



# BULLETIN OF ANESTHESIA HISTORY



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## Eponyms in the Operating Room: Careers of Six European Physicians\*

By Matthew S. Giuca, M.D.

Resident in Anaesthesia  
Harvard Medical School  
Boston, Massachusetts  
and

Sukumar P. Desai, M.D.

Assistant Professor of Anaesthesia  
Harvard Medical School  
Boston, Massachusetts

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### Introduction

Eponyms enable us to commemorate achievements of individuals in a variety of disciplines. Many are familiar with Newton's laws, Hofmann rearrangement, Pythagoras' theorem, and the Gaussian curve. However, eponyms are especially abundant throughout the medical specialties, be it Addison's disease, Billroth's procedure, Esmarch's bandage, Hunter's canal, or the Shirodkar stitch. Eponyms have been used to describe normal anatomical structures [the ligament of Trietz], congenital malformations [Fallot's tetralogy], histopathologic techniques [Giemsa staining], histologic structures [islets of Langerhans], clinical findings [Austin-Flint murmur], medical conditions [Graves' disease], surgical disorders [Spigelian hernia], surgical techniques [McBurney's incision], classification of clinical findings [Apgar score], and equipment used in the operating room [Buckwalter retractor] or the Intensive Care Unit [Swan Ganz catheter]. One possible explanation for the adoption of some eponyms is that it allows a short description of a technique, procedure, diagnosis, or pharmacological preparation. Although eponyms enrich the

*\*This work was supported by intramural funds, Department of Anesthesiology, Perioperative and Pain Medicine, Brigham and Women's Hospital, Boston, MA.*



*Fig. 1. Portrait of Sydney Ringer (1835-1910). Source: Wellcome Library, London. Reproduced with permission.*

medical vocabulary, an obvious disadvantage is that they provide little information about the object or process they describe. The burden of familiarity, therefore, falls on the reader or listener. For example, the phrase 'Sellick maneuver' does not convey any information to someone who does not already know that the maneuver refers to

'cricoid pressure.'

Most medical eponyms honor a single clinician, as in Alzheimer's disease. However, there are instances of two or more clinicians being included in an eponym as in Mallory-Weiss syndrome, or Osler-Rendu-Weber syndrome. Sometimes the same prolific individual is associated with numerous distinct eponyms as in Osler's disease, Osler's filaria, Osler's maneuver, Osler's nodules, Osler's syndrome, and Osler's triad. There are many instances where the eponym omits the names of some of the individuals associated with the syndrome. John Cleland first described an abnormality in the cerebellum and brainstem in children with spinal cord herniation ten years before Julius Arnold and Hans Chiari whose names are included in the eponym Arnold-Chiari malformation. Rarely an eponym is named after a patient afflicted with the disease or abnormality, as is the case with John Hageman who in 1955 became the first individual diagnosed with factor XII deficiency.

While examining the careers of six European physicians selected on the basis of common use, we sought answers to three questions. First, we wished to know whether these individuals are more deserving than others in receiving eponymous recognition. Second, we explored the likely pro-

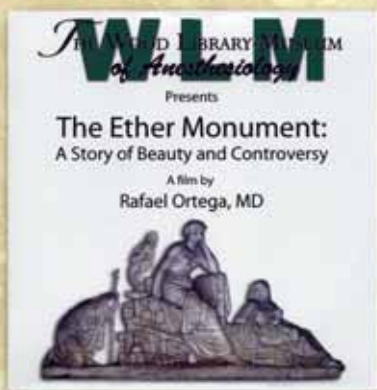
*Continued on Page 20*

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## The C. Ronald Stephen Resident Essay Contest

The Anesthesia History Association (AHA) sponsors an annual contest for the best essay on the history of anesthesia, pain medicine or intensive care. This contest is open to all residents and fellows in anesthesiology. The purpose of the contest is to promote interest in the history of anesthesia and to advance professionalism in the specialty. Additionally this contest offers residents and fellows the opportunity to present their paper at a national meeting and to publish the results of their research. The Resident Essay Contest is named for Dr. C. Ronald Stephen, an anesthesiologist, who was a revered teacher, researcher, clinician and anesthesia historian. Dr. Stephen died at age 90 in 2006.

The essays must be written in English and be approximately 3,000 to 5,000 words in length. Judging will be in two stages. In the first stage the finalists will be chosen. These finalists will be announced at the AHA dinner meeting during the American Society of Anesthesiologists annual meeting. From these finalists, the winners will be chosen on the basis of both content and delivery during the spring meeting of the AHA. All the finalists will present their papers in a session of the AHA attended by a panel of judges. The panel of judges will make their final decision based on originality, appropriateness of topic, quality of the research, and delivery. Because the final judging will be at the time of the presentation at the spring meeting of the AHA, all who enter must agree to attend the meeting at which the presentations are made. Essays must be submitted by the 10th of September 2010, in order to be eligible for presentation at the spring AHA meeting of the following calendar year. If not received by that date they will be considered for the next year's contest.

The first, second, and third place winners receive \$500 \$200 and \$100 respectively. Awards will be made during the AHA spring meeting. The three winners are required to submit their essays to the peer-reviewed *Bulletin of Anesthesia History* for possible publication.

To enter, essays should be sent to:

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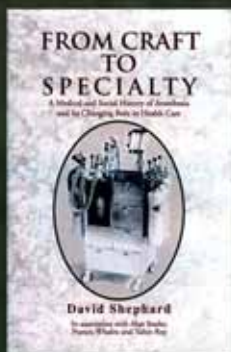
## ANESTHESIOLOGY

**From Craft to Specialty: A Medical and Social History of Anesthesia and Its Changing Role in Health Care.**

By David Shephard, M.D., in association with Alan Sessler, M.D., Francis Whalen, M.D. and Tuhin Roy, M.D. Thunder Bay, Ontario; York Point Publishing, 2009. Copies distributed by the Wood Library-Museum of Anesthesiology, Park Ridge, IL.

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*From Craft to Specialty* is a medical and social history of surgical anesthesia, from long before the advent of "modern" clinical anesthesia in 1846, to the present day. Dr. David Shephard's volume provides an insightful narrative of the development and evolution of anesthesiology from a craft to a discipline and, finally, to a medical specialty. Appealing to a wide audience, those who embark on this historical adventure will be rewarded with a deeper appreciation of how advances in our specialty effected vast changes in health care.



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Editor  
*Bulletin of Anesthesia History*  
200 Delafield Avenue, Suite 2070  
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## Eponyms. . . *Continued from Page 17*

cess by which their names evolved into eponyms. Third, we determined whether the device or procedure bearing their name was indeed their most significant contribution.

**1. Sydney Ringer** (1835-1910) (Figure 1) is famous for the intravenous solution that bears his name – Lactated Ringer's solution. Born in Norwich, England, he studied medicine at University College in London, graduating in 1860. His entire professional career was spent at that university, where he was known to be a most astute clinician. He discovered the importance of the ionic composition of perfusates quite by accident while conducting experiments on the contractility of frog heart using a self made tonometer, a device that measured contractility. The experiments required 0.75% saline, a solution he prepared using sodium chloride and distilled water. On one occasion the supply of distilled water ran out, and Mr. Fielder, his laboratory assistant, substituted tap water. Ringer published erroneous results because he was unaware of the substitution.<sup>1</sup> Since he was unable to replicate these results during follow-up experiments, he concluded that another solution had been used inadvertently. Ringer published a second article in which he commented, "I discovered that the saline solution which I had used had not been prepared with distilled water, but with pipe water supplied by the New River Water Company. As this water contains minute traces of various inorganic substances, I at once tested the action of saline solution made with distilled water and I found I did not get the effects described in the earlier paper. It is obvious therefore that the effects I had obtained are due to some of the inorganic constituents of the pipe water."<sup>2</sup> He analyzed the tap water and found that it contained significant amounts of calcium, sodium, carbonic acid, and sulfuric acid. He examined the effects of these substances separately, using distilled water as a control. Ringer noted that "heart contractility cannot be sustained without calcium; however if calcium is unopposed by potassium, this will throw the heart into tetanus."<sup>3</sup> Ringer realized the importance of a physiologic balance of salts in a solution to support normal tissue function and summarized his recommendation thus, "A mixture containing 100cc saline, 5cc sodium bicarbonate solution, 5 cc calcium chloride solution with 1cc potassium chloride solution makes an excellent artificial circulating fluid."<sup>4</sup> This formulation soon became ubiquitous in physiologic laboratory



Fig. 2. Portrait of Friedrich Trendelenburg (1844-1924). Source: *Munchener medizinischen Wochenschrift. Blatt 365, 1925 / Verlag von J. F. Lehmann in Munchen.*

experiments and was modified by many others, most notably Alexis Frank Hartmann and Daniel Cody Darrow in the 1930's. In a pioneering effort to find a balanced solution for treatment in children, Hartmann added lactate to Ringer's saline solution, thus producing Ringer's Lactate.<sup>5</sup> As a requirement for his appointment as full professor at Children's Hospital, Ringer wrote **A Handbook of Therapeutics** in 1869.<sup>6</sup> A plaque outside St. Mary's church, Lasingham, celebrates his distinguished career and reads, "To the glory of God and in memory of Sydney Ringer, eminent physician and scientist of University College Hospital, his research first defined physiological salines. The blood replacement fluids that saved countless lives and enabled so much medical, surgical and experimental research throughout the world, to the benefit of mankind."

**2. Friedrich Trendelenburg** (1844-1924) (Figure 2) was born in Berlin, and is known for the head-down position used commonly during the resuscitation of hypovolemic patients, even though he did not use it for this purpose. He studied medicine at the University of Glasgow and the University of Edinburgh, and completed studies at Charité - Universitätsmedizin Berlin, graduating in 1866. Ludwig Traube and Bernhard Rudolph Konrad von Langenbeck were two influential profes-

sors that Trendelenburg sought to emulate. Trendelenburg eventually became surgical ward director at Berlin's Friedrichshain Hospital and then professor of surgery successively at Rostock University, Bonn University, and, finally, Leipzig University. He popularized the use of the head-down position (Figures 3 and 4) to improve exposure during genitourinary surgery, his true passion.<sup>7-9</sup> He felt this position provided better exposure and wrote, "The repair of congenital defects of the urethra and bladder constitutes one of the most difficult and for that reason perhaps one of the most interesting chapters in plastic surgery, and if the outcome be successful it may be regarded with intense satisfaction."<sup>10</sup> The head-down position known as the Trendelenburg position today has been described in medical literature since the first century.<sup>11</sup> Although used today to facilitate venous return in hypotensive emergencies, Trendelenburg described its usefulness in the management of bladder stones, strangulated hernias, and vesicovaginal fistulas. He began work on the approach and pathophysiology of pulmonary embolism in laboratory animals in 1908. His student, Martin Kirschner, Professor at the University of Königsberg, Germany, was the first surgeon to successfully perform pulmonary artery embolectomy on March 18, 1924. In addition, Trendelenburg was the first surgeon to advocate endotracheal anesthesia through a tracheostomy; in fact, he helped design a cuffed tracheostomy tube. Trendelenburg

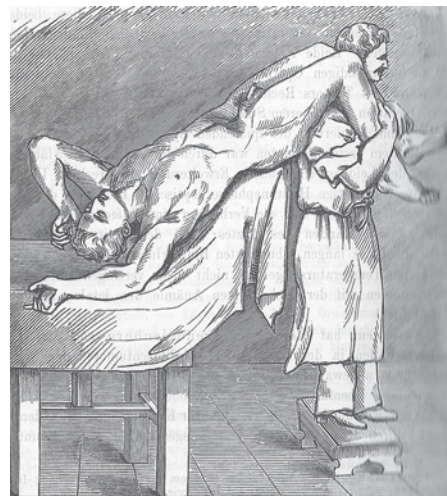


Fig. 3. Illustration depicting the original position used by Trendelenburg. Notice the flexion of the knees. Source: Meyer W. Ueber die Nachbehandlung des hohen Steinschnittes sowie über: Verwendbarkeit desselben zur Operation von Blasenscheidenfisteln. *Arch Klin Chir* 1884;31:494.



Fig. 4. Illustration of an operating table that provided operating conditions described in the original Trendelenburg position. Source: Thierry M. Friedrich Trendelenburg (1844-1924) and the trendelenburg position. *Gynecol Surg* 2009;6:295-297. Reproduced with permission.

leaves behind three surgical procedures [pulmonary embolectomy, varicose vein repair, and chondro-osteotomy], two clinical diagnostic tests [for congenital hip dislocation, and varicose veins], and one sign [waddling gait in patients with gluteal muscle dysfunction].

**3. August Karl Gustav Bier** (1861-1949) (Figure 5) is famous for an extremely simple and ingenious procedure – intravenous regional anesthesia. Born in Helsen (Waldeck district, in the state of Hesse), Germany, his interest in medicine was aroused after translating Hippocrates' texts from Greek into German. Bier studied medicine at the Universities in Berlin (1881), Leipzig (1882-1883), and eventually Kiel (1883-1886), where he lived for 16 years. In 1908, he was the first to accurately describe a neuraxial technique similar to modern spinal anesthesia,<sup>12-14</sup> and an intravenous regional technique named 'the Bier block.'<sup>15</sup> Bier was closely associated with several famous physicians of his era – training under the guidance of surgeon Friedrich Von Esmarch who was responsible for introducing the concept of bloodless surgery. He collaborated with August Hildebrandt in the introduction of spinal anesthesia with cocaine [each acting as a subject while the other performed the procedure], with internist Heinrich Quincke in the introduction of the Quincke spinal needle, and with Theodore Tuffier in the first performance of lumbar puncture in the sitting position [Tuffier's line is an important landmark for identifying the fourth and fifth lumbar vertebrae]. Bier

wished to develop regional anesthesia techniques because of the significant morbidity, mortality, and postoperative nausea caused by general anesthesia. Bier wrote about "ether pneumonia" [aspiration pneumonia] and abdominal wound dehiscence in his patients.<sup>16</sup>

Bier was especially interested in the effects of hyperemia that followed tourniquet induced ischemia. He studied and wrote about the uses of hyperemia to treat many common ailments.<sup>17-19</sup> He performed many of his experiments on himself. In 1905, Bier worked for a period of 3 months with a tourniquet used intermittently around his arm. Bier continued to experiment, write, collaborate, and teach surgery.<sup>20,21</sup> In 1916, while a physician with the Navy, Bier designed a steel helmet, a precursor to the modern helmet. As a result of his prominence in the 1920s, he was consulted in the treatment of dignitaries such as German President Friedrich Ebert, Russian Tsar Nicholas, and the communist leader Vladimir Lenin.

Bier retired from surgical practice in 1932, but continued work in forestry on a large estate in Sauen, Germany. During



Fig. 5. Portrait of August Karl Gustav Bier (1861-1949). Courtesy of the Wood Library-Museum of Anesthesiology, Park Ridge, Illinois.

World War II, his estate was at the mercy of the Russian forces that occupied that part of Germany. The Russian military wanted to construct a military hospital on the premises of the Bier family estate, and dispatched Valentina Gorneswskaja, a Russian military medical officer, to examine the property. Fortune was to smile on the eld-



Fig. 6. Portrait of Sir Ivan Whiteside Magill (1888-1986). Courtesy of the Wood Library-Museum of Anesthesiology, Park Ridge, Illinois.

erly Bier and his wife, as Gorneswskaja immediately recognized Bier from a lecture she had attended before the war, and allowed them to stay on their property comfortably. Bier died in 1949 and was buried at his estate in Sauen. A bronze plaque on the property reads, "Here lived the famous surgeon August Bier from 1912 to 1949. Dr. Bier left behind an extensive list of international awards and honors. His pioneer spirit and dedication to his craft yielded a lasting contribution to healthcare."

**4. Sir Ivan Whiteside Magill** (1888-1986) (Figure 6) is commonly remembered for the forceps he designed to assist insertion of nasotracheal tubes. He was born in Larne, Northern Ireland, and obtained his medical degree in 1913 from Queen's University in Belfast. Magill went to England after medical school and began residency training in surgery. He served at field hospitals in France during the World War I. Having administered numerous anesthetics during the Great War, he jokingly labeled himself an anesthetist on his discharge paperwork. After the war, he began work at Queen Mary's Hospital in Kent, a hospital that specialized in maxillofacial reconstruction. These procedures were in great demand for treatment of shrapnel injuries sustained during the war. It was here that Magill made acquaintance of the anesthetist Stanley Rowbotham who had published an article on the benefits of endotracheal intubation

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## Eponyms. . . *Continued from Page 21*

in 1920.<sup>22</sup> A common interest sparked a successful collaboration. The most common method of general anesthesia at Queens Mary's Hospital was ether delivered through a Phillips or pharyngeal airway with a sidepiece formed from a .303-rifle cartridge (Figure 7).<sup>23</sup> Tracheal insufflation using deliberately high flow rates was used to prevent debris from tracking down into the pharynx. Although effective, this arrangement blew ether-laden debris and gases onto the surgeons. Moreover, patients continued to suffer complications related to aspiration, since the airway was not protected. Sir Harold Gillies, a prominent surgeon at the hospital challenged Magill when he remarked, "Maggi, you seem to get the anaesthetic into the patient alright. Don't you think you could devise some method of getting it out, so that I am not anaesthetized as well?" Magill rose to the occasion, collaborating with Rowbotham to develop a two-tube method of anesthesia whereby inspiratory and expiratory gases flowed through different tubes. This replaced the narrow insufflation catheters used earlier. This two-tube design was eventually modified to a single-tube design, similar to what is used today. Magill wrote extensively about endotracheal anesthesia, and was a proponent of its use.<sup>24-27</sup> Later, Magill developed a breathing circuit that incorporated a re-breathing bag and an expiratory valve.



Fig. 8. Portrait of Sir Robert Macintosh (1897-1989). Courtesy of the Wood Library-Museum of Anesthesiology, Park Ridge, Illinois.



Fig. 7. Pharyngeal airway from a .303-rifle cartridge. Reproduced from [Airway for intranasal operations, Shipway F, British Medical Journal (1935) 1:767] with permission from BMJ Publishing Group Ltd.

This circuit, known as the Magill circuit, is classified as a Mapleson type A circuit, and was common in earlier anesthesia machines. Magill popularized blind nasotracheal intubation, and described the 'sniffing the morning air' position of the head and neck during this procedure. This position, which incorporates flexion at the neck and extension at the head, is familiar to current practitioners. Magill's forceps are currently used most commonly for facilitating nasotracheal intubation; however they were originally designed for insertion of insufflation catheters and for packing the pharynx.<sup>28</sup> He also designed endobronchial tubes and blockers to facilitate lung surgery. These endobronchial tubes and blockers were used outside the operating room as well, for the treatment of tuberculosis. Magill was named Commander of the Royal Victorian Order, a special honor bestowed by the Royal Family for personal service to them. He was knighted in 1960, and as Honorary Secretary of the Section of Anesthetics of the Royal Society of Medicine, he proposed the creation of a Diploma of Anaesthetics [DA], and was the first recipient of this diploma. He is best known in Great Britain and Ireland for promoting professionalism within the specialty, and for introducing the examination leading to the DA. The Department of Anaesthesia, Intensive Care & Pain Management at Chelsea and Westminster Hospital, London, is named after Magill. He died in 1986 at the age of 98.

**5. Sir Robert Reynolds Macintosh** (1897-1989) (Figure 8) is recognized by most for the curved laryngoscope blade named after him. Born in Timaru, New Zealand, he served as a fighter pilot during World War I. His aircraft was shot down, and Macintosh spent most of the war as a POW. He began medical studies at Guy's Hospital Medical School after the war. Although interested in a surgical career, he adminis-

tered anesthesia to make extra money. Gradually he became fascinated with anesthesia and felt compelled to improve the delivery and safety of anesthetics. His clinical skills were recognized in London, where he established a most successful and lucrative private practice, administering anesthesia for dental and surgical procedures. Macintosh began using total intravenous anesthesia with barbiturates at a time when inhalation induction with nitrous oxide was common. His reputation as a skilled clinician and exposure to wealthy patrons eventually led to a most fateful friendship with the owner of Morris Motor Company, Sir William Morris, later known as Lord Nuffield. Nuffield had experienced several unpleasant anesthetics for dental procedures. Macintosh provided excellent anesthesia care to him during subsequent procedures, and this forged a lasting bond between them. There was no Department of Anaesthesia in Britain at that time and Nuffield was keen on establishing the first such Department at Oxford University. He provided financial support for the creation of this Department, but stipulated that Macintosh be appointed chairman. This unexpected requirement and Macintosh's lack of academic experience brought on disbelief and ridicule from the university's Chairman of Medicine, Sir Farquhar Buzzard. As expected, Nuffield prevailed and Macintosh became the first Professor of Anaesthetics in Europe.<sup>29</sup> Macintosh's collaboration with Nuffield would continue and led to the development and manufacture of negative pressure respirators for the treatment of patients with polio (Figure 9). These respirators were made available to all hospitals in Britain.

Prior to World War II, Macintosh spent time in Spain as a consultant during the Civil War (1936-9), making important contributions. During World War II, Macintosh designed a portable Oxford vaporizer to meet the need for administering anesthesia in battlefield hospitals. These vaporizers were the predecessors of the EMO (Epstein, Macintosh, and Oxford) and OMV (Oxford Miniature Vaporizer) vaporizers used later. Innovation based on need would mark Macintosh's career. During the war, it was critical that downed pilots could remain floating in the sea in a face up position. In a famous experiment, Macintosh tested the ability of a life-jacket designed by him to maintain an obtunded pilot in the face-up position while in water. In a series of seminal experiments Macintosh and Edgar Alexander Pask developed a life jacket that would protect

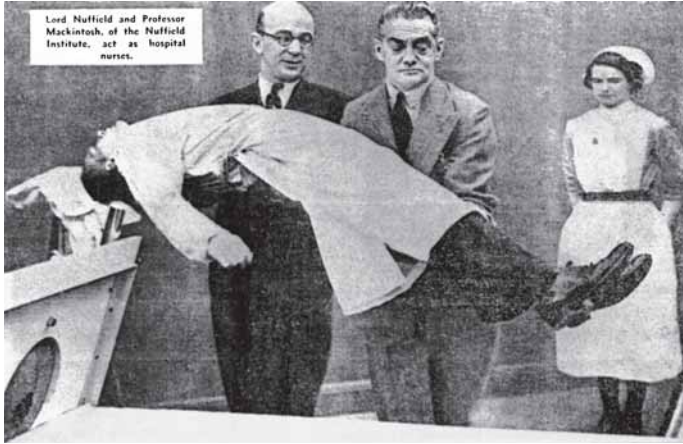


Fig. 9. Lord Nuffield and Sir Robert Macintosh with a polio victim. Source: Beinart J. *A history of the Nuffield Department of Anaesthetics, Oxford, 1937-1987*. Oxford University Press (1987). Reproduced by permission of Oxford University Press.

unconscious victims from drowning. Macintosh anesthetized Pask, after which the unconscious Pask was placed in a pool to test whether or not the life-jacket designed by them was successful in maintaining the correct position (Figure 10). This innovation saved hundreds of lives during the war, and earned Macintosh a knighthood in 1955.



Fig. 10. Life jacket experiments conducted on an unconscious Edgar Pask. Source: Beinart J. *A history of the Nuffield Department of Anaesthetics, Oxford, 1937-1987*. Oxford University Press (1987). Reproduced by permission of Oxford University Press.

Macintosh was familiar with the Boyle-Davis Gag Device, an instrument used to facilitate surgical exposure during tonsillectomy. He modified this device to aid in tracheal intubation, and thus was born the predecessor to the most commonly used laryngoscope blade in the world.<sup>30-32</sup> In addition, Macintosh developed an epidural needle with a balloon that would deflate when the epidural space was entered. A

most prolific academician, Macintosh was a teacher and mentor to generations of anesthetists in Britain.<sup>29</sup> His writing was remarkable for its clarity, whether in the scientific literature, or in textbooks designed for departmental use. These efforts helped our specialty gain academic recognition. He retired from clinical work in 1965, and died at the Radcliffe Infir-

mary at Oxford in 1989.<sup>33</sup>

**6. Brian Arthur Sellick (1918-1996)** (Figure 11) is known for the maneuver he described to prevent pulmonary aspiration of gastric contents. Born in Dorking, Surrey, England, he graduated from medical school at Middlesex Hospital, London, in 1941, and took up a position in internal medicine at that institution. The blitzkrieg

during World War II placed a tremendous strain on surgical services in England, a period during which Sellick provided anesthesia care. A skilled clinician, he was promoted to senior resident in anesthesia at Middlesex Hospital, London, in 1942. The experience of inducing anesthesia on trauma victims sparked an interest in ameliorating the risk posed by pulmonary aspiration of gastric contents.<sup>34</sup> Soon he was experimenting with cricoid pressure using a technique described by John Hunter in 1776 for prevention of gastric distention with air during artificial respiration of drowning victims.<sup>35,36</sup> Prior to Hunter, in 1774, William Cullen wrote to Lord Cathcart about his observations on the pathophysiology of death after drowning, suggesting that resuscitation using bellows could revive the apparently dead. He even suggested that gastric distention could be prevented by using a variety of manipulations of the head and neck.<sup>37</sup> Sellick did not refer to either of these earlier descriptions, but his

experiments that consisted of instilling water into cadaver stomachs placed in steep Trendelenburg position proved that water did not enter into the pharynx if pressure was applied to the cricoid cartilage.<sup>38</sup> He used contrast medium and X-rays to demonstrate the efficacy of cricoid pressure in cadavers, and he also recommended preoperative gastric suction to empty the stomach. Sellick went on to become an accomplished cardi thoracic anesthetist. Intrigued by the protective effects of hypothermia, he induced controlled hypothermia frequently, and was considered an expert on the topic. In 1957, he reported the successful use of hypothermic circulatory arrest on 32 patients during open-heart surgery.<sup>39</sup> Eventually the team at Middlesex Hospital operated on over 400 patients, with only one recorded death. Among the many honors bestowed upon him for a lifetime of contributions to the field of anesthesia was the Gold Medal from the Royal College of Anaesthetists in 1989. He retired in 1978 to Devon in southwest England and died in 1996.<sup>40</sup>



Figure 11. Portrait of Brian Arthur Sellick (1918-1996), provided by members of his family. Source: Pallister WK: *Obituary: Brian Arthur Sellick, MBBS, FRCA, FFARCS, DA 13 June 1918 to 13 July 1996*. *Anaesthesia* 2010;51:1194-5. Reproduced with permission.

## Discussion

The six European physicians we describe were selected primarily on the basis

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## Eponyms. . . *Continued from Page 23*

of common usage and familiarity. American eponymous physicians are being studied in a separate, complementary project. The answer to our first question - whether these individuals are more deserving than others of eponymous recognition - is an emphatic no. William Harvey who first described circulation of blood, or William T.G. Morton who first publicly demonstrated the use of ether as an anesthetic are not associated with an eponym. Neither do we honor any particular individual for introducing neuromuscular blockers, inhalation anesthetics, or tracheal intubation.

There is no consistent pattern in how work by these individuals led to eponymous usage. Ringer had the inquisitive mind and determination to persist until he determined the importance of electrolytes, and we believe that this was his most significant work. Having struggled with poor operating conditions, Trendelenburg used a gravity-assisted steep head-down position and successfully achieved better operating conditions. Currently, newer applications of laparoscopic surgery are bringing about a revival to its popularity. Its efficacy in cardiovascular resuscitation was never advocated by Trendelenburg, and we consider superior surgical exposure to be his most important contribution. We see three irregularities with the association of Trendelenburg and the position that bears his name - he was not the first person to use this position, he did not advocate its use for treatment of hypovolemia, and there is some doubt about the effectiveness of this position in the treatment of hypovolemia.<sup>41</sup> Bier ought to be remembered most for performing subarachnoid block since the intravenous technique described by him was not always effective. It was only after the revival of this technique in 1963 by Holmes at Oxford that its use became widespread.<sup>42</sup> Bier's block, resulted from the exploration of a curious idea, and we believe this is his most important contribution.

More important than the forceps he introduced, Magill ought to be remembered for his contributions to breathing circuits, tracheal tubes, airway appliances, head and neck positioning for blind nasal intubation, and for promoting professionalism and the recognition of anesthesia training by the Diploma in Anaesthetics [D.A.]. In designing his blade, Macintosh merely extended the idea of laryngeal exposure offered by the surgical retractor. Having offered a sample of his blade to Richard von Foregger to encourage use of the curved blade in the United States, it was the

Foregger Company that marketed the product using Macintosh's name. Although he was offered financial consideration for his idea by Foregger, Macintosh declined that offer. Even though several other laryngoscope blades are also known by the names of their designers [Miller and Foregger, among others], the name of the first person to design a laryngoscope is not well known [Alfred Kirstein].<sup>43,44</sup> We believe that Macintosh should be remembered for his many academic achievements, rather than the blade that bears his name. Sellick's work represents early translational research, and we remain uncertain whether airway protection, or the benefits offered by hypothermia during open heart surgery should be considered his most important work.

In summary, our analysis of the careers leads us to conclude that these individuals are just a few of the many who deserve to become eponyms. Moreover, we have identified the most likely processes by which their names evolved into eponyms. Ringer, Bier and Trendelenburg are rightly remembered for their most important work, while many clinicians remain unaware of the other significant contributions by Macintosh, Magill, and Sellick. We were unable to identify reasons why some individuals and achievements receive eponymous recognition while others do not.

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# Analgesia and Anesthesia in Pre-Colonial Africa

By E. Ngugi Kinyungu, M.D.

Resident

University of Chicago

Department of Anesthesia and Critical Care

Chicago, Illinois

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## Introduction

Teaching and learning in the traditional African setting occurred by way of oral communication; culture was passed on to the younger generation by word of mouth. The history of medicine in Africa is one shrouded in mystery due in part to this oral passage of the ways of yore to the newer generations' and thus poor record keeping in the Western sense. When one delves into the history however, one finds that the ancient African tribes and civilizations were adept at treating various ailments using various herbs and plants. There is also evidence as we shall see of various surgical procedures being carried out all over Africa. This article strives to find out what the African used for analgesia and anesthesia for surgery.

The definition of surgery used in this discourse is wide; I have included circumcision as a surgical operation and also tooth removal by healers. I included in my search any procedure done by a healer that would result in skin compromise and also those procedures done by bone setters. I considered actions meant to provide the patient analgesia, unconsciousness/amnesia and immobilization during a procedure. My intention was to present material that has been documented by scholars and in literature. The efficacy of these treatment methods has not been defined but it is not the intent of this discourse.

## Surgery in Ancient Africa

Surgery and ancient Africa are words that are seldom spoken in the same breath but there is evidence that various surgical practices were ongoing in Africa before the coming of Westerners. Traditional African healers can be divided into five main types: the herbalist, the midwife, the surgeon, the fortune teller or diviner and the specialist medicine man.<sup>1</sup> The Hausa people in Nigeria have seven identifiable traditional healers, each with a distinct role; one of the them, the 'Wanzami' was an "important therapeutic practitioner who performs the basic functions of both barber and surgeon."<sup>11</sup>

Traditional healers have been known to incise boils and abscesses with a sharp instrument.<sup>2,3</sup> The Masai in Kenya are known to operate on abscesses of the liver and spleen.<sup>4</sup> The Kavirondo in Uganda are documented to have punched a hole in the chest until the air passed freely through it:<sup>5</sup>

For inflammation of the lungs or pleurisy, they pierce a hole in the chest until air escapes through it. In a few days, they appear to be quite better and simply dress the wound with butter.

Other procedures to remove enlarged neck glands and uvulectomy have been documented.<sup>6-9</sup> The Masai are documented to have sutured vessels and intestines.<sup>10</sup>

Egypt stands out as having records that have been found that point to a fairly advanced environment of medicine and indeed surgery.

## Organization

I considered several ways of dividing this article and finally decided on dividing it by region and tribes. We have to remember however that by virtue of the migration of the African communities, inter-marriage and trade, a lot of these practices are probably not unique to a particular tribe or area but probably were prevalent among tribes that were close to each other and were able to observe each other. As can be anticipated, there were many instances of the mention of plants for anesthetic/analgesic properties without much context; I therefore created a table to present these treatments (Table 1).

## Uganda

One of the most detailed descriptions of surgery in pre-colonial Africa is the case of a caesarean-section observed in Uganda by a medical missionary, Robert Felkin, MD in 1879.<sup>12</sup> His description of the event is reproduced below as one has to read it in its entirety to appreciate the historical and medical impact. The surgeons made the woman drink banana wine prior to the in-

cision as a form of analgesia ("she was liberally supplied with banana wine and was in a state of semi intoxication").

So far as I know, Uganda is the only country in Central Africa where abdominal section is practised with the hope of saving both mother and child. The operation is performed by men, and is sometimes successful; at any rate, one case came under my observation in which both survived. It was performed in 1879 at Kahura. The patient was a fine healthy-looking young woman of about twenty years of age. This was her first pregnancy ... The woman lay upon an inclined bed, the head of which was placed against the side of the hut. She was liberally supplied with banana wine, and was in a state of semi-intoxication. She was perfectly naked. A band of mbuga or bark cloth fastened her thorax to the bed, another band of cloth fastened down her thighs, and a man held her ankles. Another man, standing on her right side, steadied her abdomen. The operator stood, as I entered the hut, on her left side, holding his knife aloft with his right hand, and muttering an incantation. This being done, he washed his hands and the patient's abdomen, first with banana wine and then with water. Then, having uttered a shrill cry, which was taken up by a small crowd assembled outside the hut, he proceeded to make a rapid cut in the middle line, commencing a little above the pubes, and ending just below the umbilicus. The whole abdominal wall and part of the uterine wall were severed by this incision, and the liquor amnii escaped; a few bleeding-points in the abdominal wall were touched with a red-hot iron by an assistant. The operator next rapidly finished the incision in the uterine wall; his assistant held the abdominal walls apart with both

Table 1. Plants Used for Analgesic/Anesthetic Purposes in Pre-Colonial Africa

Region	Plant/Herb	Part used	Purpose
West Africa	<i>Picralima nitida</i>	Seeds	local anesthetic <sup>21</sup>
	<i>Holarrhena wulfsbergii</i>	Leaves	local anesthetic <sup>21</sup>
	<i>Plumeria rubra</i>	Leaves	local anesthetic <sup>21</sup>
	<i>Fagara zanthoxyloides</i> (commonly known as prickly ash)	aromatic root bark	used in <b>Ghana</b> and <b>Nigeria</b> as a decoction, or in application for its alleged antiseptic and analgesic properties for example in the treatment of painful conditions, childbirth, toothache, etc., sometimes mixed with other ingredients. It has fixed oil contained in the root bark that causes salivation, a numbing action on the tongues and paralyzing effects <sup>21</sup>
	<i>Adenia cissampeloides</i>		Mano of <b>Liberia</b> use the plant to produce amnesia <sup>21</sup>
	<i>Spilanthes Uliginosa</i>	Flower heads	"The flower heads have a pungent taste, causing salivation. Chewed in <b>Nigeria</b> and the <b>Cameroons</b> to relieve toothache and are used in local application as a haemostatic and analgesic" <sup>22</sup>
	<i>Chasmanthera dependens</i>	Leaves	"Leaves and juice are used locally as a dressing for fractures and mixed with shea butter as an embrocation for pain, sprains, etc." <sup>22</sup>
Tanzania	<i>Dichrocephala integrifolia</i>	Seeds	ground seeds mixed with cow's ghee rubbed on the head to heal sores resulting from cuts made to treat headache <sup>23</sup>
	<i>Dichrostachys cinerea</i>		"Stem bark: a decoction applied cold after circumcision to heal the wound". "Leaves are pounded and applied locally to cause anesthesia" <sup>26</sup>
	<i>Abrus precatorius</i>	Leaves	"To treat swelling (cystitis?), the swelling is cut and powdered dry leaves applied to the wound covered for 4 days." <sup>24</sup>
	<i>Rhoicissus revollii</i>	Sap	"Stem sap is applied to cuts, sores and burns as it has healing and anesthetizing (numbing) properties." <sup>24</sup>
	<i>Rhoicissus tridentate</i>	Sap	"Stem sap applied to cuts and sores for healing and anesthetizing" <sup>25</sup>
	<i>Lindernia insularis</i> (kikulangumi)	leaves	"Ash of the leaves rubbed into incision of the abdomen to relieve hernia" <sup>2</sup>
	<i>Triumfetta rhombiodes</i>		"roots for the treatment of circumcision wounds" <sup>27</sup>
Venda Tribe, Southern Africa	<i>Olea capensis</i> (musiri)	Root	Root made into a powder to cover incisions made on joints for swollen joints and broken bones <sup>28</sup>
	<i>Clerodendrum glabrum</i>	Root	burned, powdered and applied on incisions for fractured bones <sup>28</sup>
		Bark	decoction is used to apply on the fractured site for fractured bones <sup>28</sup>
	Bark	burned and mixed with fat and applied externally as ointment after pulling bone straight with aid of reeds and bandaged for fractured bones <sup>28</sup>	
<i>Lippia javanica</i>	Root	Roots burned and ash applied on incisions made on joints for dislocated joints <sup>28</sup>	
Mozambique	<i>Boophone disticha</i>	Leaves	"after circumcision, a bandage is made with the dry leaves of the onion, it eases pain." <sup>29</sup>
Somalia	<i>Dichrostachys cinerea</i>	Stembark	"stembark- a decoction is applied cold after circumcision to heal the wound" <sup>30</sup>
South Africa	<i>Brunsvigia grandiflora</i> (isichwe),	Leaves	leaves- used externally during circumcision of boys to prevent inflammation; crushed leaves are used as a bandage on the sore part ; outer bulb scales are used for dressing after the circumcision for rapid healing <sup>31</sup>
	<i>Helichrysum pedunculatum</i>	leaves	leaves- as an antiseptic to induce fast healing; used after circumcision to prevent inflammation externally <sup>31</sup>
	<i>Helichrysum pedunculatum</i>		"the Xhosas of Transkei commonly use the plant to dress wounds especially after circumcision" <sup>32</sup>
	<i>Boophone disticha</i>	Bulb	outer bulb scales- moistened and applied as a dressing to circumcision wounds <sup>33</sup>
	<i>Helichrysum appendiculatum</i>	Leave	fresh leaves applied to circumcision wounds <sup>33</sup>
	<i>H. pedunculare</i>	leaves	fresh leaves applied to circumcision wounds <sup>33</sup>
	<i>E. ramossstmm</i>	Sap	sap from plant is used to relieve tooth ache and applied to the wounds after tooth extraction <sup>34</sup>

Continued on Page 28

## Africa. . . *Continued from Page 27*

hands, and as soon as the uterine wall was divided he hooked it up also with two fingers. The child was next rapidly removed, and given to another assistant after the cord had been cut, and then the operator, dropping his knife, seized the contracting uterus with both hands and gave it a squeeze or two. He next put his right hand into the uterine cavity through the incision, and with two or three fingers dilated the cervix uteri from within outwards. He then cleared the uterus of clots and the placenta, which had by this time become detached, removing it through the abdominal wound. His assistant endeavoured, but not very successfully, to prevent the escape of the intestines through the wound. The red-hot iron was next used to check some further haemorrhage from the abdominal wound, but I noticed that it was very sparingly applied. All this time the chief "surgeon" was keeping up firm pressure on the uterus, which he continued to do till it was firmly contracted. No sutures were put into the uterine wall. The assistant who had held the abdominal walls now slipped his hands to each extremity of the wound, and a porous grass mat was placed over the wound and secured there. The bands which fastened the woman down were cut, and she was gently turned to the edge of the bed, and then over into the arms of assistants, so that the fluid in the abdominal cavity could drain away on to the floor. She was then replaced in her former position, and the mat having been removed, the edges of the wound, i.e. the peritoneum, were brought into close apposition, seven thin iron spikes, well polished, like acupuncture needles, being used for the purpose, and fastened by string made from bark cloth. A paste prepared by chewing two different roots and spitting the pulp into a bowl was then thickly plastered over the wound, a banana leaf warmed over the fire being placed on the top of that, and, finally, a firm bandage of mbugu cloth completed the operation.

Until the pins were placed in position the patient had uttered no cry, and an hour after the operation she appeared to be quite comfortable. Her temperature, as far as I know, never

rose above 99.6°F, except on the second night after the operation, when it was 101°F, her pulse being 108.

The child was placed to the breast two hours after the operation, but for ten days the woman had a very scanty supply of milk, and the child was mostly suckled by a friend. The wound was dressed on the third morning, and one pin was then removed. Three more were removed on the fifth day, and the rest on the sixth. At each dressing fresh pulp was applied, and a little pus which had formed was removed by a sponge formed of pulp. A firm bandage was applied after each dressing. Eleven days after the operation the wound was entirely healed, and the woman seemed quite comfortable. The uterine discharge was healthy. This was all I saw of the case, as I left on the eleventh day. The child had a slight wound on the right shoulder; this was dressed with pulp, and healed in four days.

## Egypt

The development of medicine in Egypt is thought to have started in the 3<sup>rd</sup> dynasty under the auspices of the 'original' doctor, Iemhetep. Various medical papyri, one of the most important being the Edwin Smith surgical papyrus have been discovered that point to early forms of surgery in the 3<sup>rd</sup> and 4<sup>th</sup> dynasties.<sup>13</sup> However, evidence of the use of dedicated methods of analgesia and anesthesia is rare and controversial. Historians have conjectured that there are probably writings that have not yet been discovered that may discuss specifically about methods of analgesia and anesthesia. Others argue that many of these procedures could have been carried out without much concern for analgesia and mostly depended on the high pain threshold of the patients and the strong hands of the surgeon and his helpers. In a bas-relief from the tomb of Ankh-Ma-Hor, there is depicted a circumcision where the helper holds the patient's hands in the air and is told, "hold him fast, do not let him fall," probably guarding from loss of consciousness due to pain.

Yet another passage reads:

The surgeon should be young and youthful or in early middle age with a strong and steady hand, as expert with the left as with the right, with vision sharp and clear and spirit undaunted; so far void of pity that while he wishes only to cure his pa-

tient, yet is not moved by his cries to go too fast or cut less than is necessary.

Neurosurgery is known to have been practiced in Egypt and there is evidence of use of ground marble mixed with vinegar for local anesthesia.<sup>14</sup>

Just as in the case in Uganda where there was use of heat during surgery, the Egyptians were also known to practice cauterization, a method called *Wasm* or *Kaii*. "The instrument for cauterization is usually a metal rod, pointed at one end or often bent at the top into a crescent shape. Cauterization and the use of heat for therapy have been known to the Egyptians as early as 3000 BC for the treatment of tumours (breast 1930)."<sup>15</sup>

There is evidence that mandrake was known in early Egypt as was its narcotic effects but there is no direct evidence of its use in medicine. This use, however, is still an issue under debate among etymologists.<sup>16</sup>

The Hearst papyrus contains mention of a herb used for relief of pain. The herb is called 'senutet' and is a member of the *Convulvulus* family.

There is a herb, senutet is its name, it grows on its belly like the kadet and its flowers are like the lotus. Its shoots are found like whitewood. Gather it and smear it on the groins, then it (the pain) subsides immediately. Its seeds, made into a cake are given for pain.

The Hearst papyrus also contains mention of use of wings of the scarab beetle for pain relief. Animals are also seen in the Ebers papyrus which mentions use of a crushed mouse to relieve stiffness.

The use of opium in Egypt is also hotly debated with no direct evidence for its use. However, the possibility is very high that it was used given the contacts and close proximity of Egypt with Mesopotamia where opium is known to have been used.<sup>17</sup>

Alcohol, just as we saw previously in Uganda is also seen in Egypt with various beers being seen in the medical papyri and with some evidence that mandrake fruit was added to grain beer. The use of mandrake in beer is documented in a papyrus where "Ra conquers Hawthir by spiking her beer with mandrakes thus putting her in a deep sleep (50)."<sup>18</sup>

One passage in a medical text dealing with kidney disorders reads "If a man is to get drunk, tie up flour and boxwood in linen and put it into wine and have him

drink it and he will get drunk.”

This passage in the context of kidney treatment leads some historians to think that the alcohol was probably used as a sedative and analgesic. Yet others argue that it was the additions of frankincense and myrrh that gave beer its analgesic and anesthetic properties.

Hypnosis may also have played a role in analgesia and anesthesia. “Brief hypnosis intervention may reduce post surgical perceived pain intensity, perceived pain effect and anxiety, decrease comorbidity and enhance post surgical recovery and rehabilitation.”<sup>14</sup>

### KhoiKhoi

The Khoikhoi are an indomitable tribe in the Southern parts of Africa and have been made famous in the west by the movie **The Gods Must Be Crazy** (Jensen Farley Pictures, 1982, 20<sup>th</sup> Century Fox). The KhoiKhoi however were not crazy in their use of the plant *sceletium tortuosum* for various uses. This plant is native to South Africa produces euphoria and is today even marketed in the west. The Khoisan used the plant for various activities. They would chew the plant for a mild anesthetic effect in the mouth and they took this opportunity to extract teeth especially in children. One of the terms used to refer to the plant is Tandtrekboos which means ‘tooth pull brush.’<sup>19</sup>

### Nigeria

Traditional bonesetters have been around in Nigeria since early times and are indeed still in operation today, in part because doctors are still scarce and in part because they are cheaper than western trained doctors. One of the herbs that these traditional bonesetters have used for pain control is *Tabernaemontana crassa*. Agwu and Akah<sup>20</sup> conducted a study to test the effects of this plant and found that it does indeed have anesthetic properties:

Used a local anesthetic during traditional orthopedic painful procedures such as bonesetting. The steam from the boiling leaves is applied to the painful joint before bonesetting and the boiled leaves are placed over the affected area for 30 min after the procedures. It is claimed this helps prevent swelling at the joints. The hot water extract of the leaves appears to contain pharmacologically active principles with local anesthetic properties. The intensity of anesthesia appears to be dose related and to compare well with that of

procaine. It is obvious that the extract is potentially a good local anesthetic agent since the effect is reversible. The ability of the extract to cause both infiltration and nerve block anesthesia is very desirable. The rapid onset of action with moderate duration is worthy of note and makes it useful for short periods procedures such as a bone resetting.<sup>19</sup>

### Gusii tribe, Kenya

The Gusii in Kenya have for ages carried out craniotomies performed by skull surgeons called Omobari with the some of the main indications being acute cranial trauma and headache. There is a description of what we can infer is an attempt to provide anesthesia/analgesia is where the sap from a banana tree is used to bathe the wound during surgery so as to ‘cool the wound.’<sup>11</sup>

### Conclusion

As seen above, there is evidence that Africans were involved in numerous surgical procedures and used various herbs, plants and concoctions to achieve analgesia and anesthesia during these procedures. This evidence is scarce and scattered and more research is warranted. This scholarship is not only important for historical reasons but explores the possibility that there are agents that we could apply to our practice of anesthesiology today. Indeed, we should think of Africa as not only the cradle of mankind but the home of some of the earliest anesthesiologists!

### Acknowledgements

I would like to acknowledge the tireless dedication of my lovely wife Melissa whom God found fit to bless me with. I would also like to acknowledge the support of Dr Michael Avidan, Associate Professor of Anesthesiology and Surgery, Washington University School of Medicine, and Dr Michael O’Connor, Professor of Anesthesia and Critical Care, Department of Anesthesia and Critical Care, University of Chicago. I tried to give dates whenever possible and where there are none it is because specific dates were not available. I also tried to keep this discourse ‘African-focused’ and therefore shied away from giving broader historical contexts. The description of the operation in Uganda is long; I made attempts to shorten it but every time I did, I felt it lost some of its impact. I took the liberty to leave it as is. Finally, I would like to dedicate this article to my son Kaeri Muruthi Mukora. I love you son.

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Australian Society of Anaesthetists

Suite 603, Eastpoint Tower, 180 Ocean Street, PO Box 600, Edgecliff, NSW 2027, Australia

t 61 2 9327 4022 | f 61 2 9362 9139 | e [aic@fed.asa.org.au](mailto:aic@fed.asa.org.au)

# Royal Operations

By Fredric Jarrett, MD, FACS, FRCSC  
 Clinical Professor of Surgery  
 University of Pittsburgh Medical Center  
 Pittsburgh, Pennsylvania

## Caroline of Ansbach and George II

On November 9, 1737, Caroline of Ansbach, the wife of King George II of England, was stricken with abdominal pain and sustained several episodes of vomiting described as severe colic. She had been married for over 30 years and although originally slender and attractive, five children, innumerable royal banquets and a lack of exercise had taken their toll.

An apothecary was called and the queen was given a couple of contemporary quack remedies (cordials, mint water and brandy) purged, blistered, and given an enema. The following day the apothecary repeated the same treatment, all without benefit. At that time, the last thing one did when a patient had abdominal pain was call a surgeon, and the next to last thing one did was to call a physician. Finally, two physicians were called in the following day. The next day, John Ranby, the king's surgeon, was called to the palace. It was considered inappropriate at the time to take a medical history as we know it now from royalty. Unless details of an illness were spontaneously volunteered they were not elicited. Likewise it was very unusual to perform an adequate physical examination on royalty and Ranby was probably the first individual to examine the queen, after the king described the hernia to him. To his horror, he found an enormous strangulated umbilical hernia. Multiple consultations were obtained from a number of other surgeons, probably in an effort to dilute the responsibility for an unfavorable outcome. Discussions were held with Ranby.

In those days, two operations were possible. One was the more radical of the two and involved incising the neck of the hernia to release the obstruction, much as we would today. If the bowel was not gangrenous and could be reduced into the abdominal cavity this operation might be successful even in the absence of general anesthesia, although it might be quite difficult and this operation had an 80% mortality at the time. The second operation was more palliative and consisted of incising the anterior surface of the hernia to allow some fluid to escape. It obviously did not address the underlying pathology but allowed the surgeons to buy additional time. This

was the operation that Ranby chose which was performed the following day.

As could be predicted, there was no significant benefit and the next day the edges of the wound became gangrenous. The king was distraught with misery and guilt. The queen advised, "When I die, I want you to marry again." "No," said the king, "I will never marry again. I will just live with other women." This was a high compliment at a time when few royal marriages had an amorous component. The queen spent the following three days in agony until finally the intestines ruptured and she died bravely, ten days after the onset of her illness.<sup>1</sup>

At the time, elective abdominal surgery and general anesthesia were virtually unknown and emergency operations had a prohibitively high mortality rate due to sepsis and bleeding. Today, umbilical hernias are almost always repaired electively by an operation which requires approximately 20 minutes of operative time. The procedure can be done with local anesthesia or light general anesthesia, since unless the hernia is quite large, the operation requires minimal muscular relaxation.

King George II (1683 – 1760), also known as George Augustus, came to England in 1714 in accordance with the Act of Settlement. He had the typical education of a German prince, although unlike his father, he was multilingual. He married Caroline of Ansbach in 1705. During his life he had a tempestuous relationship with his father, George I, and later with his own son. He suffered poor health from gallbladder disease and required surgery for an anal fistula. He also had a number of mistresses and illegitimate children.

While visiting Hanover in 1735, he became enamored with a courtesan, Amelia Sophia von Walmoden, whom he "acquired" for 1,000 ducats, after consulting with his wife during the negotiations. Keeping of a foreign mistress made him somewhat unpopular with the British, as her cost was considerable. The king visited her shortly after his wife's death for *soulagement*.

George survived until 1760, when while in the toilet, his valet heard a noise "louder than the royal wind," accompanied by a groan. His valet found that he had fallen

and cut his face on a piece of furniture. When placed supine doctors were called. Attempts to bleed him were unsuccessful for the simple reason that he was already dead. Autopsy findings were of a ruptured right ventricle and hemopericardium, an empty left ventricle and "a transverse fissure" approximately an inch and a half long, in the aortic wall and aortitis, probably syphilitic in origin.<sup>2</sup>

## Edward VII

Edward VII, son of Queen Victoria, succeeded to the throne in 1901, after his mother's 64 year reign. He had a strained relationship with Queen Victoria after his "irresponsible behavior" while serving with the army in Ireland in 1861 caused her to hold him partly responsible for the death of his father, Prince Albert. Thereafter he was largely excluded from affairs of state and court. No one had waited longer to become king and Edward proclaimed that the coronation would take place in London on June 24, 1902. Twelve days prior, he developed peri-umbilical pain while reviewing troops. He vomited and the pain progressed to the right lower quadrant. The king's physician, Sir Francis Laking, was called and realized that the king was seriously ill. Sir Thomas Barlow, Physician-Extraordinary to the king, was called in for consultation. Fever and rigors occurred, and the tenderness localized to the right lower quadrant. Heavily sedated, Edward returned to Windsor Castle and refused to see surgeons, fearing that public knowledge of surgical consultation would upset the arrangements for his coronation. Edward temporarily improved and insisted on returning to London on June 22. The capital was full of royal visitors and foreign dignitaries. Sumptuous banquets were planned for after the coronation. Edward would not be denied these long awaited festivities and hosted a tremendous banquet on the evening of June 23. By the next morning he was desperately ill. Lord Joseph Lister consulted with Sir Francis Laking and once again urged him to have the king seen by a surgeon. Lord Lister explained to the king that all his medical advisors agreed that an opera-

*Continued on Page 32*

## Operations. . . *Continued from Page 31*

tion was urgently necessary. Edward refused, saying, "I must keep faith with my people and go to the Abbey for the coronation."

Sir Frederick Treves was summoned. He had performed some of the first appendectomies in Great Britain at a time when the operation still carried a high mortality and morbidity rate.<sup>3</sup> It was often done only after an appendiceal abscess had formed. Treves was an intellectually gifted individual who had been a registrar at the London Hospital. At that time, he predicted to his colleagues that he would ascend to the staff of the London Hospital, become a millionaire, be knighted, retire in his early 50's, sail around the world and write travel books. Naturally, he had few friends.

He advised King Edward, "Sire, we must operate today." Edward declined and repeated, "Tomorrow I must be in Westminster Abbey for my coronation." Treves predicted, "Sire, if you are in the Abbey at all tomorrow, it will be in your coffin."<sup>4</sup> Edward reluctantly consented to an operation and the coronation was delayed. Frederick Hewitt (later knighted) administered the anesthetic. A long incision was required because of Edward's obesity. A large abscess was evacuated, drained with two tubes and packed with gauze.

Edward's postoperative course was gladly smooth. His temperature returned to normal, his drains were removed, and wound gradually healed in. Within two weeks, the *British Medical Journal* described the progress of the wound and "In view of the fact that sinister stories continue to be manufactured and to be printed, it may again be stated as emphatically as possible, that during the operation no trace of malignant disease was observed, that no suspicion of the kind has arisen since, and that his medical attendants are quite satisfied that His Majesty's constitution is thoroughly sound."<sup>2</sup> On August 9, 1902, just seven weeks after what was at the time a major operation, Edward's delayed coronation took place.

Laking and Treves were made baronets shortly thereafter, and Lister was one of the first recipients of the Order of Merit, created by Edward. Treves became a millionaire and elective appendectomy became a very fashionable operation among London society women. He gave up his staff appointment at the London Hospital, bought a yacht, sailed around the world and wrote travel books. He wrote **The Elephant Man** which was eventually made into a movie. In actuality, Treves never re-

moved the king's appendix, but merely drained an appendiceal abscess.<sup>5</sup> Treves eventually died in Switzerland of peritonitis of unknown cause. Whether or not this was due to a ruptured appendix is not subject to adequate confirmation.

The history of acute appendicitis is a fascinating one. This entity is probably the most frequent acute abdominal disease in the western world requiring operation, yet it is only recently in history that its etiology and treatment has become adequately understood.

Lorenz Heister in 1753 was one of the first to observe an inflamed appendix, this being at the autopsy of a convicted criminal.<sup>6</sup> Several years later in 1759, Mestivier performed an autopsy of a 45 year old man who had died after an incision of a large lower abdominal abscess.<sup>7</sup> The cecum was found to be gangrenous and the appendix contained a large encrusted pin. They assumed that the pin had irritated the wall of the appendix leading to the abscess formation. This case report was heavily quoted at the time and may have contributed to the view that appendiceal inflammation was caused by incarceration of foreign bodies.

Morgagni (1761) in **De sadibus et causis morborum per anatomen indigetis** described approximately 700 case reports,<sup>8</sup> but in only one case was the appendix discussed, that being an elderly man who died of severe abdominal pains and signs of shock, in whom the cecum and the retroperitoneal muscles were found to be inflamed and gangrenous. Morgagni believed that the psoas muscle was the primary site of the inflammation and this view clouded the interpretation of appendicitis for over 100 years. The condition became known as "Psoitis." Gottfried Goldbeck in a thesis submitted in 1830 in Giessen had in his autopsies repeatedly found the appendix to be inflamed; but he also believed that the process began in the retroperitoneal tissues and involved the appendix secondarily.<sup>9</sup> He coined the term peri-typhlitis which persisted into the 20<sup>th</sup> century. Morgagni's misconception of an extra-appendicular pathogenesis for appendicitis was thus perpetuated by Goldbeck in Germany and also by the enormously influential Dupuytren in France.<sup>10</sup>

Two English physicians, Richard Bright and Thomas Addison of Guy's Hospital in a textbook published in 1839 proposed the appendix as the origin of the problem, but their theory gained little credence since therapy was limited to non-operative measures, rarely successful.<sup>11</sup>

In the second half of the 19<sup>th</sup> century,

appendicitis was gradually and hesitatingly appreciated as a disease entity. In 1886, Reginald Fitz, a Boston pathologist described the pathology of acute appendicitis and noted that up to 35% of patients treated by traditional non-operative therapy died from acute peritonitis.<sup>12</sup> On the basis of 500 autopsies, Fitz was able to demonstrate that peritonitis was caused by perforation of the inflamed appendix, and he proposed the term appendicitis and recommended appendectomy at an early stage.

Charles McBurney of Roosevelt Hospital in New York described a small right lower quadrant incision which, with modifications is the muscle splitting incision currently used for open appendectomy.<sup>13</sup> He also described what has become known as "McBurney's point" in 1889. At the same time, Lewis L. McArthur of Chicago described the same incision as McBurney.

Harvey Cushing in 1897, while a surgical resident at Johns Hopkins experienced symptoms of appendicitis a week after one of his patients had died following operation for appendicitis. Cushing made the diagnosis of acute appendicitis, but both Halsted and Osler were reluctant to operate until Cushing prevailed and operation was performed nearly 24 hours after the onset of symptoms. Cushing wrote his own admission history and physical as well as his own pre- and post-operative orders.

## King Saud

Dr. Francis D. Moore (1913-2001), chief of surgery at the Peter Bent Brigham Hospital was one of the truly superior intellects of the 20<sup>th</sup> century, and inspired countless medical students toward a career in surgery.<sup>14</sup> His contributions in transplantation, metabolic care and surgical nutrition were seminal in the literal sense of the word. Dr. Moore was committed to his students and his residents, many of whom became prominent surgical investigators.

His rounds and his conferences were always illuminating. Dr. Moore was *never* interrupted during his student conference with telephone calls. But in 1961, he was interrupted by his secretary with an urgent telephone call from the state department. He was asked to leave that afternoon for Saudi Arabia to attend to King Saud (age 59) who was sick and whose doctors had requested Dr. Moore. King Saud was the son of Ibn Saud and had succeeded his father in 1953. He was known as somewhat of a spend-thrift.

Dr Moore had previously established contacts with ARAMCO and its physicians. Shortly after his arrival in Riyadh, he was taken to see the king who was nearly to-



tally blind from cataracts but was also suffering from recurrent chest and abdominal pain and had developed ventral and groin hernias. He had been evaluated by British specialists who did not think he was having a heart attack.

It was decided that the King would be taken to Boston for surgery to be performed at the Peter Bent Brigham Hospital. For this ARAMCO hired a large jet that could accommodate about 100 people which was filled with the king and his immediate family, his chief of state and a large entourage including four of his favorite concubines. To appropriately house all of these people in Boston was a major logistic problem in and of itself, part of which was where to house the four concubines. Since this was an extremely delicate issue, it was decided that they would be housed in the student nurses' dorm under the assumption that the student nurses would exert a positive moral influence on them.

Fortunately the hospital administrator was of Lebanese decent and spoke Arabic fluently. The king's following included a couple of key people, one of whom was called the announcer. He was a large black slave who Dr. Moore described as being about seven feet tall. Remember that Saudi Arabia became a kingdom in 1932 and did not abolish slavery until 1963. There were many black slaves from the horn of Africa whose families had paid for an obligatory trip to Mecca with one of their offspring. He apparently was bare chested and carried a loaded automatic rifle and two bandoliers of ammunition crosswise across his chest.

His job was to announce to everyone what was going on. But his other talent was that he could hold a steaming pot of coffee at arms length over his head and pour this into a small cup which he held in his other hand as low as possible. This provided a source of admiration for all present.

The King was extensively evaluated by the Brigham staff. X-rays found many small bullet fragments in his body which were from low velocity missiles from the many raids and battles in which he fought along side his father, Ibn Saud. Dr. Moore repaired his abdominal and inguinal hernias and explored his abdomen. It was evident that he was suffering from severe liver cirrhosis. Even though devout Muslims are not supposed to drink alcohol, cirrhosis is quite common in the Middle East. The etiology of the cirrhosis in the king's case was not addressed. The King eventually had his cataracts repaired by Dr. Trygve Gundersen. Once his eyesight was restored

his first move was to dismiss all four concubines.

At the time of the King's operation, Tom Yawkey, president of the Boston Red Sox, was a patient on the floor below and had asked to meet the King. He made a short, polite speech saying that he hoped the King might come to a Red Sox game before his return to Saudi Arabia. After what had been planned extensively, he presented the King with a brand new baseball autographed by the entire Red Sox team. After polite acknowledgement, smiles and bows the King examined the baseball carefully. Staring at it, feeling it, turning it over in his hand, then he held it up to the light and slowly asked his interpreter "what does one do with this object?" Before anyone could reply he asked for a pen, autographed the ball and returned it to Mr. Yawkey.

The king enjoyed giving gifts, which were distributed to all 179 patients in the Brigham at the time. Gold Swiss watches with his picture on the face were distributed to the airplane crew and all the men on Dr. Moore's service. Dr. Moore was given a silked flowing robe along with a jeweled headband, gold-plated belt and dagger.

After he recovered from surgery the King and his group rented a large villa in Palm Beach. Dr. Moore as well as Dr. Gunderson, and their wives were invited to visit and the King hosted a large dinner. Dr. Moore and his wife realized that it was probably the first time women were guests at a King's dinner. Unfortunately, the King spent so much time in the United States with his surgery and recovery that he was deposed in 1964 and ultimately died of a heart attack while in exile.<sup>14</sup> His brother Faisal, who was a Princeton graduate and married to an American, became king but unfortunately was assassinated shortly thereafter.

Dr. Moore who had been appointed chairman of the department of surgery at the Peter Bent Brigham Hospital in 1948 shortly after finishing his residency at the Massachusetts General Hospital and nine years after receiving his M.D. from Harvard, was a proficient musician and ocean sailor. While at Harvard College he had co-authored the annual Hasty Pudding Show with Alistair Cooke, and was president of *The Harvard Lampoon*. His investigations into burn victims after the Coconut Grove fire in 1942 shed new light on the care of burn victims. Dr. Murray Brennan, a former resident, pointed out that Dr. Moore, with 17 grandchildren was one of the few people who had more honor-

ary degrees than grandchildren. Dr. Moore died in 2001 at the age of 88.<sup>15</sup>

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## Book Review

### The Art of Anaesthesia, third edition, by Paluel J. Flagg. Philadelphia: J.B. Lippincott Co., 1922, 371 pages.

By David S. Palilla, M.D.  
Massachusetts General Hospital  
Harvard Medical School  
Boston, Massachusetts  
and

Theodore A. Alston, M.D., Ph.D.  
Massachusetts General Hospital  
Harvard Medical School  
Boston, Massachusetts

There were seven editions of this classic text from 1916 (\$3.50) to 1944 (\$6). Formerly pricey (over three bucks for books about anesthesia!), the first three editions can now be read on-line for free at books.google.com.

A New Yorker, Flagg (Figure 1) was one of the first American MDs to concentrate in anesthesia (J. Roger Maltby, *Notable Names in Anaesthesia*, 2002). He had eponym status as the inventor of the Flagg Can, a simple device used to provide ether vapor from a spent ether container. According to Richard Kitz, the Can enjoyed use into the 1960s. Flagg also integrated batteries into laryngoscope handles. He was an eclectic inventor, one of whose patents was entitled “fan-control device for motor vehicles.”

One of Flagg’s passions was to prevent and treat neonatal and other cases of asphyxiation. This study culminated in the formation of the Society for the Prevention of Asphyxial Death, with Flagg serving as its first president. Flagg taught resuscitation for much of his academic career at Columbia, and his classes were of wide renown.

Flagg wrote beautifully, and the first pages of his book reveal a literary bent. His account of the history of anesthesia includes lines from *Cymbeline* in which Shakespeare implies knowledge of a secret narcotic able to safely “stupefy and dull the sense a while.” Flagg emphasized the importance of professionalism in anesthesia, an idea that had not solidified in America in 1922. Speaking of surgical trainees briefly providing anesthesia, he wrote, “Occasionally one sees a patient ... forgotten for the time being by the anaesthetist, because ... custom has, so to say, decreed that his work of ‘carrying the patient to the brink of the grave and leading him safely back again’ is not quite so important as holding the retractors and look-



Fig. 1. Paluel Joseph Flagg (1886-1970). The image was preserved by the Catholic Medical Mission Board, active today and founded by Flagg after he met leprosy victims in Haiti.

ing into the patient’s belly. Such a neglected patient ... may die, as has occurred not infrequently under precisely such conditions. In this case the anaesthetist is not discharged from the hospital for criminal negligence, but the cause of death is registered as cardiac failure or status lymphaticus, which, however, does not clear the anaesthetist of serious guilt, due to his negligence.”

Though Flagg felt that status lymphaticus, the supposed compression of the trachea by the weight of an enlarged thymus, was an over-diagnosed cause of anesthetic death, he did support the concept. He thus warned against overextension of the head “as this position by raising the thymus has a tendency to compress the trachea between it and the sternum effectually strangling the patient.”

Perhaps the most interesting chapter is

that entitled Emergency Anaesthesia. Flagg describes the hypodermic morphine-scopolamine technique. He tells how to test old samples of ether or chloroform for satisfactory quality. He shows how to fold a cloth into a proper ether cone to be fed by a nail hole in an ether can. He shows how to whittle a wooden mouth wedge. In hypotension, fluid can be given via the wound or else hypodermically. We learn that a “safety pin should always be fastened across the outer end” of a throat tube. The importance of improvisation is emphasized. For instance, if the anesthetist does not have access to the surgically draped face, ether can be given by open drop through the drapes.

Because of its era, the book neglects intravenous therapy, muscle relaxants, and cuffed endotracheal tubes. Flagg does go over a positive-pressure ventilator/resus-

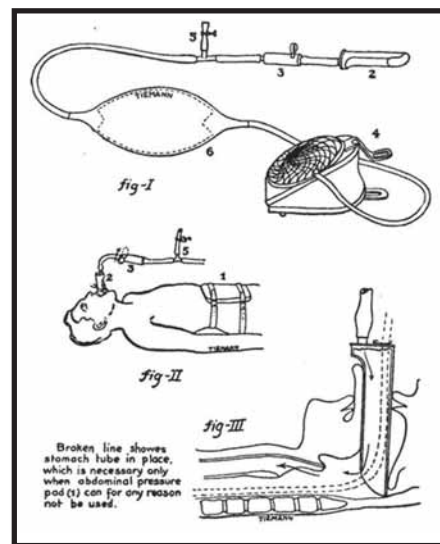


Fig. 2. “Artificial respiration and resuscitation by the Meltzer method.”

## Book Review

**Genius on the Edge. The Bizarre Double Life of Dr. William Stewart Halsted. By G. Imber. New York, Kaplan Publishers, 2010. Hardcover. 389 pp. \$33.00.**

*By Ray J. Defalque, M.D.*

*Department of Anesthesia*

*University of Birmingham School of Medicine  
Birmingham, Alabama*

This enthralling biography of Dr. W.S. Halsted was written by Dr. Gerald Imber, a professor of plastic surgery in New York. The author reviews Halsted's revolutionary contributions to modern surgery: the introduction of regional anesthesia; the rigorous surgical asepsis; the meticulous dissection, hemostasis and suturing; the challenging intestinal anastomoses; the development of cholecystectomy, radical mastectomy, aneurysmectomy and the surgery of the thyroid and parathyroid glands; and the creation of the residency training. The medical and surgical problems which led Halsted to his discoveries are clearly and simply explained for the lay reader.

Dr. Imber details the little known history of the John Hopkins institution and the role that Halsted, along with his colleagues Osler, Welch, and Kelly played in its success.

Halsted's many eccentricities are briefly mentioned: his fastidiousness in clothes, foods, smokes, and lodgings; his mysterious absences and European travels; and his reserved or distant relationships with his wife, family, colleagues and trainees. His addictions to cocaine then to morphine are alluded to, although with few details. But then Halsted never discussed this problem, except with Dr. Welch who stayed silent.

Dr. Imber's style is concise, elegant and lively, although occasionally marred by clichés and unwieldy expressions. On page 12, he mistakes trichloroethylene for trichlormethane as a synonym for chloroform. Incidentally, both Dr. Cushing, for his appendectomy, and Dr. Leonard Wood for his two brain surgeries, received chloroform.

This is Dr. Imber's first biography. Let us hope that he soon will regale us with other exciting profiles of masters of American surgery.

**Flagg. . .** *Continued from Page 34*

erator of Samuel J. Meltzer (1851-1920). That apparatus had remarkable features (Figure 2). A large tube, the introduced end of which carried a side-hole, was orally passed into the posterior pharynx. The side-hole directed gas from a foot-operated bellows to the glottis. The large tube pressed on the soft palate in order to occlude the nasal passage of gas. Interesting. Also interesting, gastric distention was prevented by a pressure pad secured over the stomach or was released via orogastric tube. The Meltzer airway is reminiscent of the LMA of Archie Brain.

Despite the title, much autobiographical information is included in Flagg's almost poetic *The Patient's View Point* (1922), reprinted in paper in 2008 and also published electronically on books.google.com. His book *The Art of Resuscitation* (1944) is well-illustrated and is also of rich historical interest.

# *History Matters!*

## International Symposium on the History of Anaesthesia

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**Year 2012 Laureate of the History of Anesthesia**

Doris K. Cope, M.D., Chairman  
[www.woodlibrarymuseum.org](http://www.woodlibrarymuseum.org)

Nominations are invited for the person to be named the fifth Wood Library-Museum Laureate of the History of Anesthesia in the year 2012. Deadline for receipt of nominations is July 1, 2011.

This program, established in 1994, has as its purpose increased recognition of the richness and importance of the history of our specialty by recognizing the work of scholars who have made singular contributions to the field. The honor is awarded every four years by the WLM Laureate Committee to an individual who has a demonstrable record of contributing over the years outstanding, original materials related to the history of our specialty as reflected by articles published in peer-reviewed journals, and/or in monographs. The first Laureate, Dr. Gwenifer Wilson of Sydney, Australia, was honored in 1996. The second Co-Laureates were Norman A. Bergman, M.D, FRCA, and Thomas B. Boulton, M.D., Ch.B., FRCA in 2000. The third Laureate was Donald Caton, M.D., in 2004, and the fourth was Dr. David J. Wilkinson in 2008.

The Laureate Program is international. Nominations are sought by physicians, not just anesthesiologists, as well as medical historians from the international history community.

Additional information may be obtained by contacting the WLM Laureate Committee at the Wood Library-Museum, 520 N. Northwest Highway, Park Ridge, Illinois 60068-2573. Please see the WLM website - [www.woodlibrarymuseum.org](http://www.woodlibrarymuseum.org) - for more information.

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Doris K. Cope, M.D., Editor  
200 Delafield Road, Suite 2070  
Pittsburgh, PA 15215  
U.S.A.