Clinical Hypnosis and Anesthesia—An Historical Review and Its Clinical Implications in Today’s Practice

by Sebastian Schulz-Stübner, MD
Department of Anesthesiology, Universitätsklinikum der RWTH Aachen, Aachen, Germany

Introduction

With the widespread use of regional anesthesia, the question of sedation during the surgical or diagnostic procedure, whether requested by the patient or by the surgeon, becomes a focus of clinical and scientific interest. Several short-acting drugs like propofol or midazolam often combined with small doses of opioids are used for sedation purposes to comfort the patient while the regional block provides the necessary analgesia. The main goal of drug-based sedation management is to achieve a relief in perioperative stress reactions. But even with the known safety profile of the mentioned drugs, there is still a risk of side effects like respiratory depression and paradoxical reactions, especially in the elderly or in patients with preexisting medical problems like sleep apnea. Therefore, a nonpharmacologic approach might be useful. A few authors and groups tried to solve the problem by introducing a method well known in psychiatry and psychotherapy under such different terms like mesmerism, animal magnetism or somnambulistic state, in this article referred to as clinical hypnosis into the field of clinical anesthesiology. In the past 150 years this is not the first time that clinical hypnosis in one of its different forms crosses the way of anesthesiology which makes it interesting to review the history of clinical hypnosis and the implications for modern anesthesia practice.

Historical Perspective

The first description of a successful induced somnambulistic state was given by Franz A. Mesmer (1734-1815), a German physician who practiced in Vienna and Paris. He tried to explain the observed phenomenon of a state of peaceful sedation combined with the ability to communicate and to follow commands by a secret fluid in the body, representing the balance of energy, which could be manipulated by magnetism. Therefore he named the process “animal magnetism.” Today one would call his technique the first clinical hypnosis by a concentration and verbal command method. Moreover he used a kind of group psychotherapy setting in his “magnetic sessions,” which took place in a strictly organized environment. The patients were seated around a big bath tub and connected to the “magnetic energy” by iron tubes which they held in their hands. The magnetic energy, which Mesmer believed to be created by the contact of mineralized water with the iron tub, should now flow into the patients in order to create a new balance of energy in the body. Mesmer started the session by a number of commands to enhance the concentration of his clients to the energy flow into their bodies. So he induced group hypnosis and got his patients in trance. Although he believed in his concept of a real energy transfer, the bath tub and the iron tubes are seen by modern psychiatrists only as tools to enhance the concentration of the patients to his suggestive commands. The so-induced feeling of depersonalization and trance was called “crisis” and was seen by Mesmer as the original therapeutic process during which energy flooded the organism and cleared the symptoms. The patients were still responsive to his commands but seemed to behave in an unconscious mode, sometimes not recalling anything of the magnetic session.

The term “mesmerism” was applied later in order to honor the discovery of Mesmer by his students and is still used to describe hypnotic techniques in many textbooks. While Mesmer was very popular with his patients, who experienced relieve from symptoms of disorders we would nowadays classify as neurotic disorders, contemporary physicians were skeptical and tried to prove him a fool but could not explain the observed phenomenon either.

The British neurologist James Braid (1765-1860) interpreted the clinical hypnotic state as a “state of sleeping nerves” and introduced the term hypnosis in his concept of “neurypnology.” He also noticed for the first time that the sensitivity to painful stimuli was reduced under hypnosis.

The first reports about successful pain relief with mesmerism for clinical use are found in Great Britain by Lynell who used mesmerisation for the management of pain in laboring women, and a few years later in America by Fahnestock who treated labor pain in eight patients and also cured one lady who had lost her eyesight and suffered from a paraplegia of her legs after a difficult labor. These symptoms are almost certainly the result of a conversion neurosis. The reactions after the publication of his case reports were very controversial as in the case of Mesmer, although Fahnestock’s theory was very close to modern definitions of clinical hypnosis. He called the clinical hypnotic state “natural

Continued on Page 4
Note from the Editor

The editorial staff is pleased to announce that we now have two tracks for articles submitted for publication. The first is expedited editorial review, which has been our usual method of acceptance. The second and new track will be a peer-reviewed process with multiple reviewers and suggestions made to the author for improvement of the manuscript. The second track will result in longer turnaround time, but these articles will be published in our new peer-reviewed section of the Bulletin. In addition, the articles published in the Bulletin of Anesthesia History are now listed in Histline, which will soon be included as well on the electronic version of Medline.

We owe appreciation to A.J. Wright of Birmingham, Alabama, who assisted in this transition. Therefore, new submissions to the Bulletin can be elected by the author to be peer-reviewed or editorially reviewed and all published articles will be indexed and available to other scholars.

— Doris K. Cope, M.D.

Call For Papers!

Through the efforts of Dr. David Shepard, the Anesthesia History Association will meet in joint session with the History of Anaesthesia Society on Saturday June 10, 2000, the day after the World Congress in Montreal. The Faculty Club at McGill University will be the setting.

Abstracts of papers should be submitted on an 8½" x 11" paper with one inch margins all around. Presentation will be of 15-20 minutes’ duration.

Please send completed abstracts by March 1, 2000 to:

A.J. Wright, M.L.S.
Department of Anesthesiology Library
University of Alabama at Birmingham
619 19th Street South, JT 965
Birmingham, AL 35233-6810

Call for Abstracts: AHA 2000

Anesthesia History Association Annual Spring Meeting
March 29, 2000
Dolphin Hotel Wait Disney World
Orlando, Florida

The Anesthesia History Association invites the submission of abstracts for presentations at its 8th annual spring meeting. This meeting will be held in conjunction with the 25th annual meeting of the American Society of Regional Anesthesia.

Presentations should be 20 minutes in length and relate in some way to the history of anesthesia, pain management or critical care medicine. Abstracts should be no longer than what can fit on one 8½" by 11" sheet of paper. If possible, abstracts should indicate the research problem, sources and methodological approach used and may contain no more than 10 references.

Abstracts may be submitted by mail, fax or e-mail. Disk submission in Word-compatible format is also permitted. All accepted abstracts will be distributed in some form to all meeting registrants. Individuals who wish to organize a paper session around a theme should contact us as soon as possible.

Abstracts must be submitted by January 31, 2000, to:

A.J. Wright, M.L.S.
AHA Annual Spring Meeting Organizing Committee
Department of Anesthesiology Library
University of Alabama at Birmingham
619 19th Street South, JT965
Birmingham AL 35249-6810
(205) 934-4696 [voice]; (205) 975-5963 [fax]; e-mail <a.j.wright@ccc.uab.edu>
Further announcements will be made as details for the program develop.

Dr. Albert M. Betcher

Dr. Albert M. Betcher passed away on October 15, 1999, aged 87. He worked with Dr. Paul Wood and Dr. Lewis Wright to build the Wood Library-Museum, nurture it, protect it, and see it grow to serve anesthesiology in preserving and propagating the culture of the specialty.

Dr. Betcher served as President and Chairman of the WLM Board of Trustees from 1955 to 1969. He saw the development of the WLM almost from its inception, helped it establish, and developed its close relationship with the American Society of Anesthesiologists during his office as President. Under his leadership, Dr. Betcher directed the course of the WLM from its temporary quarters in New York to its permanent home in Park Ridge in 1963. Dr. Betcher also helped establish the WLM Endowment Fund when he and his Board petitioned the ASA to insert a line for voluntary contribution to the WLM on the ASA membership dues statement.

Dr. Betcher has been a leader and a great friend of the Wood Library-Museum for more than half a century. We extend our deepest sympathy and condolence to his family, Mrs. Trudi Betcher, wife, and Mrs. Diane Dodge, daughter.

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Volunteer Archivists Needed

by William D. Hammonds, MD, MPH

The Wood Library-Museum of Anesthesiology (WLM) is in the midst of change with important long-range consequences. The Museum is now involved in a project to catalog the entire collection. The long-range goal of this project is to develop a computerized list of all artifacts and archives. When completed, this project will make the collections accessible to scholars and enable better accounting of the historical treasures in our care.

Cataloging a collection like the one at the WLM requires a knowledge of the art, science, and practice of anesthesiology and an interest in anesthesia history. The WLM needs volunteers who can help with this project. Volunteers who can identify and describe the use of valves, circuits, airways, vaporizers, etc., are needed. Alternatively, volunteers could help catalogue a collection of the papers of early anesthesiologists.

Volunteers will work under the general direction of the Chair of the Museum or Archive Committee or the Honorary Curator and under the day-to-day direction of Patrick Sim, MLS and Judith A. Robins, CA, collection supervisor.

A recent example of a person who provided valuable volunteer service to the WLM is Theodore Smith, MD. Dr. Smith, a veteran academic anesthesiologist, is applying his extensive knowledge of the specialty to a project in the archives. He is cataloging the papers of an anesthesiologist whose papers have come to the WLM. Dr. Smith’s knowledge of anesthesiology and its history give him unique qualifications to do this important work.

The only compensation for this fascinating work is inner satisfaction and gratitude. The gratitude will come from the Trustees of the WLM, anesthesiologists who are interested in the history of their specialty, and medical history scholars, those now working, and those to work in years to come.

To volunteer, please contact Patrick Sim, the librarian, at the American Society of Anesthesiologists, 520 N. Northwest Highway, Park Ridge, Illinois 60068-2573. The telephone number is (847) 825-5586. Or you can contact William D. Hammonds, MD, MPH, at (404) 778-4027 or <william_hammonds@Emory.org>.

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Little Prize Committee Report

1998 David M. Little Prize:


“This contribution by a renowned anesthesiologist enriches the literature with personal recollections over 50 years of involvement in the development of the specialty of anesthesiology.” (Reprinted on Page 13.)

Honorable Mention:


1999 David M. Little Prize


Honorable Mention:


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Laureates of the History of Anesthesia

Norman A. Bergman, M.D.

The Chairman of the Laureate Committee of the Wood Library-Museum of Anesthesiology, Dr. Nicholas M. Greene, is delighted to announce the two outstanding individuals selected for the Year 2000 Laureate of the History of Anesthesia. The awardees are the late Dr. Norman A. Bergman, of Lake Oswego, Oregon, USA, and Dr. Thomas B. Boulton, of Berkshire, UK. We honor their long-standing and significant contributions to the study of the History of Anesthesiology and the contributions and the First Ether Anesthetic in South Africa" published in South African Journal of Surgery 1997; 35:54-58.


1999 David M. Little Prize


Honorable Mention:


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Volunteer Archivists Needed

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Hypnosis. . . Continued from Page 1

somnambulistic state" and thought it was (although induced by the operator) finally the result of the subject’s own will to relax.

Perhaps the first surgical operation in a mesmeric state took place in Paris in 1829 and was just recently described in an historic review by Sim in "Regional Anesthesia and Pain Medicine." Madame Plantin’s ulcerated breast cancer was operated on by Jules Cloquet under mesmeric anesthesia induced by Jean Pierre Chapeland on April 12, 1829. Mesmeric sleep was maintained for 48 hours. Madame Plantin died two weeks later of other unrelated disease. The case report was presented to the French Academy of Medicine but the report of the investigating committee was never officially published. A survey of “mesmerism and surgery” can be found in an historical article by Rosen written in 1946, and a description of the perception of hypnosis by the English medical profession is given by Palfreman in 1977.

Based on Mesmer’s observation, the suggestive techniques to induce a clinical hypnотic state were used and further developed to a formal treatment regimen by Charcot (1825-1893) in Paris. His so-called “School of Paris” used the hypnotic sessions to treat hysterical symptoms. He believed that hypnosis itself was a kind of hysterical episode and only patients with hysterical disorders could be hypnotized. His theory was contradicted by Liebeault (1823-1904) and Bernheim (1837-1919) who formed the “School of Nancy” and stated that everybody could be hypnotized and that the clinical hypnotic state would be only a result of the suggestive technique used and not a symptom of any psychological disorder or mysterious energy.

Both schools used a technique of direct and very strict commands like: “You will close your eyes now and feel your body getting warm and heavy.” This technique is therefore called the “direct induction technique” and is still often used for show hypnosis by mesmerists in theatres and circus shows. These hypnotic shows became popular in Europe in the beginning of the 20th century and are still the most common form of hypnosis in the public opinion, which creates a lot of prejudice. Stories of black-haired old gypsy women who are hypnotizing young ladies to kidnap their children or steal their jewelry are an integral part of commonly told fairy tales in the 1920s.

In Vienna, Sigmund Freud (1856-1939), who studied at both places with Charcot and Bernheim and translated Bernheim’s book about hypnosis into German, used clinical hypnosis for the treatment of neurotic disorders. The case of Anna O. who suffered from absence-like mental states, muscle weakness and paralysis has become famous in medical history: first as an example of long-term use of hypnotic therapy and second as one of the first case reports of the new theory of psychoanalysis which was based on the concept of a disturbed development during early childhood. After Freud introduced the theory of psychoanalysis, he used hypnotic techniques only as a tool to explore subconscious information in the patient’s history and to recreate emotional settings of the early childhood.

In 1889, the chief of the department of psychiatry at the university hospital of Zurich, Bleuler (1857-1939) gave an impressive description of his own hypnotic experiences. He reported the feeling of regression in his mind and relaxation of his body although being able to communicate and obviously not being unconscious. He felt reluctant to his environment and sensations to his body were like padded by a cushion. He also experienced anesthesia to needle pricks and the effect of posthypnotic commands.

A few decades later, J.H. Schultz (1884-1970) introduced his concept of organic psychotherapy with an auto-suggestive method called “autogenous training” which is a kind of self-hypnosis and which in Europe is as popular in complex pain management protocols as the muscle relaxation technique by Jacobson is in the United States.

At the beginning of this century a modern type of clinical hypnosis was developed by the American psychiatrist Milton H. Erickson (1901-1980), who often used the term “trance” to describe the somnambulistic state. Erickson was handicapped by an infection with polio and temporarily dependent on a wheelchair. Moreover, he was almost deaf and could not see colors. These handicaps might have influenced his observational abilities for the behavior and emotions of other people and the creation of his hypnotic technique which can be described as the “suggestive story telling method.” In contrast to the very direct suggestive commands of his predecessors, he included his suggestive commands in a story and used images and metaphorical adjectives to induce trance. His induction method is often called “permissive” or “indirect” and gives the patient an opportunity to create his or her own images, which is a part of his therapeutic concept to open subconscious emotional elements. His understanding of subconscious emotions, however, is very different from Freud’s use of the same term in his psychoanalytic theory. For Erickson, hypnotherapy is a special kind of communication between doctor and patient, and the subconscious emotions are a great potential of experiences which can be activated in a creative manner to solve conflict situations put necessarily created by disturbances in early childhood development and sexuality.

Despite the long empiric use of clinical hypnosis for more than a century, there is still discussion about the mechanisms which are involved to produce trance; even the definition of hypnosis is not universally accepted. One of the most accepted definitions is given by Stokvis and Pflanz. They define hypnosis as a “state of regression to the basic functions of personality and body sensations without losing consciousness.” To anesthesiologists this sounds familiar as the concept of conscious sedation.

Clinical Perspective

In modern psychiatry, hypnosis is used for the treatment of neurotic disorders, anxiety disorders and episodes of minor depression (DSM IV) and related relaxation techniques are taught to patients to reduce stress and anxiety.

Studies to enlighten the mechanisms of clinical hypnosis are very difficult to conduct because of missing animal models and no possibility to blind investigators and subjects in a study setting.

Most of the reports in the literature about the use of clinical hypnosis in modern anesthesia are therefore more or less anecdotal and based on small numbers of patients or single case reports as summarized in this chapter. In contrast to the early trials to use hypnosis for analgesia, the focus of interest shifted in the last decades to its use for sedation.

For the induction of clinical hypnosis, for example as a supplement for regional blocks in the environment of an operating room, a fixation and command method like described by Schäfgen has been used. The patient’s concentration was guided by fixation of a pen or a fingertip with his eyes which will become naturally heavy and tired. This feeling was reinforced by commands like “You will feel your eyes getting tired and just close them like becoming sleepy in the evening.” By observing the reaction of the pupils, the physician could determine the appropriate time for these (pseudo)suggestive commands. After the patient had closed his eyes, the trance state was made deeper by suggesting body sensations like feeling one’s extremities lying on the OR table and getting warm. During
confirm a similar pattern of activation as that observed by Halama.\(^7\)

Although there is a long history of clinical hypnosis from the animal magnetism of Mesmer to Erickson's trance and sedation, these few studies are inadequate to evaluate the role of clinical hypnosis in the routine practice of anesthesia.

Since psychiatric literature shows almost no severe side effects of clinical hypnosis,\(^8,9\) there might be a use for clinical hypnosis in modern anesthesia for patients who are experienced in relaxation techniques or clinical hypnosis from a psychotherapeutic setting. Medical conditions like sleep apnea syndrome, severe pulmonary diseases and known allergies or paradoxical reactions to sedative drugs might also be indications to try clinical hypnosis, avoiding drug-induced ventilatory depression and side effects and alterations in breathing patterns by imagination and suggestive commands. Contra-indications include psychotic disorders, dementia, debility and other mental impairments, intellectual problems, language barriers and the use of psychodelic drugs including ketamine. If a careful psychiatric history cannot be obtained, the potential risk of inducing a psychotic episode in an undisagnosed psychotic patient must be considered. Sometimes just the calming voice of the anesthesiologist and his empathetic talk to the patient (the so-called "drug doctor") might be successful without using any explicit hypnotic technique.

The major limitations of clinical hypnosis in the daily-life practice of anesthesia are the necessity of special psychotherapeutic training for the practitioner, the complex and crowded environment in OR settings, the cooperation with the surgical staff and last but not least, time constraints to explain the method to the patient and his family and obtain adequate evaluation of his psychiatric history.

[Editor's Note: Although hypnosis may be impractical in a busy operating room setting, its use in controlling acute pain flares in chronic pain patients is a technique worth considering.]

References

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this time also the first imaginations of pic­
tures like being on the beach or walking through a nice landscape were introduced.

It has been recommended to make sure to use images related to positive experiences and emotions for the patient by getting a good history of what he or she likes and dislikes. Otherwise, the anesthesiologist might be in danger of sending, for example, a patient with hay fever through an imagi­nary grassland and might wonder why there is discomfort instead of relaxation.

Hypnotic techniques have also been used to comfort the patient during surgery or a diagnostic procedure itself.\(^1,2,3,4\) After successful induction of the clinical hyp­notic state, most environmental noises, talking and movements during the procedure might be integrated in the imagina­tion by using Erickson's story-telling tech­nique and will not disturb the hypnotic process. A success rate of about 60% using this technique has been reported in a small series of 10 patients.\(^5\) The possible dura­tion of a clinical hypnotic state in the OR is probably very different between indivi­dual patients, and studies with enough power to determine a reliable time limit are missing. A few case reports describe that a duration of one or two hours has been ob­tained.\(^5,6\)

Even moderate cognitive impairments, short term memory problems or mild confu­sion as seen in patients with traumatic brain injury or subarachnoid hemorrhage who require sedation for diagnostic procedures are reported to make clinical hypnosis almost impossible, in contrast to younger children who might profit from clinical hypnosis and can be hypnotized.\(^6,7,8\)

Beside these case reports, there was one study performed by Moret et al.\(^2\) who tried to determine whether the effects of hypnosis for analgesia were related to the opiate endorphin system by inducing experimental pain in healthy volunteers and measuring a variety of parameters. He compared clinical hypnosis to acupuncture and found it more effective for analgesia but he could not detect any effect on the endorphin sys­tem using either hypnosis or acupuncture.

Halama\(^3\) investigated changes in brain perfusion under hypnosis with SPECT and found hyperperfused areas particularly in the right frontal lobe in contrast to the rela­tively hypoperfused rest of the brain. In his opinion, this correlated with the psycho­physiological changes observed in the hyp­notized persons. However, his EEG studies showed only unpecific activation and no sleeplike formations as initially anticipated. Studies with functional MRI scans
Traveling Exhibits Available for Loan

by Judith A. Robins
Collections Supervisor

The Wood Library-Museum of Anesthesiology has an active traveling exhibits program. As of this year, ten exhibits are available for loan to educational institutions, professional groups and conferences. Each exhibit consists of informative panels that can either be displayed on easels or hung on walls. The topics of these exhibits include historical overviews of nitrous oxide and ether anesthesia; equipment safety; military, obstetric, and pediatric anesthesia; the life of Horace Wells, and pioneers of anesthesia. There is no charge for this service, but borrowers do pay the cost of shipping and insurance. On request, WLM can also lend collapsible easels and/or hanging chains and hooks for the display of these panels. For more information, please contact Judith Robins, WLM Collections Supervisor. She can be reached by telephone at: (847) 825-5586, extension 68, or by e-mail at: <j.robins@ASA HQ.org>.

The traveling exhibits available from the WLM are as follows:

1. “150 Years of Anesthesia” (3 Cases) (Created by WLM, 1996)
2. “Better Gas Machines Through Safety” (1 Case) (Created by Dr. Leslie Rendell-Baker)
3. “Davy and Beyond: 200 Years of Nitrous Oxide” (1 Case) (Created by WLM, 1999)
4. “Development of Nitrous Oxide-Oxygen Apparatus and Their Breathing Systems” (1 Case) (Created by Drs. Leslie Rendell-Baker and James A. Meyer)
5. “Early Views of Childhood Pain and the First 100 Years of Pediatric Anesthesia” (1 Case) (Created by WLM, 1998)
6. “Gas Machine Hazards and Their Solution” (1 Case) (Compare to # 2) (Created by Dr. Rendell-Baker, 1974-75)
7. “Horace Wells” (1 Case) (Created by WLM, 1994)
8. “Military Anesthesia” (2 Cases) (Created by WLM, 1995)
9. “Obstetrical Anesthesia” (2 Cases) (Created by WLM, 1997)
10. “Pioneers and Innovators in Anesthesia” (1 Case) (Created by Drs. Leslie Rendell-Baker and James A. Meyer, ca. 1993)
Surgery of the heart has probably reached the limits set by nature to all surgery; no new method and no new discovery can overcome the natural difficulties that attend a wound of the heart.

—Stephen Padget, 1884

It may truthfully be stated that the success experienced in recent years in operating on the heart is in large measure due to the development of new anesthetic agents and techniques, and more important, to the increasing skill and knowledge of anesthetists and to their rapidly increasing interest in physiology. These factors have made the anesthetist an important and integral member of a therapeutic team, rather than the mere agent of a necessary evil.

—Drs. Evelyn and MacKay, 1954

Current Researches in Anesthesia and Analgesia

The idea that men who never before in their lives had an ether can in their hands and have never seen the inside of an operating room can be momentarily transformed into anesthetists is a mistake in judgment bordering in criminal negligence.

—Dr. Francis Hoeffler McMechan, 1918

Editorial about anesthetic services during World War One

American Journal of Surgery

Today it can be stated categorically that an adequate recovery room service is a necessity to any hospital undertaking modern surgical therapy.

—Operating Room Committee, New York Hospital, 1949

The question may well be asked why do not deaths from anaesthetics show signs of diminution? The reply is that the administration is often placed in the hands of comparatively unskilled men. The first step should be an educational one.

—Frederic Hewitt, 1896

It is axiomatic that education and medical care are inextricably interdependent.

—Joseph M. White, 1966

Medical Education and Anesthesia

Frontal lobotomy, although not strictly speaking a specific operation for the relief of pain, has become an invaluable method for controlling suffering from various intolerable discomfort for which no other solution is known.

—James C. White, 1955

Pain: Its Mechanisms and Neurosurgical Control

Much discredit has come to nerve blocking from the too frequent practice of 'trying a block' without accurate diagnosis. This is particularly true when patients are treated for pain following injury or of a chronic nature.

—Rovenstine and Hershey, 1944

Anesthesiology

Medical men may oppose for a time the superinduction of anaesthesia in parturition but they will oppose it in vain; for certainly our patients themselves will force use of it upon the profession. The whole question is, even now, one merely of time.

—James Young Simpson, 1871

The conquest of pain remains, after all, the most important task, the main aim, and the crowning—though yet distant—achievement of every medical man, at the bedside, in the operating theatre, in the laboratory, on the battlefields, and wherever else mankind may suffer.

—Cornelius Medsei, 1949

Mental and Physical Effects of Pain

Please send me your submission. Include the author, date, and the source of the quote. Your submission will be credited. Thank you for your participation. Send to: Fred J. Spielman, M.D.; Department of Anesthesiology; University of North Carolina School of Medicine; Campus Box 7010; Chapel Hill, NC 27599-7010. Fax 919-966-4873

E-mail Spielman@aims.unc.edu.
Un Anesthesiste d’avant garde, le Chirurgien Theodore Tuffier

by Marie Thérèse Cousin

Abbreviated and translated with permission of the author
by Ray J. Defalque, MD, Birmingham, Alabama

Theodore Tuffier, Surgeon and Pioneer of Anesthesia

Introduction
Tuffier, one of the leading surgeons at the turn of the century, is well known for his many significant contributions to various surgical specialties, including the care of wounded Allied soldiers in World War I. He trained several generations of young surgeons, published a number of books and monographs including a popular treatise of minor surgery, wrote over 1,168 articles, and attended (and often chaired) many French and European congresses of surgery. Less known, however, is his work in the field of anesthesia.

TUFFIER’S CONTRIBUTIONS TO ANESTHESIA

Challenge of the Pneumothorax
Before Tuffier, attempts to operate on the lung had been defeated by the occurrence of a pneumothorax at the opening of the pleura. In 1896, Tuffier reported to the Société de Biologie (Paris) his successful pulmonary surgery in dogs with the use of positive pressure ventilation (PPV). Using a bellow at the opening of the pleura, he insufflated the animal’s lungs with a mixture of chloroform and oxygen through a cuffed endotracheal cannula with an inspiratory and an expiratory valve; the latter was connected to an underwater seal to create a 10 mmHg positive end-expiratory pressure (PEEP). The lung was re-expanded at the chest wall closure and the animal awakened. The tracheal cannula was introduced under direct vision through the glottis after the epiglottis had been retracted with a forceps. Tuffier designed a curved forceps, similar to our Magill forceps, to guide the cannula down the trachea. The carotid or femoral and the pulmonary arteries, the left atrium and the jugular vein were cannulated and their pressure continuously recorded during the procedure. Tuffier thus showed that not only could the pleural cavity be safely entered, but that its opening only caused minimal circulatory changes.

Using Tuffier’s technique, the Americans Parham in 1899 and Lilienthal in 1910 successfully performed lung resections in man. Tuffier’s brilliant though simple concepts were lost over the next 30 years of sterile controversies over barometric chambers until the routine use of positive pressure ventilation and of tracheal intubation in the U.S. by the 1930s allowed safe pulmonary and, shortly thereafter, cardiac surgery.

Subarachnoid Anesthesia
On November 3, 1899, seven months after Bier had reported the discovery of spinal anesthesia, Tuffier performed the first French intrathecal injection of cocaine in man. His indication was pain relief in a patient with pelvic osteosarcoma. Six days later he did the first surgical spinal anesthesia in France for the resection of a femoral osteosarcoma. His excellent initial results encouraged him to continue using the technique extensively and to popularize it in France and, through his pupils and visitors, in the rest of Europe and even in America. Tuffier’s success was due to his attention to details, his strict asepsis, and his understanding of the technique’s indications, dangers, and limitations. His results helped rescue spinal anesthesia at a time when Bier himself, discouraged by his failures and complications, had abandoned it. Tuffier quickly adopted stovaine after Fourneau’s discovery; he also designed a small-gauge, atraumatic spinal needle. His efforts contributed to the popularity of spinal anesthesia in Europe during the first three decades of the 20th century.

Other contributions to anesthesia
Tuffier studied electrical anesthesia in the laboratory but felt it to be impractical in clinical conditions because of its prolonged period of excitement. He recommended the administration of saline during surgery and emphasized the value of pre- and postoperative laboratory tests. He also invented an apparatus for direct blood transfusion which was extensively used in France. During World War I, he studied the conditions for the safe air evacuation of wounded soldiers.

Conclusion
Tuffier not only was one of the great masters of French surgery, he also made important contributions to anesthesia which deserve to be remembered.
AHA/HAS Joint Meeting—May, 1999

by A.J. Wright, MLS
Department of Anesthesiology Library, School of Medicine, University of Alabama at Birmingham

Anesthesia history enthusiasts from nine countries—including 18 from the United States—gathered in Bristol, England, in mid-May to celebrate the 200th anniversary of the nitrous oxide experiments performed in that city by Thomas Beddoes and Humphry Davy. Held on Thursday, May 13 through Saturday, May 15, the occasion served as the first joint meeting of the Anesthesia History Association (AHA) in the United States and the History of Anesthesia Society (HAS) of Great Britain. The Society of Anaesthetists of the South Western Region (SASWR) served as a third sponsor.

The conference hotel was the well-appointed Swallow Royal at College Green, down a steep hill from the University of Bristol campus. Meeting displays and presentations took place at the Watershed Conference Centre on the waterfront just a short walk below the Swallow Royal. Promptly at 0930 Thursday morning, Professor Cedric Prys-Roberts of the Sir Humphry Davy Department of Anesthesia, University of Bristol, welcomed the attendees in the crowded lecture hall. Dr. Jean Horton, HAS President, chaired the first session of four papers. Dr. Norman Bergman, author of The Genesis of Surgical Anesthesia, set the tone by offering his insights in "A Critical Re-Reading of Humphry Davy's Researches." The prolific Dr. David Zuck, a past HAS President, examined Davy's work on lung physiology with "Humphry Davy, Nitrous Oxide, and the Measurement of Lung Volume." Dr. Catherine E. Ross from the University of Texas at Tyler offered a fascinating glimpse of her dissertation work in her paper, "Twin Labouours and Heirs of the Same Hopes: Humphry Davy and Romantic Poets." To end the session, yours truly described "Gardner Quincy Colton's 1848 Visit to Mobile, Alabama," just one of Colton's many stops in his tours around America between 1845 and 1848.

The second Thursday morning session was chaired by Dr. George Bause, Honorary Curator of the Wood Library-Museum of Anesthesiology. Dr. John Birtwistle of the University of Sheffield continued a thread from the previous session in "The Contest of Poetry and Science in the Description of the Bristol Nitrous Oxide Experiences." A fascinating, long-needed look at "Beddoes' Patrons" was provided by Dr. E.T. Mathews of the University of Birmingham.

Dr. Michael Goerig of Eppendorf University Hospital in Hamburg, scheduled next, was unable to attend. Professor Cedric Prys-Roberts moved his delightful "Spreading the Message" talk from its Friday spot to fill the gap.

Dr. Prys-Roberts also served as Chair of the first Friday morning session, which, if possible, was even better attended than the previous day's. Further elements of the relationship between medicine and literature were explored by Ms. Sally Coniam, Lecturer at Bath Spa University College, in her paper "Pain, Disease and the Romantic Poets." Dr. Bause, a descendent of Humphry Davy, announced a "Discovery for the Davy Bicentennial," an anesthesia machine designed by Amos M. Long of Monroe, Michigan. California provided the material for the final two papers of the session. With her usual thoroughness Dr. Selma Calmes, University of California Los Angeles, examined "How Nitrous Oxide Was Introduced into Clinical Practice: The Case for California." Dr. John W. Severinghaus of the University of California San Francisco, shared a very personal experience in "What Dreams May Come with Nitrous Oxide."

Dr. Theodore C. Smith, President of the AHA, served as Chair of the next session. Dr. Richard Bodman from Cork, Ireland, described the fascinating research involved in "Triad of Muscle Relaxants in Conscious Volunteers, Bristol and Paris, 1951." Although "Elmer McKesson is not here to Defend Himself," Dr. Gerald Zeitlin of Newton, Massachusetts, declared in his title, Dr. Zeitlin at least made an admirable effort to understand and explain McKesson's use of two techniques of nitrous oxide anesthesia that would be unacceptable today.

Friday afternoon's first session, chaired by Dr. Brian Perriss, SASWR President, examined early anesthesia in Bristol. Dr. Robin Weller of the Frenchay Hospital in that city, examined "The First Bristol Anesthetic," which probably took place on December 31, 1846. Dr. Tony Bennett, also of the Frenchay Hospital and organizer of this wonderful meeting, explored anesthesia's delayed acceptance in "The Eclipsed Dawn of Anaesthesia in Bristol." Finally, Dr. Tom Simpson of the Royal University Hospital in Bath, delighted the audience with a presentation about "My Famous Forbear," Dr. James Y. Simpson.

The final Friday afternoon session of three papers, chaired by Dr. A' Marshall Barr, Honorary Editor of the HAS Proceedings, featured two papers on a related topic. Dr. Gordon Craig from St. Mary's Hospital in Portsmouth speculated, "Would ATLS Have Saved Lord Nelson?" Mr. Bruce Campbell of the Royal Devon and Exeter Hospital offered "Current Thoughts on ATLS Training." The session's final offering was The Humphry Davy Lecture in which Dr. David Wilkinson of St. Bartholomew's Hospital challenged our thinking on Davy in "A Lot More than Nitrous Oxide."

Five papers concluded the meeting on Saturday morning in a session chaired by Dr. Roger Eltringham of the Gloucester Royal Hospital. Dr. Bob Marjot of the Royal University Hospital in Bath examined "The John Snow Papers." Dr. Iain Wilson of the Royal Devon and Exeter Hospital asked "Ether—An Agent for Today?" Dr. J.C. Diz of Santiago, Spain, described the relationship of Professor Robert R. Macintosh to anesthesia development in his country in "Macintosh and the Spanish Connection." Professor Leslie Rendell-Baker of Loma Linda University in California examined one of the great unanswered questions in anesthesia history by asking "What Prevented the Discovery of Nitrous Oxide Anesthesia at the Pneumatic Institute?" Finally, local historian and Honorary Tutor at the University of Bristol, Miss Pip Jones, explored the topic "Bristol and the Slave Trade."

Three exhibits were also on display throughout the meeting. Professor Rendell-Baker and Dr. Bause offered "Development of Nitrous Oxide-Oxygen Apparatus and Their Breathing Systems." Dr. Ray J. Defalque of the University of Alabama at Birmingham and yours truly examined the little-known "The Society of Dutch Chemists: Its Contribution to Anaesthesia." Dr. Tony Bennett provided "A Selection of Anaesthesia Equipment from the Monica Britton Museum including Davy Artefacts." An informational display about the newly-formed anesthesia history society in France was also available.

Proceedings of this meeting will be published by the HAS sometime in 2000. Readers who are not HAS members can contact the Proceedings Editor for information Continued on Next Page
The Book Corner

by Peter McDermott, M.D.

This book is a few years old but it is too important not to bring to your attention. It was written by a leading member of “another” tribe: Stephen Greenblatt occupies a major place in the universe of literary scholars. Historians ignore the insights and the discourse of other disciplines at their peril. Anthropology, psychology, and, yes, even sociology have provided valuable perspectives on the past. Since we not only patrol but also control our own perimeter, we are enriched by permeations of the interface such as this from a powerful contemporary thinker.

Marvelous Possessions: The Wonder of the New World

This wonderful book begins with childhood memories of travel stories: The Arabian Nights and Halliburton’s Book of Marvels. The extent to which sustained narratives or overarching themes of progress or design inform the tradition of the travel journal or tale, as opposed to the collection and display of anecdotes embedded in the preconstructed attitudes of the traveler, constitutes one of the continuing tensions Greenblatt presents as he looks at ways in which cultures use “representational technology” and anecdotes act as “mediators between the undifferentiated succession of local moments and a larger strategy toward which they can only gesture.”

Dorothya love it? Sometimes a sentence cries out for a second reading. (Stories can imply historical truths and experiences in a unique manner.) The European sense of religious, social, and technological superiority and their “mission” on behalf of sovereign and Savior in the New World met with experiences for which they could not have been prepared and to which we reacted with “wonder.” Greenblatt likens the European response to America to an infant’s startle reflex. The effort to recuperate from the sensation of unexpected stimulation and discovery, sometimes aesthetically re-encoded as disgust or revulsion, sometimes as ravishment and ecstatic joy, is a series of attempts to impose meaning upon “wonder.”

Descartes called wonder “a sudden surprise of the soul” and expressed the worry that it froze the imperative of moral determination in the face of the morally indeterminate. Greenblatt sees Columbus employing a set of discursive rhetorical strategies to disconnect the ethical consequences of his rites of possession from the acts themselves. Greenblatt sets up Columbus’ discovery of the New World with a brief vignette in a 20th century Balinese festival and a historical reflection on Mandeville’s Travels, a 14th-century collection of adventures in the Holy Land and around the rim of the world. Columbus was doing something that Marco Polo and Mandeville did not: he was taking possession by a set of linguistic acts in “claiming,” naming or christening, by the use of narratives and formal speeches, and by rendering the natives silent in the “discursive economy” he created and impoverishing them of “mimetic currency” in the ecology of signs and symbols, metonyms and metaphors which he constructed. Columbus established a rhetorical relationship of incommensurability with the natives. Greenblatt, who saw the Jews portrayed as the great forgivable “other” in Mandeville’s Holy Land, sees Columbus’ Christian imperialism as a means of yoking paradoxes and establishing the interchangeability of souls and commodities. To convert the one was an act of possession and a metaphor for the conversion of the other.

Columbus’ expectations frame the ways in which he was capable of understanding his experience of discovery by pressing the signature of the creator in his creation into submission with truths already possessed. (He was restricted by the nature of his experiences and the conceptual limitations they contained.) As wonder submits to explanation, beliefs are validated. Columbus’ advantage over the natives, according to Greenblatt, his ability to employ “appropriative mimesis” (an imaginative use of signs), and the kidnapping of their language by the creation and deployment of native translators.

In his last chapter Greenblatt looks at the go-betweens, the translators and narrators of the early contacts between native and newcomer. The inequality of the exchange of representations in the Europeans’ favor related to their imaginative use of “blockage,” the denial of parallels and correspondences in the cultural practices of the natives. In a sense, a management of wonder by denial or exclusion of particular practices and the conversion of wonder into absolute difference at points of deep resemblance allowed Europeans to move, as Marc Shell observed, from the belief that “all men are my brothers” to the belief that “only my brothers are men.” As Mandeville and Herodotus sought hidden similarities in the cultures they visited, the radical differentiating of the “other” made strategies of renaming, transforming, and appropriation possible. And the act of differentiating made possible a displacement: simultaneously the possession and the dispossession.
From the Literature

by A.J. Wright, M.L.S.,
Department of Anesthesiology Library, University of Alabama at Birmingham

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Careers in Anesthesiology, III

A Book-Signing Event held at the 3rd Annual Tea for The Friends of the Wood Library-Museum, Dallas, Texas

In honor of the Friends of the Wood Library-Museum of Anesthesiology, in appreciation for their support given to the WLM through Friends membership and other voluntary services, an annual WLM Friends Tea Party is held at the ASA Annual Meeting. The Third Friends of the WLM Tea was held on Monday, October 11, 1999 at the ASA meeting in Dallas, Texas, immediately following the prestigious E.A. Rovenstine Memorial Lecture, which is the traditional time for this event.

Associated with the Tea was a book signing session upon the release of a new book, published by the WLM, titled Careers in Anesthesiology, III. Featuring autobiographical essays on the careers of leaders in anesthesiology, this series has now published three volumes, encompassing stories of the professional careers of 13 anesthesiologists. Together, these contemporary anesthesiology leaders told their individual stories that painted a panorama of post-World War II anesthesiology, which they witnessed, experienced and helped shape into a vibrant specialty of medicine. The authors of this new volume graciously availed themselves at the Friends Tea to autograph their books for admirers, friends, residents and other acquaintances. Making the rounds to autograph their books were Carlos Parsloe, M.D., E.S. Siker, M.D., John E. Steinhaus, M.D., and Peter M. Winter, M.D. The British anesthesiologist, Professor Stanley Feldman, was unable to join his fellow authors due to a prior commitment.

Copies of this volume as well as the other two Career Series can be obtained from the WLM Book Sales division.

Seated, from left to right, Drs. John E. Steinhaus, Carlos P. Parsloe, E.S. Siker and Peter M. Winter.

Authors (seated, from foreground): Drs. Peter M. Winter, E.S. Siker, Carlos Parsloe and John E. Steinhaus. Dr. Alan D. Sessler stands behind the authors; Drs. Martin Giesecke and Buddy Giesecke stand in front of the authors.
Anesthesia and The Surgical Experience

by E.M. Papper, Department of Anesthesia, University of Miami School of Medicine, Miami, Florida

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[Editor's Note: This paper was awarded the David M. Little Prize for 1998.]

And soothed them into slumber's full and deep. —KEATS

Introduction

A major revolution is now taking place in the practice of medicine in the United States and to a considerable degree in Western Europe as well. There is already great concern among the people who are actual or potential patients—now called consumers in the vernacular of this revolution of health care delivery—about the quality of their care and its availability. In the United States, costs have escalated to the point where our society either can not or does not choose to expend the funds required from both public and private sectors to ensure the level of care which preserves the high standard of the recent past. This mode of care is often associated, in the minds of many erroneously, with the traditional fee for service method of payment. The present environment, which was the consequence of a decision driven by the economic force of cost containment, is truly threatening in its impact on patients or consumers, as well as on physicians—or providers as they are called in the new language of managed care. These changes are variously described, but always in economically oriented terms. It is the worry of many physicians and patients that the quality of medical care will decline as a casualty of economic concerns.

Early after the election of President Clinton, there was an ill-timed and ill-fated effort on the part of the new President, with Mrs. Clinton in charge, to determine national health policy. It was designed to preserve the traditional American quality of excellent care while restraining or reducing the expenses deemed to be excessive. This entire process failed because of faulty political management—whether fortunately or unfortunately, is, at present, irrelevant. There was no government control put into place as a result of the activities of the White House which would have succeeded in preserving the quality of care and simultaneously managing to restrain total expenditures at an “affordable” level, whatever that might be.

It is probably an over-simplification, but it is an accurate one, to state that other options of controlling costs appeared very quickly. They took the form of private sector and entrepreneurial activity to set up Health Maintenance and Managed Care Organizations that were designed to control excessive expenses and also to preserve the quality of care. These economically driven events soon produced significant private enterprise profits, reduced income for many physicians (including anesthesiologists and other specialists), and posed a threat both to hospital survival in the not-for-profit sector and to academic medical centers. In the view of many physicians, a focus on the bottom line soon replaced the focus on compassionate and clinically effective care. The bottom line is more descriptive of the quality of care at present than of the economic successes.

Those who attributed the excessive cost to the consequences of malpractice lawsuits were very active in lobbying activities to control “pain and suffering” jury awards, thus far to little avail. Those who believed that insurance carriers were to blame for the excessive costs in terms of the way they managed their businesses also had little or no impact upon that particular industry. Finally, a modest number of clear-cut activities took place which not only redefined the nature of the practice of medicine but were predicting that its future would be driven by economic factors, possibly at the expense of professional skills. The managed care organizations were charged with the interesting problem of containing or reducing costs as well as preserving or enhancing the quality of care. All this had to take place while supporting a business establishment with comfortable, and often, generous salaries for executives as well as suitable returns for investing stockholders. All this is perfectly legal and is part of the established tradition of the American business free enterprise system. These effects had to be ensured in order to secure capital support for the new processes in providing medical and health care in the very new world for physicians. Physicians, increasingly, were becoming white collar employees, subject to all the vicissitudes of that new and unaccustomed status.

The Republican Contract with America that caused a sweeping 1994 midterm election victory, resulting in Republican control of both houses of Congress, included a pledge to curb health care costs without reducing the quality of care. All of these activities had an immediate effect upon those who were medical specialists. Included in this group of those negatively affected financially and professionally were surgeons, anesthesiologists, radiologists, and some specialists in internal medicine and several other groups. Specialists in those disciplines, as we shall see, were largely responsible for the vast progress in safety and comfort of the total surgical experience that occurred in the half century prior to the present radical changes in clinical practice. These same specialists also supported and participated in the important research that made clinical progress in anesthesia and surgery in all their aspects so dramatic and so much better.

The index of medical care has been a fascinating phenomenon in many aspects of the sociological patterns of American life. Medical care has been assumed by many, if not most people, to be a right. The implication of this attitude is one that fits the idea of the American Dream in that with sufficient hard work, the standards of living (including medical care) will always get better for everybody. The life expectancy rate change is sometimes used as an example of its validity. For white women born in 1934-41, life expectancy was 67; for white men 63. In 1992 it was 79 and 73 respectively. The gains were similar in males and females who were not white. The actual numbers were lower for each year (males 52 to 68, and females 56 to 78). Yet prior to 1940, the care that was provided was delivered by a medical profession that had only a limited supply of important weapons against serious disease and injury, in contrast to the situation of today’s large and important capability. The scientific basis for the understanding of many clinical problems was partly and often poorly understood—again in contrast to the present status of major scientific and technological support and the resulting improvement of clinical care.

The physicians delivering the care that medicine was able to provide as late as the 1930s were mostly of middle-class origin, ethnically white, and male. Despite their limited knowledge, they functioned almost as a quasi-priesthood in the way in which they took full responsibility for the care of their patients and therefore, the American public. The setting was always an intimate one-on-one relationship, and usually the

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Anesthesia and Surgery...Continued from Page 13

physician’s word was accepted as gospel truth however far it may have been from that status in reality.

With respect to the total surgical experience, anesthesiology, perhaps more than other fields in medicine, was still relatively underdeveloped in 1940. The obvious requirement of skills consistent with the best standards as we know them today could not be taken for granted in anesthesiology.

The Development of Anesthesiology

For instance, the American College of Surgeons, in its standardization report for 1934, made an astonishing commentary upon the requirements for anesthesia personnel. These skills, or lack thereof, were reflective of the usual situation outside of the few leading centers where modern anesthesia was having its tumultuous birth, specifically in Madison, Wisconsin; New York City; The Mayo Clinic, and at the Massachusetts General Hospital, and a small number of other areas. The report states "he [the anesthetist] must be as well equipped with medical knowledge as any clinician in the hospital. Through the efforts of an efficient anesthetist it is possible for the incidence of postoperative mortality and morbidity to be reduced considerably and the end results improved. Anesthesia is an important service in the hospital in as much as it is known to be an influential factor in the end results of surgical treatment." No comparable statement was issued about surgeons. It was assumed, justifiably or not, that they knew how to operate and possessed what is called surgical judgment.

With respect to the drugs that the anesthetist used, the Council on Pharmacy and Chemistry of the American Medical Association reported in 1939 about a new anesthetic drug: "Cyclopropane is a suitable anesthetic agent when used cautiously by those fully possessed what is called surgical judgment. And signs which indicate the stages of anesthesia obtained with this agent." Again, another important body felt compelled to state the (today) obvious comment. An anesthesiologist should only use drugs that he understands! Today this comment would be both unnecessary and inappropriate.

Influential colleagues in surgery and in clinical practice of other types were pointing out that the anesthetist should be competent and should know how to use his drugs. This is a striking and most peculiar enunciation of the obvious. Yet it was necessary at that time to state the obvious since it was clear that the competence of the average anesthetist was neither a certainty nor was his proper use of newer anesthetic drugs, agents, and other materials to be taken for granted. We have, in short, clear indications of concerns that do not exist in current clinical practice, but were commonplace in 1940.

Shortly after the end of World War II there was an additional stimulus to the development of surgery and anesthesia, the latter building upon the work of Waters, Rovenstine, Lundy, Wood, and others. Dr. Ralph Waters was brought to the newly expanded University of Wisconsin in Madison to develop anesthesiology department. He had previously been in private practice of a sort that evolved from general practice to a combination of anesthesia and obstetrics. Waters was essentially a self-taught individual in anesthesiology, as was the case for most of his contemporaries. It was a very fortunate thing for both anesthesiology and the development of surgery that Professor Erwin Schmidt, who was newly appointed to chair the department of surgery, felt that the development of anesthesiology was crucial for the development of surgery. He was wise, indeed, to bring Waters to the University of Wisconsin, which had just recently evolved from a two-year medical school—common in those days—to a four-year school. Dr. Waters began his program in anesthesiology in 1927, and his thus became the first Chair to be established in an academic center for anesthesiology. Dr. Waters went on to develop the first major thrust in modernizing the application of fundamental biological sciences to the clinical use of anesthesia. He began the first residency program in anesthesiology as well. His disciples were encouraged to establish programs in other institutions, and many of them did so. All of the residents had education that was fundamentally sound in the basic science departments as well as in clinical anesthesiology. This was a most important development that in a relatively short period of time would establish the basis and the groundwork for a truly magnificent development of clinical anesthesiology skills by increasing numbers of physicians. It would also provide a strong cadre of young people who were qualified to do creative and original research in this field. All these events were desperately needed for the surgical care of sick people.

E.A. Rovenstine was Dr. Waters' first and most important disciple. He left a general practice in Indiana, after having taken several short courses in anesthesiology—the only education and training that was structured and available—to join Dr. Waters in the development of his own skills in both clinical anesthesia and in research related to it, and then to spread this new and important gospel to others. This native son of Indiana stayed for five years with Dr. Waters and completed both his residency and the research fellowship at the University of Wisconsin before joining the department as the first member of his faculty. In 1935 Dr. Waters was consulted by people of surgical persuasion at New York University, which at that time used Bellevue Hospital for its major teaching program. They said that they needed to have a better development in anesthesiology for their surgical program to thrive in what was becoming a new and unsettled environment. Dr. Arthur Wright, then the professor and chairman of the department of surgery, was the individual who consulted with Dr. Schmidt at Wisconsin for guidance about improving anesthesia at New York University and Bellevue Hospital respectively. Of course Schmidt suggested that Waters be consulted, and he was. Waters recommended that Rovenstine should be invited to come to New York to establish the anesthesia service in that institution and at Bellevue.

The problem in New York City was further complicated by the fact that Bellevue at that time had four surgical divisions. The first division belonged to Columbia University; the second division was managed by Cornell University; the third, to which Rovenstine was primarily attached at first, was the New York University division; and the fourth division was open. On Rovenstine's arrival at Bellevue Hospital he was very quickly invited by the surgical services belonging to Cornell, Columbia, and New York University, as well as the open division, to be in charge of the entire hospital—not just the New York University service. To accomplish these goals he required positions coupled with salary support for a residency program, as well as for the ultimate development of other colleagues on the visiting or attending staff of the institution. Waters was a very great help to his former student and in fact got him started at Bellevue, by persuading some of the residents at Wisconsin to spend part of their education and training periods with Rovenstine in New York. It was commonplace in fact for these two good friends to share residents, and it was not unusual for many in the 1930s and in fact even into the early 1940s to have part of their experience in New York and part in Madison. Rovenstine developed a very strong residency program and an educational program whose staff conferences became a star fixture in New York City. His Monday night conferences brought people who were giving anesthesia with or without previous education and training to attend in order to learn more. I was fortunate indeed to be one of Rovenstine's residents at the beginning of 1940, until I entered the Army on military...
service a few months after the bombardment of Pearl Harbor by the Japanese. That turned out to be approximately the middle of June 1942.

Dr. John Lundy was, like Waters, a practitioner of general medicine with an interest in anesthesiology in Seattle, Washington. He was invited to join the Mayo Clinic by the then very much alive Mayo brothers, who felt that they needed to have a strong anesthesiology presence at the clinic in order to develop the kind of surgery that was important for these skillful men to perform. They also needed to have competent anesthesia in order to provide an educational foundation for the young surgeons who were being attracted to the Mayo Clinic because of its rapidly increasing reputation as an excellent place for surgical patients. Lundy established in due course a strong residency program and developed himself into a very skillful clinician, especially in regional anesthesia in which he was very much interested. The Mayo Clinic’s development in surgery was enhanced by Lundy’s presence, and in fact it would have been impossible for them to proceed without somebody of his skill. Lundy’s residency was a strong one, and he too, like Waters and Rovenstine, developed individuals who were attracted to anesthesia as a specialty. Some of them remained on the permanent staff of the clinic.

Dr. Paul Wood was also of the same generation as Waters, Rovenstine, and Lundy, and was essentially self-taught. This was a very common experience in those days prior to World War II, when people had, at the most, the opportunity to take relatively short courses to improve their knowledge from a few people who had the skills that come with simple and often brute force experience. Dr. Wood was a very busy practitioner of anesthesia in New York City and was very much interested in apparatus, organizations, and the clinical care of people. He began what became a museum and a library, and stored it at first in his own apartment until it grew too large and too unwieldy to manage. He was very important in establishing organizations and societies in anesthesia, which he did, in the main, by persuading his friends to come together for meetings; he served usually as their secretary at first and occasionally as their president. So important was his interest in both apparatus and manuscripts and books that the present library and museum of the American Society of Anesthesiologists, which is probably the best in the world in its area, has been named with affection and respect in his honor. The Wood Library-Museum is near the headquarters of the American Society of Anesthesiologists outside of Chicago.

The acquired skills of a modest number of young surgeons and young anesthesiologists were able to accomplish much in caring for the casualties of the war. They brought this new knowledge home for use in civilian life. They learned to develop greater skills in surgery, resuscitation, and many other areas of interest. They also learned of the new contributions in anesthetic care that had come from the Wisconsin school started by Dr. Waters and continued by Dr. Rovenstine. They were familiar with the vast achievements of a small but influential group at the Mayo Clinic under the able direction of Dr. John S. Lundy. They also were familiar with the combination of intellectual interest in the science of anesthesia and its clinical application under the distinguished leadership of Henry K. Beecher at the Massachusetts General Hospital.

Dr. Henry K. Beecher was a young physician who had come to the Massachusetts General Hospital after his graduation from medical school to secure education and training in surgery under the leadership of Dr. Edward Churchill, who was the Chairman of the Department of Surgery at the Massachusetts General Hospital and Harvard University. Beecher’s education in surgery was not complete when he was asked to develop an interest in the relatively new young field of anesthesia, then viewed as part of the surgical experience. He learned mostly the way the earliest pioneers did—by considerable trial and some error—and sought guidance as well from those who knew a little bit more than he did. However, Beecher did an extraordinary thing with his educational experience and spent a year with the very able medical scientist, Professor Krog, in Copenhagen. He learned a great deal of physiology from Krog and returned to Boston to lead the anesthesia service at the Massachusetts General Hospital, at that time as a member of the Department of Surgery. He made enormous strides in bringing a different kind of science to clinical care from that of the Madison, Wisconsin group, but it was a very important feature of the development of anesthesia in that it also stressed the importance of the scientific basis for clinical care. In 1938 he wrote an unusually gifted book entitled The Physiology of Anesthesia, based on his experience in Denmark as well as his clinical activities in Boston. During World War II his contributions were further enhanced when he was in charge of anesthesia activities in the North African Theater of Operations and showed that severely wounded men had less pain from their wounds than one would expect. The reasons were developed in part by evidence and in part by speculation, but it was a major contribution to the anesthesia world and to the world that deals with pain of trauma. After the war, when Dr. Beecher returned to his post at the Massachusetts General Hospital, he did important studies on the ethics of human experimentation. His work was very valuable to the surgical experience.

Other important figures in the early development of anesthesia included Robert D. Dripps and Stuart Cullen. Dr. Dripps, who was educated and trained by Waters, produced much new work and a splendid department at the University of Pennsylvania. Dr. S. Cullen was a Rovenstine product. He established outstanding departments of anesthesiology, first at the University of Iowa, then at the University of California in San Francisco.

However, despite all of these improvements, the situation in surgery and anesthesiology was not one in which widespread outstanding care was available to all Americans in 1940-45. There were important and distinguished leaders in numbers large enough to have major impacts upon the various surgical fields, and these were soon felt. Some of these surgical leaders insisted upon better anesthetic care and wished to help the development of anesthesiology in enlightened self-interest, to improve the results of surgical therapy. In a field that was trying to find its proper role almost exactly 100 years from the time of the discovery and application to clinical care, there was still much to be learned in anesthesia. There was a long latent period of at least 70 years between the discovery and the inauguration of a lusty and thriving support of research in science for anesthesiology, one that would make it possible to develop a clinical discipline characterized by excellent patient care.

A reflection of this underdeveloped status in the academic centers was the paucity of chairs in anesthesiology in contrast to the respectable number in surgery. At the end of World War II there was one chair in anesthesiology in Britain at Oxford, which was occupied by Sir Robert Macintosh. This chair was endowed by Lord Nuffield because of his personal experiences with the clinical anesthetic care provided by the then Dr. Macintosh in private practice in London. In the United States there were only two independent chairs. The first one was established in 1927 at the new four-year School of Medicine at the University of Wisconsin. The distinguished occupant of that chair was Dr. Waters, whose accomplishments are summarized in part above. The second chair in the United States was established in 1935 at New York University and Bellevue Hospital in New York City, under the brilliant leadership of Dr. Waters’ first student, permanent disciple, and close friend, E.A. Rovenstine. The third chair in the United States and the fourth

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in the world in anesthesiology was not established until the beginning of 1952, at Columbia University's College of Physicians and Surgeons and the Presbyterian Hospital in the City of New York. It was its occupant. It was all very new. The collateral signs led one to suspect that first-rate anesthetic care was not widely available in the United States nor even in Western Europe. In fact, there were some very clear indications of real trouble that had to be solved before even a reasonable level of competent anesthetic care could be obtained.

As late as the early part of World War II, in the Cardiff region of Wales, there was a most unsatisfactory anesthetic situation. A report issued by the Coroner to the City of Cardiff reflects an interesting before-and-after scenario with respect to anesthesiology. Any death associated with anesthesia, during anesthesia, or possibly caused by it, became a matter for reporting to the Coroner, who acted on behalf of the British Crown. This report was made public years later, in 1968, from Professor William W. Mushin's distinguished Department of Anaesthesia at the Welsh National School of Medicine. The report needs to be quoted in some detail to give one the flavor as well as the essence of the situation:

During the pre-war years, His Majesty's Coroner for the City of Cardiff became increasingly perturbed at the extent to which he considered anaesthesia might be contributing to the surgical mortality in the hospitals of the Cardiff area. Eventually this concern reached a point at which he felt it necessary to communicate officially with the Hospital Authorities, suggesting, in the strongest terms, that they should examine most critically the anesthetic services in their area. As a result of this report, a committee, composed of representatives of the Hospital Authorities in Cardiff and of the Welsh National School of Medicine was set up to examine every aspect of anesthesia in the hospitals of Cardiff and to make such recommendations for raising standards as it thought appropriate. The work of this committee was interrupted by the outbreak of World War II. However in 1946, agreement was reached that a Department of Anaesthetics should be created with the appointment of an Independent Lecturer in Anaesthetics who would be Director of Anaesthesiatics in the Clinical Institutions of the Welsh National School of Medicine.4

William Woolf Mushin, then First Assistant in the Nuffield Department of Anaesthetics in the University of Oxford, was appointed to the post and took up his duties in Cardiff in July, 1947. This was the beginning of safe and effective anesthesia in Southern Wales. It is of great interest and importance to note that anesthesia was so bad in Cardiff prior to World War II that the government had to take steps to insure that something better be done for the inhabitants of that city. The nature of the political pressure, if any, is unknown. All of this occurred but was not implemented before the establishment of the National Health Service in Britain. No mention of mortality due to anesthesia is available in this report, and this absence of mortality data may have reflected the difficulties in obtaining precise statistical evidence. These difficulties were to become compounded and controversial in seeking for authentic precision in the years ahead.

In 1949, when I assumed my duties at the Columbia-Presbyterian Medical Center as a member of the Department of Surgery under the direction of Dr. George H. Humphreys II, the idea of outstanding anesthetic care was new. The importance of the preparation of patients by our medical colleagues for surgery and the close collaboration among surgeons, internists or pediatricians, and anesthesiologists was only beginning to be seen as valuable. In the enlightened ambiance during its "Camelot" years, the Columbia-Presbyterian Medical Center was as optimal an environment as any at the time in which to bring all of these ideas together. There was an outstanding and brilliant Department of Medicine with noted authorities in the field, led by a very strong and highly respected Chairman, Robert F. Loeb. It was supported by many of his colleagues, including outstanding clinicians like Dana Atchley and many others. Doctors Loeb and Atchley were distinguished practitioners of internal medicine in their day and were also largely responsible for unraveling the biochemistry and the pathophysiology of Addison's disease with their great researches of the adrenal gland. There was also a very strong group of highly competent surgeons. Simple though it now seems, the idea that the surgeon and the anesthesiologist needed to have as much knowledge about the condition of the patient as possible from the internist was a new one. It was essential that excellent pre-anesthetic and pre-operative medical treatment be performed to bring a patient into the best possible condition. This idea was not yet thoroughly appreciated as part of the peri-operative experience. In fact, internists and surgeons were too often in conflict. Surgeons and anesthesiologists had much learning to do in the area of collaborating for the patient's benefit. While there were a number of institutions whose staff practiced in this fashion, this was certainly not the common rule in 1940.

Among the activities that I was advised to undertake by a distinguished nonmedical supporter of the Department of Anesthesiology at Columbia was to visit all of the "best" institutions from the standpoint of anesthesiology and surgery in the United States and Western Europe, and to learn from them. I also visited, willy-nilly, institutions where evidences of collective ignorance and other deficiencies were marked. Instances of poor anesthetic and surgical management were unfortunately quite common. It was very common to see patients who were anesthetized with ether or chloroform very deeply and as rapidly as possible—despite the circulatory hazards—so as not to inconvenience a surgeon with whom no prior discussion had taken place about any possible problems for the patient due to this technique. It also was not unusual for patients to be inadequately prepared from a medical standpoint. Commonplace also was the lack of any kind of monitoring beyond simple feeling of the pulse and the taking of an occasional blood pressure. There were many instances in which the blood pressure was never recorded, since—as I was told on several occasions—the blood pressure always went down with deep anesthesia and there was no point in measuring it! There was alleged to be no harm from this iatrogenic hypotension. The use of endotracheal anesthesia to protect the airway and to allow for as near physiological functioning of respiration as possible was a rare sight. Endotracheal intubation was thought to be necessary for only a small minority of patients. Assisted or controlled respiration were rarely used. Postoperative care and restoration of normal function was no more skilled than was that of the intra-operative anesthetic care and the preoperative preparation. Surgeons, although they did not always realize it, were greatly handicapped by insufficient medical preparation of their patients and by mediocre anesthetic care during the surgical procedures. The situation was no better in Britain: I was told of a way in which anesthetic mortality was reduced by simply moving patients, who were about to die, from the operating theater to a ward so that they would not have to be reported to the coroner.5

Past and Present

In the recounting of the story, enough background has been presented to indicate
why I felt very strongly about the need to describe from whence we came: it was awful. Great progress fortunately took place in the work of internists, pediatricians, surgeons, and anesthesiologists, which ultimately resulted in a very different kind of surgical experience from that of 1940. It was great for patients. The total surgical experience of which anesthesiology was a massive force improved dramatically decade by decade. However, this progress has been insufficiently appreciated and at the present time is possibly even threatened by the revolution in medical care occasioned by the legitimate concern about appropriate costs of that care. We are now in dire peril of a sharp retrenchment from the high quality that has been achieved.

How then to deal with the question of reminding everybody of how much progress has been made—including not only the medical profession, but the public that benefits so much from these tremendous advances? I started to write an essay which would contrast anesthetic mortality at present with that of 1940 and expected it to show a dramatic improvement today. In my study of the written literature, I began to realize that making such a comparison would be, at best, a most difficult undertaking, since the denominators of any comparison could not be agreed upon. Even the understanding of how or whether anesthesia played a part in mortality was a subject of controversy. I therefore wrote letters to people whom I consider to be leaders in anesthesiology at present throughout the United States and the United Kingdom. I also contacted those relatively few individuals, still alive, who were part of good anesthetic care of the earlier period between the two World Wars. The replies that I received from good friends and gracious colleagues are much to be appreciated. I was convinced by all of the letters that the task to which I had set myself of comparing anesthesia mortalities over a half century was not possible if I was looking for statistical or mathematical databases that would be valid by traditional and standard scientific criteria. It was not a simple problem of "counting the bodies.”

Dr. Arthur Keats of Houston was the most eloquent and the most determined of individuals indicating that we still don’t know what a death due to anesthesia is, and therefore there is no way in which one could make any statistical comparisons. Dr. Keats was one of the important leaders in anesthesiology, a highly regarded researcher in several areas of the specialty, and who has been particularly recognized as a controversial figure in the assessment of how anesthesia is involved in causing death of surgical patients. He recently retired from the St. Luke’s Hospital in Houston after a very important and widely recognized career. His opinions about death due to anesthesia are as fairly summarized as is possible to do in an essay of this nature. Other papers on the subject use criteria and numbers that make statistical comparisons tenuous and uncertain and are, at best, educated guesses.

However, Dr. John Eichhorn, the Chairman of the Department of Anesthesiology at the University of Mississippi, differs from this view. In a letter dated 20 November 1995, he states, “I would thus answer your question and state the progress from 1940 to 1990 is nothing short of outstanding, even though not stamped with the scientific p < .05 in principles to the satisfaction of Keats et al." Dr. Eichhorn’s opinion is seconded in the letter I received from my dear friend, the distinguished anesthesiologist, Dr. Leroy Vandam. Dr. Vandam was one of the most important leaders of academic anesthesiology and its clinical applications. He was the Chairman of the Department of Anesthesiology at the Peter Bent Brigham Hospital, affiliated with Harvard University, and has been widely recognized as a distinguished anesthesiologist in both its clinical application and its research aspects. He was an outstanding educator in every sense of that word and is widely respected in the field. Among his very many accomplishments was being the Editor-in-Chief of the journal Anesthesiology. He wrote in response to my inquiry: “Instinctively, we have known how much anesthesia has improved over the years with none of the disasters we once encountered. This is, of course, the result of maturation as a specialty research searching its own scientific needs.” This is a statement that most people would find congenial to their way of thinking about the development of anesthesiology.

After much thinking about how to deal with this problem, it gradually occurred to me that not all proof had to be statistical or mathematical—that there was such a thing as experience, consensus, and intuition which permitted different kinds of reliability from that of rigid mathematical proof. Dr. J.S. Gravenstein, who had served as Chairman of the Department of Anesthesiology at Case Western Reserve University and previously at the University of Florida, came to the same conclusion and described it very well. Gravenstein made his point in a fable about a conversation between him and an airplane pilot, in which they were discussing the various ways of “proving” things in flying airplanes as compared to anesthesiology. The pilot speaks to Dr. Gravenstein about proof. “Come on, if something is essentially reasonable, intuitively obvious, in harmony with the experience of conscientious colleagues, endorsed by experts, doesn’t that count for something?” For someone accustomed to the rigidity and the discipline of science, this was not an easy transition for me to make, since one could argue against any given aspect of such a contrast or comparison. Some might even cite the idea that the earth is not flat even though all the “experts” believed that it was at one time. However, there is considerable comfort in valuing and evaluating this pattern of agreement on many subjects.

I therefore decided to attempt a humanistic assessment of the total surgical experience, including anesthesia then and now. I felt that it was reasonable to use humanistic values for assessment. There are many papers that show a marked trend of substantial improvements in safety and comfort of patients. Their outlook for the anesthetic experience is a constructive and a sound one. It is almost as though everybody knows anesthesia is vastly improved, but putting numbers on this argument is what causes the difficulty. In an informal circular to leading anesthesiologists I was not able to find anyone who did not agree that things were very much better. The argument was, why were they better; and in some instances, how much better; and in only one instance, how do we know it occurred this way? If one accepts the argument that there is a trend toward marked improvement in anesthesia mortality and morbidity, the elements that go into it are worth listing and, in some instances discussing further. I accepted the fact that it was not possible in a provable statistical way to separate anesthesia, surgical complications, and patient disease mortalities. The concept includes the freak accident of timing, in which some people inevitably die in an operating room or in a hospital just by chance. I decided that it was acceptable to make an attempt to talk about the total anesthetic, medical, and surgical experience in 1940 and 1995 and to contrast the outcomes in terms of comfort and safety for patients. This now, was a different objective. The task became one of evaluating progress in the care of surgical patients over a half century without seeking for “numbers” that were incontrovertible.

To transfer one’s attention quickly over the half century back to 1940, and for the moment defer comment about the intervening decades, it is necessary to appreciate another medical world in the United States and Western Europe. The outcomes of surgical operation after medical preparation, including the important use of modern technologies and concepts in anesthesia in 1995, are vastly different.

From the patient’s point of view, and therefore the most important single aspect in the discussion, it is very unlikely that any patient will be told in 1995 that he or she is...
Anesthesia History Association
Annual Dinner Meeting
October 11, 1999
Dallas, Texas

The Gathering

Dr. William Hammond, Dr. Maurice Albin and Dr. Peter Safar

Dr. Ron Stephen and Dr. Merel Harmel

AHA President Dr. Ted Smith introducing speaker Dr. Buddy Giesecke
Photographs by
Dr. Jonathan Berman
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too sick to be considered as a candidate for surgical operative treatment. This very common practice in advice to prospective surgical patients is a vast change from 1940, when many patients were thought to be too great a risk for operation. There was the euphemistic and common belief that a very sick patient could not "take" the anesthesia safely. It is now commonly believed, with good justifiable reason, that if surgical therapy has a reasonable prospect of improving a patient's condition, it should not be denied to him or her. Medical, psychological, or other complications that, a half century ago, would have branded a patient unfit for the risk of anesthesia and operation are not problems today.

The result is, among other events, that no patient is too "sick" for an operation.

It is useful to examine the medical habit of thought that has produced this different outlook on the safety of the total surgical experience in 1995, in contrast to 1940. Clearly, there are many factors that are different now from 50 years ago. Internists prepare patients with medical problems for operations much better in 1995 than in 1940. Precision instruments for crucial monitoring of anesthetized patients are available to permit safer and better care of patients. There is now available a remarkable list of products resulting from the contributions of physics and engineering. These products are used in anesthesiology and in all branches of surgery for diagnostic and therapeutic purposes. Surgeons have learned extraordinarily rapidly how to take advantage of outstanding research in basic science, biomaterials, and the "new" anesthesia to develop a whole host of new procedures, and patients have benefited mightily from these new surgical skills.

Progress in open heart surgery is a striking example of progress in surgery, monitoring, anesthesia, and new biomaterials and drugs. Crucial to these new skills was the development of a reliable, easily managed system of monitoring extra corporeal circulation to keep the brain, the kidney, the liver, and other vital organs alive while the empty heart was being operated upon. Another later step was to develop instruments out of the appropriate materials to be able to accomplish some of the same purposes of correcting certain lesions of the heart with more conservative approaches and without open heart techniques. A good example of this sort of progress is the development of angioplasty, which has made it less necessary to do coronary bypass surgery for some people with the same lesions, i.e., narrowing or obstruction of coronary artery flow.

Other very interesting developments that promote comfort and safety are due to research in developing the right materials and the right instruments, to make procedures less and less invasive. In itself, this concept is a vast part of the improvement of comfort and safety for the various procedures, both diagnostic and therapeutic. A wit has wagged that the development of the plastic needle deserves at least a Nobel prize, since it made so many other things possible.

One could use other examples of the very great improvements that are made available by the wedding of creative imagination, the development of superb instrumentation, the sharp reduction of collective ignorance, and the better understanding of the anatomy and physiology of disease. Surgical operation is no longer viewed as too risky for the elderly or for premature infants. Surgical correction is now available to severely injured patients. Contributing to making surgery an open sesame to health and all the factors described, modern anesthesia is a major player in this scenario. It makes realities of very many possibilities in surgery.

Another example of the improvement in even smaller things that has led to a large and positive impact on safety and comfort of patients has been such modest developments as the recognition that early ambulation was more effective than prolonged bed rest. An outstanding result of this story is the very sharp reduction of morbidity and mortality from thrombophlebitis of dependent veins, resulting from patients being kept in bed post-operatively for days if not weeks in order to encourage the healing process. It was during the war that this attitude began to change with the remarkable work at the Army Air Force's March Field in California, under the superb direction of Dr. Howard Rusk, an important leader in the field of rehabilitation medicine, who had so creative an imagination as to recognize that early ambulation and early movement prevented these complications. Early ambulation restores patients to health or normality more rapidly. It happens also to fit the cost containment attitude of managed care. Unless overdone, quality of care and economic health are happy companions in this instance. Unfortunately it can be overdone. A young mother of modest economic means can not cope with a new baby nor herself with one day in a hospital after delivery.

Another very important example of great progress has been the electrifying growth in the understanding of pediatric care in cardiovascular surgery. As recently as half a century ago, some of the leading pediatricians felt that attempts at correction of congenital cardiac lesions would be fatal. Permission to operate on a lesion as straightforward in today's estimation as patent ductus arteriosus simply was not allowed in certain areas. I have a sister-in-law with congenital pulmonic stenosis, who was cared for by the famous pediatric cardiologist, Dr. Helen Taussig, and who was told when she was a teenager that she must never be operated upon. This noted pediatrician who later helped design the "blue baby" operation at Hopkins, thought the risk to be too dangerous to survive. She did not anticipate the improvements of cardiac care, the greater skill and understanding of the cardiac surgeon, and the vastly improved ability of the anesthesiologist to deal with these patients. The impossible became a reality well before 1995. It is now almost a routine procedure.

Surgical training programs have become increasingly rooted in a better understanding of science. From the 1940s it began to be a commonplace activity for young surgeons to be exposed to research as well as operating upon dogs for preliminary practice. These various research activities were supportive of the goals of creative surgeons, who needed to apply sound scientific methods to their clinical problems. Thus, surgical education changed so that the basic sciences became the platform of surgical care. Very vigorous and active surgical research programs in many institutions were undertaken to support this concept, and progress was apparent in every decade. As one comes to the present decade, it is almost miraculous to note how surgeons are well equipped with knowledge that is very useful. Technical skills have been developed, including the great advances of laparoscopic and endoscopic techniques, and many of the areas of previous ignorance that impeded surgical recovery have been removed by careful study in understanding the biology of trauma and of disease. New operations, like transplantation of organs, which have become crucial for societal benefit, depended on a highly developed knowledge of immunity to suppress the attacking cellular response against the transplanted organs. At stake were lives, kidneys, hearts and parts of intestine. Bones and joints seem to fare well by the replacement of damaged hips, knees and shoulders with biomaterials that have to move properly and are biologically inert as well. The quality of life and life itself are greatly enhanced when the patients can function at or near normal levels. Another example of the use of biomaterials permitting a new surgical approach is the intraocular lens replacement for ophthalmic cataracts. A problem has been made reductively simple by the use of appropriate biomaterials. Anesthesia also has been simplified and safety for the elderly patients suffering from cataracts has been en-
hanced, so that a major boon of vision has been given to the afflicted elderly.

Without attempting to deal with these issues as a chicken and egg story, it is clear that important changes in anesthesia capabilities were required, to make possible the advancements in surgical technology and procedures for successful patient care. When cost containment priority appeared, there was little question that anesthetic strategies, techniques, and agents had to be such as to enable safe and effective diminution in hospital inpatient stays to conform to the new ambiance. Surgical therapy was similarly affected.

Anesthesiology Today

Anesthesiology's development in the period of 1940-1995 was magnificent. It was fully and beautifully described by Dr. E.C. Pierce, a past president of the American Society of Anesthesiologists (ASA), in his 1995 Rovenstine lecture. Pierce's concentration was appropriate to his interests, on those factors that improved safety. He discussed the dramatic increase in numbers of anesthesiologists, the improvements in anesthetic technology, and the newer agents, and he described eloquently the vast improvement in the education of students and residents. Finally, he portrayed the role of anesthesiologists in pain management and intensive care, in addition to providing surgical anesthetic care in operating rooms. He stated that all these activities, under the aegis of the Patient Safety Foundation of the ASA, provided a marked improvement in patient safety. Dr. Pierce, the Chairman of the Foundation, together with Dr. E.S. Siker, the Executive Director, have made a major contribution to the safety of anesthetized patients. The ASA also has supported a research effort in a major way by establishing a foundation known as FAER (the Foundation for Anesthesia Educational Research) under the able directorship of Dr. Martin Helfich. It provides an important private-sector support system for research in anesthesiology.

The growth of academic and clinical care skills in anesthesiology has been enormous. The number of approved residencies has greatly expanded from a very modest number in 1940 to the large number of 159 in 1995-96. The number of independent chairs of anesthesiology in universities designed to discover the new knowledge, to teach it to basic scientists and clinicians, and to strengthen the supporting bulwark of clinical anesthesia has increased from the almost token presence of three a half century ago to a very respectable number today. As in so many other things, Americans use, as strategy and tactic, voluntary associations to encourage progress, cope with problems, and in general be supporting and improving agencies. This is a typical American way and has been so since the beginning days of the Republic, as de Tocqueville pointed out in 1835.10

In the academic anesthesia world, in addition to the sharp increase in the number of chairs in universities, there has been symbolism as well as a thriving reflection of the actual academic function by the establishment of the Association of University Anesthesiologists (AUA). This association held its first meeting in 1952. The AUA now consists of approximately 500 members interested in research, teaching, and the application of these streams of knowledge to clinical care in anesthesia. It is also deeply concerned to achieve a sharp reduction of collective ignorance in anesthesiology worldwide, and has functioned effectively in that regard. A few years after the founding of the AUA, it was found desirable to form yet another organization to deal with the managerial problems, budget formation, cost containment, and other matters that are not directly scientific, educational, or clinical in the academic world, and this is the Society of Academic Anesthesiology Chairmen.

There are many reasons why young people enter a specialty in medicine, and they all deserve serious attention and evaluation. They usually are concerned with what they like and whether it affords a "decent" income. These elements tend to reflect personal expectations as to what students will select, rather than societal needs or evaluations. In the case of anesthesiology, it is clear that there have been many opportunities in residencies to learn well, and this has been further helped by a crucial decision for the support for scientific research in anesthesiology by NIH. This has been attractive to students, as research is a magnet for many.

Anesthesiology in the larger sense can be viewed as a form of acute medicine whereby information about patients is immediately available with the help of precise instruments. The ability to make a judgment in accordance with that information within seconds is a luxury not available to all clinicians. When one can use information at once, because of precise monitoring devices to care for patients during anesthesia, the field is attractive to bright students. The major contributions of anesthesiology to total surgical care are impressive to young people. The importance of anesthesiology for the public health is obvious. The response of students is also positive to this concept. Many have entered the field during the last 30 years. Opportunities for gratifying clinical care, for interesting research, and for being able to contribute to the public welfare had to be among the reasons they chose this field. The net result of all these forces has been a significant increase in the number of anesthesiologists as judged by membership in the ASA and by the certification of specialists by the American Board of Anesthesiology.12

This very rapid growth has subsequently been criticized. It has been alleged that training centers have provided an oversupply of anesthesiologists because of their short-sighted views of wanting to have inexpensive and at the same time competent labor during the training period. Training centers have been accused of not being concerned about the fit with societal requirements for anesthesiologists. Whatever the reasons are, when the sharp drive toward cost containment in 1993 resulted in a precipitous decline in the number of young people seeking residencies in anesthesiology, for economic reasons, the oversupply appeared as though it would handle itself by attrition. From my point of view, there is no "oversupply" in the United States until every patient is guaranteed the care of a competent anesthesiologist—and such is far from the case. Oddly enough, it is not a unique problem. There was a time, not long ago, when the American College of Surgeons made a similar plea that all Americans deserved surgical care by an educated surgeon—not by any other medical or health care personnel. This idealization of which I am accused is stated to be a nostalgic yearning in the wilderness. However, time will tell. America seems complacent about the neglect of individuals in need because of the need to save money. I can not help but believe that societal self-destructiveness is not eternal, and that it too will pass one day.

Concomitant with the collapse of the clinical system in about 1993, there was an associated and earlier decline in the research support for anesthesiology. The ability to compete successfully for grant support in the NIH, the NSF, and similar agencies was almost ended. The anesthesiologist who sought to do research had very little opportunity for the training and education required. Finally the research system became heavily laced with boiler-plate activities like testing new drugs for industry. Some of these studies were useful and sensible, but the majority were used to satisfy FDA or similar organization requirements for a certain number of tests to be done to meet the statistical requirements for safety and efficacy. That is roughly the current status of most of the research in anesthesiology at the moment—not a pretty picture. Of course, there is still good creative research, but it is a minority effort and is threatened to go from malaise to death because of economic stress.

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It is unlikely that general agreement will occur as to whether the development of major new drugs has contributed to safety in anesthesia, with the probable exception of the muscle relaxants (although, even there, there is some controversy). However, there is no question that the ability to provide appropriate surgical relaxation without damaging other organ systems is made possible by relaxants. The major safety requirement is that depressed breathing resulting from the action of muscle relaxants must be treated by controlled respiration. Every anesthesiologist should be competent to perform this function accurately and with precision with mechanical or manual methods.

Other elements of progress which must be considered include the educational and research programs for residents and the continuing medical education courses to keep up to date. There is very good evidence that the attitude of supporting the scientific basis for clinical care has paid off in a major way. There is no doubt that anesthesiologists are more competent when they understand physiology and pharmacology and when they couple that with the technical skills that are obviously required in order to achieve the purposes demanded by the new knowledge. The various examination systems and continuing medical education programs which are related to these factors have been important in providing for the comfort and safety for anesthetized patients. The American Board of Anesthesiology and the various structures and organizations that require continuing medical education are useful in keeping this standard a high one.

The research support that goes into expanding the knowledge base so necessary for the strengthening of clinical anesthesia has had a period of very great success. Despite the decline in research support recently, the trend over the last half century has been for a much increased knowledge database and a ready application of it for clinical care. All of these factors have resulted in a reduction of collective ignorance from which everybody has benefited.

In the classic tradition of progressive education, the combination of theory and of practical experience is very important. It was pointed out long ago, as far back as the writings of Maria Edgeworth, the distinguished author and novelist of the 18th century, that learning by doing useful things is a major way in which progress can be made of any sort of activity. The establishment of the residency program and its gradual spread over the decades after World War II has been a major force in the development of highly competent anesthesiologists. I do not suggest that education of a progressive nature will make everybody equal. I do maintain that it should make everybody as good as he or she can be. The conceptual view of all of these various developments in internal medicine, surgery, and anesthesiology, together with the technical support that they have gained, are important factors making for the substantial increase in comfort and safety of patients. Since the argument in this essay is about trends, not about absolute figures, a few illustrations will be of some use in indicating the nature of the change.

Dr. W.D. Wylie, a senior anesthesiologist at St. Thomas' Hospital of London, wrote in 1975 that "the number of deaths reported as associated with Anaesthesia in England and Wales has fallen dramatically during the past twenty years." In the same year in a report by Bodlander, from Australia, there is a similar statement that there is a reduction of approximately 21 per cent in mortality attributed to anesthesia at the Royal Prince Alfred Hospital in Sydney, Australia, by the same standards of review. One year earlier Phillips, an American anesthesiologist, described his view of anesthetic death, without writing about trends. He stated that it was a public health problem and had to have epideimiological studies to understand it better. He viewed anesthesia death as due entirely to error and in fact called it an iatrogenic disease. The notion that Dr. Phillips describes of anesthesia being a public health problem was consistent with the position I took in 1964 to achieve NIH research support for anesthesia. Anesthesia is so widely given that it lends itself to epidemiological analysis and was legitimately viewed as a public health problem at the time. It may or may not be an iatrogenic disease, but it is hoped that anesthesia will never again become a public health problem.

A major study on death due to anesthesia was undertaken in Britain and is possibly one of the most reliable analyses that exists. It was published in 1983 and indicated that the trends from previous reports also show a considerable improvement in mortality. There were also reports from the Republic of South Africa. Dr. G.G. Harrison reported on the Groote Schuur Hospital in Cape Town and showed a reduction from one decade to another of approximately 30 per cent in deaths due to anesthesia. A report from Finland compares a mortality rate in that rather homogeneous country and also shows a decline from decade to decade. Professor Otteni in Alsace has indicated that in France there is a prospective study of mortality due to anesthesia, whose results will not be available for approximately another year. It will be of great interest, as it will be the first major controlled prospective study of anesthetic mortality and major morbidity. Anesthesia mortality has been halved every decade since 1960 in Australia. This point is made in a statement of the Australian Society of Anesthetists in a letter sent to all members of the society. It is dated 13 February 1996, and signed by the President, Dr. George P. Wotherspoon. All these reports have somewhat different definitions of anesthesia death, which presents some problem in comparisons of scientific rigidity, but there is no difficulty in seeing the clearest gain in trends.

There are many other works that can be cited and are undoubtedly familiar to the disputants who have argued endlessly about the improvements in anesthesia—usually, of course, centered around the dispute about anesthetic mortality. Further comment on the dispute will add no great value to our discussion. However, there is a good reason to look at the validity of evidence in medicine, since it bears considerably upon the subject. An article in Science by Gary Taubes bears upon the question of evidence. Motivating this article is the appearance of a new British journal called Evidence-Based Medicine, which will be a strong effort to publish the actual evidence on what therapies do or don't work, instead of relying upon "custom, hearsay, and dogma in choosing treatments." Those interested in the problem and the publication of the new journal will attempt to review and summarize valid data that have been lost or forgotten and deal with the original materials in order to come to a reasonable conclusion. This effort is known as the "Cochrane Collaboration." It consists of conducting systematic reviews of all randomized clinical trials on a variety of subjects, starting with an epidemiological study having to do with pregnancy and childbirth. In time, other subjects will be similarly studied in depth to lead to more rational uses of any and other therapies.

In attempting to assess the value of this approach, the discussion centers upon the fact that there are some reviews that "give no more than a qualitative conclusion." Taubes goes on to state that "others will go a step further and do what's called meta-analysis when the literature search yields enough sufficiently similar studies." Meta-analysis does permit quantitative interpretation by the examination of a substantial number of different studies. The criticism of meta-analysis is that the result "appears to be of the highest obtainable precision but is error-ridden and possibly quite unreliable." The author concludes with this interesting statement: "A careful, thorough, thoughtful, old-fashioned narrative..."
Letter to the Smithsonian

[Editor: This story from the internet was brought to a WLM Board meeting by Donald Caton, M.D., for the amusement of the group. It has been circulated on the internet and is quoted here.]

The story behind the letter below is that there is this nutball in Newport, RI, named Scott Williams who digs things out of his backyard and sends the stuff he finds to the Smithsonian Institute, labeling them with scientific names, insisting that they are actual archaeological finds. This guy really exists and does this in his spare time! Anyway... here's the actual response from the Smithsonian Institution.

Smithsonian Institute
207 Pennsylvania Avenue
Washington, DC 20078

Dear Mr. Williams:

Thank you for your latest submission to the Institute, labeled “93211-D, layer seven, next to the clothesline post... Hominid skull.” We have given this specimen a careful and detailed examination, and regret to inform you that we disagree with your theory that it represents conclusive proof of the presence of Early Man in Charleston County two million years ago.

Rather, it appears that what you have found is the head of a Barbie doll, of the variety that one of our staff, who has small children, believes to be “Malibu Barbie.” It is evident that you have given a great deal of thought to the analysis of this specimen, and you may be quite certain that those of us who are familiar with your prior work in the field were loath to come to contradiction with your findings.

However, we do feel that there are a number of physical attributes of the specimen which might have tipped you off to its modern origin:

1. The material is molded plastic. Ancient hominid remains are typically fossilized bone.
2. The cranial capacity of the specimen is approximately 9 cubic centimeters, well below the threshold of even the earliest identified proto-hominids.
3. The dentition pattern evident on the skull is more consistent with the common domesticated dog than it is with the ravenous man-eating Pliocene clams you speculate roamed the wetlands during that time.

This latter finding is certainly one of the most intriguing hypotheses you have submitted in your history with this institution, but the evidence seems to weigh rather heavily against it. Without going into too much detail, let us say that:

A. The specimen looks like the head of a Barbie doll that a dog has chewed on.
B. Clams don’t have teeth.

It is with feelings tinged with melancholy that we must deny your request to have the specimen carbon-dated. This is partially due to the heavy load our lab must bear in its normal operation, and partly due to carbon-dating’s notorious inaccuracy in fossils of recent geologic record.

To the best of our knowledge, no Barbie dolls were produced prior to 1956 AD, and carbon-dating is likely to produce wildly inaccurate results. Sadly, we must also deny your request that we approach the National Science Foundation Paleontology Department with the concept of assigning your specimen the scientific name Australopithecus spiff-arino.

Speaking personally, I, for one, fought tenaciously for the acceptance of your proposed taxonomy, but was ultimately voted down because the species name you selected was hyphenated, and didn’t really sound like it might be Latin. However, we gladly accept your generous donation of this fascinating specimen to the museum. While it is undoubtedly not a Hominid fossil, it is, nonetheless, yet another riveting example of the great body of work you seem to accumulate here so effortlessly.

You should know that our Director has reserved a special shelf in his own office for the display of the specimens you have previously submitted to the Institution, and the entire staff speculates daily on what you will happen upon next in your digs at the site you have discovered in your Newport back yard.

We eagerly anticipate your trip to our nation’s capital that you proposed in your last letter, and several of us are pressing the Director to pay for it.

We are particularly interested in hearing you expand on your theories surrounding the trans-postulating fillification of ferrous ions in a structural matrix that makes the excellent juvenile Tyrannosaurus Rex femur you recently discovered take on the deceptive appearance of a rusty 9-mm Sears Craftsman automotive crescent wrench.

Yours in Science,

Harvey Rowe
Chief Curator-Antiquities

[Per the Smithsonian Institute, the letter is a hoax. The Smithsonian Institute is not located on Pennsylvania Avenue. There is no curator of antiquities at the Institute. And there is no one there by the name of Harvey Rowe.]