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Anesthesia History Association

Anesthesia History Association 2008 Annual Spring Meeting

"The Gilded Age and the Great Industrialists"

May 8-10, 2008

The Twentieth Century Club
4201 Bigelow Boulevard
Pittsburgh, PA 15213

Course Director
Doris K. Cope, M.D.
Immediate Past President, Anesthesia History Association
Professor and Vice Chairman of Pain Medicine
Department of Anesthesiology
University of Pittsburgh School of Medicine
Pittsburgh, Pennsylvania

Anesthesia History Association
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Overview
The program is intended to enhance knowledge of historical events in anesthesia. Great advances have been made in the field of anesthesiology and it is important that practitioners recognize the historical roots of current practice. Meetings of the Anesthesia History Society offer a mechanism of disseminating and archiving the achievements that have been made in the field over the years. Needs assessment is based on prior course evaluations, literature, and expert opinion.

This program is intended to enhance knowledge of historical events in anesthesia.

Who Should Attend
Primarily physicians, anyone interested in medical history.

Continuing Education Credit
This activity has been planned and implemented in accordance with the Essential Areas and Policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint sponsorship of the University of Pittsburgh School of Medicine and the (Name of the Organization). The University of Pittsburgh School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

*The University of Pittsburgh School of Medicine designates this educational activity for a maximum of 6.5 *AMA PRA Category 1 Credits*^{TM}. Each physician should only claim credit commensurate with the extent of their participation in the activity.

*Other healthcare professionals are awarded 0.65 continuing education units (CEU's) which are equal to 6.5 contact hours.

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Schedule

Thursday, May 8, 2008

Pre-Program

8:00 AM – 10:00 AM	Guide Walking Tour of Oakland with Storyteller (optional)
10:30 AM – 4:00 PM	Frick Art and Historical Center Tour (optional)
4:30 PM – 7:00 PM	Self-Guided Tours (optional)

Program

5:00 PM – 6:00 PM	AHA Council Meeting *Holiday Inn Select – University Center*
7:00 PM	Dinner at the home of Dr. Doris Cope

Friday, May 9, 2008

7:00 AM – 7:45 AM	Meeting Registration and Continental Breakfast *Second Floor Lounge*
7:45 AM – 8:15 AM	Welcome and Announcements *Second Floor Lounge* **Arthur S. Levine, M.D.** Senior Vice Chancellor for the Health Sciences Dean, School of Medicine University of Pittsburgh **John P. Williams, M.D.** Safar Professor and Chair Department of Anesthesiology University of Pittsburgh School of Medicine **Douglas R. Bacon, M.D., M.A.** President, Anesthesia History Association Professor of Anesthesiology and History of Medicine Mayo Clinic College of Medicine

8:15 AM – 9:45 AM Free Papers
Second Floor Lounge

Moderator: **Bradley E. Smith, M.D.**
Professor of Anesthesiology Emeritus
Adjunct Professor of Clinical Anesthesiology
Vanderbilt University Medical Center

"Four Sermons Against Nitrous Oxide:
The 'Anaesthetic Apparatus' of Pittsburgh's Rev. Dr. S. J. Hayes"
George Bause, M.D., M.P.H.
Honorary Curator
Wood Library-Museum
Clinical Associate Professor
Case Western Reserve University

"Leonard M. Monheim, D.D.S. (1911-1971): Ill-Fated Anesthesiologist"
David Ryan Cook, M.D.
Clinician, Emeritus
University of Pittsburgh Medical Center
former Professor of Anesthesiology
University of Pittsburgh and Duke University Medical Center

"The Last Meeting of the Anesthetists Travel Club, Montreal – October 30 – November 1, 1941
John E. Forestner, M.D., F.A.C.A.
Professor
Department of Anesthesiology and Pain Management
University of Texas Southwestern Medical School

9:45 AM – 10:00 AM Break: *Second Floor Lounge*

10:00 AM – 11:30 AM Free Papers
Second Floor Lounge

Moderator: **Robert A. Strickland, M.D.**
Associate Professor of Anesthesiology
Department of Anesthesiology
Wake Forest University School of Medicine

"Are Greed and Villainy Inherited? The Case of Dr. William James Morton and His Father William T. G. Morton"
Gerald L. Zeitlin, M.D., F.R.C.A.
Instructor in Anesthesia, Retired
Harvard University School of Medicine

"Chloroform in 2008: Still very much with Us"
Ray J. Defalque, M.D.
Professor of Anesthesia
University of Alabama at Birmingham

"Clinical and Laboratory Research in Anesthesia for Liver Transplantation: (1965-1980)"
J. Antonio Aldrete, M.D., M.S.
Professor Emeritus
Department of Anesthesiology

University of Alabama at Birmingham

11:30 AM – 1:30 PM Luncheon
Campbell Room

"Tall Tales about Transplantation"
Thomas E. Starzl, M.D.
Professor of Surgery
University of Pittsburgh School of Medicine

1:30 PM – 2:30 PM C. Ronald Stephen Essay Award Finalists
Second Floor Lounge

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

"How Ether Became the First Successful Anesthetic Agent"
Neel H. Amin, M.D.
Anesthesiology Resident
Medical College of Georgia

"Four Decades of Suspending Disbelief: Milestones in Anesthesia"
Edward S. Kosik, D.O.
Anesthesiology Resident
Case Western Reserve University Metrohealth

2:30 PM – 2:45 PM Break: *Second Floor Lounge*

2:45 PM – 4:30 PM Free Papers
Second Floor Lounge

Moderator: **Selma H. Calmes, M.D.**
Co-Founder and Past President
Anesthesia History Association

"Noel Gillespie's Shadwell Laryngoscope"
Mark E. Schroeder, M.D.
Associate Professor
Department of Anesthesiology
University of Wisconsin School of Medicine and Public Health

"Hayden's Pneumatophera: A Chloroform and Ether Inhaler"
J. Antonio Aldrete, M.D., M.S.
Professor Emeritus
Department of Anesthesiology
University of Alabama at Birmingham

"The History of Anesthesia in Alabama and other States in the U.S."
Mark G. Mandabach, M.D.
Assistant Professor
Department of Anesthesiology
University of Alabama at Birmingham

6:30 PM – 7:00 PM Reception

Campbell Room

7:00 PM – 9:00 PM Banquet Dinner
Campbell Room

Presentation on George Westinghouse

Saturday, May 10, 2008

Post-Program

Self-Guided Tours (optional)

Faculty Listing

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Birmingham, Alabama

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Cleveland, Ohio

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Faculty Disclosure

Faculty for this activity have been required to disclose all relationships with any proprietary entity producing health care goods or services, with the exemption of non-profit or government organizations and non-health care related companies.

No significant financial relationships with commercial entities were disclosed by:

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George Bause, M.D., M.P.H.
Selma H. Calmes, M.D.
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The following information was disclosed:

J. Antonio Aldrete, M.D., Grant/Research Support: ASA Wood Library-Museum of Anesthesiology Fellowship in 2007.

Adolph H. Giesecke, Jr., M.D., Stockholder: Baxter

Bradley E. Smith, M.D., Stockholder: Anesthesia Business Solutions, LLC [ABS], Tampa, FL.

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Clinical and Laboratory Research in Anesthesia for Liver Transplantation: (1965-1980)

J. Antonio Aldrete, M.D., M.S.
Professor Emeritus
Department of Anesthesiology
University of Alabama at Birmingham
Arachnoiditis Foundation, Inc.
Birmingham, Alabama

Introduction

In 1965, orthotopic transplantation of the liver presented challenges not encountered in surgical theaters before. Most problems faced in the OR, were resolved in the laboratory. Recipients' survival depended on effective graft preservation and monitoring; both were gradually improved through findings noted during hepatectomy, graft perfusion and invasive monitoring.

Methods and Results

Hypoglycemia and hypotension occurred when the liver was dislocated and in the anhepatic period, it was treated with IV dextrose and abundant blood replacement. By sampling arterial blood, metabolic acidosis was identified requiring correction with NaHCO3; if given in excess, hypernatremia ensued. Perfusing the donor liver without K+ resulted in post revascularization hypokalemia; so, potassium was added to the perfusate. Citrated blood given to patients with liver failure or while anhepatic, produced myocardial depression, needing $CaCl_2$ therapy. Changes of serum electrolytes were measured and corrected. Choice of anesthetics and muscle relaxants was based on prevalent concepts. When found that halogenated anesthetics were metabolized, morphine, Innovar®, fentanyl and ketamine were tried. Metabolism of morphine and lidocaine, thought to be totally dependant of hepatic function was found to continue during the anhepatic phase, suggesting activity of extrahepatic metabolic sites. Expecting hypothermia, we saw that patients treated with antilymphocitic globulin became febrile under anesthesia. Extraordinary circumstances like pre-op Hct of 10%, bilirrubin of 92mg%, or serum Mg++ of 5.2 mEq/l were treated as desperately ill recipients were being induced. "Stroke" occurring during surgery made us go back to the lab, identified air embolism as cause, then found that "underwater vascular anastomosis" combined with PEEP, prevented it at the time of graft revascularization.

Discussion

Thought to be impossible by some and unethical by others, liver transplantation was indeed one of the medical wonders of the 20th Century. The beginning was not easy, nor free of criticism, but seeing it done now in almost every major city in the World, as a routine operation, is indeed rewarding.

References

1. Von Kaula KN, et al. Changes in blood coagulation during liver transplantation in dogs and man. *Arch Surg* 1966:92:71-5.
2. Aldrete JA, et al. Effects of hepatectomy on disappearance of lidocaine from blood in dog and man. *Anesth Analg* 1970:49:687-90.
3. Aldrete JA, et al. Changes in plasma cholinesterase during liver transplantation. *Transplantation* 1977:23:404-6.
4. Aldrete JA, et al. Alterations of serum K+, Na+, Mg++, Ca++ during organ transplantation. *Intl Surg* 1972:57:23-5.
5. Starzl TE, et al. Neurologic complications after liver transplantation with reference to air embolism. *Ann Surg* 1978:187:236-40.
6. Hug CC, et al. Metabolism of morphine administered for patients undergoing liver transplantation. *Anesthesiology* 1979:51:S-30.

7. Aldrete JA, et al. Body temperature changes during organ transplantation. *Anesth Analg* 1970:49:1465-9.
8. Starzl TE, et al. Right segmentectomy for hepatic neoplasms. *Surg Gynec Obstet* 1980:150:208-14.
9. Aldrete JA. Anesthesia and Intraoperative Care. Experience in Hepatic Transplantation. Starzl TE (ed) WB Saunders 1979: 83-111.

Hayden's Pneumatophera: A Chloroform and Ether Inhaler

J. Antonio Aldrete, M.D., M.S., and Amos J. Wright III, M.L.S.
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Introduction

In August 1846, W. T. G. Morton hired dentist Granville G Hayden to care for his busy practice. In early September, Hayden refused an opportunity to inhale ether. On September 30th, Hayden held a lamp during extraction of a bicuspid tooth from Eben Frost under ether anesthesia, as witnessed by surgeon H. J. Bigelow and reporter A. G. Tenney. On October 16th, Morton administered the first recorded ether anesthetic at Massachusetts General Hospital, in Boston.

Methods

Thereafter Hayden's participation in the Ether Controversy was mostly acting as a deposed witness in the inquiry regarding the dispute between Morton and Jackson as to who deserved the rights to the discovery of anesthesia. Ether and chloroform were available most everywhere, no patent could be obtained. In the next two years at least sixty inhalers were devised to administer them, as this appeared to be a possible source for claim, fame and money.

Results

In the *Boston Medical and Surgical Journal* of January 26, 1848, p. 526, a tubular type of inhaler 5.5" long, made of silver plated metal with a flaring mouth piece was shown. There were inhaling and exhaling valves close to the face piece; at the distal end there was a cylindrical chamber where a small sponge could be saturated with anesthetic, as it had a perforated movable lid, through which either chloroform or ether may be poured. As advantages, the small portable size was noted, lips and teeth were protected by the mouth piece, easy replenishment of the sponge and the fact that patients could use it while in the semi-upright or in the recumbent positions. It was noted that the inventor was G. G. Hayden, a surgeon-dentist, of Tremont Street, Boston.

Discussion

The possible reasons for the proliferation of inhalers and similar apparatus, soon after Morton's demonstration at MGH include professional interest, dissemination of information or pecuniary pursuit; most likely all three were pursued

References

1. Hayden GG. Hayden's Pneumatophora. *Boston Med Surg J* 1848:37:527.

How Ether Became the First Successful Anesthetic Agent

Neel H. Amin, M.D.
Anesthesiology Resident
Medical College of Georgia
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It is well known that Crawford W. Long sent someone to purchase a bottle of ether from a pharmacy in Athens, Georgia, for the operation on James M. Venable. As clearly demonstrated, ether has been a familiar substance to many well before the nineteenth century, hence its availability in the Athens pharmacy. And many scholars prior to 1842 made significant contributions to influence Dr. Long's administration of ether as an inhaled anesthetic agent. Lullius, Paracelsus, and Cordus formulated and described the remarkable anesthetic effects of ether.

Practitioners, such as Morris and Turner, used the substance as an anodyne for headaches, toothaches, and neurological disorders. And through the works and experiments of Davy, Faraday, and Hickman, Crawford W. Long took his experiences from ether frolics and substituted ether for nitrous oxide for the first successful inhaled anesthetic for a surgical procedure. All of these points insured ether's presence in a pharmacy in Athens, Georgia. Ether's ready availability for Crawford W. Long's anesthetic was indirectly responsible for one of the world's greatest medical discoveries – surgical anesthesia!

Four Sermons Against Nitrous Oxide:
The "Anaesthetic Apparatus" of Pittsburgh's Rev. Dr. S.J. Hayes

George Bause, M.D., M.P.H.
Honorary Curator, American Society of Anesthesiologists'
Wood Library-Museum (WLM), Park Ridge, Illinois
Clinical Associate Professor, Case Western Reserve University, Cleveland, Ohio

Born in 1833, Samuel J. Hayes was raised on a large farm outside Johnstown, Pennsylvania. He paid for his theological studies by teaching on the side. Ordained in 1862 by the United Brethren Church, the now Rev. S.J. Hayes worked as a circuit preacher in its Allegheny Conference in western Pennsylvania. After several years in the ministry, Hayes was stricken with "a severe bronchial affection." His affliction (and possibly his low pay as a preacher) led to apprenticing in a new profession— dentistry.

Over the next decade, the now Rev. Dr. S.J. Hayes expanded his practice in several directions. In addition to preaching sermons for both United Brethren and Baptist churches and to extracting teeth, Hayes began openly criticizing the often asphyxial use of pure nitrous oxide by his fellow dentist-anaesthetists. Instead, he advocated supplying room air, pumped by foot bellows, through one of eventually four types of apparatus that he invented. Forsaking nitrous oxide entirely, Hayes began promoting the use of gradually increasing concentrations of ether, of chloroform, or of his own proprietary blends of these with ethanol and/or other volatile agents. He preached that his apparatus and techniques minimized airway irritation during, and nausea following, his anesthetics.

I have labeled his inventions below as Hayes Anaesthetic Apparatus # 1 – 4.

Hayes Anaesthetic Apparatus #1 (1881)

Despite the 1880 law discouraging submission of patent models, Hayes filed his patent with a tin model in March of 1881. Tagged as "Patent [Filing] No. 28,530", Hayes apparatus was examined by a third assistant patent examiner, Dr. James B. Littlewood, and by the Chief Examiner of the Chemistry Division, Dr. Thomas Antisell. Even before gaining patent rights, Hayes began advertising that his "aerated hypnotic" was "harmless as milk." Indeed, it was "the best and safest Anaesthetic the world has ever produced."

Hayes employed a foot bellows to drive room air to his hand-held metallic shell which combined a "narcotic" reservoir with a face mask. Arriving room air passed via hose through a hollow metal tube. The first portion of air passed via pinholes to a mixing chamber above the "narcotic" liquid; the second, again via pinholes, bubbled through the "narcotic" liquid to combine with that first portion.

In May of 1882, his "Process of and apparatus for administering anaesthetics" received a U.S. Patent. By the following year, the U.S. Patent Office had consigned Hayes model, along with most of the others to storage. These were transferred to a livery stable by 1908 and then, two years later, peppered around basements and barns in Maryland, Virginia and the District of Columbia. The group of patent models were successively auctioned to Sir Henry Wellcome in 1925 and then on to Broadway producer Crosby Gaige in 1936. The latter sold the models to a group of businessmen whose "American Patent Models, Inc." would declare bankruptcy by 1940. After acquiring all the models in 1941 for $5,000, auctioneer O. Rundle Gilbert moved them en masse to his home across the Hudson River from West Point, in Garrison, New York. Fortuitously, only a ten-mile drive by automobile separated Gilbert's estate from that belonging to Mrs. Paul Wood's family in Highland Falls. [The WLM has no record for a date of sale from Gilbert to the WLM's Founder, Dr. Paul Wood.]

Hayes Anaesthetic Apparatus #2 (1892)

About ten years after filing for his first patent, Hayes filed Serial No. 429,327 – this time without a patent model. In this version he incorporated a thermometer and a top dial for "narcotic regulation." At least one of these models was sold to a Hoosier practitioner. That particular apparatus [#2] resurfaced in Iowa City, where a vendor listed it on eBay as an "OLD & Unusual Anesthesia Device—Brass/Silver." In July of 1999, I outbid 22 other bidders to acquire this version for the WLM.

Hayes Anaesthetic Apparatus #3 (1895)

Within three years of manufacturing his Apparatus #2, Hayes began advertising his #3. The latter answered anaesthetists' complaints about the cramped latchdoor compartment of the #2. In this improved version, Hayes removed the latchdoor and installed two turn-off valves (for conserving the "narcotic" agent) on top. We have no information on how at least one of these #3s arrived in California. Years ago, AHA Co-Founder Selma Calmes, M.D., happened across one of these unusual antiques. After storing her Hayes #3 for several years, Dr. Calmes shipped it to the WLM wrapped as a Christmas present near the close of 2007. She donated it officially in February of 2008.

Hayes Anaesthetic Apparatus #4 (1897)

Even though a Chicago surgeon, Edmund Andrews, had suggested supplementing nitrous oxide with oxygen as far back as 1868, practical oxygen-supplementation of anesthetics did not begin until compressed gas cylinders became available. By the 1890s, N_2O-asphyxial morbidity and mortality mounted as concerns for both anaesthetists and the public at large. Philadelphia's SS White Dental Manufacturing (SSW), the USA's leading supplier of N_2O-only anesthetic apparatus, faced increasing pressure from London's F.W. Hewitt, to the East and from Pittsburgh's S.J. Hayes, to the West. (Hayes greatest legacy may have been rushing SSW into marketing oxygen….)

Indeed, by early 1897, the Rev. Dr. S.J. Hayes was actually printing advertisements encouraging the use of supplemental oxygen. In one, the heavens salute the reader with "Greetings to Suffering Humanity !" Underneath, Hayes depicts a cherub winging around with a banner for "Pure Narcotized Oxygenated Air." In his final invention, the "Hayes Apparatus for Oxygenating the Air" connected a compressed gas cylinder of oxygen indirectly to the room air source for his Anaesthetic Apparatus #4.

Marginally successful as an educator and editor, Rev. Dr. S.J. Hayes flourished in his roles as a minister, dentist, anaesthetist, and manufacturer. While the Reverend Doctor honed his preaching skills over his final 37 years, Hayes' inventions served as sermons against anaesthetists' forays into 100% nitrous oxide anesthesia. Hayes spread a gospel of nonasphyxial anesthesia. Unfortunately, when he died from "consumption," Rev. Dr. S.J. Hayes' sermons— his apparatus— were buried with him in Pittsburgh.

Leonard M. Monheim, D.D.S. (1911-1971): Ill-Fated Anesthesiologist

David Ryan Cook, M.D.
Clinician, Emeritus University of Pittsburgh Medical Center
former Professor of Anesthesiology
University of Pittsburgh and Duke University Medical Center
Pittsburgh, Pennsylvania

Leonard M. Monheim, D.D.S., was internationally known as an author, lecturer, scholar, educator, and research clinician. He founded the first independent department of anesthesiology in a dental school at the University of Pittsburgh in 1949.

He played football, baseball, and track at Elizabeth high school. He was a three-year varsity letterman on the Pitt track team and served as its captain in his senior year. He maintained a lifelong interest in athletics and sportsmanship.

He graduated from the University of Pittsburgh in 1933 (at the age of 22). He then completed a dental internship at the University of Cincinnati (1933-34) and developed an interest in anesthesiology; he was also the assistant track coach. He then completed a four- year anesthesia training program with Dr. George Thomas at St. Francis Hospital (1934-1938). In 1938 when Presbyterian Hospital moved to its current location from the north side, he joined the staff as its only on-site, full time anesthesiologist. Dr. Thomas was then the titular Professor and Chairman of Anesthesiology at Pitt; he was also the chief of anesthesiology at St. Francis Hospital, Presbyterian Hospital (PUH), Childrens Hospital, Eye and Ear Hospital, and a consultant to Magee Hospital.

Leonard Monheim's faculty career at the University of Pittsburgh spanned three decades. He was Professor of Anesthesiology at the school of Medicine and Professor of Anesthesiology and Pharmacology at the Dental School. His writings are considered major additions to the anesthesia literature. His various seminal textbooks have been wide-read and translated into four languages.

He served during World War II (1942-46) in the Pacific theater (SWPA) with the 27th General Hospital (Pitt). He was one of several anesthesiologists in the SWPA theatre and was deployed to New Guinea. He was the only anesthesiologist at PUH from 1938-1942 and from 1946-1961. In 1961 Dr. Peter Safar replaced Monheim as chief of anesthesiology at PUH and became the first full-time, on-site Professor of Anesthesiology at the University. These experiences and his work with residents, nurse anesthetists, oral surgery residents, and dental residents contributed to his reputation as a superb teacher and supervisor of anesthesia personnel. His long association with the University of Pittsburgh Health Center culminated in his service as President of the Medical Staff at PUH.

Dr. Monheim was a member of the Allegheny County Board of Health and served as a consultant to a number of professional dental journals, as well as the Departments of Defense and Health, Education, and Welfare. He received significant national and international recognition in dental anesthesiology, including both the prestigious Horace Wells Award and the Heidbrink Award.

He married Marnie Altman in 1950. Their son Charles lives in New Zealand and their daughter Lisa lives in Ketchum, Idaho.

This talk will document the unique career of Dr. Monheim using original source materials. He completed his dental education in the middle of the great depression, became an anesthesiologist prior to World War II, participated as one of the few anesthesiologists in the SWPA theatre, and served as the only anesthesiologist at Presbyterian Hospital for several decades. He died at age 60. Thus, he might be viewed as the ill-fated anesthesiologist who was a dentist.

Chloroform in 2008: Still very much with Us

Ray J. Defalque, M.D., and Amos J. Wright III, M.L.S.
Department of Anesthesiology
University of Alabama at Birmingham
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Introduction

$CHCl_3$ as an anesthetic disappeared at the end of WWII, but its industrial use has continued to increase over the past sixty years. It raised the interest of numerous scientists in the 1970-80's (over five hundred publications) because of public and government concern in the environment, generous funding and developments in chromatography. This surge has now abated because of different interests (global warming) and decreasing funding.

Industrial $CHCl_3$

Production of $CHCl_3$ in the U.S. has increased each year to a present 1,114 million lbs./year. $CHCl_3$ is mostly (98%) used to manufacture CHCF-22, a common refrigerant. Small amounts are utilized in the chemical and pharmaceutical (300,000 lbs./year) industries. Little of this industrial $CHCl_3$ is released in the environment because the operations are performed in closed systems or the $CHCl_3$ is destroyed by the chemical processes. Since 1976 the FDA has banned the addition of $CHCl_3$ to food, drugs and cosmetics but much (94%) of our processed food still contains traces of $CHCl_3$.

There is little evidence of $CHCl_3$ intoxication in factories because of strict regulations. OSHA recommends a maximum of 50ppm for an eight-hour day in the workplace.

Organ Toxicity

$CHCl_3$ is still occasionally used for suicide (ingestion), and abduction or homicide (inhalation) with ensuing death or severe organ damage (GI tract, liver, kidney). A large amount of animal studies were carried out in the 1970-80's to elucidate the mechanism of $CHCl_3$ toxicity. In rodents, the culprit seems to be $COCl_2$ (phosgene), an oxidative metabolite of $CHCl_3$ which covalently binds to the nucleophilic sites of the macromolecules and damages the cells or their DNA. This $COCl_2$ production occurs in the liver, and probably in the renal cortex. It also probably occurs in man.

$CHCl_3$ in the Environment

The past thirty years have seen an intense search for $CHCl_3$ in our environment. It has been found:

A. In the atmosphere, as a gas deriving from natural sources (evaporation from oceans, littoral waters, lakes and rivers, and volcanoes, forest fires, etc.) or from anthropogenic sources (industry, car emissions, biogas production, landfills, incinerators, water disposals).

   $CHCl_3$ is removed from the troposphere by rainfalls and indirect photolysis. Very little of it reaches the stratosphere; it thus is not an ozone depleting nor a greenhouse gas.

B. Significant amounts of $CHCl_3$ exist in the soil air; some is produced by fungal peroxidases, but most of it derives from human discharges of treated chlorinated water. The soil $CHCl_3$ is either vaporized into the atmosphere or is dechlorinated and oxidized into volatile CO_2 by biotic enzymes.

C. $CHCl_3$ in water. Significant amounts of $CHCl_3$ have been found in oceans, lakes and rivers (enymatically produced by algae and seaweeds) and in rainfalls. The main source, however, is anthropogenic: industrial wastewaters, paper and pulp bleaching; power plants cooling waters and, especially, the discharge of urban chlorinated tap water. Humans are exposed to $CHCl_3$ in that water not only by ingestion (drinking water, food) but also by inhalation and dermal

absorption (showers, baths, indoor swimming pools, lawn irrigation, etc.). Those exposures, however, remain below the dangerous levels established by WHO and EPA. $CHCl_3$ does not bioaccumulate in animal tissues, hence meat and fish contain very little of it.

$CHCl_3$ as Mutagen

Rodent studies show that only long exposures to high doses of $CHCl_3$ are mutangenic. Experts agree that the small, non-cytotoxic doses of $CHCl_3$ in our environment are not a mutagenic threat to man.

$CHCl_3$ as Carcinogen

Most (but not all) animal studies have shown that prolonged exposures to large doses of $CHCl_3$ cause liver and kidney carcinoma. Those results cannot be extrapolated to humans, however, because of large species differences in metabolism and pharmacokinetics. In non-cyto-toxic dose $CHCl_3$ is probably not carcinogenic in man. However, recent data suggest that small doses may promote the growth of in-situ tumors in rodents. This still needs confirmation.

A review of 22 human epidemiological surveys (mostly in U.S. cities, and supported by EPA) suggest a correlation between treated drinking water ($CHCl_3$ and many other compounds) and cancer of the bladder and, possibly, of the colon and rectum. Those studies have severe limitations of design, and statistics and better surveys are needed. No causal relation was elicited. WHO and EPA agree that human daily consumption of water and food (100mg/kg $CHCl_3$) is safe.

$CHCl_3$ and Reproduction

Rodents inhaling large doses of $CHCl_3$ show decreased birth weights and survival rates, as well as intra-uterine retardation and occasional tetrata. It is unclear whether this is a direct fetal or indirect (maternal) effect. Fifteen human surveys have associated drinking tap water ($CHCl_3$ and other compounds) with a slight increase in low births rates, stillbirths, abortions, and CNS defects. The design of those surveys has been criticized by experts who have concluded that those results are unproven, except possibly, lower birth rates.

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The Last Meeting of the Anesthetists Travel Club
Montreal – October 30 – November 1, 1941*

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Background

The Anaesthetists Travel Club met yearly from 1929 to 1941, to promote clinical anesthetic tutorials for a select small group of young anesthesia innovators of that time. Meetings of the Travel Club are documented in archives at the Mayo Clinic and the Wood Library Museum of the ASA, but available histories offer no details about the last meeting in Montreal in 1941.[1,2] A recently discovered letter from Harold Griffith in Montreal to John Lundy at the Mayo Clinic describes this meeting in detail, and reveals certain aspects of the schedule which mirror historical trends in anesthesia and society in the pre-war period.[3]

Planning

Prominent Montreal anesthetists Wesley Bourne, Harold Griffith, and Charles Steward were members of the Travel Club, and their offer to sponsor the thirteenth meeting of the club was accepted by the members, to follow the meeting of the American Society of Anesthetists (ASA) to be held in Montreal in the autumn of 1941. The dates for both meetings were announced in early August, and Griffith sent out the invitations to Travel Club members. The Toronto members of the Travel Club were busy with war-related research projects and did not wish to co-host the meeting as they had two times in the past.

The Meeting

On October 30, a clinical demonstration for the Travel Club was presented by Dr. Griffith at the Homoeopathic Hospital, followed by lunch. The meeting of the ASA followed at the Mount Royal Hotel, which lasted all afternoon, followed by a cocktail party given by the Montreal Society of Anaesthetists. The evening was taken up with a dinner dance for the ASA attendees.

On October 31, Dr. Bourne conducted a clinical demonstration at the Royal Victoria Hospital, with lectures on “Blood” by Drs. Browne and Denstedt of McGill University. After lunch, Dr. Bourne demonstrated anesthesia for thoracic surgery at the Grace Dart Home Hospital, and the afternoon concluded with the annual meeting of the attendees. That evening Dr. Griffith and his wife hosted an informal supper at their home.

On November 1, Dr. Stewart and the staff at the Montreal General Hospital hosted the final clinical demonstration. Following lunch at the hotel, the Travel Club was taken by bus to tour the war industry plants, courtesy of the Ministry of Munitions and Supply.

At the annual meeting, twenty members were present, including two new recruits, Urban Eversole (#38), from Boston, who had been invited by Lundy to attend, and Frank Murphy (#39) from Detroit, who was probably invited by the hosts, since he had trained in Montreal. Lundy was absent, due to meetings of the AMA section secretaries in Chicago. In his note to Lundy reporting on the meeting, dated 8 December, 1941, Griffith noted that Murphy had offered to host the meeting in Detroit the next year, to coincide with the anticipated meeting of the ASA.[3] Lundy’s reply to Griffith, dated 12 December, 1941, objected to Murphy’s hosting the Detroit meeting, despite the acceptance of the offer by the attendees in Montreal.[5]

Events at Pearl Harbor over the weekend these letters were written made these concerns historically immaterial. The Anesthetists Travel Club would not convene again until 1952, when it met in Rochester to reorganize in another form, as the Academy of Anesthesia.

Summary – Conclusions

1. Lundy lost control of the Travel Club due to the demands for his time from other medical organizations. The tendency to operate out of Lundy's control was seen in many decisions of the membership as early as the eleventh meeting in New York City (1939). Had the group survived, it would probably have altered its loose organizational structure.

2. Prominent organizers in the United States, the majority of whom were in the Travel Club, were determined to keep Canadian anesthetists involved in their specialty organizations, and made every effort to integrate them in professional activities. This effort was only marginally successful during the war and after.

3. The end of the great depression and the war in Europe had an effect on medical education meetings in the United States due to the travel costs and time required for attendance.

4. A shifting of research efforts toward military applications could be seen in Canada which was involved earlier in the war than the United States.

5. Pearl Harbor and the onset of World War II in the United States cancelled all but the most important medical meetings for the duration of the War.

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*Supported by a Wood Library Museum Fellowship, and assistance from Patrick Sim, M.L.S., and his staff in Park Ridge. Thanks also to Renee Ziemer and her staff at the Mayo Clinic. Travel funds supplied by the University of Texas Southwestern Medical School, Department of Anesthesiology and Pain Management.

Four Decades of Suspending Disbelief: Milestones in Anesthesia Simulation

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A literary work about the major events and influences of Anesthesia Simulation. This essay makes references to patient safety as the driving force behind simulation. The Sim One years, commercialization of full scale-high fidelity simulators and the current climate of medical education are some of the events illustrated.

The History of Anesthesia in Alabama and other States in the U.S.

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In 1982, Howard Holley published his book The History of Medicine in Alabama.[1] It is the only book of its kind dealing with the history of medicine in the state of Alabama. Chloroform and ether anesthesia were discussed in Dr. Holley's book, but only two concrete references exist: Dr. E.H.C. Bailey was reported to have confirmed an adequate supply of chloroform at his Confederate supply depot in Demopolis, Alabama; and Dr. Lister L. Hill's landmark heart surgery was performed using chloroform anesthesia in 1902.

Dr. Ben Carraway and Dr. Alfred Habeeb practiced anesthesiology in Birmingham in the early days. Dr. Carraway introduced sodium pentathol into the practice of anesthesia in Alabama in the 1930's. Dr. Habeeb was the first resident in anesthesia in the state of Alabama and is the first physician in Alabama to be certified by the American Board of Anesthesiologists. Ms. Anita Smith has documented their careers in her excellent written histories of Carraway and Lloyd Noland Hospitals.[2,3] W.H. McDonald also chronicled Dr. Habeeb's personal and professional life in the touching article entitled "A long way from Bishmizzin."[4]

A. J. Wright has published several articles on the early days of anesthesia in Alabama.[5-10] Most of his work has focused on the period prior to World War II, with the exception of his research on Dr. Alice McNeal, the first chair at the first academic department of anesthesiology in the state of Alabama, the University of Alabama at Birmingham. Wright discovered that the Selma physician B.B. Rogan was utilizing the Cushing-Codman anesthesia record in the spring of 1901. The Cushing-Codman chart was developed seven years earlier but was not published by Cushing until 1902. Prior to World War I, at least three physicians had practiced anesthesiology in the state of Alabama: in Birmingham, Dr. James Robertson Dawson [1876-1973] and Dr. Robert Goodloe McGahey [1877-1959]; and in Selma, Dr. James Satterfield Chisolm [1880-19??].[11]

Several other individuals have done excellent research on the history of anesthesia in their respective states. Dr. Richard B. Clark published "A History of Anesthesiology in Arkansas" in 1986.[12] Dr. Hermann B. Stein's article "Anesthesia in Colorado during the Nineteenth Century" was devoted solely to the history of anesthesia in that state prior to 1900.[13] Dr. David L. Farringotn and Dr. Robert A. Hingson wrote a detailed paper on the history of anesthesiology in Ohio entitled "The Development of Anesthesia in Ohio 1846-1961."[14-15] Dr. Roger L. Klein and Dr. Angela Kendrick published The History of Anesthesia in Oregon, a book comprised of over 300 pages.[16] Roughly 1/3 of their book was devoted to the history of anesthesia in the state of Oregon. The remaining text covered the history of anesthesiology at the University of Oregon Medical School and Oregon Health Sciences University. These studies demonstrate that scholarly work on the history of anesthesia at the state level can and should be done. The remainder of this presentation will focus on more detailed research at the state level and plans for future exploration.

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Noel Gillespie's Shadwell Laryngoscope

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Noel A. Gillespie, British anesthetist and colleague of Ralph Waters, died in Madison, Wisconsin, in August 1955. An obituary appeared in Anaesthesia the following October which says in part, "Two of his great material contributions to anaesthesia were[1] the Shadwell Laryngoscope, which was and many people maintain is still, the best instrument for direct intubation in the very young and new born. He was too modest to name it after himself, so employed the name of the Hospital at which he used it most.[2] His book on Endotracheal Anaestheisa which is a masterpiece of English and common sense."

This paper explores a brief history of Shadwell Hospital, how Gillespie (1904-1955) came to work there, the nature of his practice, why Gillespie felt a need for a new laryngoscope, the influences on his design, whether it was modesty that caused the name "Shadwell" and finally, how a prototype, engraved with Waters' initials, became part of the anesthesia equipment museum at the University of Wisconsin.

Dr. Nathaniel Heckford (1842-1871) of the London Hospital met his future wife, Sarah Goff, a student of medicine, in the summer of 1866 when they both volunteered during the Asiatic cholera epidemic in East London. After their marriage in January 1867, they purchased buildings to start a children's hospital. A year later the East London Hospital for Children and Dispensary for Women opened with ten beds. Despite Heckford's tragic death from consumption in 1871, the hospital continued to grow and a new building was opened in Shadwell in 1877. The name was changed to the Princess Elizabeth of York Hospital for Children in 1932.

Thomas Pomfret Kilner (1890-1964) was appointed as a specialist in Plastic Surgery to the hospital at Shadwell in 1931. Kilner was a colleague of Harold Gilles (1882-1960) at Sidcup Hospital following World War I and is considered one of the founders of the specialty of Plastic Surgery in the UK. His interest in congenital deformities, including cleft palate and lip, contributed significantly to the modern operations for the repair of these abnormalities.

In the summer of 1934, Noel A. Gillespie was elected to the consultant anaesthetic staff of the London Hospital. The number of anaesthetists in London was small and Noel knew many of his colleagues personally, including Ivan Magill (1888-1986) at the Westminster and Brompton Hospitals. Interestingly, Magill had anesthetized patients for Harold Gilles at Sidcup and when that hospital closed they continued their collaboration in private practice. Gillespie also visited Ronald Jarman (1898-1972) at the Princess Beatrice Hospital who was interested in using intravenous barbiturates for anesthesia.

Gillespie visited prominent American anesthesiologists during a three-month tour of the United States in the spring of 1935. He met Ralph Waters for the first time on his arrival in Madison and they quickly found they shared similar views about the practice of anesthesia. Gillespie stayed two weeks before departing by train for Rochester, Minnesota, to visit John Lundy of the Mayo Clinic. His welcome wasn't cordial as Lundy accused Gillespie of collaborating with Jarmen to publish first about the new intravenous induction agent thiopental. This caught Gillespie by surprise and he resolved to be extraordinarily careful in associating his name with any project that appeared to be self-aggrandizing. When he returned to London in June 1935, Gillespie discovered Jarmen had arranged his appointment to the PBH. Gillespie resolved to distance himself from Jarmen as soon as possible.

The opportunity to resign from the Princess Beatrice Hospital arose shortly after the New Year in 1936 when Magill suggested Gillespie apply for a vacancy to work with Kilner at Shadwell. Regarding the initial meeting with Kilner Gillespie writes, "He explained the difficulties of his cases: almost all of them were babies for the repair of lip or palate: the former done at 6/52 and the latter at about a year. His deliberate methods called for intubation: this was an exceedingly ticklish business on children so small. So much so that his work had been interrupted since the departure of his previous anaesthetist… I had been captivated by Kilner's personality, and challenged by the technical difficulty of the job… I liked and trusted the man at first sight."

Gillespie soon discovered the difficulty of using an ordinary Magill laryngoscope – the handle met the baby's chest before the spatula entered the mouth. Realizing that "ENT men" favored Chevalier Jackson's laryngoscope, Gillespie went to Mayer and Phelps, manufacturer of aural instruments, and asked them to make a laryngoscope combining the spatula of the Jackson with the in-handle battery of the Magill. He stipulated that the lumen of the instrument should be made with a removable slide to prevent bulging tissue from obstructing the view of the cords, but still allow intubation. The tiny electric bulb was positioned out of lumen of the scope to facilitate passage of the endotracheal tube. Extra bulbs are stored in a closed recess at the end of the handle. Mayer and Phelps took about four months to produce the first two instruments.

Gillespie's case book records an early use of the new instrument, "22-iv-36. D-V [direct visualization?] Very easy with Shadwell scope. Vision only of arytenoids: Gibberd technique—epiglottis not lifted." This compares with an earlier note, "4-iii-36. Fairly easy intubation: classic laryngoscopy. Chief difficulty child too small & scope (Magill) too large."

Ralph Waters and his family visited England in the summer of 1936. Gillespie was instrumental in arranging the visit and invitations to speak to the Anaesthetic Section of the British Medical Association and the Royal Society of Medicine. On Wednesday morning, July 22, 1936, Waters went to Shadwell with Gillespie, met Kilner, and observed some cases. At the hospital Gillespie gave the second Shadwell Laryngoscope engraved with the initials "R.M.W." to the "Chief." That engraved scope is now on display in the Department of Anesthesiology at the University of Wisconsin.

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Are Greed and Villainy Inherited?
The Case of Dr. William James Morton and His Father William T.G. Morton

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Richard J. Wolfe, the former Curator of Rare Books at Harvard Medical School, has changed our opinion of William T.G. Morton's probity with the publication in 2001 of his book Tarnished Idol. In the opening chapters Wolfe meticulously documents Morton's travels and activities during the six year period before he settled into busy dental practice in Boston in 1844. Wolfe summarizes his findings thus: "Morton ……. (was) possessed of an unscrupulous character – indeed, perhaps even a criminal mind – that led him to lie, steal and commit gross misdeeds in order to achieve his goals which, all evidence indicates, was the pursuit of money, no matter how gained." Careful reading of Wolfe's book reveals a strong anti-Morton bias but there is no denying the evidence he presents about Morton's misdeeds in business. It is not unreasonable to assume that Morton's lifelong struggle with Dr. Charles Jackson to claim priority was also motivated by greed.

During a visit to William T.G. Morton's grave and monument in the Mount Auburn Cemetery, Cambridge, Massachusetts I observed that on the adjacent headstone for his son William James Morton, MD (1845 – 1920), there appears the following inscription under his dates and places of birth and death: DEVELOPED HIGH FREQUENCY CURRENT 1886. This struck me as a remarkable claim. I investigated this claim quite carefully and found that it was and is a lie.

This led me to study William James Morton's life and career in more detail. There is little in his career to contradict my findings that he was also a greedy villain. The only difference is that his behavior worsened as he got older and he was sent to jail for large scale fraud in his sixties. Although he achieved success and modest renown as a neurologist in New York City there are aspects of his life and career that parallel the most disreputable elements of his father's life. This raises the question: Is criminality an inherited trait or is it the result of the criminal's family environment?

I am not knowledgeable enough to answer this question and, so far, I have not consulted any criminal psychologists. The listener should judge for him or herself.

Nothing in this investigation should take away from the importance of the older Morton's public demonstration of the use of ether to abolish the agony of surgery.