johannes Froben, a Swiss publisher, introduced the caduceus as a medical symbol. It was displayed as a rod with the entwined serpents, surmounted by a dove. This symbol was then perpetuated by Sir William Butts, physician to Henry VIII. Butts, however, added wings to the top of the staff in recognition of the analogy to the serpent on the staff, of Mercury.

Besides the legends of one snake on the staff of Aesculapius and the two snakes of the caduceus came a third possible legend. In this instance, the serpent was a parasite known as Dracunculus medinensis, a guinea worm found in Asia, Africa, southern Russia, and later, South America. It may have had its ancestral origins in the biblical fiery serpent. The traditional healers extracted the worm from the patient's body by rolling it into a coil on a stick. In spite of the analogy to the serpent on the staff, this legend never contested the role of a symbol for the medical profession.

The Snakes and the Temples of Healing

With the era of emerging scientific medicine, a religious medical cult (1200 BC) evolved to venerate Aesculapius. Certain Greek physicians identified themselves as Asclepiads ("son of" or "family of" Aesculapius). Some 300 healing temples known as "Asklepieia" were built in his honor, the greatest at Epidaurus, where Aesculapius had worked. An Asklepieion was not one temple, but a group of buildings. One was a temple to Asclepios, another was for sleeping and bathing, and others were for physical therapy. These temples were managed by physician-priests, as medicine and religion, physical factors and psychic factors became inseparable.

There were three phases in the healing process. The "cleansing rite" involved a perfumed bath in the waters of the sacred spring, before submission of a token admission payment (animals or cakes). After a solemn procession accompanied by music, incense and pomp, the patient entered the central temple, where sacrifices were offered to the sacred snakes, followed by a visit to the holy fountains. Eventually, the patients were called to an adjacent building (Abaton) to enter a hypnotic state called "dream sleep" or incubation. During this state, the priests and gods visited while the sacred snakes were allowed to crawl among the patients. The snakes either induced this dream sleep or healed by direct touch, for example, healing an ulcer with snake saliva.

The cult of Aesculapius spread throughout the Grecian empire. By 200 BC, however, the Asklepieia ceased to be temples and became fashionable sanitaria that were similar to modern spas.

The Western Parallel

Although Roman medicine had its origins in Greece, it was a fortuitous bonding of knowledge, medicine and religion from many continents. At the beginning of the Christian era, the devotion to Aesculapius was retained for six centuries on the basis of scientific merit. As ancient mysticism and mythology were abandoned, Christ assumed the work of Aesculapius as a healer, aided by a cadre of saints, including Sebastian, Cosmas and Damien. Although purging, bleeding and fasting became therapeutic modalities, the art and science of healing were reaching for new horizons. The practice and teaching of Hippocrates, then Galen, then the Arabic school (Avicenna and Rhazes), and later, the prominent medieval physicians (de Mondeville, de Chouliac, de Saliceto, Mundinus) fostered many early scientific advances. The major accomplishments awaited the arrival of the Renaissance and the work of Paracelsus, Ambrose Paré, Andreas Vesalius, Nicolas Andry, John Hunter and others. Science relegated the healing snakes to the tomes of ancient history.

The Survival of the Symbolic Snake(s)

Somehow the serpent figure has survived our tumultuous medical history. It continues to appear as the Aesculapian snake encircling a staff, or the caducean entwined snakes on a rod. Even the healing factor in snake saliva has never been forgotten (and has even been subjected to biochemical study). Today, one still finds some deference to the association of the snake, any snake, with tender, loving care.

One snake? Would two or more be better? One snake entwined around a pole (the Aesculapian staff) is the emblem (seal, crest, insignia, armorial bearing) of many institutions (Table 1). The caduceus, two or more snakes entwined on a staff, has symbolized both medical and non-medical institutions (Table 2). The president of the Royal College of Physicians (London) carries a staff of distinction bearing four entwined snakes. This staff was presented to the College in 1556 by its president, Dr. John Caius, who was also the founder of Caius College in Cambridge. A similar staff was recently presented to the President of The Royal College of Physicians and Surgeons of Canada. The symbolic snake is included on the armorial bearings of two of the 16 Canadian medical faculties. The faculty of medicine of the University of Toronto displays the staff of Aesculapius with the single snake. The armorial bearings of the medical faculty of the University of Ottawa includes three snakes. These three snakes represent the three programs of the faculty, namely undergraduate, graduate and postgraduate. One snake is red; the second is white; the third is represented in counterchanged colours (red-white), indicating that the faculty is a meeting-ground for Canadians speaking either or both of the two official languages, be they students or teachers. Each snake is

Table 1. Institutions displaying the staff of Aesculapius.
- Medical Corps U.S. Air Force
- All French military medical insignia
- German military physicians
- Royal Army Medical Corps of England
- World Medical Association
- Canadian Medical Association
- Royal Canadian Army Medical Corps
- American Medical Association
- World Health Organization
- American Air Force Medical Service
- British Orthopaedic Association
- The Coat of Arms—U.S. Army Medical Corps
- British Medical Association

Table 2. Institutions displaying the caduceus.
- Royal College of Physicians (London)
- Royal College of Physicians (Canada)
- Medical Corps of U.S. Navy
- British Royal Air Force
- U.S. Public Health Service
- RCAP Medical Corp (collar badge)
- American College of Physicians
- The Society for Computer Medicine (Washington)
- The Insignia—U.S. Army Medical Corps
- Arm Insignia for U.S. Military Hospital Stewards
- Bank of Commerce
- Sun Oil Co.
From the Literature

A.J. Wright, MLS Clinical Librarian Department of Anesthesiology Library University of Alabama at Birmingham


Excellent overview of this topic. 19 illus., 2 tables, 43 refs.


Brief history of the drug's use and regulation. 1 illus., 9 refs.

Balcells M. Historical aspects and synonymy of cluster headache. Rev Neurol 23 (suppl 85):442-443, 1996

This letter responds to an article by Muravick et al, Austin Lamont and the evolution of modern academic anesthesiology. Anesthesiology 84:436-441, 1996. 3 refs.

Balcells M. Historical aspects and synonymy of cluster headache. Rev Neurol 23 (suppl 85):442-443, 1996

Excellent overview of this very broad topic. 62 refs.


Brief description of the life and career of John Murray (1843-1873), an Englishman who "described his wire mask in 1868 when he was a young chloroformist at the Middlesex Hospital. 1 illus., 4 refs.


Describes Frederick William Hewitt’s research which began in 1886 and resulted in this inhaler in 1892. 1 illus., 4 refs.


Brief account of Long’s career and use of ether in surgery. 3 illus., 3 refs.


Describes developments by decades, beginning with “pre-1910.” Includes useful timeline. Good overview of the topic. 2 illus., 3 tables, 48 refs.


Brief overview of the topic, beginning with Thomas Skinner’s “first published reference to cross infection in anaesthesia, while promoting his own cloth-covered wire-frame chloroform mask” in 1873 in Liverpool, England. 40 refs.


Includes some material on historical aspects. 12 illus., 42 refs.


This letter comments on a paper published by the journal in 1967 and authored by Dr. P. Murphy which the writers consider a "classic." Includes material from Dr. Murphy. 7 refs.

Caton D. "In the present state of our knowledge": early use of opioids in obstetrics. Anesthesiology 82:779-784, 1995

Concentrates on twilight sleep in the early 20th century. 70 refs.


Examines the place of pain before and after the “discovery” of anesthesia. Excellent overview of this very broad topic. 62 refs.


"This article has not been examined.

Colón-Morales MA. Trivia on the history of the anesthesia screen. ASA Newsletter 60(8):24, August 1996

Brief account of the "ether screen" and Dr. Colón-Morales’ modern adaptation. 2 illus.


Good overview from the thoracic surgeon’s viewpoint. 9 illus., 33 refs.

Donahue KES. The creation of a new collection documenting the history of pain studies in the History and Special Collections Division of the Louise Darling Biomedical Library, UCLA. Watermark 19(3):80-83, 1996

Describes the genesis of the collection in the oral history work of John Liebeskind in the early 1990s.


This excellent book on the French chemist includes the chapter Mesmerism and Public Opinion (pp. 211-234). Illus., references, bibliography, index.


Fascinating study of Esdaile’s background, his work with mesmerism in Calcutta in the mid-1840s, his supporters and critics and the social and medical context of his efforts. Extensive reference list, 88 refs.


Brief overview of the topic. 3 illus., 21 refs.


Popularized history of anesthesia’s development from Davy to Long/Morton/Wells/Jackson. Includes sidebars on anesthetic practice today and an explanation of how anesthesia works. "The achievement in the development of anesthesia was neither lofty nor scientific; it was only in bringing a fresh perspective to an unhappy, old problem (pain relief). Noble as that is, anyone could have done it. But no one did until 1846..." (p. 26) I’m pleased to note that so many are blessed with such "fresh perspective." Article is generally accurate, although it does contain such zingers as the characterization of Davy’s 582-page opus on nitrous oxide as a "booklet." (p. 24) 10 illus., no references.


Documents the great surgeon’s connections with his home town. 13 illus., 20 refs.


Rey authored the brilliant "History of Pain" (Harvard University Press, 1995). This French-language tribute has not been examined.


This German-language monograph has not been examined.


History and collections of the formal AANA archival program. 9 illus., 6 refs.


Overview of the topic. 16 illus., 2 tables, 95 refs.

Goerig M, Beck H. Priority conflict concerning the discovery of lumbar anesthesia between August Bier and August Hildebrandt. Anesthesiolog

Continued on Next Page
McGoldrick KE. Lewis H. Wright Memorial July-October 1996 Lecture: 'From Symmetrical to Asymmetrical: An Historical Perspective.' ASA Newsletter 60(7): 10-11, 1996

BULLETIN OF ANESTHESIA HISTORY

Literature. . . Continued from Page 21

Intensivmed Notfallmed Schmerzther 31:111-119, 1996

This German-language article discusses the quarrel Hildebrandt began with his former surgical colleague over whether Bier or James Corning developed spinal anesthesia.


This German-language article has not been examined.


This marvelous book is an extensive compendium of illustrations from medieval times to the present. 400 refs.


Rey authored the brilliant "History of Pain" (Harvard University Press, 1995). This French-language tribute has not been examined.

Jack Moyers, MD, 1921-1996. ASA Newsletter 60(6):37, 1996

Brief obituary. 1 portrait.


Brief remembrance presented to members of the Council of the Royal College of Anaesthetists.


This German-language article has not been examined.

Lewis O, Stephen Hales and the measurement of blood pressure. J Hum Hypertens 8:865-871, 1994

Describes the series of experiments on animals documented in Hams' classic Haematsticick (1733). Hales (1677-1761) was a natural philosopher and inventor. 1 portrait, 2 illus., 1 table, 17 refs.


Examines the creation of anesthesia societies, academic departments, certification procedures, journals and other aspects in both Great Britain and the United States. 9 refs. 10 illus., 46 refs.


This book chapter has not been examined.


Shepherd's biography has recently been reviewed in Anaesth Intens Care 24(2):292-293, April 1996 and Anaesthesia 51:519, 1996.

This brief profile notes that Marsden was one of the first physicians in Canada to administer chloroform. 1 portrait.


who delivered the 35th lecture at the ASA 1996 annual meeting in New Orleans in October, 1996.


Describes the series of experiments on animals documented in Hams' classic Haematsticick (1733). Hales (1677-1761) was a natural philosopher and inventor. 1 portrait.


Panning B. Comment on: Legal outcome of crime under anesthesia. Anaesthesiol Intensivmed Notfallmed Schmerzther 30(7):461, November 1995

This German-language article has not been examined.


This German-language article has not been examined.

Pierce EC Jr. 40 years behind the mask: safety revisited. Anesthesiology 84:965-975, 1996

In the 34th Rowenstine Lecture delivered at the 1995 annual meeting of the American Society of Anesthesiologists in Atlanta, Georgia, Dr. Pierce reflects of the safety of anesthesia over the past four decades. 37 refs.


Part 1 is subtitled "Earlier years and the introduction to mesmerism"; part 2 is subtitled "The mesmeric scandal and later years." Due to his support of many things controversial, including mesmerism, Dr. Eliottson "lost his reputation, position, fortune and friends." A fascinating story, to say the least. Part 1 has 5 illus., 34 refs.; part 2, 2 illus., 34 refs.


German-language article describing survey of 78 surgical hospital departments involving more than 55,000 anesthetic procedures.


This monograph has not yet been examined.


Explores the "independent wealth" of Halsted that allowed him to accept a full-time faculty position at Johns Hopkins in the late 1890s. That wealth was apparently based on his father's embezzlement. 3 illus., 23 refs.

Safer P. On the history of modern resuscitation. Crit Care Med 24(2, suppl.): s3-s11, 1996

Adapted from two previous publications in 1989 and 1995 by Dr. Safer on this topic. 1 illus., 1 table, 111 refs.


Briefly describes the life and career of winner Dr. Philip Raikes Broamge. 1 portrait.


Brief account of the career of Dr. Elam, who died in July, 1995. 1 illus.


Dr. Shepherd's biography has recently been reviewed in Anaesth Intens Care 24(2):292-293, April 1996 and Anaesthesia 51:519, 1996.


Brief account of Dr. Warren's life and career. 1 portrait.


This brief profile notes that Marsden "was one of the first physicians in Canada to adminster chloroform." 1 portrait.


This book chapter has not been examined.

Marx OF. In memoriam... Grete Teutich, MD. 1/17/1912-7/18/1996. NYSSA Sphere 48:35, July-October 1996

Brief obituary. 1 portrait.
Another entry in Dr. Spielman's "Art and Anesthesia" series in this journal. Reproduces James Gillray's famous caricature of Davy's nitrous oxide demonstrations at the Royal Institution in London in 1801. 3 refs.


This German-language editorial has not been examined.

Sykes MK. Intermittent positive pressure respiration in tetanus. Anaesthesia 50:332-337, 1995

Reprint of a paper originally published in 1960. Brief introduction by Dr. Sykes.


This German-language monograph has not been examined.


A collection of 12 essays devoted primarily to 20th century developments in the field. Each chapter has extensive references. 182 illus.


Describes the mask of Thomas Skinner, "who was Obstetric Physician to the Dispensaries, Liverpool, [when he] published his account of a new device, the first of the 'wire masks.'" 1 illus., 2 refs.

Westhorpe R. Chevalier Jackson's laryngoscope. Anaesth Intens Care 20:5, 1992

Describes the work and device of Jackson (1865-1958). 1 illus., 5 refs.

Westhorpe R. Ethyl chloride. Anaesth Intens Care 22:3, 1994

Describes discovery and use of this agent and three containers from early in the twentieth century. 1 illus., 3 refs.

Westhorpe R. Cattlin's bag and Clover's facepiece for nitrous oxide anesthesia. Anaesth Intens Care 21:3, 1993

Describes this device and nitrous oxide anesthesia in the second half of the nineteenth century. 1 illus., 2 refs.

Westhorpe R. Kelene (ethyl chloride) inhaler. Anaesth Intens Care 22:133, 1994

Describes use of ethyl chloride for anesthesia and this inhaler, which is French in origin. Designer and manufacturer are unknown. 1 illus., 2 refs.


Describes this inhaler for Somnoform (a mixture of ethyl chloride, methyl chloride and ethyl bromide), introduced in 1901 by Georges Rolland. Inhaler was developed by William Harper De Ford (1858-1932). 1 illus., 3 refs.


This monumental work from the new Laureate in Anesthesia History has been reviewed in Anaesth Intens Care 24(2):294, April 1996 by Dr. Michael G. Cooper.


Describes the first experimentation with nitrous oxide in America by James Woodhouse and his University of Pennsylvania chemistry students, including William Barton. Also covers knowledge of nitrous oxide in America between Woodhouse and Barton and the experimentation by Horace Wells beginning in late 1844. 1 illus., 82 refs.

Wright AJ. Humphry Davy's small circle of Bristol friends. Middle East J Anesthesiol 13:233-279, 1995

Examines the work with nitrous oxide of Davy and Thomas Beddoes at the Bristol Pneumatic Institute in the late eighteenth century and the various individuals who also participated in the trials of the gas. 5 tables, 218 refs.


Groups more than 150 examples by chronological or topical categories. 89 refs.


Excellent overview of the topic. This article is available on the World-Wide Web portion of the Internet (URL: http://www.achilles.net/~izunder). 25 illus., 24 refs.


Italian Ramazzini's 1700 work is "considered to be the first text to specifically deal with occupational illnesses. It was also the last for over 150 years." [from the abstract] The book describes 69 occupations, 12 of which often produced headaches.

Robert Andrew Hingson, M.D.
1913-1996

Physician, innovator and humanitarian, Dr. Hingson received his M.D. degree from Emory University in 1938. He interned at the U.S. Marine Hospital on Staten Island and then was Director of Anesthesia there until 1943, serving during one of those years as a Fellow in Anesthesiology at the Mayo Clinic. From 1943-45 he was Director of Anesthesia at the Philadelphia Lying-In Hospital and then was Professor of Anesthesia at the University of Tennessee from 1945-48. From 1948-51 he was Associate Professor of Anesthesia and Co-director of Anesthesiology Research at Johns Hopkins University. From 1951 until his retirement he was Director and Professor of Anesthesiology at University Hospitals, Western Reserve University in Cleveland, Ohio.

While at the Marine Hospital on Staten Island, he introduced the continuous caudal technique for obstetrical delivery, publishing a landmark article on this technique in the Am. J. Surgery in 1942. Later this was modified to the continuous epidural technique. During his career he authored some 150 scientific papers and wrote two textbooks on anesthesia in obstetrical practice.

In 1958, Dr. Hingson founded the Brother's Brother Foundation and also developed for clinical use the hypospray "jet" injector, with which he and colleagues were able to successfully immunize over a million people in Liberia and Costa Rica against smallpox. Later his group also carried out mass immunizations against poliomyelitis and measles in Nicaragua, Honduras and Panama. Through the years the Foundation, in broadening its scope, has distributed to our 100 countries on five continents some $560 million in medical supplies, textbooks, seeds and other assistance to over 40 million people.

In 1987 Dr. Hingson received the U.S. President's Award for International Volunteerism for his work in promoting international health. In his generation he was truly a pioneer and humanitarian of the first order.

He is survived by his wife of 56 years, a daughter, four sons of whom one, Luke L. Hingson, now heads the Brother's Brother Foundation in Pittsburgh, Pennsylvania, one brother and four grandchildren.

Memorials may be sent to the Brother's Brother Foundation, 1501 Reedsdale St., Suite 305, Pittsburgh, PA 15233-2341.
Snake(s)... Continued from Page 20

depicted minus a staff, and loosely knotted on itself, a setting reminiscent of other ancient presentations. The University of Ottawa faculty of medicine crest bears the Aesculapian staff, similar to the medical crest of the medical faculty of Calgary.

Other items, including postage stamps, coins, armorial bearings, staffs, emblems, seals and crests have included either the staff of Aesculapius or the caduceus. Queen Anne and King George I included the caduceus in their medallions. Military units in both Canada and the United States use either symbol. Military medals display one or the other. Thus, the snake continues to enjoy the status of an icon in its symbolic presentation.

Dare one ask then, which symbol correctly represents the art and science of healing? By history alone, the staff of Aesculapius is the legitimate medical symbol, at least to the historical purists. Lest there be any remaining doubt, this author is one of those purists!

Acknowledgment

The author wishes to acknowledge the invaluable aid of Mrs. Patricia Johnston, director of library services, Children's Hospital of Eastern Ontario.

References