The Heritage of Anesthesia by Patrick Sim

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The Heritage of Anesthesia by Patrick Sim presents the history of anesthesia as chronicled through the rare book holdings of the Wood Library-Museum of Anesthesiology (WLM). Consisting of 19 chapters and more than 200 discrete entries, this 450-page annotated bibliography traces the history of this uniquely American contribution to medicine by beginning with the introduction of surgical anesthesia in 1846, and then describing the factors that enabled this initially merely technical exercise to develop and evolve into a medical specialty and profession based on scientific principles (Figures 1 and 2).

Our beloved colleague Patrick Pui-Kam Sim, MLS, the Paul M. Wood Distinguished Librarian Emeritus of the Wood Library-Museum of Anesthesiology, died on the eve of the American Society of Anesthesiologists 2010 Annual Meeting. Patrick served the WLM with extraordinary expertise, grace, and devotion for 39 years. During the last three decades of his tenure, Patrick meticulously had been compiling an annotated bibliography of the Rare Book Collection of the WLM. This was an enormous undertaking, as Patrick had multiple other responsibilities and virtually no support staff during the first 15 years of his service to the WLM. In addition, compiling the bibliography demanded knowledge not just of history and the English language, but of medicine, science, Chinese, French, German, and Latin as well. However, his book, titled The Heritage of Anesthesia, was unfinished at the time of his death from lung cancer. Realizing that this very necessary scholarly compilation was Patrick’s labor of love, several of us felt compelled to complete Patrick’s work as a tangible expression of the love and admiration he engendered in all of us.

A few years before Patrick’s death, Donald Caton, MD, Past President (1997-2001) of the WLM and 2004 Laureate of the History of Anesthesia, and I, in collaboration with WLM Archivist Felicia Reilly and medical editor Pauline Snider, embarked on our mission to complete the annotated bibliography. Among Patrick’s files we found more than 1,100 pages of comprehensive, type-written notes pertaining to the annotated bibliography. These pages contained scholarly details concerning the context and the provenance of the WLM’s priceless books. Remarkably, several of the WLM-held manuscripts predate 1456, the year when the oldest known version of the Gutenberg Bible (the first major book produced on a printing press) appeared.

Fig. 1. The Heritage of Anesthesia by Patrick Sim.

It soon became apparent that organizing this wealth of information would be challenging—and critical. Patrick’s original manuscript was comprised of 27 chapters, and some of the chapters contained repetitious material. Moreover, Patrick had organized the material by subject, regardless of the date of publication of the work. The numbering of his chapters reflected solely the order on which he worked on the assorted topics rather than a specific timeline. With this as background to our organizational conundrum, Don and I initially envisioned rearranging the material in chronological order. Yet, upon further reflection, this approach seemed less than optimal. Had we followed this plan, the introduction of surgical anesthesia would not have appeared until almost the last third of the manuscript!

Then Don had an epiphany. He suggested that we begin by featuring the fascinating concatenation of events surrounding the introduction of surgical anesthesia in 1846, clearly a watershed occurrence replete with colorful participants (Table 1). After introducing other methods of surgical anesthesia, we focused on the application of principles of basic science to the clinical practice of anesthesia. Although such luminaries as Andreas Vesalius, William Harvey, Robert Boyle, Richard Lower, and Antoine Lavoisier made seminal scientific discoveries decades to centuries before the introduction of surgical anesthesia on October 16, 1846, there is no evidence to suggest that clinicians began to apply these principles until the last years of the 19th century. We therefore placed this section in the context of when it was used in the development of the medical profession of anesthesiology. Next, we presented practices that attempted to relieve pain before the introduction of surgical anesthesia. These included acupuncture, refrigeration anesthesia, acupressure, and mesmerism.

Continued on Page 20
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The Heritage of Anesthesia

Patrick Sim’s Annotated Bibliography of the Rare Book Collection of the Wood Library-Museum of Anesthesiology
Table 1. Table of Contents of *The Heritage of Anesthesia*

The table of contents reflects not only the breadth of the book but also the complexities of organizing the information in a logical manner. By starting with the introduction of surgical anesthesia, Sections I, II and III proceed chronologically in terms of how knowledge and events were used in the development of anesthesiology into a medical profession. This construct provides a well-defined relief of the history of the profession.

I. The Introduction of Surgical Anesthesia

   Introduction
   - Chapter 1. “The Ether Controversy”
   - Chapter 2. Ether and Anesthesia
   - Chapter 3. Chloroform and Anesthesia
   - Chapter 4. Nitrous Oxide-Oxygen Anesthesia
   - Chapter 5. Infiltration, Local and Regional Anesthesia

II. Anesthesia and Clinical Practice

   Introduction
   - Chapter 6. Inhalation Anesthesia in Clinical Practice
   - Chapter 7. Reflections on the History of the Relief of Pain
   - Chapter 8. Obstetric Anesthesia, Analgesia and “Twilight Sleep”
   - Chapter 9. Blood Transfusion and Shock Therapy
   - Chapter 10. Asphyxia and Resuscitation

III. Basic Science and Clinical Practice

   Introduction
   - Chapter 11. Respiratory Gases and Pneumatic Medicine
   - Chapter 12. Pharmacology, Physiology and Anatomy before 1846
   - Chapter 13. Pharmacology, Physiology and Anatomy after 1846
   - Chapter 14. Medical Sciences: General and Miscellaneous

IV. Precursors to Surgical Anesthesia

   Introduction
   - Chapter 15. Acupuncture, Moxa Cautery and Chinese Medicine
   - Chapter 16. Mesmerism, Animal Magnetism, Somnambulism and Insensibility to Pain
   - Chapter 17. Refrigeration Anesthesia and Acupressure

V. Biographies and History References

   - Chapter 18. Biographies (by Contemporaries or Near-Contemporaries)
   - Chapter 19. History References

Author Index
Fig. 2. Entry for Valerius Cordus in The Heritage of Anesthesia. In addition to describing the specific book being discussed (in this case, *Dispensatorium*), this typical entry includes a biography of the author, the context into which the book was published, and the implications of the book. Thorough descriptions assist the reader in developing a scholarly understanding of the book’s place in anesthesia history.

Finally, we closed the book with biographies of many of the individuals who contributed to the discovery and the advancement of anesthesia, and we suggested some modern references for those interested in exploring a more contemporary perspective on the history of our specialty.

A Personal Note

Working on this project has been an extraordinary privilege, representing an opportunity to keep Patrick Sim close to our minds and hearts despite his physical absence from our lives. We hope that medical historians, medical librarians, and reflective anesthesiologists and surgeons throughout the world will value this labor of love for many years to come. Even more importantly, we hope that our cherished friend Patrick would be proud of the finished product. Just as the Renaissance humanist Michel de Montaigne embarked on his Essays as a way to keep his friend Étienne de la Boétie alive, we fervently wish that *The Heritage of Anesthesia* will ensure an enduring legacy for Patrick Sim.

Acknowledgments

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the translation of Latin texts, as well as the Board of Trustees of the WLM and its Committee Chairs, and Mr. Bob Opek, Senior Account Executive at Lake County Press, Inc., who accelerated his printing schedule to accommodate our exigencies.
Primer on Medical History for Anesthesiologists: Introduction

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Editor’s note: The absence of a recognized formal curriculum in anesthesia history means that many of us have known and unknown gaps in our knowledge. These gaps limit our ability to understand how things came to be, how things may become and how we can affect the future. I have asked Dr. Manisha Desai and Dr. Sukumar Desai to provide a survey of medical history. The goals of this primer are 1) to educate, and 2) to help individuals target future study. Below is the first article in a continuing series.

As few anesthesia historians and enthusiasts have undergone formal training in history, the primary purpose of this series is to provide a historic perspective about major events that form the basis of modern science, medicine, and anesthesia. We hope these broad horizons help readers better appreciate the human and societal context in which advances in these disciplines occurred.

History of Science: The word ‘science’ is derived from the Latin scientia which means ‘knowledge.’ In the past, the term natural philosophy was used for the study of the natural world. From historical records, it is apparent that ancient Western science began with the Babylonians who lived in the first and second millennia BCE in present day Iraq and with the Egyptians. The Babylonians left their writings on clay tablets, and their main contributions were in astronomy and mathematical notation [using a base of 60, a practice currently followed in the measurement of time in seconds and minutes]. The Egyptians used a solar calendar of 360 days and 5 days of festivals. They introduced metalworking and glassmaking. Thales of Miletus [circa 600 BCE] in Greece is credited with starting the scientific tradition of searching for causes and principles to explain observations made in nature. Thales and other pre-Socratics concerned themselves with questions related to what the world was made of, how the universe was created, where the world came from, how changes occur, and whether the senses were accurate guides for investigation. Other significant individuals include Anaximander, Anaximenes, Heraclitus, Parmenides, Empedocles, Leucippus, and Democritus. Pythagoras [circa 570-495 BCE] established a community rooted in philosophy and mathematics, and he is known for contributions in geometry, irrational numbers, immortality of the soul, and reincarnation. Plato [circa 428-348 BCE], a student of Socrates [circa 469-399 BCE], was one of the first to use scientific inquiry by formulating general principles through observing individual objects. In the dialogue Timaeus, Plato describes the origin and structure of the world and its contents. In addition to articulating the characteristics of a harmonious society, the Timaeus also posits the rationale underlying human anatomy and physiology. Pythagoras and Plato believed that the world was created by design, rather than by random events. Plato’s student Aristotle [384-322 BCE] still influences ideas about ethics, logic, and biology.

History of Medicine: Paleomedical evidence from between 2,000-10,000 BCE supports the existence of diseases such as tuberculosis, arthritis, and bony abnormalities and treatments such as trephination of the skull, perhaps to remove blood or to let out evil spirits. Imhotep [circa 2900 BCE] in Egypt, and Hippocrates [460-370 BCE] in Greece, are individuals clearly identified with the practice of medicine. Prior to Hippocrates, Aesculapian practices included prayers and rituals, since disease and illness were believed to occur from supernatural causes. Hippocrates, the father of Western medicine, is credited with ascribing natural causes to illness, carrying out careful observation and examination of patients, and keeping accurate records of the progress of illness. These practices allowed Hippocratic physicians to offer diagnosis as well as prognosis. Although Hippocratic physicians believed that body would heal itself, they also believed that they could assist in this process by balancing the four important body fluids—blood, energy, yellow bile [anger], black bile [depression], and phlegm [slow temperament]. They also treated fractures and drained abscesses and hematomas. Hippocrates is best remembered for his strict moral code of the Hippocratic Oath.

History of Anesthesia: Man has sought relief from the cardinal symptom of pain since times immemorial. Introduction of nitrous oxide and ether in the middle of the 19th century greatly accelerated the development of surgery, but prior to the mid-1840s, painful procedures were still necessary, and the role of anesthetic agent was served by substances known to be analgesics, sedatives, amnesiacs, or hallucinogens. Agents most often quoted in the literature are alcohol, opium, cannabinoids, and the belladonna derivatives.

Alcohol: Winemaking traces its origins to those of agriculture, civilization, and society. The fermentation process has been applied as early as 9000 BCE in Georgia and 5000 BCE in regions surrounding the Mesopotamian basin. Its use was known in ancient Greece and Egypt. Grape juice was used in most of these regions, but in the Middle East honey and dates were substituted. The use of alcohol fumes as an anesthetic was recorded in the mid-16th century. Surgeons would occasionally intoxicate patients with alcohol in the 18th and 19th century, especially when the ‘procedure necessary freedom from struggling.’ In 1842, a painless dental extraction was reported under alcohol anesthesia. Although alcohol
was administered intravenously in as early as 1668, there was no mention of its use as an analgesic. With the availability of modern agents, intravenous alcohol anesthesia has been used rarely during the past century.

Opium: The poppy *Papaver somniferum* (Figure 1) has been cultivated at least since the Neolithic Age [10,000 BCE]. Inhabitants in the Middle East, India, Egypt, as well as those in the Greek and Roman empires were aware of the analgesic effects of opium. The term opium refers to the dried milky extract of the fruit of this plant. It contains several alkaloids [naturally occurring compounds with basic nitrogen groups], mainly morphine [12% by weight], as well as smaller amounts of codeine, papaverine [a smooth muscle relaxant and vasodilator], thebaine [a stimulant chemically related to morphine that can also be used to manufacture other narcotics such as oxycodone, oxydorphone, nalbuphine, naloxone, naltrexone, and buprenorphine], and noscapine [a non-analgesic cough suppressant]. Dried opium was used by itself or, more commonly, as a mixture with other plant ingredients to offer relief for a wide variety of disorders.

Cannabinoids: The active ingredient tetrahydrocannabinol [THC] is just one of several dozen cannabinoid compounds that can be harvested from several plant species *Cannabis sativa, Cannabis indica*, among others] and these plant derivatives have been called hemp, hashish, ganja, marijuana, etc. THC stimulates cannabinoid receptors in the central nervous system. TCH provides mild to moderate analgesia, suppresses nausea, increases appetite, reduces fatigue, alters visual and auditory sensations, and promotes a sense of relaxation. As with opium, the preparation could be used alone or combined with other ingredients.

Belladonna Derivatives: These ingredients are obtained from the deadly nightshade plant *Atropa belladonna* (Figure 2). The active ingredients in the plant extract include atropine, hyoscine [scopolamine], and hyoscamine. Other names used for plants or extracts that contain these and other similar compounds include henbane, mandrake, and mandragora. Preparations that contain belladonna derivatives provided relief during surgery by delirium, hallucinations, and amnesia. These drugs have also long been used as poisons, and the term belladonna ("beautiful lady") is derived from Italian, as Venetian ladies used these herbs to dilate their pupils and appear attractive.

Soporific Sponges: These were used as vehicles for delivering vapors during surgery. Sea sponges were soaked in a variety of potions containing alcohol, opium, belladonna alkaloids, and even poisons such as hemlock [which contains many toxins including the neurotoxin coniine]. After absorbing these potions, the sponge was dried out. The sponge would be moistened with warm water and placed near the nose before and during the surgical procedure.

Mesmerism: Franz Mesmer introduced Mesmerism in Vienna in 1775. He had a fanatical following in Europe, and the technique was used to cure a variety of illnesses and to relieve pain during surgery. It was not always effective as an anesthetic, although it was used widely in Europe as well as the colonies in Asia. It was largely abandoned after a French committee that included Benjamin Franklin amongst its members determined that the technique was a fraud.

Other Methods: Bleeding, nerve compression, bilateral carotid artery compression, and exposure of the skin to be incised to various chemicals were other techniques used to obtain relief from surgical pain.

Summary: Man's ingenuity in obtaining pain relief allowed many patients to be rendered unaware during surgical procedures. It is likely that many patients succumbed to overdose of these potent agents and toxins. However, it is also possible that combining drugs with different mechanisms of action allowed practitioners a margin of safety not possible with the use of only one drug. This might represent the earliest use of balanced anesthesia.

Next: We shall discuss other advances made in science during the classical period, the role of Galen and how his work influenced medical thinking for almost a millennium, and the period of the 1840s during which our specialty was born.

**Additional Reading**

The 19th Spring Meeting of the Anesthesia History Association - May 2-4, 2013
Hartford, Connecticut

The 19th Spring Meeting of the Anesthesia History Association (AHA) will be held at the Downtown Marriott at historic Adriaen's Landing. The area is named after Adriaen Block, a Dutch explorer who sailed up the Connecticut River in 1614 aboard the Onrust, the first American-built ship. The following year he visited the small island off the coast of Rhode Island now known as Block Island.

Anesthesia history enthusiasts are aware that although Crawford Williamson Long had been using ether in his practice in rural Georgia since 1842, he did not publish his findings until 1848, by which time Horace Wells and William Thomas Green Morton, primarily the latter, had stolen the show. Boston, Massachusetts,legendarily boasts historical sites and artifacts related to Morton and the introduction of ether. Less well know are the sites and artifacts in Hartford, Connecticut.

The meeting starts on May 2, 2013, with a tour centered on Horace Wells. Wells is credited with being the first to use nitrous oxide to provide anesthesia for tooth extraction. The tour begins at Bushnell Park (established in 1868) where a beautiful monument and statue of Horace Wells were erected in 1875. The sculptor was American artist Thomas Howard Bartlett, whose other famous known work is The Wounded Drummer Boy of Shiloh. Bushnell Park is named in honor of reverend Horace Bushnell who was greatly influential in securing the establishment of this park, the first public park in the United States. We next visit Cedar Hill Cemetery (established in 1868) to view Horace Wells’ burial site, beautifully adorned by works filled with allegory and symbolism. The cemetery is also the final resting place of luminaries such as actress Katharine Hepburn, financier John Pierpont (JP) Morgan, and firearms-maker Samuel Colt. Before achieving fame, Colt had been an occasional itinerant demonstrator of the curious effects of nitrous oxide. The tour will also include a Tiffany stained glass window panel in Center Church (built in 1739) and a plaque denoting the location of Horace Wells’ dental office.

Lunch will be offered during a stop at the Connecticut Historical Society (founded in 1825), which houses Horace Wells’ artifacts including his personal diary and death mask. Our local guide, William McDonnell, DDS, will lecture during lunch. Dr. McDonnell is an office bearer in the Horace Wells Club (founded in 1894), an organization that strives to preserve and propagate interest in the history of anesthesia. We will also visit the Mark Twain House and the Harriet Beecher Stowe Center. Samuel Langhorne Clemens (aka Mark Twain) and his family lived in this house from 1874 to 1891. Here he wrote Adventures of Huckleberry Finn, The Adventures of Tom Sawyer, The Prince and The Pauper, and A Connecticut Yankee in King Arthur’s Court. Author and abolitionist Harriet Beecher Stowe lived here, and her 1852 novel Uncle Tom’s Cabin galvanized anti-slavery forces in the north. During the evening, a welcome reception will be held for delegates and accompanying guests on a cruise aboard the Lady Katharine on the Connecticut River.

The scientific sessions will be held on Friday, May 3, and the morning of Saturday, May 4. On Friday evening, our guest speaker will be renowned author and medical historian, Yale surgeon Sherwin Nuland. Among the many books he has written is the classic, The Origins of Anesthesia. Another guest speaker will be Julie Fenster, the author of Ether Day. Although this book is now out of print, Ms. Fenster has agreed to help us with autographed sales from her personal collection. Another author who will offer autographed sales will be Boston University anesthesiologist Rafael A. Ortega, MD, author of Written in Granite: An Illustrated History of the Ether Monument.

The program will end on Saturday, May 4, with a novel workshop/course offered for the first time by the Anesthesia History Association – Techniques in Historical Research. Our aim is to help history enthusiasts conduct projects with a greater degree of academic rigor. It will also help attendees identify potential areas to explore, help them formulate their plans, and offer suggestions on how to get their work published.

This meeting is a great opportunity to visit Hartford and explore sites related to the history of our specialty. At the same time it offers interested individuals an opportunity to present their work, meet renowned authors, and learn how to conduct history-related research. We are delighted to welcome and encourage one and all to attend.

Submitted by Meeting Co-Directors - Manisha S. Desai, MD, and Sukumar P. Desai, MD.
Addition information at aha.anesthesia.wisc.edu or by email at sdesai@partners.org
Mount Auburn Cemetery and Its Importance to the History of Anesthesia*

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Background

Boston, Massachusetts, is home to many sites related to the first public demonstration of ether, including the Ether Dome, the Ether Monument, and several homes in which William T. G. Morton lived. Notably, many of the participants in Morton’s successful demonstration of ether are buried in nearby Mount Auburn Cemetery in Cambridge, Massachusetts (Figure 1). Here we explore how changing burial customs in early 19th-century America brought so many of these individuals to rest in one location. We explain how Mount Auburn Cemetery was established, the difficulties it faced, how it evolved, and the role it plays today. Moreover, we describe some of its remarkable features and explore some unusual structures located within this institution so very closely associated with the history of anesthesia.

Existing Burial Practices

Early 19th century customs in the United States were similar to those of England and Europe and reflected the deep religious, social, and political beliefs of the times. In many cities and towns, graveyards were located near churches. Rural cemeteries, often owned by patrons, were found on the outskirts of cities. There were a few lawn cemeteries away from towns, and these were usually managed by professional superintendents and owned by private corporations. Lawn cemetery graves are covered by grass and marked with a small horizontally placed commemorative plaque.

The crowded and impersonal graveyards of 19th century Boston were a convenient and necessary place for the disposal of the dead, while also serving as a constant reminder to the living, not only of their own fragility but also of an urgent need to prepare for death. Death was considered not merely the termination of earthly existence, but equally (or more importantly) the beginning of life in heaven. To remain in good standing with the Church was essential, and prayers were regularly offered for the collective dead. Eternal damnation could be avoided by charitable actions, after which one could expect the reward of heavenly bliss. Temporal life was devalued and de-emphasized, while simplicity dictated that gravestones, if any, were engraved with simple epitaphs such as *memento mori* (remember your mortality) or *fugit hora* (the hour flies). Due to the scarcity of land in cities, it was not uncommon for many bodies to share one grave or tomb, a practice called 'stacking.' This often took place beneath or on the side of a church, making it difficult for family members to clearly locate the spot where their loved ones were buried. Communal burials emphasized the importance of the group over individual autonomy. While wealthy families had the option of building a graveyard or chapel on their property, the masses had to make do with crowded city graveyards. Burial at a significant distance away from churches was reserved for individuals and families considered undesirable: the excommunicated, executed individuals and their families, and those who had committed suicide.

An Urgent Need for Change

Several factors caused a shift away from church-administered graveyards to secularized cemeteries. Attitudes amongst members of the educated upper class and the popularity of the Unitarian movement brought about reconsideration of society’s approach to burial customs and the Church’s role in this process. Increased urbanization due to the industrial revolution brought about a scarcity of burial space. In the absence of any regulatory controls, it was only a matter of time before society could no longer ignore some obvious problems with current burial practices. For instance, the foul odor emanating from shallow graves in the center of the cities became especially worrisome in light of epidemics of diseases such as cholera, smallpox, diphtheria, scarlet fever, yellow fever, and measles. Health officials proposed a correlation between the outbreak of such epidemics and contaminated water run-off from burial grounds. The recommended secularization of burial customs as well as the changing beliefs regarding nature and melancholy provided the necessary impetus for the emergence of the rural cemetery movement in the early 19th century. Secularization also allowed churches to opt out of the legal requirement to bury every parishioner on their grounds, especially if such parishioners did not attend services. Thus, secularization was a practical solution not only to society at large but also to the Church. Once it became acceptable not to bury the dead in the church graveyards, surviving loved ones began to return to secular burial sites to remember, mourn, reminisce, and meditate on the departed. This was not always possible in the crowded, malodorous church graveyards of mostly anonymous graves. However, the idea about how best to design secular graveyards came from Europe.

Père Lachaise Cemetery

The need for a new approach to burial practices had already been realized in many European cities. The French were the first to

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Mt. Auburn...Continued from Page 26

Fig. 1. Map of Mount Auburn Cemetery. Numbers show the location of graves as follows: Henry Jacob Bigelow and Jacob Bigelow [1], Oliver Wendell Holmes [2], William Thomas Green Morton [3], Charles Frederick Heywood [4], Augustus Addison Gould [5], Charles Thomas Jackson [6], Charles Bulfinch [7], Joseph Milner Wightman [8], Henry Wadsworth and Frances Longfellow [9], and Mary Sawyer Tyler [10]. Modification of map provided by Mount Auburn Cemetery, Cambridge, Massachusetts. Reproduced with permission.
adopt the style of the English garden estate to design landscaped cemeteries. A prime example of this is Père Lachaise Cemetery, created on a large estate east of Paris in 1804. It is the largest cemetery in Paris and reputed to be the world’s most visited cemetery. Functioning also as a park, it is the resting place of such eminent people as Claude Bernard, Oscar Wilde, Molière (Jean-Baptiste Poquelin), Joseph Louis Gay-Lussac, and Guillaume Dupuytren. Although it was slow to gain acceptance during its first decade, little by little it became the most desirable cemetery in France. The burial of notable figures here helped popularize the cemetery and foster a sense of patriotic melancholy. It became a refuge for the living as much as for the dead, and a new pleasure of the melancholy surround -ing death supplanted the old fear of it. Père Lachaise Cemetery during a visit to Paris. Bigelow (Figure 2) was impressed by Père Lachaise and its magnificent view of Lachaise contrasted the living and the dead, and a of patriotic melancholy. It became a refuge for the living as much as for the dead, and a new pleasure of the melancholy surrounding death supplanted the old fear of it. Père Lachaise contrasted the living and the dead, the city and the country, the present and the past. Moreover, its magnificent view of Paris spurred a characteristic that was to be adopted in the US.

Other Founders
General Henry A. S. Dearborn, the Society’s first president, had grand plans to transform a piece of land adjacent to the Charles River into an area of refinement similar to Père Lachaise. He wished to enrich it with nature to effect an appreciation of the harmony that ought to exist between man and his environment. It was while planning the design of the proposed park that Jacob Bigelow met George W. Brimmer, a merchant who was willing to sell a large plot of land at cost (for $6,000) to the Horticultural Society. Officers of the society voted to purchase the land contingent on selling enough family burial plots to cover the cost. Bigelow felt that starting the cemetery using the Horticultural Society as an affiliated umbrella organization would ensure public acceptance of this innovative concept.

The public religious consecration cere mony of Mount Auburn Cemetery on September 24, 1831, was attended by a crowd of almost 2,000. Joseph Story, a Unitarian, spoke eloquently at the ceremony and was elected to serve as Mount Auburn’s first president. Mount Auburn would become a nondenominational but spiritual institution in line with Story’s beliefs. Having lost several children, his first wife, and his father, Story had managed to find a controlled expression of mourning, permitting him to get on with his life and work. His address was sentimental and invoked great emotion.3

Cemetery Evolution
Mount Auburn Cemetery derives its name from the local custom of calling this serene and tranquil area ‘Sweet Auburn.’ Local residents borrowed this title from Oliver Goldsmith’s poem The Deserted Village, in which city migrants fondly reminisce about Auburn, the idyllic village they had deserted in their quest for work. Père Lachaise offers panoramic views of Paris from its grounds, and Jacob Bigelow wished no less from Mount Auburn Cemetery. A hill on the property was used as the base for constructing 125-foot Washington Tower in celebration of the nation’s birth, and visitors to its top are rewarded by majestic views of Boston, Charlestown, the Boston Harbor, Harvard University, the Blue Hills in nearby Milton, Wachusett Mountain in central Massachusetts, and New Hampshire’s Mount Monadnock. Mount Auburn Cemetery became a popular final resting place for many well-known literary figures, politicians, physicians, artists, religious leaders, and architects. Representing a novel approach to burial and offering the pleasant ambience of a landscaped garden, Mount Auburn Cemetery remained a must-see for visitors to Boston. Partly as a result of this prominence, it has a special link to many participants in the first ether demonstration, as depicted in the famous painting by Robert C. Hinckley. The cemetery founders predicted that the public would “delight in these tributes of respect, and the place may gradually become the honorary mausoleum for the distinguished sons of Massachusetts.”

Bigelow made his claims evident:

We regard the relics of our deceased friends and kindreds for what they have been, and not for what they are. We cannot keep in our presence the degraded image of the original frame; and if some memorial is necessary to soothe the unsatisfied want which we feel...it must be found in contemplating the place in which we know their dust is hidden...The human heart clings...and seeks consolation in rearing emblems and monuments and in collecting images of beauty over the disappearing relics of humanity. This can be...done, not in the tumultuous, harassing din of cities, not in the gloomy and almost unapproachable vaults of chan nel houses...but amidst the quiet verdure of the field, under the broad and cheerful light of heaven where the harmonious and ever-changing face of nature reminds us, by its resuscitating influences, that to die is but to live again.

Ether Day Participants Buried at Mount Auburn Cemetery
Henry Jacob Bigelow (1818-1890) (Figure 3) was the son of Jacob Bigelow and a graduate of Harvard Medical School. Trained as a surgeon, he detested suffering. Bigelow had helped arrange the demonstration after reading about Morton in a newspaper article describing a painless tooth extraction performed on September 30, 1846. He was present during the ether demonstration and is depicted in Hinckley’s painting. He described Morton’s demonstration in the Boston Medical and Surgical Journal, a predecessor of the New England Journal of Medicine. He remained a staunch proponent of Morton's claims to the discovery of anesthesia. He later specialized in orthopedic surgery and described the structure and,

Continued on Page 28
function of the eponymous Y ligament of Bigelow, which is the iliofemoral ligament of the hip. The Bigelow family graves are located off Beech Avenue (Figure 1).

Oliver Wendell Holmes, Sr. (1809-1894) (Figure 4) though a physician of renown, is more widely known for his literary accomplishments. Educated at Harvard College and Harvard Medical School, he also trained in Paris and taught medicine, initially at Dartmouth Medical School and later at Harvard. His principal medical contribution was advancing the idea that physicians transmitted puerperal sepsis from one patient to another. In a letter to Morton on October 21, 1846, he stated: "Everybody wants to have a hand in a great discovery. All I will do is to give a hint or two as to the names, or the name, to be applied to the state produced by the agent. The state should I think be called 'Anaesthesia.'" Holmes is buried off Lime Avenue (Figure 1).

William Thomas Green Morton (1819-1868) (Figure 5) conducted the first public demonstration of ether as an anesthetic and is most closely associated with the discovery of anesthesia. He died at the age of 49. His life after the ether demonstration was consumed by attempts to secure financial rewards and recognition as the discoverer of anesthesia. He pursued these endeavors with maniacal vigor, destroying his clinical practice and bringing financial ruin to himself and his family. He died without any significant resources, and it was Morton's friends who erected the grand monument over his grave. The fluted column topped by a draped urn reads: "On behalf of the 'Citizens of Boston' the Inventor and Revealer of Anesthetic Inhalation/Before whom in all time surgery was agony/By whom pain in surgery was averted and annulled/Since whom science has control of pain." A year earlier philanthropist Thomas Lee, who as a patient had received the "miracle anesthetic," honored Morton's public demonstration of ether by proposing and funding the Ether Monument, which was sculpted by John Quincy Adams Ward and is located in the Boston Public Garden. The monument was in recognition of Morton's demonstration and did not specify which individual deserved credit for the discovery. The inscription of the 1868 monument read, "In gratitude for the relief of human suffering by the inhaling of ether," simply proclaiming the discovery but not attributing it to anyone in particular. The Morton family graves are located off Spruce Avenue in Mount Auburn Cemetery (Figure 1).

Collins Warren and W. T. G. Morton, who received the following invitation written in Heywood's handwriting on October 14, 1846.

Dear Sir
I write at the request of Dr. J. C. Warren, to invite you to be present on Friday morning at 10 o'clock, at the hospital, to administer to a patient who is then to be operated upon the preparation which you have invented to diminish the sensibility to pain.
Yours respectfully
C. F. Heywood
House Surgeon to the General Hospital

After three years as a house surgeon at MGH, Heywood went to Paris for further studies and then returned to practice at St. Luke's Hospital in New York City. Heywood died at age 70 and is buried in the cemetery's southwest, off the intersection of Fir Avenue and Spruce Avenue (Figure 1).

Augustus Addison Gould (1805-1866) (Figure 6) graduated from Harvard College and Harvard Medical School, was a visiting physician at MGH, and later became president of the Massachusetts Medical Society. Though a physician by training, he was world famous as an expert conchologist and malacologist (sea shells and mollusks, respectively), an interest he developed as a youngster combing the beaches of New...
Hampshire. Morton was Gould's house-guest at the time of the ether demonstration. The night before the demonstration, Gould recommended that Morton consider using valves to prevent the asphyxia caused by rebreathing exhaled gases. 18,19 Gould was present at the demonstration and went on to a successful career as both a physician and a scientist.20,21 He died at the age of 61 in Boston and is buried off the intersection of Fir Avenue and Spruce Avenue (Figure 1).

Charles Thomas Jackson (1805-1880) (Figure 7) was a prominent physician, chemist, mineralogist, and geologist who claimed also to have introduced Morton to ether and its potential uses.20 This was the basis for his role in the ether controversy, a bitter dispute that has never been resolved. Jackson has been accused throughout his life of taking credit where others made the primary contribution. He spent the last few years of his life at McLean Hospital after suffering a stroke. His gravestone is inscribed with the following epitaph:

Eminent as a chemist, mineralogist, geologist and investigator in all departments of natural science. Through his observations of the peculiar effects of sulfuric ether on the nerves of sensation, and his bold deduction therefore, the benign discovery of painless surgery was made. Thy Godlike crime was to be kind, to render with thy precepts less, the sum of human wretchedness, and strengthen man with his own mind.

He died at the age of 75 and is buried in the cemetery off Mountain Road, near Washington Tower (Figure 1).

Other Notables Buried at Mount Auburn Cemetery

Charles Bulfinch (1763-1844) is considered the first native-born American to train and work as a professional architect. He designed the Massachusetts State House in Boston, the Old State House in Hartford, Connecticut, and the Bulfinch building in which the ether demonstration was performed.22 He died at the age of 80 and is buried in the cemetery off Bellwort Path (Figure 1).

Joseph Milner Wightman (1812-1885) was the machinist and mechanic consulted by W. T. G. Morton as he worked on a delivery system for ether vapor. Wightman later served as Mayor of Boston for four years. He died at age 72 and is buried in the cemetery off Elder Path (Figure 1).

Henry Wadsworth Longfellow (1807-1882) was a poet and educator who spent most of his life in New England writing the famous poems Paul Revere’s Ride and Song of Hiawatha.20,23 His second wife, Frances Elizabeth Appleton, was the first woman to receive an anesthetic (ether, on April 7, 1847) for labor and delivery in the United States. Henry and Fanny Longfellow are buried in the cemetery off Indian Ridge Path (Figure 1).

Mary Elizabeth (Sawyer) Tyler (1806-1889) is the girl about whom the “Mary had a little lamb...” nursery rhyme was composed by a classmate.24 Many years later, Mary and her husband, Columbus Tyler, worked at McLean Hospital, she as matron and he as general superintendent. It is likely that she was matron at McLean Hospital during Jackson’s last few years. Both Tylers are buried in the cemetery off Mistletoe Path (Figure 1).

Mount Auburn Cemetery Today

Mount Auburn Cemetery is an arboretum of national importance, housing an inventory of 5,300 trees from more than 630 taxa. As the nation’s first landscaped cemetery, it has been expanded and updated, being preserved and restored by the Friends of Mount Auburn Cemetery. The now paved avenues bear tree names, while walking paths through the intricately landscaped grounds have been named for flowers. The scarcity of land for burials led to community mausoleums. Mount Auburn Cemetery has also become an outdoor museum and classroom to many. It remains an active cemetery, and the original intentions of Bigelow and Dearborn to provide fine landscape architecture, monument design, and horticulture are still evident. A full 175 years after Mount Auburn’s inception as a retreat and memorial to the deceased, it allows us, the living, to travel back in time. Amidst the verdant beauty of nature, its various trees, shrubs, flowering plants, ponds, and gentle hills, one is also rewarded by the sight and sounds of many species of resident and migrant birds.

Conclusion

There are several reasons that so many participants in the ether demonstration are buried at Mount Auburn Cemetery. Scarcity of land and public health hazards demanded a new approach to burial, while secularization led to a secondary role for the church. However, these factors alone could not have produced Mount Auburn without the leadership, perseverance, and vision of its founder and main architect, Jacob Bigelow. This first and premier landscaped cemetery in the country began a tide of reform, and similar cemeteries emerged throughout the nation. In the serene ambience of these cemeteries, loved ones reminisce and meditate on the lives of loved ones lost to accident, illness, or old age. As the leading cemetery

Continued on Page 32
Laughing and Crying about Anesthesia: A Memoir of Risk and Safety.

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Laughter is the best medicine – unless of course you’re undergoing surgery, in which case anesthesia is probably better. Then again, the two aren’t mutually exclusive—in fact, they are often synergistic. Gerald Zeitlin, MD, has melded the two into a self-published autobiography that also covers both his life and recent advances in the practice of anesthesia.

The anesthesiologist with less grey hair and more technical skills may not be aware that anesthesia is an exceptionally dangerous medicine, arguably far more hazardous than humor. In the wealthier countries of the world, the risk of an acute fatal complication from anesthesia is somewhere in the region of one in several hundred thousand. By contrast, even within living memory, the odds of an anesthetic death were on the order of one in several thousand. Even the television networks’ post-Olympic sitcoms are not that bad. Zeitlin’s book covers the not-too-distant past of his professional life that spanned the period in which the specialty changed from a ‘primitive...non-science to something at the forefront of surgical care.’

The initial third of the book covers the author’s professional origins as an ‘untutored beginner’ in that well-worn cradle of anesthetic expertise, the teaching hospitals of Oxford and London. He outlines his initial experiences in Britain’s National Health Service during the 1950’s with a keen eye and a keener wit. The NHS and British medical career structures have changed dramatically in the past decade. (Zeitlin’s old stamping grounds of Oxford’s famed Radcliffe Infirmary and even more famed in-town parking opportunities for the Infirmary’s anesthetic staff having been sold off to a salivating University incredulous at its own luck, by example.) Despite this, the practical workings, career machinations and educational processes of the early NHS will remain instantly recognizable to many contemporary readers. Americans have long been baffled by English wit, but the humorous anecdotes that convey the atmosphere of this disappearing anesthetic world cross the Atlantic successfully.

From England’s green and pleasant land, Zeitlin also successfully crossed the Atlantic to the greener pastures of New England in 1965. In time he became a naturalized American, “an affliction” he points out, “from which there is no return.” The IRS, demanding lifelong tax returns of Americans no matter where they live on the planet, would doubtless agree. Zeitlin spent the remainder of his career in and around Boston generating tax returns from the Brigham and Woman’s, the Massachusetts General Hospital and private practice.

The earlier accounts of patient care in the NHS include humorous but harrowing accounts of near misses that will be uncomfortably familiar to many of us. At MGH Zeitlin’s luck, and that of one his patient’s, finally ran out – recounted in painful detail. Fatalities were not unusual in those days, as the historical accounts outlined in the book make clear. What was unusual at that time was the recognition that these fatalities, although often accidental, were not unavoidable, inexplicable or simply the result of bad luck.

During this time, the structure of how anesthetic education and practice was delivered and taught was changing dramatically. Zeitlin met various Harvard anesthesiologists and academics such as Henry Beecher, Donald Todd, Ellison “Jeepee” Pierce and Jeff Cooper. These were men who led a fundamental shift in anesthetic practice, carefully identifying flaws in practice, chasing the root causes and introducing reforms in monitoring and education to minimize these tragic errors. The contrast between Zeitlin’s early work environment and contemporary practice highlight the advances this generation of anesthesiologists have accomplished.

Zeitlin wrote Laughing and Crying about Anesthesia as a project for a budding-writers’ workshop he took after retiring from clinical medicine. The narrative and focus flag a little in the latter part of the book, and perhaps both could have benefitted from some experienced editing to better draw the picture of stories into a more cohesive whole. The book is written for the lay public, and from the perspective of the professional anesthesiologist some parts could benefit from a more detailed history and background to the advances that improved outcomes.

For an earlier detailed historical background, the reader might consider Sykes’ Essays on the First Hundred Years of Anaesthesia, a publication to which Zeitlin refers, as a useful companion to this book. Like Zeitlin, this English anaesthetist embarked on his literary career on retirement from practice, but around the time Zeitlin was starting on his clinical career. Sykes’ book, dealing largely with the period prior to the 1950s, sets the stage for Zeitlin’s world with the same self-deprecatory humor and keen sense of the ridiculous. Nevertheless A Memoir does not aim to compete with the extensive historical research that Sykes performed, but rather provides individual accounts from the second century of anesthesia. If Sykes largely wrote the history of other anesthetists from secondary sources, Zeitlin has produced a primary historical work predominantly from anecdotes of his own experiences.

The narrow margin between comedy and tragedy resembles the fine line between

Continued on Page 32
Book Review


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Paper copies of this much-mentioned book were pricey at the Boston International Antiquarian Book Fair of 2011. Indeed, the intoxicatingly fragrant paper seemed too expensive to handle. The loss of olfactory reward notwithstanding, much of its priceless value can be savored on-line for free at, for instance, books.google.com.

The book is of interest to anesthesiologists because of work on curare (or what he called “wourali”) by Waterton (Figure 1). He was not the first European to report on the poison, but he dramatically called attention to it in this popular account. Indeed, Claude Bernard cited the influence of “Watterton.”

Waterton’s entertaining writing is reminiscent of the hunting accounts of Theodore Roosevelt and Ernest Hemingway. It has been likened to the yarn spinning of Mark Twain. For instance, in Waterton’s best-known anecdote, he Tarzan-like subdues an Amazonian crocodile (caiman) with his bare hands. However, his comments on curare are entirely plausible.

He nicely details the secret and superstitious preparation of wourali and its application. Formulations included additives such as ants and snake fangs, but Waterton understood the active ingredient to be a “vegetable essence.” Superstitions required abandonment of the manufacturing-shed after secret production of a batch. The darts and arrows were works of Neolithic art, as were the requisite blowguns and bows (Figure 2).

Waterton reports a dramatic wourali experiment that he performed upon return to England. A large equine was given an apparently lethal dose of the poison and became profoundly symptomatic. He sup-Fig. 1. Charles Waterton (1782-1865). The engraving is of a portrait by Charles Willson Peale and was frontispiece for Waterton’s Essays on Natural History, edited by Norman Moore (1847-1922), London: Frederick Warne and Co.; 1871. The close-cropped hair was Bohemian for the era. The preserved head of a domestic kitty cat evinces Waterton’s interest in taxidermy and his flamboyant sense of humor. He also wanted to prove with well-known domestic examples that his exotic specimens were realistically preserved. It is not known if mercuric chloride, a key reagent in Waterton’s taxidermy, contributed to his Mad Hatter-like antics. One of his many stunts was to climb the Basilica of Saint Peter at the Vatican. Because he left his gloves on a lightning rod, an encore performance was commanded. Waterton was a nature conservationist, and Waterton Lakes National Park in Alberta, Canada, is named for him.
ported the animal with bellows ventilation via tracheotomy until the poison wore off. Thus was born a pithy phrase in anesthesiology. Waterton wrote that artificial breathing “saved the ass” from final dissolution. Though a hunter and a vivisector, Waterton exhibited compassion for animals, and he ensured that this one, thereafter dubbed

Continued on Page 32
in the Boston area, it is not surprising that Mount Auburn shelters for eternity so many prominent statesmen, physicians, lawyers, and other notable members of society.

Reference List

Zeitlin… Continued from Page 30

triumph and tragedy that anesthesiologists often tread. This is a varied and engaging book, dealing with anesthetic practice in a manner that is appropriate to the subject. As Friedrich Nietzsche opined: “Perhaps I know best why it is man alone who laughs: he alone suffers so deeply he had to invent laughter.” Or maybe the effective juxtaposition of tears and laughter to describe anesthesia is better captured by Woody Allen: “I am thankful for laughter, except when milk comes out my nose.”

Waterton… Continued from Page 31

Wouralia, would be rewarded for its ordeal. He promised, “Wouralia shall be sheltered from the wintry storm; and when summer comes she shall feed in the finest pasture. No burden shall be placed upon her, and she shall end her days in peace.”

Waterton was a friend of Joseph Banks, who set sail with Charles Darwin on the Beagle in 1831. It is likely that Waterton influenced both scientists. There are hints of Darwinism throughout Wanderings. In one of many instances, Waterton said of the South American birds (including finches), “Nature has not known where to stop in forming new species and painting her requisite shades.” After clearing out an abandoned building for use as a laboratory, he wrote, “The frogs, and here and there a snake, received that attention which the weak in this world generally experience from the strong, and which the law commonly denominates a ejectment.” He likened the sticky tongue of an anteater (“ant-bear”) to that of a woodpecker. Of the formidably clawed ant-bear, he added, “As his habits and haunts differ materially from these of every other animal in the forest, their interests never clash, and thus he might live to a good old age, and die at last in peace, were it not that his flesh is good food.” The first edition of Wanderings may have set Darwin to thinking even before the Beagle left port.

Waterton’s writing and exploits have been excerpted in various forums, but this entire book is well worth perusing.

References