Hartford: A Marriage of Time and Place
Opening Lecture, Anesthesia History Association
19th Annual Meeting, May 3, 2013

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When my name was suggested to Dr. Desai as someone who might have a word or two to say regarding the legacy of Dr. David Little and the city of Hartford as it relates to the history of anesthesia, little did he know he would be asking one of the remaining dinosaurs of the specialty to speak. Not believing I’d ever be in this position, I’m reminded of something Groucho Marx was quoted as saying: “There’s one advantage being 102 yrs. old. There’s no peer pressure.” As for myself, I think I’m still working with a full deck of cards. I just seem to shuffle them a bit slower these days.

Whatever the case may be, I’m happy to welcome you to Hartford, and I thank you for having chosen our city for your meeting. It’s appropriate, in my opinion, that you’ve done so because the history of anesthesia is inexorably tied to that of our city. Yesterday, your schedule took you to several historical sites in order that you might touch base with the man we claim is the discoverer of anesthesia, although some among you may believe otherwise. Whatever your views are, we, the citizens of Hartford, are one in the belief that because of Horace Wells, our city stands in a vaunted position relative to anesthesia’s beginnings in our day. That said, you may take comfort knowing that I’m not here today to re-ignite the historical controversy over ownership rights—namely, about who did what first. Rather, I wish only to apprise you of an aspect of our history which is often overlooked or perhaps not appreciated by younger members of our profession who are likely products of university training programs. I speak of the fact that in its infancy our specialty took its initial steps not only at a handful of university affiliated programs that existed at the time, but also at disparate venues about the country, namely at hospitals and clinics such as the Mayo Clinic, the Cleveland Clinic, the Lahey Clinic, the Virginia Mason Clinic, Charity Hospital in New Orleans, Bellevue Hospital in New York City, Henry Ford Hospital in Detroit, and Hartford Hospital, to name a few. It was also at places such as these where forward-looking men envisioned a world in which physicians with the intellectual wherewithal to understand and address the needs of both patient and surgeon would stand at the head of operating room tables during the surgical experience. Which brings me to the story of Ralph Tovell and the city of Hartford.

For a timeline, you will recall that Ralph Waters arrived at the University of Wisconsin in 1927, and soon thereafter created the nation’s first university department of anesthesia. A few short years later, Ralph Tovell, a Canadian who had been working with John Lundy at the Mayo Clinic, was hired by Hartford Hospital in 1935 for the purpose of establishing an anesthesia department which later developed into that institution’s first approved residency training program. Already producing specialists at the onset of World War II, Tovell was recruited by the army when the US entered the conflict, and with the rank of colonel was given the assignment of directing all anesthesia services for the Allied Forces in Europe.

For Tovell it was a formidable challenge and one that he met head on. His first order of business called for the urgent collating and standardization of existing anesthesia equipment assembled hastily from British, French, and American sources after numerous catastrophic anesthetic mishaps had been reported in the field—a task that led to the uniform color coating of gas tanks and to the subsequent development of the pin-indexing system. By war’s end, Tovell’s name was securely seeded in the minds of returning medical officers as a prominent figure in the budding specialty of anesthesia—a fact that resulted in a burgeoning number of veterans arriving at Hartford Hospital to train at a time when a new building whose construction plans largely influenced by Tovell before the war, was now being built. A model of modern design, the hospital was heralded upon completion for its many innovations that included such prominent features as an on-site oxygen manufacturing plant, an intravenous fluid producing pharmacy, and a fog room for use primarily in the treatment of infant croup and other respiratory illnesses.

Influenced by the nature and scope of the responsibilities demanded of medical and hospital personnel serving in the army, Ralph Tovell was thoroughly convinced that an anesthesiologist could and should function beyond the narrow confines of the operating room and proceeded on his return to make his department relevant within Hartford Hospital in heretofore unheard of ways. He took over and supervised that

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May 1-3, 2014

Location: Dearborn Inn, Dearborn, Michigan (A Marriott Hotel)

Deadline for Papers: March 1, 2014

(Papers should be on one 8.5 X 11 inch or one A4 and contain title, authors and affiliations, text and references)

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institution’s blood banking and intravenous therapy services. He provided pulmonary rehabilitation measures of deep suctioning and tracheo-bronchial toilet to respiratory patients throughout the hospital. He demanded that a member of his department be called whenever a child in respiratory distress was seen in the emergency room and remain present until it was determined that an adequate airway had been established. He created what was believed to have been the nation’s first 24 hour staffed recovery room and welcomed multi-traumatized patients needing one-on-one nursing care and monitoring to be treated in that venue. It was not uncommon for postoperative and other patients to remain in Tovell’s recovery room for days. An obtunded patient of unspecified etiology, for example, had access to nursing care in the anesthesia recovery room resulting in what, in effect, was a rudimentary form of intensive care medicine being practiced long before the concept was conceived of as such. He provided a pain service for patients by offering therapeutic nerve blocks, intravenous procaine infusions that were popular then, and controlled narcosis when indicated. All of these essentially non-anesthesia practices were routine functions of a department clearly ahead of its time.

Ralph Tovell was a founding director and later president of the American Society of Anesthesiologists. He was a founding director and later president of the American Board of Anesthesiologists. In fact, for many years the office of the American Board of Anesthesiology was located opposite Tovell’s office on the third floor of Hartford Hospital before it was moved to a different location in the city. He was a founding editor of the journal, Anesthesiology. And perhaps most unheralded of his many contributions to the specialty was his successful presentation along with John Lundy before the House of Delegates of the American Medical Association in 1940, arguing that anesthesia should be recognized as a medical specialty and not exist as a division of surgery.

All the while Hartford Hospital under Tovell’s leadership was gaining a reputation as a center for anesthesia training, the city’s other major hospital brought Dr. Stevens J. Martin from Bellevue Hospital in New York City to Hartford for the purpose of organizing the anesthesia services of St. Francis Hospital and establishing a competing residency program. Dr. Martin trained physicians for nearly two decades, and was the second physician from Hartford to be elected president of the American Society of Anesthesiologists. The third person with that distinction was Dr. J. Earl Remlinger, a product of the Hartford Hospital program, who later served as director of anesthesia at the Evanston Hospital in Illinois. Today all of the major hospitals in the Greater Hartford Area, with Hartford Hospital as the largest facility, are united as a single training program under the banner of the University of Connecticut Health Center located in nearby Farmington, Connecticut.

Which brings me now to say a few words about Dr. David Little who is remembered annually by your organization with the awarding of prizes bearing his name. If it seems I’ve regaled you at length speaking about Tovell, it was only to provide context for my remarks about Dr. Little, for like Tovell, his story is also that of Hartford and Hartford Hospital, and like his mentor he too ascended to the presidency of the American Board of Anesthesiologists and was the fourth president of the American Society of Anesthesiologists to have emanated from this city. But rather than recount the many accolades bestowed on David Little or touch upon the wide ranging body of literature associated with his name, my intent is to say a few words about him as the person I knew.

David was not a scientist nor did he pretend that he was. He was first and foremost a clinician and a teacher, and Hartford Hospital was the beneficiary of his many and impressive talents. A Harvard Medical School graduate, he served his internship and residency at Hartford Hospital and McGill University, which at the time had an affiliation with the Hartford anesthesia program. An institution as large and as busy as the one where David practiced, Hartford Hospital afforded him the treasure trove of clinical material he savored. And it was the institution he would never leave except for two tours of duty in the U.S. Navy, the first at the end of World War II and the second during the Korean conflict. Wherever he served, the surgical suite was that part of a hospital where he felt most comfortable and alive, believing as he did, that for him it was always a special place.

Writing in the journal Anesthesiology as the newly elected president of the American Society of Anesthesiologists, David Little admonished its members at a time when many were exploring areas of practice outside the surgical arena not to minimize the importance of their presence in the operating room. He pointed out that by drifting away from their original and historical practice mode, Society members would be embracing fields where parallel personnel of other specialties were equally capable of doing whatever it was that they, as anesthesiologists, would be taking upon themselves to do. And he exhorted his readers further by reminding them that it was in the operating room where no other specialist would be capable of replacing them in the performance of tasks for which they as anesthesiologists were uniquely trained. David was in no way opposed to sub-specialization or to anyone’s incursion into pain management or critical care medicine, for example. His concern was that the nuts and bolts of anesthesia practice should not be demeaned in the minds of others within our specialty or thought of in any way as being a lesser form of service.

Born in Cambridge, Massachusetts, David was a Yankee, a New Englander who literally grew up on the Harvard University campus where for many years his father was a resident college master. A love of words both spoken and written was instilled in him by the many encounters he had with people of letters early on in life and by the milieu in which he was raised. Oh, how he loved to write and how well he could turn a phrase. What a speaker he was and how comfortable he felt behind a podium! Known for his playful nature and quick wit, he was always fun to be with. Curiosity was his second nature. “What would you think if I steamed these lobsters in Chablis wine instead of salt water?” he once asked me. “They should taste better that way, don’t you think?” I, a mid-westerner and a newcomer to Connecticut at the time, wasn’t so sure. But I nodded my head in assent anyway.

David’s library was different from what one would expect it to be. Indeed, books and papers were everywhere. What was unique about the place, however, was the absence of a desk—that is, the usual kind. Instead, from one end of the room to the other was a long elevated writing platform similar to what is commonly seen in a bank or a post office. And as a companion to that makeshift arrangement was his sky-high director’s chair on wheels that allowed him to slide back and forth along the platform, giving him access to any earmarked page or document he had been working on. “I believe I write and think better at this elevation,” he once quipped. “The air is more rarified up here, you know.”

David was blessed when he married his wife Skippy and later by the children they raised together. As a couple the Littles loved to entertain, and dining with them on Walbridge Road in West Hartford was always a special occasion. David’s friendships were long and lasting. One such relationship was forged at McGill when he and Ronald Stephen of Duke University fame met and worked together as anesthesia residents. That association led not only to
the co-authorship of a significant output of literature, but also to strong family ties as each became a godfather to the other’s child.

David was a born politician, fierce at times when dealing with issues important to him. Capable of playing hard ball with an adversary, he also knew when to compromise or negotiate. “Come along,” he once beckoned me at an ASA meeting while others were viewing exhibits or listening to papers. “I want you to see what goes on behind the scenes. There’s a parallel meeting taking place here that most attendees are never aware of,” he said. “It’s important you know. Government and insurance issues that threaten us. Regulations and questions of turf. Somebody’s got to get into the trenches, and, if necessary, do battle over things that matter.” And for the good of the specialty, he immersed himself deeply into the politics of anesthesia practice at a time when strong leadership was needed.

Dr. Little was courted by numerous university programs, but turned down every opportunity offered him. Only hours from the family cottage on Lake Chocorua in New Hampshire, he was happy living in Connecticut and was loathe to move away. Oh how he loved life, but sadly for him it was short. Well insured when stricken by cancer, he refused at any time to think of himself as being disabled, a situation, which we, his partners, urged him to admit. Instead, he continued to work until a few short weeks before he died. He was only 61 at the time. And although his years with us were not enough, he lives on today as a colleague and friend.

In conclusion let me say that as familiar as I know all of you are with the history of pain relief as it was practiced in antiquity by Mayan, Asian, Middle Eastern, Mediterranean and other cultures that followed; and as interesting and primitive as the means employed have been of alleviating the misery of people throughout the ages, for us the modern era of pain relief and of anesthesia as we think of it today, began in the mid-19th century with heroes whose names are familiar to you and whose stories call for no repetition by me. Rather than having chosen to speak this morning on a subject more in keeping with the history you know far more about than I, my intent has been to limit my remarks to the specialty of anesthesia as it developed during its infancy in America and to bring to your attention a few relevant facts associated with that part of our history with which some of you may have been less familiar.

Ours is a wonderful calling unlike any other, and I commend you for all that you do as a Society to keep alive the narrative of where we’ve come from if only to enlighten others on their way going forward. I thank you for inviting me to address you today to speak about Hartford and its place in the story of modern anesthesia and to reminisce about one of its noble sons, Dr. David Mason Little.
Lucien E. Morris, MD, Aqualumnus, Inventor, Academic and Historian

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Lucien E. Morris, inventor of the Copper Kettle, the first precision anesthetic vaporizer, died peacefully at his home in Seattle, Washington, on November 15, 2011, two weeks before his 97th birthday. He was one of four remaining Aqualumni, the doctors who trained with Dr. Ralph Waters at the University of Wisconsin. His life epitomized Waters’ admonition “to teach doctors to go out and teach other doctors” the medical specialty of anesthesiology.

Lucien was born November 30, 1914, at his maternal grandparents’ home in Mattoon, Illinois. Lucien’s father was a Harvard-trained biochemist teaching at his first post-graduate appointment in the medical school at Washington University in St. Louis. In 1918, he was appointed Head of Biochemistry at the Western Reserve University School of Medicine. Lucien’s sister, Marcia, was born when he was six years old and added to his memories of a happy early childhood. Family vacations were to northern Canada, planned to ease Lucien’s seasonal hay fever. This established a pattern that Lucien would follow in his young adult years.

Tragedy struck when Lucien’s father was diagnosed with pulmonary tuberculosis, the most common cause of mortality at the time. This necessitated a sanitarium stay at Saranac Lake, New York, that separated him from the family in 1925. He died a year later following a pulmonary lobectomy, never having returned home. Lucien, at age 11, became the last male in the Morris line. The family remained in their Cleveland Heights home with help from Lucien’s paternal grandmother who provided a modest monthly stipend that sustained them through the Great Depression.

Lucien was a good student with an interest in the sciences, and he found ways to keep himself in spending money through his hobbies, notably stamp collecting and photography. In high school he discovered fencing, a sport that would come to figure prominently in providing his future education. The family was able to continue to vacation in Canada, where Lucien’s interest in camping and canoeing was nurtured.

After graduating from high school in 1932, Lucien matriculated at Oberlin College, a small undergraduate institution near Cleveland with a reputation for academic excellence (Figure 1). Lucien pursued a degree in chemistry. He worked in food service, a “board job,” first washing dishes and then as a waiter in a women’s dorm dining hall. He joined the fencing club and in addition to honing his skill as a competitive fencer, he became the spokesman and manager of the team and convinced Oberlin’s athletic department to make fencing an intercollegiate sport.

With a degree in chemistry, Lucien chose to follow in his father’s footsteps with graduate studies in biochemistry. He secured a position at Western Reserve University that included a teaching fellowship. As a laboratory instructor for medical and dental students, he received free tuition and a stipend of $65 a month. Wishing to stay physically active, Lucien investigated practicing with the neighboring Case Institute of Technology fencing team and discovered they were in need of coach. He served as the volunteer head coach for the next seven years. The team developed sufficiently to win five of eleven competitions against Big Ten schools between 1941 and 1943.

Part of Lucien’s own curriculum included medical school courses. He wanted to understand what his students, as future practitioners, needed to know about biochemistry to make his teaching more relevant. Lucien decided to take the full medical course of study. He was able to maintain his teaching fellowship in biochemistry, but soon recognized that obtaining a medical degree would enhance his future opportunities.

In 1939, Lucien met a young Canadian woman studying Public Health Nutrition, Jean Pinder, who was taking biochemistry with the dental students. Their friendship blossomed. They were engaged in the spring of 1941 and married in June of 1942 (Figure 2). Jean had completed her master’s degree, and Lucien was beginning his senior year of medical school. Due to the war and the need for doctors, the medical curriculum was accelerated and vacations and holidays were cancelled. Lucien’s medical program became full time with no time for his teaching fellowship. That in turn meant that his stipend and tuition-free education ended. Jean’s job as an assistant nutritionist for the City of Cleveland provided a salary that was insufficient for the last year of medical school tuition. Lucien shared his difficult financial situation with the Athletic Director at Case, who made arrangements to pay the last year of tuition. With the addition of other part-time work, including guiding a previously scheduled canoe trip to the Temagami Lake district of Canada, Lucien was able to complete the year.

Because of the wartime expedited schedule, Lucien was graduated in February 1943. In April, Lucien began his internship at Grasslands Hospital in Valhalla, New York. By coincidence, the superintendent of the hospital had been a biochemistry student of Lucien’s father and was helpful in providing married living quarters and facilitating a job for Jean. While Lucien had seen surgery and

Fig. 1. Lucien Morris, probably at the time of his graduation from Oberlin College in 1936. Photo courtesy of Don Morris from the Oberlin College Archives.

Fig. 2. Jean and Lucien Morris were married in the college chapel on the Adelbert Campus of Western Reserve University in June of 1942. Photo courtesy of Don Morris.
anesthesia as a student in Cleveland, it was during a July 1943 anesthesia elective with a good teacher that Lucien first appreciated the benefits physician-anesthetists offered with their understanding of physiology, pharmacology and the effects of surgery. With the end of his war-truncated internship approaching, but no decision about active duty from the Army, Lucien chose to strengthen a self-perceived area of weakness in his training by applying for a residency post in gynecology at St. Mary’s Hospital in Madison, Wisconsin. He began January 1, 1944, as the Chief Resident. In fact, he was the only resident in the hospital, because the other residents had been called to military service. One evening, after having been pressed into providing an ill-advised anesthetic, Lucien described his discomfort to a medical student extern from the University of Wisconsin. The student suggested Lucien see Professor Ralph Waters (1883-1979), who had established a well-regarded residency in anesthesia at Wisconsin. Within weeks Lucien received notice to report for active duty with the Army. Before leaving Madison, Lucien met with Waters and agreed that if Lucien survived the war, he would come back for a residency at Wisconsin.

After induction at Carlisle Barracks, Pennsylvania, Lucien was assigned to several Army hospitals for additional training. At each assignment he found ways to enlarge his anesthesia experience. Finally, he was assigned to be deployed with the 103rd General Hospital that was organizing in Illinois. This was fortunate, as it allowed him to be with Jean in Cleveland for the delivery of the first addition to the Morris household, Jim, in early June. By late July, the 103rd had crossed the Atlantic and established hospital facilities near Ludgershall, England about ten miles north of Salisbury. Prior to duty assignments, Lt. Morris was interviewed by Colonel William S. Middleton,* who by fortunate coincidence was the Dean of the Medical School at Wisconsin. The next day, Lucien found he was appointed Chief of Anesthesia and Operating Rooms Section at the 103rd Hospital (Figure 3).

The Anesthesia Section of the 103rd provided nearly 5000 anesthetics between July 1944 and April 1945. Lucien personally administered more than 700. During this period the 103rd experienced no anesthetic-related mortality. Lucien was pleased to attend several meetings of the Section on Anaesthetics of the Royal Society of Medicine in London where he met prominent English anaesthetists. In March 1945, he attended one of the twice yearly Oxford review courses organized by William Mushin. A highlight of the course was the discussion sessions over tea with Professor Robert R. Macintosh.†

As the war in Europe ended, Lucien was ordered to join a mobile surgical hospital departing from Marseille en route to the Pacific theatre. In mid-Atlantic, the ship changed course and sailed to New York. The war was over. After a series of stateside postings, during which Lucien attended his first (1945) American Society of Anesthesiologists (ASA) meeting and submitted his first anesthesia paper,‡ he was separated from the Army. He brought his family to a new house on Gregory Street in Madison, Wisconsin and began his residency with Waters on September 1, 1946.

This was an exciting time to be in the Waters’ program. In addition to learning from Waters, known as the “Chief,” and benefiting from the well-established teaching program reinforced with returning faculty from the war, there were also the other residents, many from overseas. Lucien became good friends with Carlos Parsloe§ from Brazil, who would go on to become president of the World Federation of the Societies of Anaesthesiologists, and learned alongside Jone Wu,** who established a...
Department of Anesthesia in Shanghai and is widely viewed as the father of Chinese anesthesiology. Residents also benefitted from the annual Easter-time gatherings of the “Aqualumni” a term coined by Virginia Apgar to describe the residents trained by Waters. There were frequent notable visitors including the neuroanaesthetist Olive Jones†† from Oxford and Edgar Pask,‡‡ who became the Professor of Anaesthesia at Newcastle upon Tyne. Waters and the department were also involved in research. An ongoing study evaluated chloroform as it approached its centenary as though it was a new anesthetic agent. In late 1947, Waters observed Lucien giving a chloroform anesthetic as part of the study. The erratic performance of the vaporizer was frustrating, and Lucien commented, “Anyone ought to be able to make a better vaporizer than this.” A few weeks later the vacationing Waters sent a postcard from Florida with a single sentence, “Has Morris made a new vaporizer yet?” Lucien’s background in chemistry perfectly suited him for grasping the essential elements necessary for a successful vaporizer design. The new vaporizer featured a metered gas flow passed through a sintered bronze plate and copper construction to enhance heat conduction. The sintered “bubbler” created a large gas-liquid interface leading to rapid and complete saturation of the introduced gas.

The Foregger Company produced the first prototype of the commercial device, delivering it in September 1948 (Figure 4). Lucien discovered that Richard von Foregger, PhD,§§ the owner of the company, had modified the design. After further written and face-to-face discussions, all the original designed features were included. A paper describing the apparatus was published in Anesthesiology in 1952. Later modifications, including positioning the filling port to prevent overfilling and a double cam valve to close inflow and outflow to the vaporizing chamber, further enhanced safety. As the first precision anesthetic vaporizer, the “Copper Kettle” became the standard vaporizer in anesthesia for the next twenty-five years, and its design features can be traced to the most modern vaporizers in use today.

Waters retired from clinical practice on his 65th birthday in October 1948 and from the University a year later. Leadership of the department was left in the hands of five senior people, with Lucien the best known and respected clinician to the Wisconsin surgeons. Dr. Miller MacKay,*** an Oxford-trained Canadian, was appointed chair. Lucien thought this would be a good time to seek another academic appointment and in 1949 accepted an assistant professor position at the University of Iowa. Stuart Cullen (1909-1979), a Wisconsin graduate trained by Emery Rosenstone (1895-1960) at Bellevue Hospital in New York, was the chair. In 1951, Cullen, who had taught internationally, declined an invitation to participate in a World Health Organization/Unitarian Service Committee teaching trip to Israel and Iran (Figure 5). He suggested Lucien go instead. This trip positively influenced Lucien and his career by broadening his viewpoint and establishing many friends, both among the team members and those at the training sites. Lucien’s research interest at Iowa included studying the anesthetic qualities of xenon, but this promising work was stopped due to the cost and scarcity of the agent.

Lucien began to receive inquiries about other academic opportunities. None seemed suitable either for professional or family reasons. Then in early 1954 he was asked to consider the Chair of Anesthesia at the University of Washington in Seattle. It was an unsettled situation: the search for a new Dean of the Medical School was underway.

**Jone Wu, MD (1912-2008), Professor of Anesthesiology National Shanghai Medical College, Shanghai, China. A graduate of the National Shanghai Medical College, note Fudan Shanghai Medical College, in 1938, he was a Lecturer in Physiology and Pharmacology until he traveled to America in 1947 to study clinical anesthesia with Dr. Waters. After a post-residency year in Salt Lake City, Utah, he returned to Shanghai in 1950, establishing the first independent academic department of anesthesia in China in 1954. He was a founder of the Chinese Society of Anesthesiologists, established the first blood bank in China, and authored the textbook Clinical Anesthesia. He set the standard for anesthesia education and research in China and trained more than 150 residents.***

††Olive M. G. Jones, MBBS (Lond) (1902-1986), Consultant Anaesthetist to the United Oxford Hospitals. Jones graduated from the London School of Medicine for Women in 1928 and in 1933 became neuroanaesthetist for Sir Hugh Cairns. When Cairns was appointed the first Nuffield Professor of Surgery at Oxford, Jones was initially made first assistant to Macintosh, but soon thereafter became a full-time anaesthetist to the Department of Neurosurgery. She visited the Wisconsin Department in the late 1940s. Jones was the first full-time salaried specialist anesthetist in the UK, retiring in 1967.***

‡‡Edgar Alexander Pask, MD, OBE (1912-1966), Professor of Anaesthesia, University of Newcastle upon Tyne, UK. "Gar" received his medical training at Cambridge and London Hospital, qualifying in 1937. He joined the Nuffield Department of Anaesthesia in 1939. During WW II he conducted experiments to improve survival of airman, including such problems as high altitude desert, artificial respiration and life jackets supporting unconscious pilots in the water, frequently using himself as the subject. With his university appointment, he became the second Professor of Anaesthesia in the UK.***

§§Richard von Foregger, PhD (1872-1960), Founder of the Foregger Company. Born in Vienna, he received his PhD in Chemistry from the University of Bern in 1896. He established his company in Roslyn, Long Island, in 1914. He frequently collaborated with practicing anesthesiologists, including Gwathmey, Waters, Lundy, and Guedel, bringing their designs for anesthesia equipment to market. The Copper Kettle was the last major device developed by the Foregger Company.***

***Alexander Miller MacKay, BA, MDCM (1908-1977). Mackay was born in New Glasgow, Nova Scotia, He was graduated from Dalhousie University in 1929 and from their medical school in 1933. After a year of internship at Victoria General Hospital, Halifax, he worked as a staff anesthetist between 1934 and 1940 at Aberdeen Hospital, New Glasgow. He served in the Royal Canadian Army Medical Corps, 1940 to 1945. He was a Registrar in the Nuffield Department of Anaesthetics for two years and then became First Assistant to Macintosh in July 1947. In July 1948, he was appointed Instructor at Wisconsin. He was promoted to Associate Professor in May 1949 and named Chair of Anesthesia after Dr. Waters retired. His tenure as chair was short-lived because he left Wisconsin for private practice. The next Chair, Dr. Sid Orth, was named in 1952.***

![Fig. 4. The first commercial prototype of the Copper Kettle was located in the University of Wisconsin Department of Anesthesiology Collection.](Image 366x539 to 474x719)
and anesthesia was a section of surgery. In an uncharacteristic decision, having not met the Chair of Surgery, but liking Seattle, Lucien accepted the position. The family, now totaling seven, loaded a station wagon with trailer hitched behind and made the ten-day trip camping along the way. They arrived in late June. Over the next year both faculty and residents were successfully recruited to the department, which also accepted the responsibility for anesthesia services at the Veterans Administration Hospital.

Lucien received repeated invitations to speak to the Australian Society of Anaesthetists, probably at the instigation of Dr. Mary Burnell,‡‡‡ whom Lucien met while at Iowa. He accepted in 1958. This resulted in a month-long tour of New Zealand and Australia for both Lucien and Jean. Lucien delighted in meeting Geoffrey Kaye‡‡‡ and in being houseguests of Burnell, who in 1955 was named the first woman Dean of the Faculty of Anaesthetists in the Australian Royal College of Surgeons. The trip home continued to Singapore, Calcutta, Katmandu, Delhi, Innsbruck and finally a direct flight from London to Seattle. At each stop the Morrices combined contact with local anesthesiologists with visits with acquaintances and sightseeing.

The spring of 1959 brought the completion of new operating rooms in phase one of a new University of Washington hospital. The planning for the facility was done by the surgery department and had been inadequate. Lucien approached the Dean to express the need for direct communication, including departmental status for anesthesia. The request was denied. Lucien subsequently tendered his resignation effective in September of the following year. Almost immediately an opportunity to establish a “heart center” with an anesthesia research laboratory at Providence Hospital in Seattle was presented and accepted. Meanwhile, during the summer of 1960, John Bonica was approached as a candidate for the University chair position.‡‡‡ Lucien met with him and suggested twelve things to ask for; Bonica asked for ten, got all of them, took the position as Chair of the new Department of Anesthesia and later commented that he should have asked for all twelve!

His work at Providence Hospital was successful as a training program and in the laboratory (Figure 6). The laboratory work focused on the acid-base status of patients on cardiac bypass and attracted international visitors. However, Lucien spent a significant portion of his time providing clinical care in this private practice environment. When the opportunity to return

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‡‡‡ Mary Taylor Burnell, MD (1907-1996). Dr. Burnell graduated from Adelaide University School of Medicine in Australia in 1931 and was appointed as assistant Honorary Anaesthetist to the Children’s Hospital in 1934. She was a founding member of the Australian Society of Anaesthetists, becoming its president in 1953. Elected as a member of the Board of the Faculty of Anaesthetists in 1955, she became Dean in 1966. She was instrumental in establishing the Australian Society Annual Overseas Visitor program beginning in 1953.18

‡‡‡ Geoffrey Kaye, MD (1903-1986). An Australian, Kaye received his pre-medical schooling in England, then graduated from the University of Melbourne Medical School in 1926. In 1929, he presented a paper to the Australasian Medical Congress on anesthetic mortality that impressed an American attendee, Francis McMechan. McMechan arranged for a US tour for Kaye that served as an introduction to prominent American anesthesiologists, including Waters. Returning to Australia in 1931, Kaye worked to establish the Australian Society of Anaesthetists (1934), and founded a museum dedicated to anesthesia (1937), now named in his honor. During WW II he served in the Middle East. He wrote on anesthetic topics and widely on his other interests. Somewhat disillusioned, he retired from active practice in 1957, but was honored with awards and recognition over the next 20 years.19

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Gilbert Brown, MBChB (1883-1960). Brown received his medical degree from the University of Liverpool in 1908 and moved to South Australia in 1912. He was president of the section of Anaesthetics for the Australasian Medical Congress held in Sydney in 1929. When the Australian Society of Anaesthetists was formed in 1934, he was elected President. He was Honorary Anaesthetist at the Royal Adelaide Hospital and instigated the Deaths Investigation committee formed in 1934. He was a foundation fellow of the Australasian Faculty of Anaesthetists in 1952 and honored with a Commander of the British Empire in 1954. He died after a long illness.20,21

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Fig. 5. Lucien departing on the World Health Organization/Unitarian Service Committee trip to Israel and Iran in late August 1951. Photo courtesy of Don Morris.

Fig. 6. At Providence Hospital, Seattle with trainees in the research lounge, September, 1964. Left to Right: A. A. Majewaska, L. H. Ensign, L. E. Morris (seated), Dick Schlobohm, Gerald G. Enloe. Photo courtesy of Dick Schlobohm.

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plan for the faculty. Lucien also traveled to international anesthesia meetings in Argentina, Japan, and Mexico, frequently meeting acquaintances and former trainees. In 1977, he was an external examiner of the medical school in Lagos, Nigeria. That year was notable for a special visiting professor to the department, Sir Robert R. Macintosh, who Lucien first met during the review
course at Oxford. Macintosh stayed a month, participated in conferences and operating room teaching, and was granted an honorary degree of Doctor of Science with the citation read by Lucien.

A year later, in the spring of 1978, Lucien was honored by being elected a Fellow of the Faculty of Anaesthetists of the Royal College of Surgeons in London (Figure 7). He and Jean were the guests of Professor Jimmy Payne. Payne later assisted Lucien in arranging a year-long sabbatical at the Royal College of Surgeons Anesthesia Research Department beginning in the fall of 1980.

On his return to Toledo, Lucien anticipated a brief stay in the Department before retiring. But because they were in need of help in the operating rooms, he continued working clinically until September 1985. During this period Lucien attended the first International Symposium on the History of Anaesthesia (ISHA) held in 1982 in Rotterdam, Netherlands, and presented a paper on contributions of Ralph Waters to anesthesiology as an academic discipline and medical specialty. As Lucien became involved in anesthesiology history much of his work related to Waters, the Aqualumni, and other second and third generation professional descendants of Waters. This work is preserved in the “Waters Tree” developed by Lucien and Jean that shows the professional descendants of Waters who became chairs of academic departments. Other involvements were in the Anesthesia History Association where Lucien served as secretary-treasurer, president-elect and president. He actively participated in the work of the Wood Library-Museum of Anesthesiology and the Arthur E. Guedel Memorial Anesthesia Center. He attended and presented carefully prepared papers at each of the subsequent ISHA meetings, thoroughly enjoying the international context of the meetings and the opportunity to laud his teacher and mentor, Ralph Waters (Figure 8).

After retirement from active practice, Lucien relocated to Seattle and was gratified to be reinstated as a Clinical Professor in the Department of Anesthesiology at the University of Washington. For ten years, beginning in 1989, he was invited by Wendell Stevens, Professor and Chair of Anesthesiology at Oregon Health Sciences University in Portland, to make regular monthly visits to lecture and teach clinically. In 1989, Lucien received an honorary fellowship in the Faculty of Anaesthetists in the Royal Australian College of Surgeons. In 1994, the Medical College of Ohio in Toledo recognized him with an honorary Doctor of Science degree.

Personal Recollections of Lucien Morris

As the 75th anniversary of Waters arrival at the University of Wisconsin approached, Lucien lobbied the Department of Anesthesiology at Wisconsin to hold a celebratory meeting. I was appointed to be the departmental representative and local arrangement chair. I remember meeting Lucien as we began to plan the meeting. He was a formidable character, very certain about how things should be done and with an uncanny eye for detail. This was to be no small event and each time I spoke with him I was given another load of assignments. Not only would the University of Wisconsin Department of Anesthesiology host the event, but we would be joined by the Wisconsin Society of Anesthesiologists, the Anesthesia History Association, the History of Anaesthesia Society, and the Wood Library-Museum of Anesthesiology.

The meeting was a success. We had visitors from around the world. Just as I was ready to settle back into a daily routine, I got a call from Lucien telling me it was time to publish the proceedings from the meeting. We worked together on the “book” for more than a year. Part of our collaboration included my several-day visit to Lucien and Jean’s Bainbridge Island home. Their hospitality was extraordinary, and Lucien’s ability to work far into the night when I wanted nothing more than to get some rest was astounding. When it was completed I remember saying how I would miss our frequent telephone exchanges. Lucien encouraged me to call him, and, true to his word, he was always excited to hear from me. He wanted to know what project I was working on and would invariably give insightful advice.

Lucien frequently commented that Waters was expert at combining the efforts of others to achieve a common goal, usually a goal Waters had set. Lucien had learned this technique well. In early 2011, I found myself collaborating with Vaidy Rao of the University of Oklahoma on one of Lucien’s favorite topics: Waters’ professional descendants. It was a short paper, but it made an important assertion, that Waters’ resident, John Moffit, established the first university department of anesthesiology at the University of Oklahoma in 1930. That turned out to be my last project with Lucien and his last paper. I am honored to have been a co-author.

But no one told Lucien that was his last project. Don Morris told a touching story at his father’s memorial service:
Lucien's career spanned a period of rapid development in anesthesia. His own contributions to the specialty were significant. He was profoundly influenced by training at Wisconsin with Ralph Waters and never tired of describing Waters' impact on the specialty of anesthesia. Part of that experience was meeting the visitors that came to Madison and in time expanding that circle of friends by hosting visitors and students to his own department and through his international travels.

I feel tremendously fortunate to have known Lucien Morris. He was a true friend and mentor; I appreciated his challenges and encouragement. Through him, I was the beneficiary of Waters' admonition “to teach other doctors to go out and teach other doctors.”

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Eponyms in the Operating Room: Careers of Five American Physicians

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Many clinicians have made significant contributions to medical knowledge and practice; few have a procedure, a syndrome, a sign, an instrument, or other term named after them.1,2 Every medical specialty has common eponyms, and anesthesiology is no exception. In an earlier report, we examined the careers of six eponymous European physicians—Sydney Ringer (1835-1910), Friedrich Trendelenburg (1844-1924), August Karl Bier (1861-1949), Sir Ivan Whiteside Magill (1888-1986), Sir Robert Macintosh (1897-1990), and Brian Arthur Sellick (1918-1996).3 From the scores of individuals who have advanced our knowledge of anesthesiology and laid the foundations of our specialty,4 we have selected a few names that are used very commonly in operating rooms in the United States. We examine the lives and careers of these individuals to explore the circumstances that led to their contributions. We also comment on how and why their achievements continue to play such an important role in the daily practice of clinical anesthesiology the world over.

Robert Alden Miller (1906-1976) (Figure 1) is known to most anesthesiologists for the straight laryngoscope blade named after him. He graduated from Eclectic Medical College in Cincinnati, Ohio, in 1929 and completed his internship in 1930 at the Grace Hospital in Detroit. He was a general practitioner until 1936 when he moved to San Antonio, Texas, where for unknown reasons he devoted his practice to administering anaesthesia. During World War II, he served as Captain in the US Army.

Miller believed he could make the process of endotracheal intubations “easier and more certain” by modifying laryngoscopes popular at the time.5,6 Most of these were modifications of the original design by Alfred Kirsten (1895) and based on descriptions of techniques employed in successfully intubating the trachea.7,8 Many notable clinicians in England (Ivan Magill) and United States (Henry Janeway, Arthur Guedel, Ralph Waters, and John Lundy) had also sought to improve upon the design of laryngoscope blades.9

Miller believed his blade was superior to its predecessors because it was thin with a curved tip that directly engaged the epiglottis while minimizing dental trauma.2 He recognized there was still a risk of dental injury when his blade was used and advocated the use of a metallic mouth guard to distribute pressure more evenly and thereby minimize the risk of trauma. He recommended that a stilet, rather than grasping forceps, facilitate passage of rubber tracheal tubes beyond the vocal cords. In addition, he described conditions where difficult tracheal intubation could be predicted, as in patients with a deep throat, a thick tongue, or prominent upper incisors. Miller even developed a blade for use in children and recommended that tracheal intubation under direct visualization was preferable to the common practice of blind passage facilitated by digital palpation of the epiglottis.10 These modifications and clinical observations made Miller’s blade one of the most popular laryngoscopes ever. Miller was an avid pilot and golfer. He spent much of his career in private practice. He died on September 30, 1976, in San Antonio, Texas.

Edward Boyce Tuohy (1908-1959) (Figure 2) is known for designing a needle used for placement of epidural catheters. He graduated from medical school at the University of Pennsylvania and commenced residency training in medicine at the Mayo Clinic in 1933. Over the next few years he became interested in anesthesiology, and in 1936 he became the first American anesthesiologist to earn a master’s degree in anesthesiology.12,13

Tuohy was convinced of the many advantages offered by continuous spinal anesthesia. He knew of the original description of this technique by Henry Percy Dean in 1906 and William Lemmon’s description of an in-situ malleable needle for continuous spinal anesthesia in 1940.14 Tuohy was aware that ureteral catheters were used for subarachnoid drainage by neurosurgeon J. Grafton Love at the Mayo Clinic. While serving in the US Army Medical Corp in 1944, Tuohy described a technique of continuous spinal anesthesia in which a silk ureteral catheter was inserted through a specially designed needle. The following year he modified dentist Ralph Huber’s needle by providing a lateral orifice for cephalad advancement of the catheter.15,16 Although Tuohy intended his technique to be used as a means for continuous spinal anesthesia, Cuban anesthesiologist Manuel Martinez Curbelo used the Tuohy needle for continuous caudal (epidural) anesthesia.17 Over time, synthetic catheters replaced those made from silk, and epidural analgesia by the lumbar route became more popular.

Tuohy left Mayo clinic in 1947 and became head of the Department of Anesthesia at Georgetown Medical Center, Washington, DC. He completed his career as a professor at the University of Southern California School of Medicine, Los Angeles, California. He died of a cerebrovascular accident on February 12, 1959, in San Marino, Los Angeles.
operative and postoperative safety. Her 1949 articles by her indicate an interest in intra-bronchiectasis. She also made three salient observations: first, that some anesthetics were administered by anesthetists who had not completed residency training; second, that records kept during these anesthetics were poor; and finally, that accurate records would improve clinical care. Subsequent articles by her indicate an interest in intra-operative and postoperative safety. Her 1949 article on intraoperative use of norepinephrine to maintain hemodynamic stability and decrease the need for blood transfusion during thoracolumbar sympathectomy (which was employed at that time for surgical treatment of hypertension) foreshadowed regional anaesthesia. Weiss modified the Touhy needle by adding stabilizing wings at the hub and dulling the tip. The winged design was his ingenious way of utilizing a two-handed technique to stabilize the needle while using his favorite hanging drop technique. The blunt tip provided better tactile feedback while identifying the epidural space, thereby decreasing the likelihood of accidental dural puncture.32

He was president of the American Society of Anesthesiologists (ASA) in 1979, and in 1994 he received the ASA’s highest tribute for meritorious service and achievement, the Distinguished Service Award.33 Weiss promoted the ASA Relative Value Guide for reimbursement of anesthesia related services.35,36 This system allows practitioners of anaesthesia to collect reimbursement on the basis of case complexity as well as duration. Most other physician services are reimbursed on a flat-fee based on the procedure. Weiss retired from clinical practice in the late 1980s, and died in Pompano Beach, Florida, June 28, 2007.34

**Seshagiri Rao Mallampati** (1941-) (Figure 5) was born in Patchala Tadiparru, Andhra Pradesh, India. An influential uncle suggested that his curious and logical mindset was ideally suited to a career in medicine. After graduating from Guntur Medical School in Guntur, India, he migrated to the United States and completed training in anaesthesiology at the Lahey Clinic, Boston, Massachusetts.3 An interest in academics led him to Boston Lying-in-Hospital, where he worked with Weiss. In 1980, three teaching hospitals affiliated with Harvard Medical School merged to form the Affiliated Hospital Center, which was later named Brigham and Women’s Hospital. The

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**Fig. 3:** Virginia Apgar

**Fig. 4:** Jess Bernard Weiss

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We are reminded of **Virginia Apgar** (1909-1974) (Figure 3) every time a baby is delivered. Born in Westfield, New Jersey, she attended Mt. Holyoke College in Massachusetts after which she attended medical school at Columbia University College of Physicians and Surgeons, graduating in 1933. Her desire to pursue a career in surgery was quashed when her Chairman, Allen Oldfather Whipple (a surgical eponym), dissuaded her from continuing as a surgical resident, citing the many difficulties her gender and the Great Depression would place upon her ability to establish a successful practice as a surgeon. Heeding his advice, she decided on another means of improving the care of surgical patients by training to become an anesthesiologist. Residency training at Columbia University was followed by additional work under the guidance of pioneers such as Ralph Waters of Madison, Wisconsin, and Emery A. Ravenstine of Bellevue Medical Center, New York. Upon returning to Columbia University in 1938, she was appointed Director of Anesthesia. Most of the anesthetics at that time were administered by trained nurse anesthetists. Physicians rarely entered the specialty of anaesthesia when Apgar began to establish herself as a clinician and investigator.

In 1946, she published an article about the safe use of curare, a newly introduced drug. In it she describes possible indications and complications including a case of recall by a surgeon who had a lobectomy for bronchiectasis. She also made three salient points: first, that some anesthetics were administered by anesthetists who had not completed residency training; second, that records kept during these anesthetics were poor; and finally, that accurate records would improve clinical care.33 Subsequent articles by her indicate an interest in intra-operative and postoperative safety. Her 1949 article on intraoperative use of norepinephrine to maintain hemodynamic stability and decrease the need for blood transfusion during thoracolumbar sympathectomy (which was employed at that time for surgical treatment of hypertension) foreshadowed regional anaesthesia. Weiss modified the Touhy needle by adding stabilizing wings at the hub and dulling the tip. The winged design was his ingenious way of utilizing a two-handed technique to stabilize the needle while using his favorite hanging drop technique. The blunt tip provided better tactile feedback while identifying the epidural space, thereby decreasing the likelihood of accidental dural puncture.

A clinical objective scoring system developed by Apgar was published in 1953. This scoring system was further developed over the ensuing 8-year period, and her 1962 follow-up article summarized her experience with 32,511 births.2,3 The criteria she advocated were color, pulse, response to stimulation, muscle tone, and respiration. Later an acronym was developed using her last name to facilitate recall of the criteria (Appearance, Pulse, Grimace, Activity, and Respiration). Apgar also worked on placental transfer of cyclopropane and the effects of anesthetics on the parturient. She was the first woman to be appointed full professor at Columbia University College of Physicians and Surgeons in 1949 and was the only anesthesiologist to appear on a US postal stamp (1994). This posthumous recognition would have been especially important to her because she was an avid philatelist. She died August 7, 1974, at Columbia Presbyterian Hospital, New York.

**Jess Bernard Weiss** (1917-2007) (Figure 4) is best known for designing a popular needle for placement of epidural catheters. He attended St. Mungo’s College of Medicine in Glasgow, Scotland, and also Middlesex University School of Medicine, Waltham, Massachusetts. Middlesex Medical School was founded in Cambridge, Massachusetts, in 1914, but moved to Waltham, Massachusetts, in 1928. In 1946, its charter and campus were transferred to the foundation that established Brandeis University (also in Waltham). Although the university has distinguished itself over the decades with academic excellence, it closed Middlesex University School of Medicine in 1947. Weiss’ medical school training was interrupted by World War II, during which he served in the US Navy.

After the war he embarked on a long career in anaesthesia that combined teaching, leadership, and innovation. Weiss was interested in obstetric anaesthesia and was a strong advocate of fetal monitoring. Under his leadership the practice at Boston Lying-in-Hospital slowly shifted away from general anaesthesia in favor of...
three hospitals were Peter Bent Hospital (established in 1913), Robert Breck Brigham Hospital (established in 1914), and Boston Hospital for Women (established in 1966). The latter itself was formed as a result of the merger of Boston Lying-In Hospital (established in 1832 as one of the first American maternity hospitals) and Free Hospital for Women (established in 1875). He distinctly remembers a day in 1975 when he had to help colleagues with tracheal intubation during emergency caesarean delivery. He successfully intubated the trachea, but the task had not been accomplished without difficulty. Although the patient had become cyanotic, neither the mother nor the fetus suffered any apparent long-term sequelae. This near-miss made a lasting impression on Mallampati, who noted during a detailed postoperative examination of the oral cavity several days later that the patient’s large tongue obscured the view of the faucial pillars. Roentgenographic examination of the neck did not reveal any cervical spine abnormality. During the subsequent eight years he systematically evaluated anatomical variations of the airway in his own patients. In 1983, in a letter to the editor in Canadian Anaesthetists’ Society Journal (which became the Canadian Journal of Anaesthesia), he hypothesized that it should be possible to predict difficult laryngoscopy on the basis of preoperative airway examination. In an unusual move, he was encouraged by the chief editor, Douglas Craig, MD, not to stop at the hypothesis stage, but to undertake a prospective study, which he completed and reported in 1985. This pioneering work on predicting difficult laryngoscopy has been repeated and critiqued by many, and current practice supports the use of a combination of criteria. Mallampati practices anesthesiology at Brigham and Women’s Hospital, Boston, and he is the only living member of our list of eponyms.

Discussion
Modern anesthesia was discovered in the United States in the 1840s and its use spread rapidly to Europe and the rest of the world. Despite this, many of the early developments in our field originated in Europe. This is most likely due to the fact that our specialty attracted physicians in Europe several decades earlier than in the United States. Young disciplines offer pioneers great opportunities to introduce new techniques and such times also encourage adoption of ideas from other specialties. Thus, it is not surprising that earlier eponyms had European origins and that three of the six European physicians were not anesthesiologists (Table 1). Of the eight European and United States physicians who became anesthesiologists, anesthesiology was not their initial choice for five of them.

Table 1: Initial choice of specialty and career specialty for eponymous physicians.

<table>
<thead>
<tr>
<th>Name</th>
<th>Initial Choice of Specialty</th>
<th>Career specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>European Physicians</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ringer</td>
<td>Internal medicine</td>
<td>Internal medicine</td>
</tr>
<tr>
<td>Trendelenburg</td>
<td>Surgery-Urology</td>
<td>Surgery-Urology</td>
</tr>
<tr>
<td>Bier</td>
<td>Surgery</td>
<td>Surgery-Orthopedics</td>
</tr>
<tr>
<td>Magill</td>
<td>Surgery</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Macintosh</td>
<td>Surgery</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Sellick</td>
<td>Internal medicine</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td><strong>United States Physicians</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miller</td>
<td>Anesthesiology</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Tuohy</td>
<td>Internal medicine</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Apgar</td>
<td>Surgery</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Weiss</td>
<td>Anesthesiology</td>
<td>Anesthesiology</td>
</tr>
<tr>
<td>Mallampati</td>
<td>Anesthesiology</td>
<td>Anesthesiology</td>
</tr>
</tbody>
</table>
Physicians have become known for their secondary or minor contributions, while their US counterparts remain clearly identified with their primary contribution. Although this would suggest that the process by which an eponym is created appears to have become more narrowly focused, the process remains unpredictable. None of the physicians we discuss, European or American, attached their own names to the instrument, procedure, classification, solution, or process they introduced. It thus appears that the process of eponymous recognition is controlled and determined by subsequent users. Textbooks of medicine and surgery suggest that the late 19th and early 20th centuries were periods when the growth of eponyms was explosive. In recent decades, eponymous recognition is becoming exceedingly difficult to achieve. One only needs to observe that in the past few decades very few, if any, new techniques or equipment used in the operating room are identified with an eponymous individual. Perhaps this trend has inherent safety as an eponym does not convey accurate information about an object or action. We can assume therefore eponyms will continue to be less commonplace and have their deserved place in history along with the people behind them.

Table 2: Summary of personal information, country of birth, difficulty encountered, achievement, and commonly encountered eponymous contribution for physicians from Europe and from the United States.

<table>
<thead>
<tr>
<th>Name</th>
<th>Country of Birth</th>
<th>Difficulty Encountered</th>
<th>Achievement</th>
<th>Eponym</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ringer</td>
<td>UK</td>
<td>Unexplained results in cardiac physiology</td>
<td>Identified role of ions in normal cardiac function</td>
<td>Lactated Ringer’s solution</td>
</tr>
<tr>
<td>Trendelenburg</td>
<td>Germany</td>
<td>Poor surgical exposure</td>
<td>Improved surgical conditions due to head-down positioning</td>
<td>Trendelenburg position</td>
</tr>
<tr>
<td>Bier</td>
<td>Germany</td>
<td>High risk of general anaesthesia</td>
<td>New and simple regional aesthetic for surgery on limbs</td>
<td>Intraoperative regional anaesthesia</td>
</tr>
<tr>
<td>Magill</td>
<td>UK</td>
<td>Difficult insertion of nasotracheal tubes</td>
<td>Designed suitably shaped forceps to assist tracheal tube manipulation</td>
<td>Magill forceps</td>
</tr>
<tr>
<td>Macintosh</td>
<td>New Zealand</td>
<td>Poor visualization of the larynx</td>
<td>Designed curved laryngoscope blade</td>
<td>Curved laryngoscope blade</td>
</tr>
<tr>
<td>Sellick</td>
<td>UK</td>
<td>Pulmonary aspiration of gastric contents during anaesthesia</td>
<td>Described a maneuver to prevent regurgitation and pulmonary aspiration</td>
<td>Sellick maneuver</td>
</tr>
<tr>
<td>Miller</td>
<td>US</td>
<td>Poor visualization of the larynx</td>
<td>Designed straight laryngoscope blade</td>
<td>Straight laryngoscope blade</td>
</tr>
<tr>
<td>Tuohy</td>
<td>US</td>
<td>Difficulty in placing continuous spinal catheters</td>
<td>Designed an improved needle for placement of continuous spinal catheters</td>
<td>Tuohy needle</td>
</tr>
<tr>
<td>Apgar</td>
<td>US</td>
<td>Lack of an objective means for assessing neonates</td>
<td>Designed an objective and simple clinical system for assessing neonatal well being</td>
<td>Apgar score</td>
</tr>
<tr>
<td>Weiss</td>
<td>US</td>
<td>Inadequate control in advancing a needle into the epidural space</td>
<td>Designed a winged epidural needle for an better needle control during a two-handed technique, especially suited for the hanging drop method</td>
<td>Weiss needle</td>
</tr>
<tr>
<td>Mallampati</td>
<td>India</td>
<td>Lack of an objective means of predicting difficult laryngoscopy</td>
<td>Developed a simple visual scale to predict difficult laryngoscopy</td>
<td>Mallampati airway classification</td>
</tr>
</tbody>
</table>

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Anesthesia and the Lone Star State
Casey B. Wiley, MD
Department of Anesthesiology, University of Texas Health Science Center San Antonio, San Antonio, Texas

Dr. Wiley won the prestigious 2012 C. Ronald Stephen, MD, Anesthesia History Essay Contest sponsored by the Anesthesia History Association. His paper, Anesthesia and the Lone Star State, underwent rigorous peer review with no special consideration.

The history of anesthesia is a relatively short but colorful one, filled with interesting characters and stories. The same can be said for the history of Texas. Texans have Davy Crockett, Willie Nelson, and the Alamo. Anesthesiologists have Crawford Long, William Morton, and the Ether Dome. Anesthesia has been practiced in various forms for thousands of years, but it was not until the 19th century that anesthesia as a modern medical science was born, far away from the banks of the Red River. In fact, the state of Texas was celebrating its first year of existence when Morton made his debut of ether in Boston, Massachusetts, in 1846. Though Texans may not have been the first to practice anesthesia, Texans have made many important contributions to the field and have several pioneers whose work has helped shape the practice of anesthesia as we know it today. This article chronicles the evolution of anesthesia in Texas, tells the story of a few of the pioneers of Texas anesthesia, and notes some of the major contributions to anesthesia that have come from the Lone Star State.

Anesthesia and the Native Americans

Little is known of the early medical practices of the Native American tribes that roamed the lands that would someday become Texas. These tribes were nomadic and left few records of their lifestyle and culture. This changed when a hurricane left Álvar Nuñez Cabeza de Vaca and his men marooned off the coast of current day Galveston, Texas (de Vaca called it the Island of Misfortune) in 1528. The local tribes were initially welcoming, but this welcome dissipated by 1534. The natives thought that he would make a great medicine man due to his ability to speak an alien language. He initially refused, citing his lack of medical knowledge, but eventually gained notoriety through various tribes as a successful medicine man. The natives treated and compensated de Vaca well for his work as a medicine man. de Vaca travelled through much of present day Texas working as a healer and trader and is even credited with performing the first surgical operation in Texas when he removed an arrowhead from a man’s shoulder. No mention was made of analgesic use.2

de Vaca’s transformation from slave to respected medicine man illustrates the importance of the medicine man in the Native American culture. He functioned as a prophet, priest, and physician for the tribe. His medical duties included setting fractures, practicing phlebotomy, cutting and cauterizing wounds, performing dental extractions, and sucking venom from snake bites and pus from abscesses. He would heal the sick through a combination of spells, religious ceremonies, hypnotism, and herbal medications. Although the medicine man was given honor and fortune, it was not all fun and healing. The Nacogdoches tribe of East Texas would blame the death of one of their tribesmen on the malice of the medicine man, who in turn, paid for the death with his own life. As the Spanish influence grew stronger, and the Spaniards tried to convert many of the natives to Catholicism, some medicine men were captured and publicly hanged to discourage other medicine men from practicing superstitious rituals.2

Anesthesia on the Frontier

By the mid 1840s the medical field was quickly becoming aware of the anesthetic effects of inhaled ether. It took two years from the date of Morton’s demonstration of ether in Massachusetts until the drug was used in Texas. George Cupples, a Scottish-born surgeon, came to San Antonio in 1844. He served as a surgeon during the Mexican War and later worked as a surgeon for the Confederate Army during the Civil War. He was the 2nd president of the Texas Medical Association in 1853. In 1848, Cupples was credited as being the first surgeon to use ether in Texas. In May 1850, Cupples and J. B. Wright were the first to use chloroform in Texas.6 The surgery was a mid-thigh amputation for gangrene in a sixty-year-old male. Cupples performed the surgery and Wright gave the anesthetic.7 By the 1860s, the anesthetic effects of ether and chloroform were widely known throughout the state.4

In 1861, our country was immersed in a civil war that cost more than 600,000 American lives. While the Confederate state of Texas was not involved in any major fighting, Texan physicians were directly involved. After the start of the Civil War, the Union army blockaded Texan ports on the Gulf of Mexico, preventing the physicians from receiving much needed medical supplies. The spring of 1864, commodities such as ether, chloroform, medicinal whiskey, turpentine, quinine, calomel, and opiates were completely unavailable. In other states, where the fighting and casualties were much more severe, the sheer number of injuries left physicians understaffed and out of supplies. Most wounds resulted in long bone fractures, and the treatment of choice was the quick and simple amputation. When medicinal supplies ran out, amputations were often performed without any analgesia, and several strong assistants were required to subdue the screaming patient.8

After the Civil War, many physicians returned home and found work in frontier forts. Post surgeons, as they were called, endured a constant lack of supplies. When supplies were available, chloroform was the preferred anesthetic over ether. Others preferred using whiskey instead. Post surgeons faced many unique problems in the forts and found ingenious solutions with the supplies they had available.

Lafayette Guild, a post surgeon based in Fort Mason (Northwest of San Antonio), was...
having a difficult time with the local Native American tribes in the area. Guild devised a plan to improve the relations with the local natives. He had one of his colonels, Charles May, dress as a medicine man and invited the local leaders of the tribe to the fort to show them that he could raise the dead. Colonel May asked the crowd for a volunteer. When no one volunteered, May picked up a dog in the crowd and took it back to his tent. Using some of the fort’s newly acquired chloroform, May anesthetized the dog with a rag and took it back out to the crowd. To prove that the dog was truly “dead,” May cut slices of the unconscious dog’s tail off and passed it to the chiefs. He then told the group that he would bring the dog back to life and proceeded back to his tent. The natives were stunned to see the “dead” dog return with him, running and barking as it had prior to the demonstration. Needless to say, Guild no longer had difficulties with the local tribes, and word soon spread that Colonel May was a great medicine man with many powers.9

In another record,10 Dr. James P. Kimball had just arrived in Fort Clark (in present day Brackettville, TX) for his position as the new post surgeon. His first patient was a soldier who had recently taken a nap out in the sun and unknowingly had a fly lay larva into his nose. The larva soon grew into maggots, which were progressively obstructing the soldier’s airway. Kimball took a rag of chloroform and held it over the soldier’s nose, suffocating the maggots, and saving the soldier from an unusual death.9

**University of Texas Medical Branch**

In 1891, the University of Texas opened its first medical school on Galveston Island.* At the time, no Department of Anesthesia existed, let alone faculty hired to teach anesthesia. The surgeon was responsible for the anesthetic management during surgery. He would administer all regional, spinal, and local anesthetics, while inhaled anesthetics were given by whoever was available (medical students, interns, nurses, or orderlies). No one involved had any formal training in administration of anesthesia. The circulation nurse would check vital signs between managing her other duties. Usually depth of anesthesia was addressed whenever the patient started moving or when the surgeon noticed the blood becoming darker. Due to the dangerous anesthetic conditions, most surgeries were quick and filled with multiple interruptions in order to resuscitate the patient.

By the end of the 1930s, a focus toward better anesthetic management was emerging, thanks to the formation of the newly established Texas Society of Medical Anesthesiologists (which would later form the TSA). A nurse, Elvie Crisman Shaver, was listed in the 1937-1938 University of Texas Medical Branch (UTMB) catalog as an “Instructor in Anesthesia.” Since 1931, she had been listed as a “Registered Nurse in Anesthesia.” She appears to have left UTMB in 1938. It is unclear what her responsibilities were and why her title had changed for that one year. In 1938, the Department of Surgery at UTMB hired Dr. James Bennett as Assistant Professor of Surgery (Anesthesia). Bennett was hired to establish an anesthesiology program and provide clinical anesthesia coverage in the operating rooms. He soon found it impossible to create an anesthesiology program due to his increasing clinical duties in the operating room and the surgical “dominance” perpetuated through the department. Tired and frustrated, Bennett resigned within two years and left, citing “professional, financial, political and personal reasons.”

After Bennett’s departure, the anesthesiology program ceased and operating rooms returned to control of the surgeons. But this time, things were different. The surgeons had grown accustomed to the level of anesthetic care that Bennett had provided. Dr. John Spies, Dean of the Medical School, recognized that a Department of Anesthesia could never develop under the control of the Department of Surgery. He began plans for an autonomous Anesthesia Department in 1940, but due to internal political conflicts within the medical school, the department would not be established until 1942.

In February 1942, Spies sent a telegram to Dr. Harvey Slocum at the University of Wisconsin asking if he would head the new Department of Anesthesia. Slocum agreed, taking the position for $6,000 per year providing that he had to answer only to the executive committee and that he would have a PhD for research within six months of starting.

In the time of its creation, the Anesthesia Department at UTMB was only the third of its kind in the south (the first was in Augusta, Georgia, and the second was in New Orleans, Louisiana). Slocum hired Dr. Charles Allen, a colleague from Wisconsin, as his PhD for research, and they started the Department of Anesthesia in a single room on the first floor of the Ashbel Smith (Old Red) building. Three nurse anesthetists remained on the staff from the Surgery Department; however, within one year, only one remained. For research, Allen had an electrocardiograph and $10,000 annual budget, but no lab space or equipment. He made a deal with the chair of the Department of Physiology that, in exchange for his annual budget, he could have free use of their facilities. In December 1942, the first resident, Dr. Emilia Hoelich, began her training in anesthesia.12

**Claudia Potter**

“I will be home soon, for I know you have lost your mind if you have employed a woman doctor.” These were the words Dr. White wrote to his partner, Dr. Scott, back in Temple, Texas, in 1906, upon hearing the news that the fourth staff member hired in their newly formed Temple Sanitarium was Claudia Potter. Upon his return to meet this “woman doctor,” White reluctantly told her that she could stay on as staff on a monthly probationary basis. At the end of the first month, she was to meet with White, who extended her probation for one more month. After three of these monthly meetings, he told her that she no longer had to meet with him each month, but he informed her that she was still on probation. When Potter retired from Scott and White forty-one years later, she joked that as far as she knew, she was still on probation.

Claudia Potter started her medical school education in 1900 at the University of Texas Medical Branch in Galveston. As the only female graduate, Potter faced much resentment and discrimination from her male counterparts, but slowly won their friendship and respect by keeping their temper and using her “woman’s wiles.” Although it would be another forty years until UTMB had a formal anesthesiology department, and she had no formal training in the subject, Potter was hired as an anesthetist simply because that was the position that was needed.

Potter’s starting salary was twenty-five dollars per month, plus room and board. Not only did she work as an anesthetist, she also served as a house doctor, nurse, and even pathologist between cases during her early career. Potter learned her anesthetic skills through practice, since few colleagues and books published on the subject were available. In those days, she would practice both in the hospital and the patients’ homes, trav-
eling by buggy, and later by car and plane, with the surgeon and their sterile equipment. Conditions were often much more difficult for Potter in a patient’s home. At times she had to use light from the fireplace, which was dangerous considering the flammable ether rags she used for anesthesia.

During one memorable house visit, Potter was told that the case was a hernia repair and was told only to bring a large amount of ether because the patient was quite large. When she arrived to the home, she was surprised to find that the patient was a 1200-pound hog that was indeed suffering from a large hernia. Since her face mask was not made to fit a snout, she had to wrestle her patient down with ether towels. She was ultimately able to induce anesthesia, and the surgery was a success.

When Potter began her career, the only options for anesthesia were chloroform and ether. Potter favored ether because it was safer. In 1908, she went to Johns Hopkins to study the use of the newly popular nitrous oxide, and returned home with a crude Gatch gas machine to administer the gas to patients. She is credited as the first physician to administer gas anesthesia in Texas, an event that has marked the beginning of scientific anesthesia in Texas. Potter helped found the Texas Society of Anesthesiologists, and even served as president of the organization from 1946-1947. In 1961, she was named an honorary member of the American Society of Anesthesiologists.

Robert Miller

Although Robert Miller may not have invented the laryngoscope, he did design a blade that is now found in almost every operating room in the world. Miller was born in Pennsylvania, trained in Ohio, and after a brief stint in general practice in Michigan, he settled in San Antonio, Texas, in 1936 to begin his career in anesthesiology. Prior to the 1940s, most anesthesiologists used a laryngoscope blade designed in 1913 by Chevalier Jackson that required a large external battery and cords that were known to cause explosions with anesthetic vapor.

In 1941, Miller published an article in the journal *Anesthesiology*, outlining his design for a new laryngoscope blade that addressed many of the problems encountered with the blades being used at the time, especially in patients with difficult airways. The tip of the blade was thinner to decrease the risk of trauma to the teeth of patients with large incisors and tongue. His blade was longer and flatter than the older versions, allowing it to pass beyond the epiglottis and lift it up, exposing the vocal cords. The blade also allows for direct laryngoscopy with minimal manipulation of the mouth.

Marion T. “Pepper” Jenkins

Dr. M. T. “Pepper” Jenkins, a Texas native, was graduated from the medical school at UTMB in 1940. After serving in the US Navy during World War II, Jenkins completed his surgical residency at Parkland Memorial Hospital in Dallas, Texas. While at Parkland, his mentors urged him to take further training in anesthesia so that he could start a new anesthesia department in the new medical school (Southwestern Medical College). He received his training in anesthesia at Massachusetts General and returned to UT Southwestern to found the Department of Anesthesia in 1948. Jenkins served as chairman of the department until 1981. In 1949, he established the first recovery room in Texas. In 1950, Jenkins helped to popularize the use of balanced salt solutions for resuscitation of shock in trauma patients. Prior to this time, D.W was the fluid of choice. Jenkins liked to joke that “Pepper likes salt.” Jenkins also served as president of the American Society of Anesthesiologists and was the first anesthesiologist to win the Distinguished Service Award of the American Medical Association.

Despite national recognition and accolades, it was not until November 22, 1963, that Jenkins gained worldwide fame. This was the day that President John F. Kennedy made his fateful trip to Dallas. Upon arrival to Presbyterian Hospital, Kennedy was nott to have agonal respirations. The receiving doctor performed a direct laryngoscopy and noted light was coming through an anterior neck wound and into the trachea. The president was intubated and then a tracheostomy was performed through the neck wound. Jenkins arrived and began ventilating the president. External cardiac massage was begun and an examination of the president’s head wounds was performed. Remembering that the president suffered from Addison’s disease, Jenkins gave a stress dose of hydrocortisone. It was soon determined that the wounds were not survivable, and the president was declared dead less than thirty minutes after his arrival.

In the investigation of the president’s death that followed, Jenkins testified several times before the Warren Commission. Throughout the years, as conspiracy theories abounded regarding grassy knolls and multiple shooters, Jenkins held fast that the injuries he witnessed were from a single gunman. Twenty-eight years after Kennedy’s death, Jenkins was asked by Oliver Stone to be a consultant for the resuscitation scene in his movie, JFK. Jenkins even played himself in the scene, even though he disagreed with the conspiracy message. He stated that “It is a great movie, but it is not a documentary.”

Anthony DiGiovanni

In Germany in 1889, August Bier and his assistant, Dr. Hildebrandt, were the first men to perform and receive spinal anesthetics. The next morning, they were also the first men to experience the pain of a spinal headache. While spinal anesthesia was widely used during the first half of the 20th century, postdural puncture headaches remained a common problem, with no reliable treatment options. It was not until 1960, when Dr. James Gormley suggested the idea of placing 2-3 milliliters of autologous blood into the epidural space as a treatment for postdural puncture headaches, that a therapeutic option was developed. Gormley’s blood patch was not widely used until 1970, when Dr. Anthony DiGiovanni, Chief Anesthesiologist at Wilford Hall Medical Center in San Antonio, Texas, published his report refining the blood patch. DiGiovanni found improved outcomes when 10 milliliters of autologous blood was injected into the epidural space. DiGiovanni’s work helped popularize the technique of placing blood patches in patients with postdural puncture headaches that is still widely used today.

Summary

The field of anesthesiology has changed dramatically from its humble beginnings. Rags of ether and the art of monitoring blood color for oxygenation have been replaced with precise concentrations of inhaled anesthetic and continuous pulse oximetry. It is on the shoulders of our predecessors that we stand today as anesthesiologists. We must constantly evolve to adapt to an ever-changing medical profession. It is this spirit and mind-set that will allow the field of anesthesiology to continue to advance and improve the care of our patients.

References

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Book Review

On Continuous Molecular Changes, More Particularly in Their Relation to Epidemic Diseases: Being the Oration Delivered at the 80th Anniversary of the Medical Society of London. By John Snow, MD, Vice President of the Society. Published by request of the Society. London: John Churchill; 1853, 39 pages.

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Soon after this lecture of 1853, John Snow (1813-1858) aided in the birth of Prince Leopold (Figure 1) and dramatically show how to stop cholera in Her Majesty’s capital city. The brilliant lecture, now published at books.google.com, explains why a yeoman of modest origins became an important consultant to royal authorities. The lecturer reveals himself to be a scientific scholar during a scientifically exciting era. Indeed, Snow was 21 years of age when the word “scientist” was coined in 1834. Straight away, the scientific anesthetist indicates his bent by use of the word “molecular” in his title. The word was not common in 1853, a time in which there was debate as to whether molecules had definable structures. (Of note in anesthesia history, the Williamson Ether Synthesis of 1850 was an early indication of that concept.)

Snow had evinced an ability to think “molecularly” when he remarkably described a “second gas effect” in 1847. That is, air saturated with ether was not physiologically hypoxic; rapid uptake of ether by the blood restored oxygen tension in the alveoli.

He begins this lecture by rejecting a widely held suspicion that chemical science does not apply to life processes. He says, “A species of plant or animal consists, in fact, of a number or collection of continuous molecular actions. … There is no line of demarcation between vital processes and those which are not vital.” Although urea had been artificially synthesized in 1828 and acetic acid in 1845, there were surely many vitalists in Snow’s medical audience. For them, Snow adds in a preface, “To dispute whether the formation of urea or cholesterine is a chemical or a vital process, is as useless as it would be to dispute whether a fossil ichthyosaurus [a find of 1811] is a mineral or an animal, and whether it belongs to geology or zoology.”

If living creatures may be viewed as collections of molecules, how did early life arise? Snow rejects ongoing spontaneous generation. Plants and animals “have never commenced anew within the experience of man.” What about “the first tiger or the first upas tree”? Charles Darwin did not publically address Snow’s interesting question until 1859. What about a first case of communicable disease? In 1853, many yet suspected that microbes were capable of spontaneous generation. Snow is coy on this microscopic possibility. He notes that fermentation of sugar into alcohol is accompanied by the growth of yeast, but he remarks that “Schleiden is of the opinion that the yeast cells originate without the influence of a living plant.” He refers to Matthias Schleiden who formulated the so-called cell theory with Theodor Schwann in 1837. Not until 1857 did Rudolph Virchow add that every cell arises from another cell. Microbially, the hypothesis was not deemed clinched until the swan-neck flask experiments of Louis Pasteur in 1862. Snow is prescient, then, when he likens fermentation by yeast to the communicable diseases. He says that “yeast and other fermenting materials communicate, to substances capable of undergoing fermentation, a state of change similar to that by which they themselves have been produced.” Likewise, the “material cause of every communicable disease resembles a species of living being in this, that both one and the other depend on, and in fact consist of, a series of continuous molecular changes, occurring in suitable materials.”

Getting intellectually prepared to remove the Broad Street water pump handle because of the London cholera epidemic of 1854, Snow called for cleanliness, especially clean water, in the control of communicable disease. Regrettably, he does not include puerperal fever in his list of communicable diseases. It is hard to believe that he may have agreed with James Y. Simpson that Ignaz Semmelweis had been mistaken in 1847. He mentions antiseptics but does not beat Joseph Lister to surgical antisepsis, championed in about 1867. According to Snow, “The erysipelatous inflammation, for instance, which attacks the neighborhood of wounds, probably arises now and then without being communicated; otherwise we must suppose the material which causes it to be almost as widely diffused as the spores of some of the fungi.” He just missed a important surgical concept. It is a shame he had so little time. A stroke took him at the age of 45 years in 1858.

References