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THE HISTORY OF  
ANAESTHESIA SOCIETY  
PROCEEDINGS



VOLUME 47 2014

**Volume 47**

Includes list of Members  
2014

The History of  
Anaesthesia Society  
Proceedings

Volume 47

INCLUDES LIST OF MEMBERS

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## **Deaths**

No deaths of members were reported during the last year.

## **HISTORY OF ANAESTHESIA SOCIETY**

**Meeting at West Dean College, 19<sup>th</sup> - 21<sup>st</sup> June 2014**

**Organiser: Dr Ken McLeod**

The organiser is most grateful to Ms Miranda Hill and all her staff at West Dean College for the smooth running of the meeting and for their courtesy. Nothing was too great a problem. He would also like to thank Dr Ian McLellan for running the very successful partners' programme.

Dr Neil Adams, once again, took care of the smooth running of the audiovisual equipment, for which we are very grateful. He would also like to thank Dr Ann Ferguson for her supervision of the Registration Desk.

### **FUTURE MEETING 2015**

Falmouth Hotel, Falmouth

2<sup>nd</sup> and 3<sup>rd</sup> July 2015

Organiser: Dr John Pring

Email: [j.pring@talk21.com](mailto:j.pring@talk21.com)

### **The History of Anaesthesia Society Proceedings**

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# HISTORY OF ANAESTHESIA SOCIETY

## Council and Officers – June 2014

President	Dr John Pring, Penzance	2014-2016
Immediate Past President	Dr Anne Florence, Liverpool	2014-2015
Honorary Secretary	Dr Christopher Woollam, Norwich	2014-2016
Honorary Treasurer	Dr Kenneth MacLeod, Huntingdon	2014-2018
& Membership Secretary		
Honorary Editor	Brig Ivan Houghton, London	2014-2018
Honorary Archivist	Mr Patricia Willis, London	2014-2018
Webmaster	Dr Peter Featherstone, Melbourne	2014-2016

## Members of Council

Dr Ronald Lo, London	2013-2016
Dr Ian McLellan, Dorset	2010-2015
Dr Adrian Padfield, Sheffield	2012-2015
Dr Meinolfus (Wulf) Strätling, Cardiff	2010-2015
Dr Edward Young, Reading	2012-2015

## Honorary Members, UK and Eire:

Dr Aileen Adams CBE, Cambridge  
Dr C. Neil Adams, Bury St Edmunds  
Dr Thomas B. Boulton OBE, Reading  
Dr Peter M. E. Drury, Liverpool  
Dr Jean Horton, Cambridge  
Dr Ian McLellan, Dorset  
Dr Adrian Padfield, Sheffield  
Professor Sir Keith Sykes, London  
Dr David Wilkinson, London  
Dr David Zuck, London

## Honorary Members Overseas:

Professor Roger Maltby, Jasper, Alberta  
Professor John Severinghaus, Ross, California

For more information visit the website: [www.histansoc.org.uk](http://www.histansoc.org.uk)

## **EDITORIAL**

This is the forty-seventh volume of the History of Anaesthesia Society Proceedings and I am honoured that you should have elected me as the sixth honorary editor. The format of the Proceedings is now effective and well trusted and I have no intention to stray far from what has gone on before. The observant will have noticed that I am using a more economical font (Garamond) and I hope that I have improved legibility by using an unjustified right margin.

I hope that the list of members and their addresses will be useful for keeping in touch with other members, though for privacy the Council decided not to publish these online.

I must thank Dr Adrian Padfield for his help with the arrangements for the printing of the Proceedings.

## **LETTERS TO THE EDITOR**

Editor - I regret that my article on 'Anaesthesia and the development of intensive care of adults in England and Wales.' contained two errors.

The first is the omission of a single word: on what is page 47 in the printed version, the paragraph about insufflation anaesthesia says that it does not inflate the lung. Of course it does inflate the lung but it does not allow it to contract or 'exhale'. It should have said that it does not inflate the lung intermittently but I omitted the word 'intermittently'.

The bottom half of the last paragraph on page 70 should have read:

‘... 280 additional consultants per annum.<sup>19</sup> Other developments in the 1960s helped equip and encourage anaesthetists to become involved in intensive care: cardiac surgical patients needed post-operative intensive care. The first purpose-built ICU in England was built at the Cardiac Surgical ICU at Broadgreen Hospital, Liverpool in 1964, and expanded in 1971.<sup>20</sup> In general hospitals, anaesthetists had to treat post-operative respiratory failure when, for example, relaxants resisted reversal. Automatic lung ventilators became more commonly available and barbiturate poisoning, flail chest, asthma, myasthenia gravis etc. were treated by IPPV. Perhaps more importantly. . .’

I should be grateful if you could publish this letter and I offer my apologies for these regrettable mistakes.

Tony Gilbertson

Editor – I should like to apologise profusely to Dr Peter Featherstone for failing to acknowledge his hard work in compiling the Index for Volumes 36-45 in Volume 46 of the History of Anaesthesia Society Proceedings.

Adrian Padfield  
Former Honorary Editor

## West Dean College Meeting: Speakers' photographs



Dr Aileen Adams



Dr Neil Adams



Dr Silvia Baciú



Dr John Dick



Mr Robert Dorfman



Dr Lisa Grimes



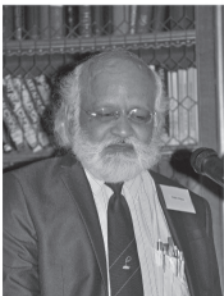
Dr Jean Horton



Dr Ian McLellan



Dr Adrian Padfield



Dr Yash Pole



Dr Wulf Strätling



Ms Janet Sinclair



Prof. Tony Wildsmith



Dr Ed. Young



Dr David Zuck



Dr John Pring  
President



Dr Anne Florence  
Past President



Dr Ken McLeod  
Organiser

## LIST OF DELEGATES

### **History of Anaesthesia Meeting, West Dean College, June 2014**

Dr Aileen Adams	Dr Paul Goulden	Dr Adrian Padfield
Dr Neil Adams	Dr Lisa Grimes	Dr Robert Palmer
Dr Sylvia Baciú	Dr Geof. Hall-Davies	Dr Yash Pole
Dr Moyna Barton	Dr Jean Horton	Dr John Pring
Dr Colin Birt	Brig Ivan Houghton	Dr Miles Rucklidge
Dr John Blizzard	Dr Chris Hutter	Dr Michael Skivington
Dr Elizabeth Bradshaw	Dr Mary Knowles	Dr Wulf Strätling
Dr Jennifer Caddy	Dr Ronald Lo	Dr Tony Wildsmith
Dr Henry Connor	Dr Kenneth MacLeod	Dr David Wilkinson
Dr Ian Corall	Dr Ian McLellan	Ms Trish. Willis
Dr John Dick	Dr David McCallum	Dr Ray Wise
Mr Robert Dorfman	Prof. Ronald Millar	Dr Chris Woollam
Dr Ann Ferguson	Dr Megan Montoya	Dr Ed. Young
Dr Anne Florence	Dr Peter Morris	Dr David Zuck
Dr Michael Gough		



## Two Sides to Every Story (Abstract)

**Dr Peter Featherstone**

Senior Registrar in Intensive Care Medicine, The Alfred Hospital, Melbourne, Australia.

*'Only those who dare to fail greatly can ever achieve greatly'*

**Robert F. Kennedy**

A triumph of modern scientific and clinical endeavour, liver transplantation has evolved to become the treatment of choice for chronic end-stage liver disease and for some cases of acute hepatic failure. Today, more than 20,000 liver transplants are conducted worldwide *per annum*,<sup>1</sup> and advances in surgical technique, anaesthetic management and immunosuppressive medication have resulted in overall one year survival rates that exceed 80%.<sup>2</sup> Despite this success, the early years of human liver transplantation were beset by failure. Eyewitness reports from this period make for tragic, yet compelling reading, recording heroic surgical procedures in desperately ill recipients, along with vivid descriptions of the complications encountered.

Volume Twelve of *The History of Anaesthesia Society Proceedings* contains one such account, written by the late Dr Elizabeth Gibbs.<sup>3</sup> This outlined the experience of single-handedly anaesthetising the recipient of the first liver transplant to be undertaken at Addenbrooke's Hospital, in June 1967. At the time, Gibbs was a newly appointed senior registrar and entirely unaware that such an operation was even possible. Arriving in theatre one morning, expecting to anaesthetise a patient for a cholecystectomy, she was informed that there had been a change of plan, and Professor (later Sir) Roy Calne would be attempting a liver transplant instead. Despite her best efforts, Gibbs was unable to obtain the assistance of a consultant anaesthetist, and met the patient, a jaundiced middle-aged man, for the first time

when he appeared in her anaesthetic room. No specific preparation had been made for the operation and the anaesthetic technique used for renal transplants was hastily adapted. Physiological monitoring comprised her hands, eyes and a sphygmomanometer, and intravenous access consisted of two peripheral drips. Faced with massive intraoperative bleeding, Gibbs and her anaesthetic nurse transfused a total of 54 pints of citrated blood, which they attempted to warm by placing the tubing of the giving set in a bowl of hot water. Despite the best efforts of the team, the patient died from uncontrollable haemorrhage 19 hours after the start of the initial procedure.

While this tragic outcome might have been acceptable in the early days of liver transplantation, Gibbs included an unsettling postscript to her manuscript. This stated that all of the patient's records had apparently been 'lost', and the date of the first Cambridge liver transplant was publically reported as 2<sup>nd</sup> May 1968, some eleven months after the events described.

This paper outlines the results of research aimed at critically appraising this postscript. Unfortunately hopes of rapidly settling the matter were dashed when it indeed proved impossible to locate any of the clinical records relating to the case. It was therefore necessary to assess the validity of Gibbs' statements with reference to the accepted historiography of liver transplantation, before examining the accuracy of this body of work itself. In doing so a number of unexpected discoveries were made. These highlight some important lessons for medical historians and demonstrate that if you look hard enough, there really are two sides to every story.

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## Dudley Wilmot Buxton (1855-1931)

Jean Horton

Former President of the History of Anaesthesia Society, Cambridge

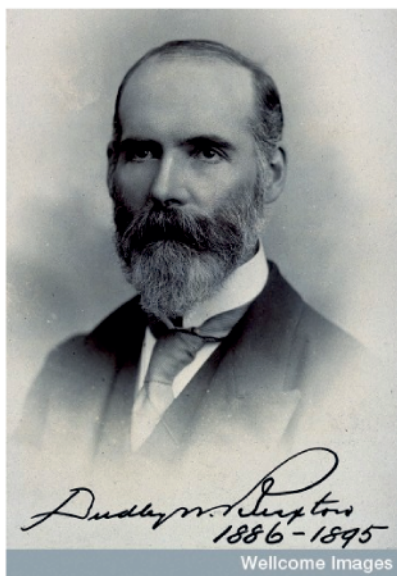


Figure 1: Photograph of  
Dudley Wilmot Buxton.  
Wellcome Library

Dr Dudley Wilmot Buxton was one of the foremost anaesthetists of his day, that is in the late Victorian, Edwardian and the early part of the reign of George V. He was born in St John's Wood, London on 28<sup>th</sup> June 1855, the second son of Mr Harry Wilmot Buxton who was a barrister of the Middle Temple and Louise Buxton.

One obituary said that he was educated privately (*BMJ*)<sup>1</sup> and the other that he was educated at private schools (*The Lancet*).<sup>2</sup> The fact that he could have been educated privately was because in the 1881 census in his father's household there is

a Swiss governess.<sup>3</sup> Whichever it was, it was probably because he had a cleft palate. My father, who was a medical student at University College Hospital, was taught anaesthetics by Dudley Buxton and he used to imitate Buxton's way of speaking which was typical of someone who had a cleft palate. Also in his obituary in the *Lancet* of 4<sup>th</sup> July 1931,<sup>2</sup> it mentions that he was an indefatigable instructor of anaesthetics, and that he had triumphed over difficulties of elocution. Furthermore in FF Cartwright's 'Eminent Anaesthetists No 8'. 'Dudley Wilmot

Buxton', it states that he suffered from a severe speech defect.<sup>4</sup> Also if you look at his photographs you can see that this is the typical face of someone who has a cleft palate.

After his private education he went on to study medicine firstly at University College London (UCL) and then in 1878 to University College Hospital (UCH).

He was a successful student and qualified as a doctor in 1882 with the conjoint diploma MRCS, LRCP, and MB, BS with honours.

He was then a house surgeon and house physician at University College Hospital (UCH), took the MD (London) in 1883 and became an MRCP (London)<sup>1</sup>, in 1884.

Undecided about a career path he was appointed as an assistant to Sidney Ringer, the Professor of Medicine at UCL and UCH. Sidney Ringer was famous, amongst other things for Ringer's Solution, the isotonic solution containing sodium chloride, potassium chloride, calcium chloride and sodium bicarbonate. While working with Ringer, Buxton edited the fourth edition of Waring's *Therapeutics* and also undertook the investigation of the action on the heart of acids, alkalis and cocaine. Edward John Waring (1819-1891) was a surgeon in the British Indian Army, where he was interested in materia medica, especially for the local Indian population, and so wrote '*Practical Therapeutics*' for the other doctors with the Indian Army.<sup>5</sup> In 1883 when in England he was becoming blind and so Dudley Buxton helped him with the 4<sup>th</sup> edition.

Thus Dudley Buxton was on his way to being a physician, but was also interested in the physiological actions of nitrous oxide, ether and chloroform, so in 1885 he decided to specialize in anaesthetics and was appointed as an anaesthetist to University College Hospital, The Royal Dental Hospital, The National Hospital for Nervous Diseases in Queen Square and the Hospital

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<sup>1</sup> Member of the Royal College of Physicians

for Women in Soho Square. During the Great War or World War One he also was an anaesthetist at the King George V hospital in Stamford Street (where incidentally women doctors were not allowed to apply for posts).

In 1888 he published his experience in anaesthesia in the textbook '*Anaesthetics, their uses and administration*'. This was a popular and practical textbook, of which there were few available at the time for anyone interested in anaesthetics<sup>6</sup>. This book ran for 35 years and reached a sixth edition in 1920.

As well as his work as an anaesthetist at UCH and the Royal Dental Hospital he taught medical and dental students how to administer anaesthetics at both hospitals. As I have mentioned before, he taught my father, who used to imitate Buxton's cleft palate speech, but he must have also been well taught, because when I was about 10 years old he gave me nitrous oxide for dental extractions in the dentist's surgery. Dudley Buxton may also have taught my grandfather who qualified in 1894. He was known as an indefatigable teacher who had considerable influence among the medical profession. One of his great desires was that when a doctor went into practice, that he should have a competent knowledge of how to administer an anaesthetic. To this end, amongst other activities, he published an article in the British Medical Journal of April 27th in 1901 'On the advisability of the inclusion of the study of anaesthetics as a compulsory subject in the medical curriculum'<sup>7</sup>. Dr J Frederick W Silk of Guys Hospital had already published a similar article in the Lancet in 1892 entitled 'Anaesthetics, a necessary part of the curriculum'<sup>8</sup>. In the British Medical Journal of September 7<sup>th</sup> 1912 the General Medical Council eventually saw the light and stated that anaesthetics was now to be included in the undergraduate curriculum.<sup>9</sup>

His lecture notes on anaesthetics given to the students at UCH, are deposited in the Wellcome Library in Euston Road.<sup>10</sup> The lectures, four in number, and dated 1911, which was a year before



the General Medical Council said that anaesthetics should be part of the undergraduate curriculum. The lecture notes are handwritten on foolscap paper in a clear hand, (so much for the anecdotes about the handwriting of doctors).

Amongst his papers at the Wellcome Library there are also lecture notes for dental students at the Royal Dental Hospital, where he also perfected the chair-side administration of nitrous oxide and air or oxygen for dental extractions.

Also amongst the papers deposited at the Wellcome Library is an article entitled “The Story of Anaesthesia” written in 1922 after he had retired, on foolscap size paper, and typed (Progress). This was one of the best histories of early methods of producing anaesthesia before the introduction of nitrous oxide, ether and chloroform, that I have read. Of particular note are his descriptions of the early use of mandrake.

### **Anaesthetic Instruments Designed or Modified**

He designed or modified several pieces of anaesthetic equipment. Most of his own or modified instruments can be found as illustrations in his textbook. ‘Anaesthetics: their uses and administration’



Figure 2: Dudley Buxton mouth gag. Courtesy of the Hunterian Museum of the Royal College of Surgeons



Figure 3: Dudley Buxton modification of Clover's ether inhaler. Courtesy of the Hunterian Museum of the Royal College of Surgeons



Figure 4: Dudley Buxton modification of Junker's inhaler. A chloroform bottle. Courtesy of the Hunterian Museum of the Royal College of Surgeons



## Committees

His expert knowledge of anaesthetics and their practical application led to appointments to numerous committees of inquiry, particularly with reference to chloroform and its high mortality.

The story of the two Hyderabad Commissions on chloroform has been told many times, the best article being 'Chloroform: commissions and omissions' presented in 1974 by Dr K Bryn Thomas at a meeting of the Section of Anaesthetics of the Royal Society of Medicine.<sup>11</sup>

Dudley Buxton made a valuable contribution and edited the summary that was published in the Lancet in 1893.<sup>12</sup>

In summary these were:-

That ether is the safest anaesthetic for major surgery.

That nitrous oxide should replace chloroform in minor surgery.

That chloroform is never devoid of risk.

That the death rate under chloroform had been unduly high and could be lowered by improved methods and greater care.

That every anaesthetic required the undivided attention of a trained medical man.

In 1901 The British Medical Association set up a third Chloroform Commission to 'investigate methods of quantitatively determining the presence of chloroform in the air and the living body'.

Dudley Buxton acted as secretary and the other members were Sir James Barr, a physician from Liverpool, Vernon Harcourt a chemist from Oxford and designer of the chloroform regulator, Sir Victor Horsley the neurosurgeon, Sir Charles Sherrington, physiologist and Nobel Prize winner in 1930 and Dr A D Waller (Chairman) a physiologist,

In their final report in the British Medical Journal in 1910 the committee stated that chloroform doses above 2% were unsafe as cardiac arrest occurred under inhibition of the vagus nerve. They also deemed these inhalers (Vernon Harcourt inhaler) suitable for giving accurate measures of chloroform.<sup>13</sup>

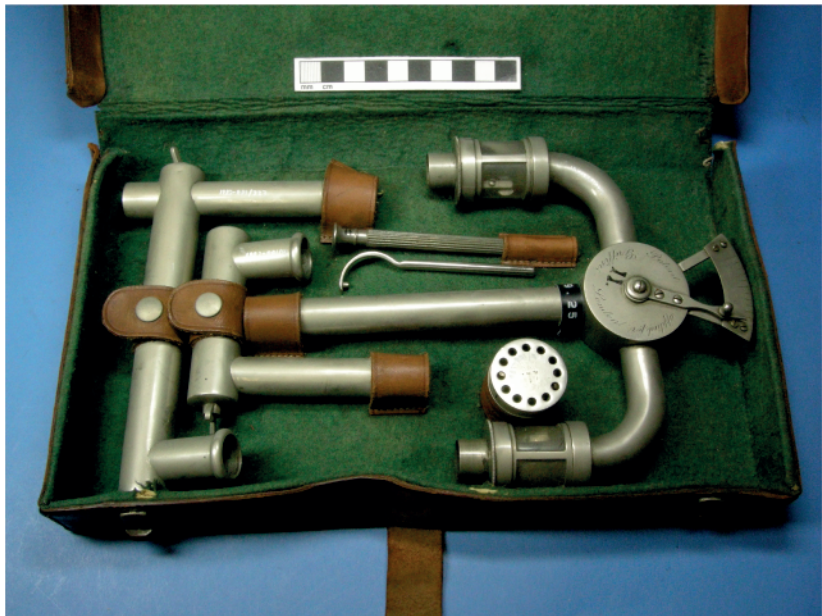


Figure 5: Vernon Harcourt Inhaler in leather case. Courtesy of the Hunterian Museum of the Royal College of Surgeons

## **President of Societies**

Dudley Buxton was a founder member and then President of the Society of Anaesthetists, which later became the Section of Anaesthetics of the Royal Society of Medicine in 1908 (once they had agreed to admit women as fellows). He was President of the Section of Anaesthetics of the British Medical Association, and President of the Section of Anaesthetics at the International Medical Congress held in London in 1913.

## **What was he like? What did he look like?** <sup>4, 16</sup>

He was tall and with a beard, as can be seen in his photograph, wore a grey frock coat and grey top hat, and was a familiar figure in Wimpole Street and Harley Street, carrying his bag of anaesthetic equipment from the consulting rooms of one dentist to another dentist. With his family he lived at 83 Mortimer Street, which is in walking distance of Harley St and Wimpole St. He was like a typical Victorian *Paterfamilias* and as a teacher of anaesthetics was a strict disciplinarian, a martinet. So successful was his undergraduate teaching that it was said that a University College Hospital student could always be recognized by his ability to give a competent anaesthetic.

## **Retirement**

He retired from his London practice in 1919, said to be due to ill health, but he was then 64 years of age, a time when many present day anaesthetists would have retired anyway. He had built a house in Boxmoor, Hertfordshire, where he went to live, but found that gardening did not fill his time satisfactorily, and so he used to give anaesthetics at the West Herts Hospital and also taught the nurses. During his retirement and when the British Journal of Anaesthesia had been founded in October 1923,<sup>14</sup> he contributed an article on Joseph Clover to the first issue. Thereafter he contributed regular historical articles on John Snow, Joseph Lister, Henry Hill Hickman and articles of a philosophical nature, the last one in the January issue of 1930, on 'the mentality of the patient and its bearing upon the phenomenon of anaesthesia'.<sup>15</sup>

In 1884 he married Louise Clarke, by whom he had three sons all of whom had successful careers. The eldest, Leonard was a reader in physical anthropology at Oxford University, the second son, St John, had a distinguished career in both World Wars and was an orthopaedic surgeon at Kings College Hospital, and the third son Leicester was a dental surgeon at University College Hospital.<sup>2</sup>

## **Death**

He died on his 76<sup>th</sup> Birthday on June 28<sup>th</sup> 1931.

## **Conclusion**

It is strange that the life of an anaesthetist who contributed so much to the teaching of anaesthetics, designed apparatus, wrote so lucidly, was Chairman of many Committees, President of Societies, has not been presented before at a meeting of the History of Anaesthesia Society or at any of the International Symposia on the History of Anaesthesia. However, the Royal College of Anaesthetists do award a Dudley Buxton Prize and bronze medal for meritorious work in anaesthesia or in a science contributing to the progress of anaesthesia. The prize was instituted in 1967 and has been awarded on 19 occasions.

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# **Changing Dynamics of the Surgeon-Patient relationship following the introduction of Anaesthesia in 1846**

**Robert G. Dorfman<sup>1</sup> and Sukumar P. Desai<sup>2</sup>**

<sup>1</sup>Graduate Student, Faculty of History, University of Oxford. <sup>2</sup>M.D., Department of Anaesthesia, Harvard Medical School and Brigham Women's Hospital, Boston, Massachusetts

## **Background**

Anaesthesia is now administered safely each year to millions of patients throughout the world, yet such was not always the case. While surgery under excruciating conditions was the norm before the discovery of ether anaesthesia, it continued to be commonplace for decades following the introduction of anaesthesia as a result of initial resistance to the new substance among doctors and patients alike. In many instances patients were conscious and forced to endure agonizing pain. In a strange rationale, patients were considered partners in the surgical process, even during the procedure, as surgeons wished to communicate with patients during the operation.

After the widespread introduction of anaesthesia in the mid-nineteenth century patients lost this agency in the operating relationship by being rendered unconscious. We explore an important and previously unaddressed issue in the history of science, medicine, and technology; namely, why and how operating room dynamics between surgeon and patient changed in the wake of Ether Day in 1846. Although the vast majority of patients and surgeons welcomed the era of pain-free surgery, this concept was not universally accepted for several reasons. These include – complications, modesty in female patients, a lack of availability, resistance by surgeons, fire hazards, and a lack of feedback from the patient during the procedure. Each of these objections would yield over ensuing decades as anaesthetic techniques improved and society fully embraced the concept of



pain-free surgery. We explore one aspect of such resistance, sustenance of 'the patient's narrative during surgery, even though it resulted in considerable pain'.

### **The rôle of the patient**

The rôle of the patient in medical care, especially for non-surgical treatment, has been studied extensively by medical historians. Nicholas Jewson divides medical care into two phases: 1) 'bedside medicine', when physicians were responsible for treating the 'sick man'; and 2) 'laboratory medicine', when physician-scientists focused their efforts on treating diseases rather than sick individuals.<sup>1</sup> This process has evolved continuously over the decades, with each major medical advance apparently increases the 'distance' between the patient and the physician. As medical cosmology shifted focus from the individual to the disease, the 'sick man' was relegated to the passive rôle of 'patient'. According to Mary Fissell, this shift towards a laboratory-based medicine resulted in the patient's narrative losing significance.<sup>2</sup> Many historians suggest that the change from bedside medicine to laboratory medicine was the most important reason for the sick individual losing status as a partner in a consultative relationship, and for the practice of medicine becoming de-humanised.

The change from partner to patient is also discernible in the history of surgery, though the shift from bedside medicine to laboratory medicine is less applicable, but the rôle of medical imaging becomes ever more important. Furthermore, although the question of how, why, and when the patient's narrative lost significance in the realm of surgery is highly relevant, it has received much less attention than it deserves within the historical scholarship. Consequently, we separate the history of surgery into pre-anaesthesia and post-anaesthesia; before and after the near universal acceptance of anaesthesia.

## **Before Acceptance of Modern Anaesthesia**

The pre-anaesthesia era certainly cannot be characterized as peaceful. John Struthers, President of the Royal College of Surgeons in Edinburgh, aptly sums up the gruesome nature of operations:

‘The operating theatre ringing with the groans and shrieks of the patient, the distressed faces of the crowd of students, and the haste of the operation to be done’.<sup>3</sup>

Before anaesthesia was introduced, the patient played an important rôle in any operation. More specifically, the patient was a partner in the decision regarding whether or not to proceed with surgery as well as in any decision making during the procedure, largely due to the risk of substantial pain and complications linked to surgical procedures at the time. Generally, surgery was postponed until the patient could no longer delay the operation. One could argue that there were few unnecessary operations, even though surgical delay likely increased morbidity and mortality. Historian Stephanie Snow (a relative of pioneering English anaesthetist John Snow by marriage) suggests, ‘Prior to ether the surgeon and patient functioned as a symbiotic unit’.<sup>4</sup>

‘Fully conscious or with sensibility only barely dulled by some narcotic, a patient was a partner in an operation. Surgeons took advantage of the opportunity to question patients in the midst of procedures, and there was always communication even when there were no words’.<sup>5</sup>

In 1818, New York surgeon Valentine Mott endeavoured to complete an operation on Michael Bateman, a 57-year-old sailor, in which he attempted to ligate an artery to treat an aneurysm.<sup>6</sup> Having no idea what the outcome of this procedure would be, Mott looked to Bateman for his answer:

‘I therefore drew the ligature gradually, and with my eyes fixed upon his face, I was determined to remove it instantly if any alarming symptoms had appeared. But, instead of this, when he



showed no change of feature or agitation of body, my gratification was of the highest kind'.<sup>6</sup>

In the midst of the operation while Bateman's chest was wide open, Mott's assistant engaged in dialogue with Bateman and asked if he felt any strange sensations in the areas normally supplied by the artery being tied – 'to which he replied that he did not'.<sup>6</sup> Currently, surgeons value such feedback from patients during certain intracranial procedures; however, the awake patient is comfortable and lightly sedated. It is difficult to imagine the horrific conditions under which Mott and Bateman communicated. Charles D. Meigs suggests that the patient's responses to the question 'Does it hurt you?' are worth a 1000 dogmas and precepts, referring to how before anaesthesia, surgeons 'privileged the patient's own experience of the body over other abstract theories the doctor might possess'.<sup>7 8 9</sup> Once again, current practitioners can only surmise that the surgeon would be inquiring about some additional pain, over and above the excruciating background pain during operation.

Professor George Wilson, who in 1843 underwent a Syme amputation performed by the surgeon James Syme himself, was able to put his experience of being a 'partner' in an operation into words:

'During the operation, in spite of the pain it occasioned, my senses were preternaturally acute, as I have been told they generally are in patients in such circumstances. I still recall with unwelcome vividness the spreading out of the instruments, the twisting of the tourniquet, the first incision, the fingering of the sawed bone, the sponge pressed on the flap, the tying of the blood-vessels, the stitching of the skin, the bloody dismembered limb lying on the floor'.<sup>10</sup>

One wonders why the surgeon and the patient would not prefer the use of pain relief and amnesia available at that time – opiates, alcohol, and belladonna derivatives, among others.

## **After the Acceptance of Anaesthesia**

Surgical history was forever changed on October 16, 1846, today remembered as Ether Day. John Collins Warren of Massachusetts General Hospital operated on Edward Gilbert Abbott, who inhaled a preparation of sulphuric ether administered by William T.G. Morton of Boston.<sup>11</sup> According to Warren's notes from that day:

'On October 16<sup>th</sup>, the patient being prepared for the operation, the apparatus was applied to his mouth by Dr. Morton for about three minutes, at the end of which time he sank into a state of insensibility. I immediately made an incision about three inches long through the skin of the neck, and began a dissection among important nerves and blood vessels without any expression of pain on the part of the patient'.<sup>12</sup>

Before ether anaesthesia, surgeons occasionally obtained useful feedback from the patient during an operation, yet in the post-anaesthesia era, the patient was silent. According to Dawn Goodwin, 'In rendering the patient unconscious, anaesthesia incurs a silencing of the patient'.<sup>13</sup> Moreover, in another account by Ether Day witness Henry Jacob Bigelow:

'On Saturday, the 7<sup>th</sup> of Nov., at the Mass. General Hospital, the right leg of a young girl was amputated above the knee, by Dr Hayward, for disease of this joint. Being made to inhale the preparation...she became insensible in about five minutes. The last circumstance she was able to recall was the adjustment of the mouth piece of the apparatus, after which she was unconscious until she heard some remark at the time of securing the vessels – one of the last steps of the operation. Of the incision she knew nothing, and was unable to say, upon my asking her, whether or not the limb had been removed. She refused to answer several questions during the operation, and

was evidently completely insensible to pain or other external influences'.<sup>14</sup>

In this report, the patient has no voice, even though there is evidence of awareness under anaesthesia, and the metaphor of silence permeates the description. When asked about the incision, she 'was unable to say,' and 'she refused to answer several questions'.<sup>14</sup> This suggests that upon being anaesthetised, patients could be perceived as having temporarily lost their identity or individuality by virtue of having been rendered unconscious. Upon awaking from surgery, patients typically had no recollection of what had taken place. The historian, Richard Hollingham, for instance, reports that approximately two months following Ether Day, surgeon Robert Liston decided to give anaesthesia to a 36-year-old butler with a septic knee:

'A rubber tube was connected to a flask of ether gas, and the patient was told to breathe through it for two or three minutes. He became motionless and quiet. Throughout the procedure, he did not make a sound or even grimace. 'When are you going to begin?' asked the patient a few moments later. He had felt nothing'.<sup>15</sup>

The word 'anaesthesia' itself stems from the Greek *anaesthesia*, meaning 'lack of sensation'.<sup>16</sup> It first appeared in English in Bailey's dictionary of 1721 as 'Anaesthesia, a loss or Defect of Sense, as in such as have the Palsy or are blased'.<sup>17</sup> The term, later proposed to Dr William T.G. Morton in a letter by Oliver Wendell Holmes, thereby literally implies insensibility.<sup>11</sup>

There is also evidence that patients were slow to embrace the concept of anaesthesia, perhaps suggesting their awareness of its potential consequences relating toward their power status within the surgical relationship – once they were unconscious, the surgeon could decide to do anything on their body. Complications, including death, were being reported in the press, and many surgeons preferred to perform smaller operations

without anaesthesia. Modesty and a fear of sexual assault caused many women to prefer not to receive anaesthesia, considering that all the surgical team and audience would be male. Some physicians had suggested that patients were never the same again, after having undergone anaesthesia. Thus, by the early 1850s the patient's dread of surgery had metamorphosed into a particular fear of the anaesthetic. 'His fear was of the loss of autonomy, of what might happen to him while unconscious; and patient reluctance continued to be a feature'.<sup>18</sup>

Although it is reasonable to assume that patients would have adopted anaesthesia immediately because the technology prevented pain, this was clearly not the case. Instead, patients' initial unwillingness to undergo anaesthesia suggests a struggle to decide between pain and loss of individuality in the operative process. Dawn Goodwin writes in the twentieth first century,

'A choice was made, anaesthesia was adopted, and today, the sick individual's voice has been replaced by: Alternative route(s) of expression with monitoring devices displaying 'readings,' diagrammatic 'traces,' and measurements... In a very practical and material sense, the patient becomes a mix of organic and technological components, in other words, a cyborg'.<sup>13</sup>

## **Discussion**

In the minds of some, the shift from the pre-anaesthesia to the post-anaesthesia era meant the patient went from being a partner of the surgeon to surrendering all power to the surgeon. An unconscious or insensible patient could not participate in any decision-making during the procedure, and the low risk that came with further surgical advances reduced the quantity of discussion preceding the operation. The patient was reduced from a being a partner during surgery to being a body needing to be fixed from the subject to the object. In due course, such changing power dynamics resulted in the patient's narrative losing significance within the surgical domain. While this may have been true in the early and mid-twentieth century, the past half-century has seen an

unprecedented amount of preoperative discussion between patient and surgeon. Moreover, many simple operations are routinely carried out under regional anaesthesia, a technique that allows the patient to remain an active participant during surgery. Another criticism of this argument is that the advent of anaesthesia was not the first time that patients became completely 'insensible' and passive in an operating theatre. Doubtless, the long-standing practice of surgeons prescribing opium or alcohol to reduce sensitivity also reduced the patient's rôle during operations. Surgeons pointed to examples that proved how effective true intoxication could be. Francis Boott, a well-known American physician living in London, wrote of a colleague who would frequently refer to 'the case of an Irishman, part of whose face was eaten by a pig while he was lying dead drunk on the ground'.<sup>19</sup>

Nevertheless, for the vast majority of patients, such practices rarely resulted in anything more than nausea or inadequate pain relief. According to Julie Fenster,

'Whatever the means used during an operation, the goal was to put the mind in a state in which it could not feel anything. Some people tried to jolt themselves chemically into such a manner of thought...they were the ones who looked to liquor, opium, or any number of other herbal drugs, none of which worked reliably or completely'.<sup>5</sup>

Critics may even point to the use of hypnotism or mesmerism prior to anaesthesia, but like alcohol or opium, it seldom provided insensitivity to pain comparable to ether, and most surgeons considered it quackery.<sup>5</sup> Consequently, Ether Day in 1846 was the point at which complete 'insensibility' was consistently and reliably produced in the surgical patient.

Before October 16, 1846, few patients consented to elective surgery, since the procedure was likely associated with great pain.



However, drugs and procedures were available to considerably diminish discomfort or memory. In any case, the patient was a partner in the decision to proceed and any decision-making during the procedure itself, especially due to the risk of considerable pain and complications associated with surgical procedures at the time.

Anaesthesia removed the fear of pain but was still associated with a high rate of complications. In the early years it was viewed with suspicion by both surgeons and patients. However, with the passage of time and improvements in safety, patients underwent anaesthesia and surgery readily. An unconscious patient could not participate in any decision-making during the procedure, and the low risk decreased the amount of discussion prior to the operation. Whatever minor medical benefits ensued from an awake or partially awake patient may offer; these were steadily overcome with the advent of safe and reliable anaesthesia.

## **Conclusions**

Medical historians examine the interactions between society and health in the broadest possible sense. Beliefs, values, religion, gender, race, institutions, patients, and practitioners are evaluated as variables that determine the evolution of medicine and health. There is no right or wrong answer, merely observations seeking explanations and understanding. We provide examples from journals, books, periodicals, and notes by patients as well as physicians to document the changing relationship between patient and surgeon as a result of the introduction of anaesthesia.

Although there was resistance to the acceptance of anaesthesia for several reasons, each of these was successfully overcome. The rôle of the patient has changed from someone reluctantly undergoing a painful operation, perhaps offering some useful medical information to the surgeon, to someone who understood what was to occur and willingly allowed the surgeon to operate while they were unconscious. The practice of medicine continues to evolve with every new advance. Just as laboratory

investigations have transformed the practice of internal medicine, so have anaesthesia and imaging technology transformed the practice of surgery. Often such types of radical advances are resisted initially as some disadvantages are noticed. Yet in the case of anaesthesia, the objections were overcome as the advantages offered become evident. There can be no doubt that the discovery of anaesthesia truly is a blessing, even though for a brief period in history there were doubters.

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## **C.J. Massey Dawkins: An early film of epidural anaesthesia from 1954.**

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Charles John Massey Dawkins (CJMD) played an important part in the development of regional anaesthesia in Britain. I present here highlights from a 27-minute film that has come to light, which was produced in 1954 detailing the epidural technique for Caesarean delivery at University College Hospital.

My interest in Massey Dawkins was kindled by an excellent biography in *Anaesthesia News*<sup>1</sup> by Adrian Padfield, who has written many illuminating articles about him<sup>2</sup>. Massey Dawkin's many achievements as a pioneer in epidural anaesthesia include the credit for the first epidural given in the UK<sup>3</sup>; he developed continuous postoperative epidural analgesia<sup>4</sup> and wrote an early report on the use of bupivacaine shortly after its introduction in 1968<sup>5</sup>. He recognized the suitability of epidurals for labour analgesia as well as their advantages over spinal anaesthesia as well as general anaesthesia for Caesarean section.

This film was part of the AAGBI archive, having been discovered there by chance on moving out of Bedford square. When I enquired it had been passed onto the Wellcome Library in a 16mm film format and has subsequently been digitized. By chance at the same time an enquiry was made to the University College Hospital archivist in 2012 by the patient with the main role in the film. By coincidence I recognized the patient's name on a circulated email as a relative of mine and was subsequently able to find the film and show it to her and her son who features at the end of the film. Her insight into how the filming took place is fascinating.

The film is in colour with a voice-over of Massey Dawkins himself and was sponsored by Duncan, Flockhart & Co (makers of Xylocaine). It starts with a demonstration of the anatomy and follows an explanation of segmental epidural spread. There is a comprehensive explanation of techniques for confirming epidural entry, with CJMD's favourite being a Brook's indicator filled with sterile coloured saline which yields a visual movement of a capillary of fluid on epidural entry. This technique involves application of a naked flame to the bulb of the indicator once the Tuohy needle is lodged within the ligaments to create a meniscus in the capillary tube.

There are actually two patients and two techniques demonstrated. In the first a Tuohy needle is used and a catheter inserted into the epidural space for postoperative analgesia.

The second case demonstrates 'single shot' epidural anaesthesia for Caesarean section (indicated for cephalo-pelvic disproportion). Of interest a T12/L1 entry point is preferred. A Wilfred Harris 18G 6cm short-bevelled needle is used. After identification of the epidural space the needles is left in position while a test dose of 3 ml of 1.75% Xylocaine is given and the patient asked to dorsiflex feet at five minutes to exclude sub-arachnoid block. A total of 20 ml of plain anaesthetic solution are given, and the block is supplemented with atropine and pethidine pre-medication. Hypotension is countered with a head-down position and a combination of intravenous and intramuscular ephedrine. Classical incision Caesarean surgery proceeds uneventfully shortly afterwards, and the patient is interviewed during and after the birth to demonstrate her comfort and the elegance of the technique.

Although I have been unable to establish the extent of distribution of the film, I am certain that the widespread adoption of these techniques probably helped to pave the way for the development of epidural service on labour wards by anaesthetists

and must have contributed to the reduction in anaesthesia related mortality that occurred alongside this in the 1970s.

### **Acknowledgements**

Wellcome Library, London for permission to show the film.

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## **DR HEINRICH BRAT (1867-1909) – a forgotten German pioneer of international Oxygen therapy, Ventilation and Anaesthesia-Technology**

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### **Background / Material and Methods**

As part of a longstanding research project conducted in the Dräger-archives<sup>1</sup> since 2001/2002, we recently completed an extensive study on the history of ventilation.<sup>2</sup> This led to a number of critical re-appraisals.<sup>3-6</sup>

One of the most remarkable details among these is the significance of the German physician Dr. Heinrich Brat. He had a notable influence on Dräger (and probably others). This is also of international relevance and has so far been under-recognized.<sup>7-11</sup>

### **Results - Biography**

There is little known about the biography<sup>2,12</sup> of Dr Heinrich Brat (1867-1909). He was born on 3<sup>rd</sup> October 1867 in Mohrungen. □ He died on 1<sup>st</sup> February 1909 in Merano. □<sup>12</sup>

Brat studied Medicine in Berlin and Königsberg.<sup>12</sup> His earliest ‘key-publication’<sup>13</sup> suggests that he also spent his career in and around Berlin. By 1900 the German capital was probably the leading (inter)national centre of ‘oxygen therapy’ and respiratory physiology.<sup>14</sup> It had a tradition which went back as far as

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□ East Prussia (Poland since 1945).

□ Austrian Hungarian Empire (Northern Italy since 1918).

1781/1782, with many individuals from the Jewish community playing a particularly noteworthy role.<sup>14 15</sup>

Despite Brat's 'high calibre' contributions to anaesthesia-related technology, his writings do suggest that his clinical and scientific main interests were rather medical, than surgical or anaesthetic. According to one short account on his life<sup>12</sup> he worked as a 'Kassenarzt' für 'Gewerbehygiene'. Translated into more 'modern' and English terminology this is a Senior Medical Officer, responsible for 'occupational health' and 'health and safety'. He also worked as a senior researcher in pharmacology. His employer was the 'Aktiengesellschaft für Anilinfabrikation' ('AGFA'), at the time one of the worlds' largest chemical companies. Situated in Rummelsburg, close to Berlin, this firm produced colours, dyes, pharmaceuticals and photographic equipment.

Brat must of have been, to start with, a very successful chemist and pharmacist: Apparently he developed several drugs, which were widely marketed at the time.<sup>12</sup>

His main interest, however, seems to have been clinical toxicology. Probably owed to his background at a major chemical plant, he focused particularly on noxious gases and on the treatment and resuscitation of patients following gas intoxications. For purposes of prophylaxis and therapy he also researched inhaled agents, especially oxygen. This fortunate combination of interests, knowledge and skills made Brat an almost ideal 'link-person' for the emerging disciplines of Anaesthesia and Emergency Medicine. What eventually followed must have been a remarkable trans-disciplinary 'success-story' at the time.<sup>12-14</sup>

Brat became a very successful developer of medical technology in the fields of oxygen therapy, resuscitation and anaesthesia. He was a widely respected researcher, who was held in high esteem by his clinical co-operation partners. Notable among these were

the surgeons Prof. Moritz Borchardt (1866-1948) and Victor Schmieden (1874-1945), with whom he worked on his anaesthetic apparatus.<sup>11 12</sup> Also in the early emergency medicine community his devices were popular.<sup>2 10 12 16</sup> Even as a 'rival' and 'competitor', Brat was highly respected: Dräger sources repeatedly acknowledge his outstanding contributions to the history of early oxygen therapy and resuscitation and to the development of the relevant technology.<sup>2 10 12</sup>

Finally, Brat also authored scientific publications. The perhaps most notable of these is one 'key' contribution<sup>13</sup> to Max Michaelis' (1869-1933)<sup>9</sup> landmark 'Textbook on Oxygen Therapy' ('Handbuch der Sauerstofftherapie', Berlin, 1906).<sup>14</sup>

This was – to our knowledge – probably the first 'modern' and truly comprehensive text- and reference book on the topic. It covers the breadth of the physiologic knowledge and theories, the therapeutic rationales and practices, and the available technology of the time. It was clearly also noted internationally, particularly by the British physiologist John Scott Haldane (1860-1936). Haldane had received much of his relevant training in Germany and was fluent in the language.<sup>12</sup> German was, in fact, at the time still a much more frequently spoken and read 'lingua franca' of international research, than it is today. Michaelis' landmark publication was later followed by an even more extensive, likewise explicitly 'international' three-volume textbook, commissioned by Dräger.<sup>17 18</sup> These and other important German publications clearly influenced subsequent British and US research and publications, notably - yet again - of Haldane and his cooperation partners.<sup>19-24</sup>

Unfortunately, their later publications often seem not to adequately recognize earlier, notably foreign contributions. The phenomenon is probably largely owed to the effects of the Great War. As a consequence, Haldane and colleagues were (and often still are) very unilaterally (and therefore erroneously) credited in



Anglo-American historiography with having ‘founded’ modern inhaled oxygen therapy.<sup>2 7 10 15</sup>



**Figure 1: Dr. Heinrich Brat (1867-1909).<sup>12</sup>**

### **Brat's contributions to medical technology**

Brat designed a number of devices for the use of inhaled oxygen in different settings. These were initially marketed quite successfully:

The ‘H. Brat Apparatus for inhaled Oxygen (with Injector)’ (1905) [in German: ‘Sauerstoffatmungsapparat von H. Brat (mit Dampfstrahlpumpe)’; ‘Heinrich Brat Sauerstoffatmungsapparat’]. The ‘Heinrich Brat Rescue/Resuscitation Apparatus’ (1906) (‘Heinrich Brat Rettungsapparat’) and the ‘Heinrich Brat



Apparatus for Anaesthesia and Ventilation' (1908) ('Heinrich Brat Narkosebeatmungsapparat').<sup>2</sup>

### **The 'Dr H. Brat Apparatus for inhaled Oxygen' (1905)**

The aim of this device was to treat patients especially with methaemoglobin intoxication. Accidents with noxious gases were then relatively common, notably in the emerging chemical and pharmaceutical industry. Also in domestic settings, where gas became ever more widely available for heating and illumination, accidents soon happened in considerable numbers. Breathing apparatuses ('respirators') were only just about getting 'fit for purpose' and not yet widely available.<sup>25</sup> In consequence, victims and rescuers alike often required urgent treatment following exposure to noxious gases. Brat's initial experiments (~1904/1905) showed that for most purposes it sufficed to offer a form of '(assisted) positive-pressure 'ventilation' for (spontaneously breathing) patients'. Its application could be manually controlled, either by a 'therapist' or even by the patients themselves.<sup>2 26 27</sup>

### **The 'Dr. Brat apparatus for Resuscitation with inhaled Oxygen' (1906)**

Brat's second apparatus 'evolved' just a year later. Its aim was to improve the above 1905 device by expanding its therapeutic options: Experiments had confirmed that it could in principle also be used for fully controlled 'artificial' alternate (positive-negative) pressure ventilation. Therefore Brat soon began to recommend his original device also for those emergencies, where full 'artificial ventilation' was deemed necessary for resuscitation. By 1906 he launched his new, improved apparatus, which was built until 1917.<sup>2 10</sup>

### **The 'Heinrich Brat Apparatus for Anaesthesia and Ventilation' (1908)**

The aim of the 'Heinrich Brat Narkosebeatmungsapparat' was to provide anaesthesia for thoracotomies with consecutive

pneumothorax. The technique proposed<sup>29</sup> should be simpler and safer than its contemporary alternatives: the complicated and costly 'Druckdifferenzverfahren' of Ferdinand Sauerbruch (1875-1951) ['Sauerbruch-(Unterdruck-)Kammer'], or the likewise relatively complicated and unsafe 'Überdruckverfahren', as promoted by Ludolph Brauer (1865-1951).<sup>29 11</sup>

Brat's solution was a modification of his 1906 resuscitation device. It was developed between 1906 and 1908. His main co-operation partner was the surgeon Victor Schmieden (1874-1945) from the University Hospital Berlin. The device was launched in 1908 and produced by the firm 'Oxygenia GmbH', Berlin.<sup>29</sup>

Borrowing from his previous developments, Brat's apparatus facilitated the following options: oxygen supplementation, application of continuous positive airway pressure (for prevention of pneumothorax), application of volatile anaesthetic agents and (optionally) artificial ventilation. The latter was manually controlled and usually only for emergencies or resuscitation. The standard ventilation mode was alternating (positive/negative) pressure ventilation; alternatively it could facilitate positive pressure inspiration and passive expiration. Ventilation was preferably applied via an endotracheal metal tube, or - if intubation was not possible - via a special facemask.

The historical importance of this is immediately obvious:

It is, internationally, clearly among the earliest devices, which facilitated this relatively wide array of therapeutic options in anaesthesia.

Also a number of 'Brat-Dräger interactions' emerge:

The Brat-Schmieden device was an explicit response<sup>29</sup> - and a recognizable improvement to the 'Brauer-Dräger anaesthesia apparatus' (1906).<sup>29</sup>

For its anaesthetic components Brat utilized a setup, which was probably inspired by the 'Roth-Dräger-(Krönig) series' (1902-

1904). Also the oxygen-reservoir bag ("Sauerstoffsparbeutel") in Brat's ventilator component may have been influenced by an identical setup in the Roth-Dräger anaesthesia apparatus (1902).

Brat recommended endotracheal intubation which in Germany was then pioneered by Franz Kuhn (1866-1929). At the same time Kuhn also pioneered the closed circuit for anaesthetic purposes. This he did in close co-operation with Dräger, leading to a series of (experimental) Kuhn-Dräger devices (1905/1906).<sup>24</sup>  
9 11

In 1912 Dräger finally issued its own 'Combination device for Chloroform +/- Ether-Anaesthesia, positive pressure application and resuscitation' ('Kombinations-Apparat für Mischnarkose, Überdrucknarkose und Wiederbelebung'; short: 'Dräger-Kombi').<sup>249</sup> This facilitated the same therapeutic options like the Brat device. It was, however, more successful and marketed for over 30 years.<sup>249</sup> Thus both devices jointly mark notable pioneering contributions, almost half a century before the change of surgical techniques and the introduction of curare eventually brought the advent of really widespread, fully controlled artificial ventilation in anaesthesia.

## Conclusions

Heinrich Brat is historically remarkable for the breadth of his outstanding contributions on many different fields.<sup>4</sup> Brat's two most important developments from an anaesthetic perspective - [i.e. the 'Rettungsapparat' (1906) and the 'Narkosebeatmungsapparat' (1908)] pre-date the comparable key Dräger developments by one to a few years [i.e. the 'Pulmotor' (1907/1908) and the 'Dräger Kombi' (1912)].

Brat's devices are technologically less sophisticated than the subsequent Dräger devices. He was a physician after all, not an engineer.

His devices have, none the less, significantly influenced the following Dräger developments and inspired their improvements.

On the other hand Brat's oxygen therapy device (1905) and his resuscitation device (1906) were most probably influenced by previous (not least Dräger) innovations (e.g. the Dräger- 'Sauerstoffkoffer' / 'Oxygen Trunk' (1902); and Dräger's miniaturized pressure reduction valves and injectors).<sup>7-10</sup> His anaesthesia devices also show influences by Dräger.

Brat, his devices and their manufacturers were serious competitors to Dräger for about the following 20 years. They were, however, ultimately less successful.

He and his pioneering developments are an excellent example for the reciprocal interactions between key-pioneers at the time.<sup>4</sup>

The significant role of Heinrich Brat, and of his devices, in pioneering what we consider 'key features' of 'modern' anaesthesia and its technology today have clearly been missed and under-recognized so far.<sup>7-11</sup>

## **Acknowledgements**

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## Update on the College 'Lives of Fellows' projects

**Prof. Tony Wildsmith**

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Since the last report this project has progressed although not as rapidly as was hoped. The primary reason was that the College's part-time Archivist moved on to full-time employment and some months passed before a replacement was appointed. However, this unfortunate situation has been rectified, and with the result that the duties (two days per week) are the responsibility of a full-time member of staff whose other duties are in the membership department, a very suitable arrangement.

Otherwise the plans are as outlined in last year's *Proceedings*, and the form for collecting biographical information on each individual is now in its final agreed form. However, to keep the project within manageable proportions the initial focus will be on two groups: the Foundation Fellows (as was always the case) and the retired Fellows. Once we have a system, which seems to be working effectively, the range of Fellows targeted will be expanded. A 'Lives' section of the College website will be developed and, once the final details have been agreed, an article in the College *Bulletin* will launch the project formally.

The 'Lives' form, with guidance on its completion, will be available for download for completion at leisure, with return by e-mail. There will be a list of the Foundation Fellows (with their affiliations) with an invitation to volunteer to complete the form on these early stalwarts of our specialty. To avoid the possibility of duplication it will be made clear that no one should start work on such a biography without a specific commission from the College.

## **Anaesthesia in Sheffield 1900-1919.**

### **Dawning of Specialisation?**

**Dr Adrian Padfield**

Emeritus Consultant Anaesthetist Sheffield and Past President HAS.

This paper arose from a contribution to a book about doctors and other caring professions from Sheffield involved in the Great War for an exhibition and lectures from 25<sup>th</sup> June 2014. The Sheffield City Archives hold many of the Sheffield Hospitals' documents. The principal hospitals were the Royal Infirmary, the Royal Hospital and the Fir Vale Hospital (now the Northern General [NGH]) and the records include minutes of Board meetings and also Annual Reports and include data about the provision of anaesthetics in the hospitals. Most of these data were superfluous for the Sheffield book but the pattern of appointments to anaesthetic posts seemed to show an advancement of the speciality in the City. Some idea of developments in other teaching hospitals in England has been found. Before the beginning of the twentieth century, very few doctors, mostly in London, specialised in anaesthesia; there was little income to be gained. A variety of hospital workers - housemen, dentists, medical students, nurses and porters gave most anaesthetics. However, numbers of operations increased towards the end of the nineteenth century at least partly due to the take up of antiseptics, nearly impossible before the use of anaesthesia. Surgical deaths due to infection reduced considerably and anaesthetic fatalities became more noticeable and indicated the need for doctors specialising in administering anaesthetics.

In Sheffield, according to a graph in the 1912 Annual Report of the Royal Infirmary, the number of operations had risen by 50% between 1901 and 1906 (from 1100 to 1800). A later graph shows ENT operations for the first time, the numbers of which

reflect the drop in general surgical operations after 1908. A ten year review; 1911 to 1920, shows a steady increase in ENT surgery both inpatient and outpatient from 1911 to 1914.

There are no similar Royal Hospital graphs but a new ether apparatus had been ordered in March 1901. In July 1902, at weekly meetings of the Board of the Royal Hospital, the appointment of an Honorary Anaesthetist was discussed and the byelaws changed to allow the appointment (with the proviso that a register of anaesthetics administered would be kept; sadly there is no trace of the register). In October an advertisement was placed in a local newspaper regarding the election of such a person and on 5<sup>th</sup> November, an Election Committee met. Mr Herbert Hallam was elected with 10 votes (two other candidates got no votes!). In 1904 Mr Henry Temple Wightman seems to be the Infirmary's first Honorary Anaesthetist. Mr Alfred Reckless almost certainly preceded him but the date of his appointment cannot be traced in the Infirmary documents or the Medical Directory (see later). It should be remembered that Medical Directory entries are self-written. Wightman was soon followed by Mr JW Stokes and Dr Rupert Hallam. The Royal Hospital Board amended the byelaws again in 1905 to allow the election of another two Honorary Anaesthetists; Mr Norton Milner and Dr C Graham Murray. A point here: only medical practitioners with an MD were styled 'Dr' and this included surgeons with the MD who otherwise seem to be designated 'Esq.'. Honorary Anaesthetists were local general practitioners who attended usually for one three hour session per week and were paid an honorarium of £25 per annum; equivalent to £2,500-3,000 today. They were re-elected to their posts annually. It is most likely that house physicians administered anaesthetics before these appointments were made.

Elsewhere in England (outside London) Birmingham seems to have been a generation ahead of Sheffield and perhaps other provincial cities. According to the late Dr ET Mathews<sup>1</sup>, a

Director of Anaesthetics was appointed at the Children's Hospital in 1871 and a chloroformist at the Dental Hospital. An extraordinary appointment in 1897 was that of William Joseph McCardie as a member of the visiting (consulting) staff of the Birmingham General Hospital. His income was solely from anaesthetic fees and he charged the same fees as the surgeons! Other anaesthetists in Birmingham were GPs who, as in Sheffield, provided sessions at various hospitals receiving an honorarium. In Bristol, according to *'The History of Bristol Royal Infirmary'* in 1917<sup>2</sup>, a Resident Anaesthetist was appointed in January 1897 because the number of operations had increased and the House Officers were no longer able to cope. In January 1902 an Instructor in Anaesthetics was appointed but in 1904 an Honorary Anaesthetist was elected. By 1905, as at the Sheffield Royal Hospital, the numbers of anaesthetics had increased and an Honorary Assistant Anaesthetist was appointed, as well as an Honorary Anaesthetist to the Dental Department. At the General Infirmary in Leeds three anaesthetists with honoraria were appointed in 1896.<sup>3</sup> In Newcastle, despite Dr Gary Enever's best efforts, the situation is obscure: there was a Wilfred Alderson who was 'Senior Honorary Anaesthetist; Newcastle on Tyne Dental Hospital' and wrote a book on dental anaesthesia before the Great War. The Infirmary has no records about this or the Newcastle Dispensary but William Arnison was named 'Anaesthetist to the Infirmary'. In the *'History of Newcastle Infirmary'* by GH Hume, published in 1906,<sup>4</sup> there is nothing about anaesthesia but copious information about the introduction and use of antisepsis, which probably would have been impossible without general anaesthesia. Professor T. Cecil Gray makes no mention of the provision of anaesthesia or the appointment of Honorary Anaesthetists in the early 1900s in his essay 'The History of Anaesthesia in Liverpool'.<sup>5</sup> However, a letter from Dr Peter Drury<sup>□</sup> suggests that around 1900 the

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\*Drury PME, Personal communication, 2014.

situation was similar to Sheffield: 'Hospital service was provided by GPs, commonly two sessions per week. Occasional cases were dealt with by house surgeons'. The history of Manchester Royal Infirmary (1752-1948) mentions no anaesthetists in this period.<sup>6</sup>

In 1911 Drs W Dakin Mart and R Vernon Favell (who replaced Rupert Hallam) were added to the Infirmary's Hon. Anaesthetists. The Royal Hospital Board in May 1913: '*resolved that four Anaesthetists be appointed*' and in November '*another anaesthetist be appointed*'. Favell had moved to the Royal and RG Abercrombie was also appointed making five. MW Sneddon replaced Favell at the Infirmary in 1913 but he had vacated the post by 1915. In April 1919; '*Dr Sneddon has returned from the war*'. Wightman resigned and retired from practice in 1914; he was replaced by T. Robertson. On 3<sup>rd</sup> March 1915, Dakin Mart wrote to the Board to resign; he had been called for *Military duties* from '*Monday last*' (which it seems was the 1<sup>st</sup>). On 19<sup>th</sup> May, Mr H. Caiger FRCS was made temporary anaesthetist. He and Robertson were paid £50 p.a. from 1<sup>st</sup> May; it seems likely they had two sessions.

Fir Vale Hospital in north Sheffield was originally a Poor Law hospital so it wasn't part of the Medical School. Only an Operations book dating from 1906 (to 1915) is in Sheffield Archives but it is illuminating because no such records have been found from the Royal and Royal Infirmary showing the day-to-day use of anaesthesia. The first mention of anaesthesia is on 10<sup>th</sup> October 1906 when ethyl chloride followed by ether is noted. This combination was used several times in the following months as well as ether and chloroform alone; sometimes as the ACE mixture. Chloroform seems to be used most frequently. On the 15<sup>th</sup> January 1908 the anaesthetist's name appears for the first time: Dr Brander and he used Stovaine as a spinal anaesthetic for two varicose vein operations and an amputation. Brander's name is noted again on 13<sup>th</sup> February again using Stovaine for an inguinal hernia. Ethyl chloride is mentioned as being applied



locally for minor surgery. From March 1908 under the 'Remarks' column of the operating book the anaesthetist and the anaesthetic is often but not always specified until September when it becomes routine. In January 1909 Brander, Ritchie and Stocks are named. Dr Elizabeth Stocks is notable as the only female anaesthetist recorded (several female house physicians and surgeons were noticed). At least 22 other names appear including Holroyd, Robertson and Ryan who later became honorary anaesthetists at the Royal and Royal Infirmary. In May a local anaesthetic 'Endrenine' was used\* and in July 1912 nitrous oxide started to be used particularly for abscesses but chloroform was the most frequent agent. However, on 16<sup>th</sup> February 1914, a five-year old child died '*after a few whiffs of chloroform; found to have pyaemic pericarditis... at post mortem*' was added. On the 11<sup>th</sup> November the first '*Wounded British Soldier*' was anaesthetised and at the end of the Operations book on 17<sup>th</sup> October 1915 the 245<sup>th</sup> British soldier had local anaesthesia using Novocaine.

Returning to the Royal Hospital, in a letter dated 22<sup>nd</sup> September 1914, RG Abercrombie resigned: '*withdrawing from the post...accepted for active service*'. However, it appears he continued at least until 1917 when he became an 'Assistant Physician'. He had been a Civil Surgeon to HM Forces in South Africa. He sailed there in May 1902 and took local discharge in 1904/5; he was awarded the South African Medal with four clasps<sup>□</sup>. Mr JBH Holroyd and Mr JH Wylie were appointed in November 1914 '*until after War in place of Dr Abercrombie and Mr Vernon Favell*'. This suggests that Favell had been 'called up'. (*Since giving the paper I have discovered that RV Favell was 'Mentioned in Despatches', which confirms his active service.*) Before this, in January 1911, Holroyd had provided anaesthesia at Fir Vale and he had been appointed '*anaesthetist to the Dental Dept*' in November 1913, evidently a busy part of the

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□ Information kindly supplied by Captain P Starling, formerly Director Army Medical Services Museum.



Royal (he had been Casualty Officer at RH from 25<sup>th</sup> July 1910). Dr Vernon Mossman replaced Holroyd as *'temporary Dental anaesthetist'* in May 1915. Mr AHH Howard became temporary anaesthetist in April 1916 but in August his resignation was accepted and Mossman replaced him. Around this time the Dental Department was closed and taken over by the Military Authorities.

The Proceedings of the Royal Infirmary Board has a newspaper cutting dated 1<sup>st</sup> March 1916: an advertisement for *'two anaesthetists to be appointed for the period of the war but candidates must be ineligible for Service with HM Forces'*. On the same date Mr Alfred Reckless (mentioned earlier): *'be appointed Hon. Consulting Anaesthetist...for valuable services gratuitously rendered in a time of stress during the Great War'*. Sad to say, he died three weeks later and his tombstone is in Fulwood churchyard. Three more anaesthetists were appointed for the period of the war on 15<sup>th</sup> March @ £25 p.a.: Mr CF Coombe, Dr Norton Milner and Dr JH Wilks. In the Medical Directory of 1916, Milner was *Captain RAMC 3<sup>rd</sup> Northern General Hospital*. (This was a conglomerate of hospitals set up for military casualties; for instance a local council school was taken over). There is no mention of Milner's resignation from the Royal Hospital but he is not on the list of honoraria paid after December 1915. In June it was decided to engage an additional anaesthetist to the Honorary Ophthalmic Surgeon *'for the period of the War'* and Mr Simon Ryan FRCS (Ed.) was appointed in July. After this there is no mention of anaesthetists until 1919, when Dr Coombe retired from his temporary wartime appointment following the return of Dr Sneddon. At the Royal Hospital, on 31<sup>st</sup> March 1917, Holroyd was called for *Military Duty*. Soon after, Dr HG Dickinson was appointed temporary anaesthetist in his place. After the War, Holroyd was a partner in general practice with the father of our distinguished member, Dr Aileen Adams. He later endowed the annual undergraduate prize in anaesthetics. Reginald Ernest Pleasance became Honorary Anaesthetist in September 1918. Curiously his qualification date is given in both

Medical Directory and the Medical Register of 1920 as MB ChB Sheffield 1919 presumably he passed the Conjoint or LMSSA earlier. He was paid £10/3/3 in September 1918 which suggests he was already providing the service. He and other Honoraries got their half yearly £12/10/0 in December 1918. His appointment as Honorary Anaesthetist is not mentioned in the 1920-23 Medical Directories but he is listed as Demonstrator in Pathology. In 1932, he was one of the first members of the Association of Anaesthetists of Great Britain & Ireland. Pleasance was the fifth on the list of Fellows of the Faculty of Anaesthetists of the Royal College of Surgeons in 1948. He was the first provincial Fellow and preceded many distinguished London and other provincial Fellows.

Such was the scale of casualties in the War that there was an enormous demand for anaesthesia. Any doctor could be called upon to give an anaesthetic and many who gave them had very little training or experience and that as a medical student or perhaps as a houseman. Before the advent of pre-registration house posts, every medical student had to have had experience of administering general anaesthesia. At least four Sheffield anaesthetists were 'called up' for military service and it is notable that the importance of appointing experienced doctors, ineligible for HM Forces, to provide anaesthesia was emphasised by the Royal Infirmary's advert. mentioned above. It is not however, possible to trace the Army careers of the Sheffield anaesthetists with wartime service in the Army. The Army Medical Services Museum only has records of regular RAMC officers. Perhaps if any had been awarded medals for gallantry, more would be known about them.

There is no doubt that 'the art of administering anaesthesia was greatly developed during the war...' <sup>8</sup> Ether, chloroform, ethyl chloride and nitrous oxide were used for general anaesthesia in the Great War. The first two were needed in such vast amounts that special facilities were granted to the manufacturers to

increase their output. Both were simply dripped on to the *Schimmelbusch* mask often by non-medically trained staff. *Clover's ether inhaler* and *Buxton's modification of the Junker apparatus for chloroform* were sophisticated pieces of equipment allowing controlled vapourisation. Steel was needed for munitions, so nitrous oxide and oxygen in cylinders were necessarily less available. The British Oxygen Company provided oxygen while French firms filled nitrous oxide cylinders. By 1916, a nitrous oxide/oxygen machine was available; based on equipment devised by the American anaesthetist, James Gwathmey, it was first modified by Captain (later Sir) Geoffrey Marshall and then by Captain H.E.G. Boyle. It was used with or without local anaesthetic infiltration for short operations. A warm ether vaporiser designed by Dr (later Sir) Francis Shipway though elaborate, provided better surgical conditions, improved recovery and less pollution.

Shipway's Apparatus, courtesy of the Science Museum, London.



From early 1916 it was in regular use at Casualty Clearing Stations. Chloroform was used less often because of its

hypotensive effect and the occurrence of sporadic cardiac arrest. Ethyl chloride was seldom used in contrast to French and German anaesthetic practice.

As mentioned above local anaesthesia was used; commonly Novocaine (procaine) and Stovaine (named after its discoverer; M. Fourneau [French for stove]).

Cocaine, the first local anaesthetic discovered, was only applied topically because of its toxic and addictive properties. Procaine/Novocaine was a very weak local anaesthetic improved by the addition of adrenaline and mainly employed for infiltration. Since Stovaine caused sloughing of the skin it was used as a spinal anaesthetic in a 5 % glucose solution. Because spinal anaesthesia causes hypotension it was dangerous when used in exsanguinated casualties so the technique was abandoned except for lower limb amputations.

### **Acknowledgements**

I am most grateful to Dr John Powell for supplying reference 2 and Dr RS (Ted) Edmondson for obtaining reference 3.

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# **A brief history of the development of the electrocardiogram and its use in anaesthesia**

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## **Introduction**

The ability of a patient's cardiovascular system to withstand the stresses placed upon it during anaesthesia and surgery, arguably determines the immediate success of any anaesthetic or surgical procedure. The electrocardiogram enables us to provide continuous monitoring of the electrical activity of the heart. In conjunction with regular measurement of blood pressure, it can give early indications of cardiovascular instability, which can then be acted upon to enable the patient to withstand further stresses thus increasing the chance of safe and successful anaesthesia and surgery.

Electrocardiographic monitoring forms part of global patient assessment during anaesthesia. Arrhythmias are not unusual during anaesthesia and often have multifactorial causes: an increased vagal tone during an anaesthetic is not uncommon, and can be compounded by direct surgical stimulation of the vagus nerve, and sympathetic blockade following spinal anaesthesia. Intense vagal stimulation may inactivate the sinus node and cause a cardiac arrest. Increased sympathetic activity, which is most commonly manifested as a sinus tachycardia, is also commonly seen under anaesthesia, secondary to inhalational agents, anaesthetic drugs, retention of carbon dioxide, and during the surgical manipulation of adrenal tumours. Thus, the use of electrocardiographic monitoring therefore enables the early detection, and thus rectification of a multitude of physiological problems.

The principles of measurement of electrical changes accompanying cardiac muscle contraction were demonstrated by



British physiologist Augustus Desiré Waller in 1887 using the Lippman capillary electrometer, and the electrocardiogram was further developed by Dutch Professor of physiology, Willem Einthoven in the early 1900s using a string galvanometer.

### **Augustus Desiré Waller**

Augustus Desiré Waller first demonstrated the electrical changes that accompanied the movement of the human heart in 1887. He was born in Paris in 1856 as the son of Augustus Volney Waller, the British physiologist known for discovering Wallerian degeneration of nerves. Augustus Desiré Waller studied medicine in Aberdeen, qualifying in 1878. He developed a keen interest in physiology, and received his first appointment as a lecturer in physiology at the School of Medicine for Women in London in 1883.<sup>1</sup>

Waller, who was described as ‘short in stature with an ‘intelligent’ face, made a little longer by a small pointed yellow beard’<sup>1</sup>, used his pet bulldog, Jimmie, to demonstrate his electrocardiograms. Jimmie was trained to stand with two legs in pots of normal saline in order to obtain recordings of his cardiac electrical activity. Waller’s technique involved the use of the Lippmann capillary electrometer, which was invented by Gabriel Lippmann in 1873. Surface electrodes were strapped to the front and back of the chest, and, later, limbs were immersed in jars of saline. A light beam interrupted by the mercury column enabled photographic records to be made on plates, which were mounted on slowly moving toy train wagons.<sup>2</sup>

1887 was an electrifying year, with Queen Victoria celebrating her Golden Jubilee, and Waller demonstrating a way of recording electrical phenomena of the human heart. He proved that this electrical activity preceded cardiac muscle contraction, and demonstrated that it was not necessary for the electrodes to be applied to the subject’s chest. Although Waller demonstrated his recording technique in Basel, Switzerland, at the First International Congress of Physiologists in 1889, he did not feel



that electro-cardiography would have any extensive use in hospital,<sup>3</sup> and that it would be reserved only for the recording of rare cardiac anomalies. Watching this presentation were Willem Einthoven, William Bayliss and Edward Starling.

### **Willem Einthoven and the String galvanometer**

The development of the clinical ECG is widely attributed to Willem Einthoven, having initially observed Waller's demonstration of his technique in Basel in 1889. Einthoven tried to refine the Lippman capillary electrometer and was able to record some higher frequency curves in 1895. He later modified the string galvanometer, a piece of equipment originally invented by a French physicist Arsene D'Arsonval and an engineer named Clement Ader. Einthoven was credited as the first person to use the term Electrocardiogram in 1893 at a meeting of the Dutch Medical Association, a title he later claimed to belong to Augustus Desiré Waller. Einthoven's first recordings were published in 1902 using the string galvanometer; a large, cumbersome apparatus that weighed almost 300kg, filled two rooms, and required five people to operate it.<sup>4</sup>

The string galvanometer was developed commercially by the Cambridge Scientific Instrument Company, who produced a smaller instrument in 1909, and then a portable electrocardiograph in the late 1920s.<sup>5</sup> The Cambridge Scientific Instrument Company established in 1881 by Horace Darwin, the youngest surviving son of Charles Darwin, was also responsible for the production of the rocking microtome, first made in 1884, which continued to be manufactured until the 1970s.<sup>6</sup>

Welsh cardiologist Thomas Lewis, who was well acquainted with Einthoven, pioneered the use of electrocardiography in a clinical setting, publishing his book 'Clinical Electrocardiography' in 1913.

## **Introduction into anaesthesia, and the subsequent AAGBI guidelines on minimum monitoring**

With the introduction of neuromuscular blocking agents, and controlled ventilation techniques in the 1950's came the need for closer patient monitoring techniques. However, at this point electronic monitoring was in its infancy and the basic guide to patient wellbeing was achieved by palpation of the pulse, non-invasive blood pressure measurements and the colour of their blood visualised in the wound<sup>7</sup>, a worrying reliance upon surgeons to gauge patient wellbeing. Nonetheless, electrocardiographic monitoring was employed when King George VI underwent a pneumonectomy at Buckingham Palace in 1951, the ECG machine used in this case is in the AAGBI Heritage museum.

In 1956 Michael Johnstone, an anaesthetist at Manchester Royal Infirmary, published a paper highlighting the importance of Electrocardiographic monitoring during anaesthesia. He stressed that whilst these techniques such as pulse palpation and blood pressure measurement give a degree of information on cardiac output, myocardial function itself is not assessed, hence the need to introduce the ECG to anaesthetic practice.<sup>8</sup>

As cardiac surgery and Intensive Care Units developed during the late 1960s, the need for continuous cardiovascular and pulmonary monitoring became paramount. Whilst equipment at this time was unreliable, and understanding of electrical safety still rudimentary, computers were beginning to be introduced into operating theatres in the 1970s.<sup>7</sup>

It was the surge in malpractice suits in the United States of America in the 1980s that instigated the introduction of monitoring requirements throughout the western world. In Harvard, insurance companies urged anaesthetists to develop standards for patient monitoring during anaesthesia, as the expense for monitoring was felt to be minimal in comparison with the cost of defending malpractice claims.<sup>9</sup> In 1985, standards

for patient monitoring during anaesthesia were introduced at nine teaching hospitals associated with Harvard Medical School. Included in these standards was that every patient should have the electrocardiogram continuously displayed from the induction of anaesthesia until preparing to leave the anaesthetising location, where clinically practical. These standards were endorsed by the American Society of Anesthesiologists and have subsequently been modified, and through the late 1980s several states in the USA adopted specific standard monitoring as a legal requirement. This change in practice subsequently led to a reduction in malpractice suits against anaesthetists in the USA. Not long afterwards, similar policies were introduced in Canada, Australia and continental Europe.

In 1987, the Faculty of Anaesthetists specified a list of monitoring facilities to be available at every location where anaesthesia was administered, including recovery. Hospitals in the UK had to meet these requirements in order to be recognised in the training of candidates for the Fellowship of the Faculty of Anaesthetists (Now known as FRCA).<sup>6</sup>

The first AAGBI guidelines on minimum monitoring standards were published in 1988, currently in their fourth edition.<sup>10</sup> These emphasise the presence of an anaesthetist as the most important determinant of patient safety during anaesthesia. Furthermore, this guideline lists the standard patient monitoring equipment required in theatre as a pulse oximeter, non-invasive blood pressure monitor, electrocardiograph, airway gases analysis (oxygen, carbon dioxide and anaesthetic vapours), and facilities to measure airway pressure. In the recovery unit, a pulse oximeter and non-invasive blood pressure monitor must supplement clinical observations. Whilst continuous electrocardiographic monitoring is not required in this setting, it must be readily available if required.

The benefits of electrocardiographic monitoring during anaesthesia are well known: the introduction of monitoring,

including electrocardiography to anaesthetic practice was associated with reduction in anaesthesia related morbidity and mortality. Advances in clinical facilities and training coincided with the introduction of monitoring, all of which are associated with a reduction in morbidity and mortality.<sup>10</sup>

### **ECG in pre-operative assessment**

Although routine ECG monitoring is now universal in patients undergoing an anaesthetic, the routine use of pre-operative 12-lead ECGs has declined over the last decade, reserved only for the older, increasingly co-morbid patients, as recommended by NICE.<sup>11</sup>

Routine preoperative 12 lead ECGs, along with a battery of other tests, were conventional for practically all patients in the 1980s. In 2001 the AAGBI published guidelines on preoperative assessment, recommending that an ECG be performed on every patient with a cardiac or related history, but that an ECG is not indicated for asymptomatic males under 40 years, or asymptomatic females under the age of 50 years.<sup>12</sup> The start of the twenty-first Century saw cost-cutting featuring more and more throughout the NHS, and the routine use of pre-operative investigation was seen as expensive, labour intensive, and of questionable value. The second edition of the AAGBI guidance on pre-operative assessment published in 2010<sup>13</sup> incorporated recommendations by NICE in 2003 that a pre-operative 12 lead ECG recording should be used in patients older than 80; if older than 60 and surgical severity  $\geq 3$ ; any cardiovascular disease; or severe renal disease. There are a higher proportion of abnormal pre-operative ECGs seen with increasing patient age and ASA grade, suggesting some value to its use in this population.

There is little evidence to support the use of the routine pre-operative 12 lead ECG in all patients. Many preoperative ECGs are abnormal, but in low risk patients, rarely does this finding lead to any change in their management, or indeed correlate with outcome. There is no direct evidence that carrying out

preoperative ECGs would improve health outcomes for patients. However, in practice, we may observe abnormalities on patient's ECG tracing during the cardiovascular stresses of anaesthesia and surgery, and it is useful to have a baseline ECG with which to compare such changes to.

## **Conclusions**

We have come a long way since 1887 and the meticulous methods of recording cardiac electrical activity as demonstrated by Waller, and then Einthoven. Having commenced my anaesthetic training in 2013, I find it difficult to comprehend not having continuous ECG, blood pressure and pulse oximetry monitoring on all patients. To me, it is astonishing that it took a hundred years from Waller's discoveries, for the routine use of continuous electrocardiography, and other standard monitoring to become commonplace in anaesthesia. At the same time, the use of 12 lead ECGs in the pre-operative setting has become increasingly restricted over the last 20 years, as it seldom changes the management of most patients, and rarely affects patient outcome. Preoperative 12 lead ECG is a useful screening tool in selected patients, namely those with cardiovascular disease or advanced age, but in this age of austerity, one must be mindful not to request a test if it is unlikely to alter the patient's management.

The fact that the AAGBI guidelines reinforce that the presence of an anaesthetist as the most important factor in determining patient safety, suggests that although electrocardiographic monitoring is valuable for improving patient safety under anaesthesia, vigilance of the anaesthetist remains of paramount importance. In an age where we become increasingly distracted by electronic equipment and advances in technology, it is important not to forget clinical acumen and the value of human experience in ensuring patient safety under anaesthesia.

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## Methoxyflurane Revisited

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In the September 1966 issue of *Anesthesiology* a case series of methoxyflurane nephrotoxicity was reported from the White River Junction Veterans Administration Medical Center, Vermont. The accompanying editorial emphasised that the methodology was rather poor, data had been extracted from a single hospital, with bias in the patient selection and missing information in some retrospective cases.<sup>1</sup> It would be probably never have been published if not for a similar article in *The Lancet* in the same year regarding this unexpected side-effect of methoxyflurane.<sup>2</sup>

Methoxyflurane, a non-flammable halogenated ether (2:2 dichloro-1:1 difluoro-ethyl methyl-ether) had been synthesised in the 1940's by William T. Miller, Professor of Organic Chemistry at Cornell University in New York and subsequently manufactured by Abbot Laboratories. It was introduced into anaesthetic practice in the USA by Professor Artusio of Cornell Medical College and between 1960 and October 1966, the PubMed database recorded 287 articles (including 101 studies in man). The drug gained popularity in the anaesthetic community because of fewer cardiac side effects and less hepatotoxicity compared with halothane. It appeared to be used safely in various types of surgery including special subgroups such as children and pregnant patients and appreciated for prolonged postoperative analgesia. Although two studies reported the effects of methoxyflurane on renal function, they were published in German<sup>3</sup> and Italian<sup>4</sup> and were probably not read outside their countries at that time.

The authors of the case report published in *Anesthesiology* (1966) were surgical residents, some of them with previous experience in a research laboratory. They were seriously concerned to find that 16 out of 94 patients, after receiving methoxyflurane anaesthesia in their hospital, subsequently produced large volumes of urine and developed hypernatraemia.<sup>5</sup> Further tests done in some of the patients demonstrated a urinary concentrating defect resembling nephrogenic diabetes insipidus. When they discussed their findings with their colleagues from other disciplines, endocrinologists supported their observations, while anaesthesiologists tried to suppress their enthusiasm regarding a possible 'renal epidemic' related to methoxyflurane use<sup>6</sup> as experts had already approved the drug. However, reading carefully through the results of Professor Artusio's leading article, 'A clinical evaluation of methoxyflurane in man in 100 cases', one notes that neither the renal nor haematopoietic system had been analysed.<sup>7</sup> It will not be the first time in anaesthetic research when a new compound shows unexpected side-effects compared with a related one from the same family (see the case of rapacuronium<sup>8</sup>). The prediction of clinical effects cannot be based solely on a chemical structure.<sup>9</sup>

In the following five years, it was estimated that 10 to 12 million patients had received the anaesthetic worldwide, with 100 case reports regarding nephrotoxicity. In a follow up report, Crandel<sup>10</sup> underlines the difficulties in diagnosis: on one hand, for many surgeons, renal impairment is defined by oliguria not polyuria; on the other hand, studies involving water restriction in postoperative patients are difficult to perform, as patient have already shifts of fluids from the intervention and possible associated co-morbidities.

These are the reasons why in 1969 Dr Mazze, an assistant professor at Stanford University, tried to investigate the renal toxicity. He started a randomised prospective clinical evaluation of renal function during methoxyflurane versus halothane

anaesthesia. To his great surprise, in 12 cases, five had high-output renal failure and associated metabolic disturbances, while seven had similar but less severe changes.<sup>11</sup> Fascinated by his discovery; he dedicated the following 10 years and more than 30 experimental and clinical studies towards a better understanding of halogenated anaesthetic toxicity.

There have been plenty of issues to be addressed. In the first instance, why was this toxicity not observed in animal experimentation? Initial studies in dogs and Sprague–Dawley rats found no evidence of nephrotoxicity. A strain of rats, Fischer 344, developed the clinical and histological renal manifestations that made them a better model for experimentally-induced toxicity. Methoxyflurane continued to be used in veterinary anaesthesia in dogs; however, co-administration of the NSAID flunixinmeoglumine produced severe renal failure.<sup>12</sup> This means that methoxyflurane has an effect on renal function in dogs as well, but Professor Artusio did not have the appropriate biomarkers to detect it.

Other questions followed. What is the culprit for the renal damage? Is it the fluoride ion/methoxyflurane metabolites alone or in combination with other potential nephrotoxic insults? Are there any subgroups of patients with predisposing factors? Are there factors related to the type of surgery or anaesthetic technique that might have influenced the results? Is there a dose-related relationship between observed fluoride levels and toxicity? What about drug interactions?

The renal issues of methoxyflurane raised concerns about the possibility of similar findings with other halogenated ethers.<sup>13</sup> For some years, until further research demonstrated no such effects, sevoflurane did not enter widely into clinical practice.

There are points of view from other specialities. From the Department of Pathology at the University of Rochester there were two cases of death with severe renal failure following

methoxyflurane anaesthesia. There is an interesting description emphasizing a generalised deposit of crystals resembling oxalate in the tubules with, occasionally, crystals appearing inside the tubular cells.<sup>14</sup> A nephrologist tried to suggest that other factors besides the fluoride ion<sup>15</sup> may contribute to the nephrotoxicity, including intrarenal *in situ* formation of fluoride ions. Subsequent experimental research demonstrated the isoenzymes responsible for defluorination of methoxyflurane in the kidneys: P450s 2E1 and/or 2A6 and P450 3A.<sup>16</sup> A further clarification of the metabolic pathways and metabolites happened in 2006: nephrotoxicity is related to O-demethylation, which results in fluoride and dichloroacetic acid formation. Experimental tubular necrosis is greater when both compounds are used.<sup>17</sup>

A less-studied side-effect is methoxyflurane's hepatotoxicity (Tables 1 and 2), resembling but not identical to halothane induced-hepatitis. Cross reactivity with other anaesthetics was noted and hepato-renal failure was described in some cases.<sup>18</sup> The only case report that had a full viral and autoimmune screen was the one observed in 2011 in Australia.<sup>19</sup> Retrospectively the other case reports are difficult to interpret. Hepatic metabolism of methoxyflurane is linked mainly to cytochrome P450 2E1 isoenzyme (and less by P450s 1A2, 2C9/10, and 2D6).<sup>20</sup>

Table 1: Methoxyflurane hepatitis: Cases related to anaesthesia

Country	Year	Case Report
USA	1967, 1970	1 GA <sup>8 9</sup>
USA	1970	2/3 GAs <sup>79</sup>
France	1972	2 GAs <sup>10</sup>
USA	1968, 1977	1 GA, hepatic and renal failure <sup>1112</sup>
Romania	1982	1 GA, hepatic and renal failure <sup>13</sup>
Holland	1973	1 GA, hepatic and renal failure <sup>14</sup>

Table 2: Methoxyflurane hepatitis: Cases related to sub-anaesthetic doses

Country	Year	Case Report
USA	1975, 1983	Labour analgesia, previous exposure <sup>15 16</sup>
USA, Japan	1977, 1985	Abuse <sup>17 18</sup>
Australia	2011	Three doses at weekly intervals <sup>19</sup>

Because of the above-mentioned hepatic and renal side-effects, methoxyflurane was completely withdrawn even as an analgesic since 1974 in USA and did not have its licence renewed following an application in 2005. However, it has been used for the last 30 years in Australia for pre-hospital care: military, ambulances, and emergency departments.<sup>21</sup> The use of methoxyflurane in Australia is due to the efforts of an anaesthetist who is passionate about it, Dr David Komersoff. He has designed a completely closed system for the safe administration with a single-use inhaler<sup>22</sup> and he has conducted numerous studies into the safer use of methoxyflurane (used intermittently with sub-anaesthetic doses that are below the nephrotoxic threshold). In 2010, Professor Ian Jacobs of the Department of Emergency Medicine at the University of Western Australia conducted a retrospective cohort study over 17 years (1990-2004) of 17,629 cases that had received methoxyflurane in a pre-hospital setting and none had any complications on follow up (heart disease, renal disease, hepatic disease, diabetes or cancer) compared with patients that did not receive the drug.<sup>23</sup> But in the era of evidence-based medicine, randomised controlled trials will have to prove that a real benefit exists. Or maybe pharmacogenomics will help to identify patients at risk of developing toxicity.

And so the story of methoxyflurane continues ...

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## **Anaesthetic Items in the Hunterian Museum of the Royal College of Surgeons of England**

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The Hunterian Museum is based on the eighteenth century collection of the surgeon-anatomist John Hunter. On his death in 1793 he left his collection to the government, who unsurprisingly did not know what to do with it so it languished until 1800, when the government persuaded the then Company of Surgeons to accept it whilst at the same time the Company was promoted to become the Royal College of Surgeons of England (RCS). The Museum itself opened 13 years later and has been on display to a variety of audiences since then.<sup>1</sup>

Originally the majority of specimens were healthy or morbid human and comparative anatomy. Over the 19th century it was principally used for teaching purposes, but it also developed as a centre for biological research and it collected a variety of specimens, manuscripts and illustrations, including x-rays and surgical instruments, and by the Second World War contained some 65,000 items. In May 1941 the College was bombed and a large part of the collection was destroyed. The remaining part was re-organised and re-displayed in a new space in 1963, but by the 1990s the changing function of museums was becoming clear and a further major reorganisation took place. Since then the Museum has become very popular not just for surgeons but also for schools - many children really enjoy it - and a variety of students. In 2012 it attracted over 75,000 visits.

The Faculty of Anaesthetists was a part of the RCS from 1948 to 1990, when it moved out into its own buildings on becoming an independent college. Unfortunately not everything was transferred to the new premises and a large amount of early Faculty archives disappeared. Professor JAW Wildsmith, the

Honorary Archivist of the Royal College of Anaesthetists, is currently tracing what he can of these from RCS records.

Earlier this year I was asked if I would look at the anaesthetic collection in the Hunterian Museum. The Museum has recently received extra funds for conservation and the curator Sarah Pearson wished to know which anaesthetic items were most important to conserve. I was surprised to learn that there are over 300 items, all stored in excellent conditions, mostly accurately described and with full details of their designers, manufacturers and provenance.

### **History of the collection**

The earliest donation of anaesthetic equipment to the Historical Instrument Collection was a mouthpiece for a chloroform inhaler, c.1860, presented by a Mrs Hatton in 1871. Acquisitions came in slowly during the succeeding years, until 1932, when Mr N Buxton FRCS presented over 70 pieces of anaesthetic apparatus made by his father Dr Dudley Wilmot Buxton (1855-1931) an early pioneer in anaesthetics. This gift included many examples of Buxton's own design. A further major acquisition came from Dr Probyn-Williams MRCS in 1936-7, who presented 12 pieces, two of his own design. Many more have been added and, with a few exceptions, all of the items have been identified. The collection was catalogued in the 1950s by WE Thompson, Museum Clerk to the College, with the help of Mr A Charles King, an early collector of anaesthetic equipment, and Dr H Epstein of the Nuffield Department of Anaesthetics in Oxford. Currently the Museum has two catalogues compiled by Thompson available.<sup>2,3</sup>

## Scope of the collection

The collection is mainly from the century following the introduction of anaesthesia in 1846, with a few items from the later twentieth century. The items are mainly small in size and include inhalers, masks and face-pieces, gags, bottles and drugs. The earliest items in date of invention are three examples of Prothero-Smith's chloroform inhaler, invented in 1847. While only 15 items are currently on display in the Museum, all are available to visiting researchers by appointment.

Some highlights include:

- Dudley Wilmot Buxton's apparatus for ether per rectum, c.1900, owned and presented by the designer. A note that came in the box also states that the apparatus was 'specially devised for an operation performed by Lord Lister in 1883' though no mention of this is made in Buxton's book *Anaesthetics*.
- A Skinners mask used by Sir Spencer Wells (1818-1927). Mr Alban Doran (1849-1927) who had been his assistant stated that Spencer Wells 'preferred this mask for a long time, but some of his anaesthetists used a Junker's inhaler.'
- Joseph Clover's (1825-1882) bag for nitrous oxide gas that he carried on his back during operations.

## The Future

The collection is underused, probably because a substantial anaesthetic section in a primarily surgical library is unexpected and hence not well known. The Museum would like historians and researchers to look at this important series.

Descriptions and photographs of the collection can be found on the online catalogue, Surgicat <http://surgicat.rcseng.ac.uk/>. The quickest way to find the collection on the catalogue is to select the 'expert search' option and type in 'RCSIC/S' - which is the catalogue number prefix for this collection.

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## **The Biblical Basis of the 'Blood Doctrine' of the Jehovah's Witnesses**

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Today is the 21<sup>st</sup> of June; it is the Summer Solstice and the longest day of the year. On this day, in 1982, the Prince William was born, and may he have many happy returns of the day and a prosperous, happy and long life.

On this day in 1675, the first stone of the new St Paul's Cathedral in London was laid, after the old one had been burnt to the ground by the 'Great Fire of London' in 1666. It was Sir Christopher Wren who designed the new Cathedral.

May I start by saying, 'welcome to the world of religion' and on a macabre note, may I bring to your attention that 'a young mother who was a Jehovah's Witness, dies after refusing a blood transfusion'? How often have we come across such tragic news in the media? Well, at last there appears to be light at the end of the tunnel, so perhaps, we have a solution to this perennial problem.

This is the 'plastic' era. Plastics move our lives in more ways than one, both in the figurative and the literal sense. Nowadays, we have 'plastic' airways, plastic laryngoscopes, plastic Zimmer frames and very soon we will have plastic blood.

But first, let us give due credit to the person who invented 'plastic', Alexander Parkes, a British chemist and metallurgist, who publicly demonstrated it at 'The Great International Exhibition of 1862' in London, and, it was called 'Parkesine', incorporating his name and it was made of organic material derived from cellulose, that once heated could be moulded, and it retained its shape when cooled. Then followed the invention of the 'plastic red blood cells' by Professor Joseph de Simone, the inventor of Teflon and the Chancellor's Eminent Professor of Chemistry at the University of North Carolina, USA. Using the PRINT technology (Particle Replication In Non-wetting Templates), he

synthesized extremely deformable red blood cell-like microgel particles and loaded them with bovine haemoglobin to potentiate oxygen transport. He thus invented the 'universally compatible human red blood cells' made of poly-ethylene-glycol. These are benign devoid of untoward effects, and deliver oxygen and carry away carbon dioxide. Scientists have envisaged that plastic red blood cells will soon be available (by 2020) on the shelves of the supermarkets like Sainsbury's and Marks and Spencers.

Three topics derive from the title of this presentation, namely the Jehovah's Witnesses, their blood doctrine, and the biblical basis.

### **Jehovah**

From where does the name 'Jehovah' come? It originates from the mediaeval Latin, which in turn comes from the Hebrew, YHVH, Jehovah, the God of the Israelites, His name being revealed to Moses as the four Hebrew consonants called the 'tetragrammaton'. According to the Old Testament, it is the personal name of God revealed to Moses on Mount Horeb [Book of Exodus, Chapter 3, Verses 4-14]. Scholars are not sure exactly how it should be pronounced, but it means 'I am that I am' or 'I am the one who is'.

Who is a Jehovah's Witness? A Jehovah's Witness is a member of a Christian Church of American origin, the followers of which believe that the end of the present world system of government is nigh; that all other Churches and Religions are false or evil; that all war is unlawful, and that the Civil Law must be resisted whenever it conflicts with their church's own religious principles.

### **What is its origin?**

Jehovah's Witnesses is a Millenarian Movement that had its origins in the Bible Student Movement, which developed in the United States in the 1870s among the followers of the Christian Restorationist, Minister Charles Taze Russell. Bible student missionaries were sent to England in 1881, and, in 1900, the first Overseas Branch was opened in London. The group took on the

name 'International Bible Students' Association' and, by 1914; it was also active in Canada, Germany, Australia and other countries. Of course, to some it became the acronym 'IBS Association' that expressed little initial interest in health and sickness (except for the early animosity against vaccinations).

After Russell's death in 1916, the Movement split into several organisations, with one led by his successor, Joseph Judge Rutherford, who retained control of both his magazine, the Watchtower, and his legal and publishing Corporation, 'The Watchtower Bible and Tract Society of Pennsylvania'. Under Rutherford's direction, the IBSA introduced significant doctrinal changes, and, in 1931, the name Jehovah's Witnesses was adopted.

At a convention in Columbus, Ohio, on July 26, 1931, Rutherford made a psychological breakthrough with a large number of 'disaffected Bible students', by proposing the adoption of the name 'Jehovah's Witnesses', based on the Scripture, Isaiah, chapter 43 verse 10, 'ye are my witnesses, saith the Lord'. The Watch Tower said the new distinctive name was designed to exalt the name of God and end public confusion caused by the proliferation of groups carrying the name 'bible students'. It explained, 'It will be a name that could not be used by another, and such as, none other will want to use'.

Under Rutherford, Jehovah's Witnesses grew from 44,000 in 1928 to about 115,000 at the time of his death on 8<sup>th</sup> January 1942. Currently, there are about eight million Jehovah's Witnesses worldwide. Further refinements of its doctrines led to the

1. Prohibition of Blood Transfusion by members from 1945,
2. Abandonment of the Cross in worship,
3. Rejection of Christmas and birthday celebrations because of their pagan origins and exaltation of humans, and,

4. The view of the biblical Armageddon as a global war by God that will destroy the wicked and restore peace on earth.

### **What were the parallels on the field of haematology during this time?**

In 1900, Karl Landsteiner of Vienna first observed the agglutination of human red cells by serum belonging to other individuals, and he described three blood groups, A, B, and O, according to the two types of agglutinin, their combination or their absence which can cause agglutination when brought into contact with agglutinins in the serum. The Viennese physician Decastello described the fourth group AB in 1902, and Landsteiner and Weiner discovered the Rhesus factor or system in 1939-1940. Thus blood transfusion was in vogue during the First World War, because, in 1914, Albert Hustin of Belgium introduced the use of the anticoagulant 'citrate'.

And in 1935, William Kekwick and Marriot introduced the continuous drip blood transfusion after the invention of the glass drip bulb by Laurie.

### **What are the blood doctrines?**

On the basis of various Biblical texts, including Genesis, Leviticus and the Acts, the Jehovah's Witnesses believe that blood represents life and is sacred to God. After it has been removed from a creature, the only use of blood that God has authorized is for the 'atonement of sins'. When a Christian abstains from blood, he is in effect expressing faith that only the shed blood of Jesus Christ can truly redeem and save life. Blood must not be eaten or transfused, even in the case of a medical emergency. Blood leaving the body of a human or an animal must be disposed of. Certain medical procedures involving blood fractions or that use a patient's own blood during the course of a medical procedure such as haemodilution or cell salvage are a matter of personal choice, according to what a person's conscience permits. A 'baptized Witness' who unrepentantly accepts a blood transfusion is deemed to have disassociated himself from the

religion by abandoning its doctrines, and is subsequently subject to organised shunning by other members.

As of 14<sup>th</sup> June 2000, there has been a change, and, the leaders of the Jehovah's Witnesses have revoked the strict ruling that their members automatically faced excommunication if they accept blood transfusions. That may come as cold comfort to many that have watched their loved ones die because they refused blood. Only a week before, a British Jehovah's Witness, who lost many pints of blood in a machete attack, renounced his faith at the last minute, so that he could have the blood transfusion that saved his life. He will nevertheless be disassociated from the religion. One cultural anthropologist has suggested that the doctrine was promulgated to re-establish the Sect's internal cohesiveness camouflaged as mass hysteria.

### **What is the biblical basis of the blood doctrines?**

The Doctrine is based on three biblical passages:

The first passage is from the Book of Genesis Chapter 9 verse 4 where God established a covenant with Noah. 'But you must not eat meat that has its "Life-Blood" still in it' The Watch Tower Society says that the prohibition against 'eating blood' is a part of the 'eternal covenant' with mankind. Parenthetically, the majority of Christian Bible scholars believe that the Noachian covenant was no longer binding on mankind after the new covenant of Jesus Christ was established.

The second biblical passage is from the Book of Leviticus chapter 17 verses 10-16, where God gave a Law to Moses saying,

'None of you may eat blood, nor may an alien living amongst you eat blood' (Leviticus chapter 17 verse 12). This indeed indicated that God prohibited the Jews from 'eating blood'. However, the Watch Tower teaches that Christians are not under 'The Mosaic Law', which includes the dietary laws such as the prohibition on eating pigs and eels. They inconsistently argue that one dietary law is binding which can be seen from Leviticus Chapter 3 verse

17, 'you must not eat any fat or any blood'. Clearly, the law prohibited eating fat and blood is in the same terms, yet the Watch Tower Society prohibits only the eating of blood and by extrapolation, blood transfusion.

The third biblical passage is from the Book of Acts chapter 15 verse 28-29, where James proposed to write a letter to Gentile Christians urging them to follow Jewish customs as follows, 'it seemed good to the Holy Spirit and to us not to burden you with anything beyond the following requirements. You are to abstain from food sacrificed to idols, from blood, from the meat of strangled animals and from sexual immorality. You will do well to avoid these things. Farewell'.

One last point: 'how would the invention of plastic blood affect the Jehovah's Witnesses and their stance against blood transfusions? Would they accept plastic blood or not?

A Jehovah's Witnesses' spokesman replied:

'To each one his own conscience' The point is that God Jehovah says to 'abstain from blood'. So no matter if it is human or animal or synthetic plastic blood. I personally would still strive to uphold God Jehovah's view.

As the Americans would have said 'You can't win'em all, can ya?'



## **The ‘Biblical Method’ of Ventilation – Fact or myth?**

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### **Introduction**

As part of a major research project, the authors produced an extensive survey on the history of ventilation and its general systematics. In this context also a detailed, critical re-appraisal of the ‘Biblical Method’ was conducted.<sup>1</sup> Mouth-to-mouth (or nose) ventilation is assumed to be the earliest form for ‘artificial’ (emergency) ventilation and resuscitation. It is commonly alleged to date back as far as pre-historic (i.e. ‘biblical’) and mediaeval times.<sup>1</sup>

### **The history of ‘artificial ventilation’ – A very short and systematic introduction**

In most general terms, the history of ventilation is based on two main groups of criteria. Both are normally used in tandem: the general techniques employed to achieve pulmonary gas exchange and the chronologic phases or periods, when these first emerged, re-emerged, or were particularly prevalent.<sup>1</sup>

The general *techniques* employed were:

1. positive pressure (ppv) or alternate pressure ventilation (apv),
2. manual methods
3. and negative pressure ventilation.

The main *chronologic periods*, which are suggested in the present historiography<sup>1</sup>, are the following:

## **Prehistory, Antiquity and the period until the late Middle Ages**

The only form of artificial ventilation, which might have been sporadically used during this very long period, seems to have been the technique of positive pressure ventilation. Surviving sources suggest mouth-to-mouth (or nose) ventilation and, more rarely, the use of bellows.

## **Renaissance until the early nineteenth century**

Also in this period exclusively positive pressure ventilation was probably used. This was increasingly achieved by bellows and was particularly promoted by the early Humane Societies. It heralded the advent of ever more sophisticated techniques to resuscitate the ‘apparently dead’. The last few years of this phase then saw the gradual spread of the manual methods [e.g. of Marshall Hall (1790-1857), Henry Robert Silvester (1828-1908), Benjamin Howard (1836-1900) and Edward Albert Schäfer (1850-1935)].

## **Second third of the nineteenth to the second half of the twentieth century**

This is the most complex period. It saw several simultaneous and parallel ‘time-lines’. These often had significant interactions. Despite their relatively recent nature, however, many of these have so far not been fully researched and understood. Initially, this period seems to have been dominated by the ‘heyday’ of the manual methods. In comparison to these, the contemporary positive pressure techniques are usually presented as having been in a phase of relative weakness. Then the period saw the advent of negative pressure ventilators in the style of the ‘iron lungs’ or ‘cuirass respirators’. On the other hand, however, the ‘dominances’ often alleged were increasingly accompanied by disputes. These raged between advocates of negative pressure ventilation (either ‘a manual method’, or ‘iron-lung-style’) on one hand and positive or alternate pressure ventilation on the other.

### **The 1950s until today**

The disputes and accompanying technical developments and research finally led to a ‘renaissance’ and breakthrough of positive pressure ventilation. Until today this remains, almost exclusively, the only form of artificial ventilation routinely used/or in routine use.<sup>1</sup>

### **The ‘Kiss of Life’ – a ‘Biblical Method’ of ventilation and resuscitation?**

Mouth-to-mouth (or nose) ventilation is the easiest and most basic way to perform potentially life-saving positive-pressure-ventilation (ppv). This fact makes it a very plausible and probable contender for also being the oldest technique. A different matter is, whether the sources often cited<sup>2-11</sup> as the earliest ‘evidence’ for ‘artificial’ ventilation are actually suitable to provide this evidence in historic terms. Surviving sources and secondary literature cited to support the claim do indeed predominantly refer to the Old Testament of the Bible and the Torah. There are also myths of ancient Egyptian, Mesopotamian or Greco-Roman origin and later commentaries, mostly in Jewish, Christian or Arabian theological literature.<sup>1 4 7 10</sup>

### **The most important ‘Biblical’ Sources – a short assessment**

In the Old Testament already the act of the creation of man is sometimes referred to as an example for alleged ventilation: *‘And ...God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul’* (Elberfelder Bibel (1905); Genesis, 2:7). Among scholars of the relevant disciplines, however, there is little doubt that this and similar descriptions of the act of creation and animation of man represent a central mystical and theological statement, rather than a literal description of an act of ventilation.<sup>3</sup>

Another commonly cited,<sup>6 8 9</sup> but unconvincing example<sup>10</sup> describes an allegedly successful mouth-to-mouth ventilation administered by the midwife Puah.

In the 'Babylonian Talmud' a new born lamb appears to be either ventilated, or to receive some respiratory support.<sup>4 10</sup> On further examination, however, this passage also remains inconclusive. Most probably the manoeuvre at best constitutes a technique to clear an obstructed airway of mucus.<sup>10</sup>

Another example is a passage where the prophet Elischa (around 800 B.C.) restored the dead son of a Shunammite to life.<sup>2 3 5 8-11 16 17</sup> For a multitude of reasons, however, this interpretation is also highly controversial.<sup>1 2 3 10 12</sup>

Other prehistoric sources with a biblical context are also said to suggest a 'tradition' among midwives to perform mouth-to-mouth ventilation on newborn children. Most authors concede, however, that the available sources on this are also weak and contradictory until well into or even beyond the middle ages.<sup>4 8 10</sup>

### **Other early sources and interpretations: What's in a kiss?**

The same problems apply to other, 'non-biblical' accounts. Most of these have been identified in the creational mythologies of ancient Egypt, Mesopotamia and the Greco-Roman Civilizations. They all share an act of 'inspiration' as a central act of creation, or of beings receiving a soul or spirit.<sup>2</sup> Often this is also put in context with 'rites of passage' after death, 'resurrection' and 'rebirth'. However, all these concepts are, yet again, strictly theological, mystical and spiritual in nature. The very idea and concept of 'resuscitation' in a more 'modern' and medical sense is entirely alien and obviously unknown to them. In Egyptian mythology, for example, there is the frequently-cited resurrection of Osiris by Isis with 'the breath of life'.<sup>3 19</sup> Unsurprisingly, on further examination, also this account has been found to be highly doubtful and inconclusive.<sup>1 3 4</sup>

Ancient Egypt also provides probable 'analogies', where prehistoric myths and theology have previously been mistaken as early medical 'case reports'. The two best known examples for this were the misperception of Egyptian embalmers as early

‘anatomists’ or ‘surgeons’ and the ‘mouth opening ceremonies’ and burial rites as early ‘airway manoeuvres’, or even ‘intubations’.

Today it is generally accepted that the remarkable skills of Egyptian embalmers had no significant influence on contemporary Egyptian medicine.<sup>20-24</sup> This phenomenon of a failure to transfer knowledge and techniques from one field to another may at first sight seem somewhat surprising from today’s perspective. It is, however, far less surprising from a perspective of the comparative history of medicine and science. Also in the Western Civilizations physicians famously had hardly any connection with anatomy and surgery until well into the Renaissance.<sup>20-22</sup>

On the field of the history of anaesthesia, more specifically, the ‘mouth opening ceremony’ in the ancient Egyptian ‘Book(s) of the Dead’<sup>28</sup> has been suggested as an early ‘airway manoeuvre’, or even as endotracheal intubation.<sup>27</sup> In this controversial theory<sup>26</sup> the central error is that the underlying concept is not one of ‘revival’ or ‘resuscitation’. Instead, it is all about a highly complex ‘cycle of creation’ and ‘rebirth’.<sup>24 28</sup> This error led to a number of very obvious and serious mis-interpretations and mis-representations.<sup>1 24 26</sup> Finally, surviving medical and surgical papyri do not suggest any major invasive surgical procedures in the region of the upper airways, significant ‘airway-management’ manoeuvres, or even artificial ventilation.<sup>23-25</sup>

Even if a ‘kiss of life’ is interpreted as being derived from a basic physiological act, this is, in most cases, rather unlikely to be respiration. Instead, the kiss can quite safely be assumed to have developed out of an act of providing ‘nourishment’. In most ancient or still surviving aboriginal cultures and even among many animals it originally represents an act of ‘feeding’.<sup>29</sup> Out of this the kiss developed into the symbol and method of social, emotional and spiritual ‘bonding’, we associate it with today.<sup>29</sup> Both, feeding and bonding are likewise elementary to sustaining human life. These facts also illustrate that the interpretation of the



‘kiss of life’ primarily (or even exclusively) as ‘ventilation’ is factually rather less likely. It ignores its clearly predominant historical origin and socio-cultural context.

For many centuries after pre-history, artificial ventilation seems not to have played any significant role. Between AD 175 and 177, the Greco-Roman physician Galen of Pergamon (AD c. 129-199), for example, mentions in his work *‘De usu partium corporis humani’* the possibility of ventilating a pig, which had previously undergone thoracotomy. Here again, however, it is unlikely that Galen made the connection to use this finding in any ‘therapeutic’ way, notably in man.<sup>1 3 5 20-22</sup>

### **Conclusion: The Biblical Method – more of a ‘myth’ than a historical fact**

Until well beyond the middle ages there seems to be no actually surviving, reasonably robust and convincing evidence for artificial ventilation as an in any way or setting ‘established’ method of emergency treatment in human or veterinary health care. The content of most sources, which could perhaps be interpreted in this way, is factually of highly questionable reliability and authenticity and therefore controversial (e.g. different and contradictory accounts, interpretations and translations which are usually implausible medically). Just as importantly, practically all early sources are strictly religious or metaphysical in nature. They aim to educate and spread the respective beliefs, mystics and spirituality. Theologically, all manoeuvres symbolize the making of man, his creation, his ‘animation’ (being given a soul), acts of sustaining life by nourishment, social and spiritual bonding, rites of passage around the time of death, rebirth and miracles. These all aim to reveal the greatness of the respective gods, their priests and prophets. In wider cultural and historical terms and from a more evidence-based perspective, there is, so far, no indication that any of these acts were contemporarily put in context with human anatomy, physiology and general health care. Therefore, on the base of presently available evidence, the potential existence



of an in any way significant ‘Biblical Method’ of emergency ventilation and resuscitation is, strictly speaking, pure speculation. From pre-historic until beyond medieval times it is, on balance, rather unlikely. The surviving accounts mostly relate to ‘myths’ – in their original, spiritual, religious or metaphysical sense. Given this lack of evidence overall, the claim of the existence of a ‘Biblical Method’ is scientifically misleading. Therefore, it should rather be avoided: from a methodological perspective the claim of a ‘Biblical Method’ is so far solely based on an ‘un-historic’ misrepresentation and mis-interpretation of the available sources. The perspective taken is relatively ‘modern’ in origin and rather ‘medically’ orientated. It is one-sided: it disregards other basic necessities of human existence (nourishment, social bonding, spirituality), which in the actual, contemporary context provide explanations, which appear much more plausible. Similar mistakes are well known and documented in the wider history of medicine, science and anaesthesia: Alleging a ‘biblical method’ is, methodologically speaking, about the same as alleging there had been a connection between Egyptian embalmers and anatomy and surgery, or between the ‘mouth-opening ceremonies’ and ‘airway manoeuvres’ (or even ‘intubations’). We know today, beyond *reasonable* doubt that probably neither of these phenomena ever existed.

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## **The Delphic Oracle: Was she anaesthetised?**

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The Delphic priestess has always been renowned for the ambiguous answers she gave to requests for advice.

For example if you were a general asking the oracle whether or not it would be wise to go to battle, you might welcome an answer such as: 'you will go and you will return - not in the battle will you perish'. But on thinking it over further, you might realise that if you put the pause after the 'not' instead of before, then exactly the same words turn into 'you will go you will return not - in the battle will you perish'.

The site of this oracle is the temple of Apollo at Delphi and it is one of the sites most often visited in Greece. It is perhaps one of the best-documented places in ancient Greek history, being described by virtually every writer from Plato to Pausonius, including Cicero, Pliny, Strabo, Aeschylus and others whose names are familiar even to non-classicists such as myself. Many contemporary writers described the rituals of the temple. Perhaps the most reliable are Strabo (c. 64 BC to AD 24) and Plutarch (c. AD 46-120) a little later who wrote in detail from first-hand, as he was himself for many years one of the two priests at Delphi, although the temple was somewhat past its peak by his time. The ruins visible today date from the fourth century BC and the following centuries. It is an extremely beautiful site, on a very steep mountain slope with magnificent views of the surrounding countryside.

Delphi is reported to have been inhabited since at least the twelfth century BC, but it was from the eighth century BC that it became known throughout the Eastern Mediterranean for the worship of Apollo, the god of prophesy, light, order and harmony. The temple priestess, Pythia, was consulted for her oracular powers, and for several centuries no major decisions in the Greek states would be made without consulting her. Pythia is the generic name by which the oracle is known, each priestess seems to have relatively short life before being substituted by her successor. It is noteworthy that the oracle did not deal primarily with predicting the future; rather she was consulted in order to help people who were faced with dilemmas to make the right choices. She was consulted not only by individuals but also by governments and state authorities to help decide whether, for example, to go out and found new colonies, by leaders of armies before battles, by anyone in fact who was trying to make sound decisions.

Pythia did not give her prophesies throughout the year, but at fixed dates on what was called 'Apollo's day', namely, the seventh day after each new moon in spring, summer and autumn, but never in winter. This limited availability meant long queues built up to consult, and to get to the front it helped to be rich and pay generously, consequently the temple became very wealthy.

Plutarch tells how at times appointed for consultation Pythia would fast for several hours and then be conducted by the priests to enter a chamber called an *adyton* in a fissure in the ground where she would sit slumped on a sort of barstool. The term *adyton* may be translated as 'not to be entered' and so the priests stayed outside, no one except Pythia would enter the chamber. The priests described that she would inhale what they referred to as *pneuma*, namely the sweet-smelling vapours that arose from the chasm in the ground and enveloped her in her chamber. She would fall into a trance and reply to questions by muttering words that often only the priests could interpret.



Occasionally, rather than being trance-like, she would become excited and stimulated into a frenzy.

The temple survived for centuries, but it fell in and out of enemy hands and eventually in AD 66 it was stripped of its treasures by the Romans and finally disappeared from use after about 800 years.

This is the received and well-known story that is retold in the guidebooks and when you visit the temple at Delphi today.

### **Geology**

However considerable doubt was thrown on this story in the mid-nineteenth century when French archaeologists claimed that there never were any ravines at Delphi, no vapours emerged, consequently the story was impossible and it was all a myth. (Amandry, 1950, quoted in <sup>1</sup>) Unsurprisingly this seems to have divided the world of archaeology, not to mention the Greek tourist trade.

However a team led by De Boer in America <sup>12</sup> decided to look again at such evidence as there is available. His group covered a wide field of expertise, including an archaeologist, a geologist, a chemist and a toxicologist, though not an anaesthetist. They looked at the geology of similar areas in the Greek peninsula and noted that there were widespread faults and shifts due to seismic tectonic activity. They surmised that these geologic patterns were not fixed but varied from time to time according to volcanic activity; thus there could well have been major changes over the years and the fact that there were no chasms at Delphi now did not mean that there never had been. Today Delphi is close to the intersection of two major faults and there is said to have been springs emerging nearby, although these cannot be seen at the present day, nor it seems have they been seen for several centuries. However water from springs in the vicinity today is channelled away to supply the modern town of Delphi so the springs may well have been diverted.

De Boers' group noted too that there have been long-term changes in volcanic activity, in particular major earthquakes have been recorded in 373 BC, when Delphi was at its height, in AD 83 after which it went into decline, and more recently in the sixteenth, seventeenth and eighteenth centuries and these have certainly altered the lie of the land.

De Boer found that the tectonic chasms existing today do emit various gases and vapours. Chemical analysis shows the commonest to be ethane, methane, and ethylene. Of these ethylene is the only one with a strong sweet smell such as was described by the priests at the temple. Very few vapours are emitted during the winter, presumably because the water supplies above were frozen, but as the temperature rises in the spring more gases are released. It may therefore have been significant that Pythia refused to pronounce during the winter months.

De Boer went on to postulate that the trance into which the priestess sank when giving her prophesies may have been a state of second stage anaesthesia due to the inhalation of ethylene, a gas that not only emerged from Greek chasms but also had a brief period of popularity as an anaesthetic from the 1920s onwards.

Let us consider the feasibility of his claims.

### **Pharmacology**

Ethylene is a simple hydrocarbon with the formula  $C_2H_4$ . It seems to have first been investigated by Thomas Nunneley of Leeds, an assiduous early researcher who investigated some thirty or so gases and vapours in the late 1840s. He regarded it as an unsatisfactory and dangerous agent (Nunneley 1849 quoted in Sykes<sup>3</sup>), but his experimental methods were crude and oxygen was not available to him. However Isabel Herb in 1923 introduced it into general clinical practice in North America and it seems to have been used sporadically for a number of years.<sup>4</sup> The historian Stanley Sykes writing in 1960<sup>3</sup> strongly criticised both Nunneley's

research methods and his conclusions, saying he himself had personally given ethylene on 1,100 occasions with success and no ill-effects. A well-known dental anaesthetist in Britain, James Bourne also used it at this time.<sup>5</sup>

Ethylene did indeed have advantages over earlier agents; it acted faster than chloroform and much faster than ether; it was effective at about half the concentration of nitrous oxide, and this greater potency means that normal blood oxygen concentrations can be more easily maintained, something that may be difficult when nitrous oxide is used as a sole agent. Ethylene is non-irritant, has a sweet smell and is not unpleasant to inhale. However whilst these are obvious advantages over other inhalation agents available at the time, its usefulness is limited by its flammability and explosiveness.

### **Was Pythia in Stage 2 anaesthesia?**

Today, because of the near universal use of intravenous induction, we do not often see the Guedel second stage of anaesthesia. However those of us who remember earlier days of inhalation induction would tend to agree with De Boer and his colleagues when they pointed out the close similarity between the description of Pythia's trance and what we observed of the light levels of inhalation anaesthesia before consciousness is lost; rapid onset, pleasant sensation, maintenance of muscle tone enabling the subject to maintain a seated posture, slurred speech and hallucinations may occur; there is fast and complete recovery, usually though not always with amnesia for the experience. Occasionally patients struggle and fight, hence Guedel stage 2 is sometimes called the excitement phase; again Pythia was described as occasionally showing this. De Boer even suggested that making the priestess fast beforehand might have been because they had made the practical observation that inhaling these gases on a full stomach tended to cause nausea and vomiting.

De Boer's papers were published in the early 2000s and their theory was reported both in the academic literature and in several semi-scientific magazines such as the *Scientific American* and the *National Geographic Magazine*. It got most attention in America though the *Sunday Times* in 2000 and the *Daily Telegraph* a year later included it (quoted in 6). I did not see it at the time, and I am indebted to Dr Simon Chaplin of the Wellcome Library for drawing my attention to these publications.

However Dr Boer did not have it all his own way. In 2007 Foster and Lehoux<sup>6</sup> in *Clinical Toxicology*, issued a strong rebuttal, both on scientific and philosophical grounds. They complained that De Boer had not actually proved that there was ethylene emitted at Delphi in the centuries BC; that the concentrations he had measured were too low to have much effect and thus he was forced to postulate that historically the concentrations might have been higher; Foster pointed that it was equally possible they might have been lower, or even much the same. Quite how he thought De Boer could have transported his gas chromatograph to Delphi in the centuries BC is not clear. Foster also objected on philosophical grounds that by putting forward this theory, rather than allowing his readers to draw their own conclusions, De Boer had evoked 'a positivist expectation in his readers which predisposed them to believe him', an interesting argument that is not often advanced as a means of refuting a scientific hypothesis. The only convincing objection he makes is to ask 'why were no explosions reported by ancient historians?' As candles were the only form of lighting and were almost certainly used in the vicinity one must concede that it is surprising if no fires occurred, and certainly ancient writers did not report them.

## **Conclusion**

So we can take our choice. We can regard De Boer and colleagues as having advanced an ingenious explanation for some well-documented historical events, or we can concur with Foster in demanding a higher standard of positive proof. It also begs the

question as to whether oracular advice given under second stage anaesthesia is better or worse than that given under other conditions. Alas there is no prospect of a randomised control trial being carried out to determine this. However it is always enjoyable to read plausible explanations for otherwise inexplicable historical events, even if they are not provable.

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## **Chloroform and diamonds – The crime of the Torpeys**

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Reports about chloroform being used to assist robberies or other misdemeanours go back to the earliest days of general anaesthesia. Generally victims claimed that a chloroform-soaked pad had been clapped on their face as they were walking along the street, and they had instantaneously lost consciousness and been robbed of all their valuables. Sometimes it was reported that the effect was produced by simply waving a handkerchief in front of the face. This was the explanation given by a respectable young solicitor in a case described by Linda Stratmann in her excellent book about chloroform.<sup>1</sup> He woke up naked in the morning in the bed of a prostitute, found that he had been robbed of everything including his clothes, and chloroform was the only explanation he could offer of how he had got there. In other cases chloroform was used, or attempted to be used, to reinforce unwanted amorous advances. One such case was dismissed with a stern warning when the victim withdrew her evidence, having married her assailant the day before the trial.

I first came across the case of the Torpeys seven or eight years ago, as a reference in a paper about anomalies of Victorian Law as they affected women, and was surprised that it wasn't already included in the canon of the history of anaesthesia, since it received world-wide publicity in English-speaking countries at the time. This account is taken partly from the court record of the trials at the Old Bailey, and partly from newspaper reports, which in some respects were more detailed.<sup>2</sup>



We first meet the proponents, or criminals, a young couple, Michael and Martha Torpey, both aged 27, in June 1870, when they took rooms at Windsor Villa, 9 Campion Terrace, Leamington, an attractive Georgian spa town in the Midlands, south of Coventry. Their landlady, with whom they seem to have established good relations, was Miss Charlotte Pitt, who lived there with her sister. Mrs Torpey, who was described as petite, with very fair hair, was three months pregnant. Mr Torpey was rather stout, about five feet six inches tall, with a full face of hair, moustache, beard, and side whiskers; and from time to time he would disappear for a few days, carrying a small leather valise. Miss Pitt was told that he was attending race meetings in various parts of the country. It seems that he was not very successful, because Mrs Torpey had to borrow money from her occasionally. Mrs Torpey went into labour on 13<sup>th</sup> December, and was delivered of a baby, whose gender, although it achieved international celebrity, is nowhere specified.

### **The Crime**

At the beginning of January 1871 Michael Torpey was away for a few days, and Martha told Miss Pitt that when he returned he would need to go to London urgently to see to some business, and that she might have to join him for a day or two. She would be notified by telegram<sup>3</sup> if she were needed, so she had arranged for a nurse to look after the baby. Michael left for London on Monday, 9<sup>th</sup> January. On Tuesday 10<sup>th</sup> January Miss Pitt was asked by Martha to post a letter, which, she later stated in her evidence, was addressed to Michael Torpey at 241 Oxford Street, London; either Miss Pitt had a good memory, or was keeping tabs on the Torpeys. On the same morning Michael Torpey, described as a well-dressed and personable young man, turned up at the office of Thomas Flight, an estate agent for upper class properties, in Walbrook, in the City of London. He introduced himself as Mark Tyrrell, arranged to rent No. 4 Upper Berkeley Street, a very good address near Marble Arch, for six guineas a week, and paid for one week in advance.<sup>4</sup> As a reference he gave the name of a

Frenchman said to be staying at the Royal Hotel, Bath. A letter from the Estate Agent to that address brought an immediate reply from the wife of the proposed referee, whose English she said was not good, affirming that they had known MrTyrrell in Paris for some years, and were confident that any engagements that he may have entered into would be honourably fulfilled. As a result the rental arrangement was confirmed, and Tyrrell, or Torpey, took possession of the premises on Wednesday 11<sup>th</sup> January; he visited the house, ostensibly to check the inventory, but did not sleep there. He agreed to keep on the resident housekeeper, Susan Cook, who had been engaged by the Agent to look after the house and its contents.

During that Wednesday morning Martha Torpey received a telegram, and then a second which led her to tell Miss Pitt that she was needed in London, and that she might not return by the following evening, but if so she would send a telegram. A little later she asked Miss Pitt to order her a cab so as to catch the 9.45 p.m. train to London. Miss Pitt was in Martha's bedroom while she was dressing, and noticed that she put on a drab green dress, then another one over it, and a cloak, and a waterproof over that. Then she handed the baby over to the nurse, and set off.

The following day, Thursday 12<sup>th</sup>, was a busy one for the Torpeys. In the morning, as came out later as a result of the publicity generated by Martha's trial, Michael Torpey visited the shop of a West End jeweller, and made an appointment for a number of pieces to be brought to the Upper Berkeley Street house for his wife to see. In the early afternoon of the same day, Thursday 12<sup>th</sup> January, he brought a lady to the house in a cab, without any luggage. The lady, whom the housekeeper Susan Cook later identified as Mrs Torpey, asked her to deliver a letter by hand to an address in Tulse Hill, quite far away in South London. When she arrived there, in the late afternoon, she could not find anywhere corresponding to the address on the envelope, and after

a making a number of fruitless enquiries she gave up and started to return to Upper Berkeley Street.

When the jeweller's salesman turned up accompanied by a 'well-built attendant,' Torpey apologised that his wife was unwell and cancelled the arrangement. He then very quickly visited the shop of the crown jeweller, London and Ryder, at 17 New Bond Street, explained that he had come into some money, and selected a number of items which he said he would like his wife to see. He arranged for them to be brought to the Upper Berkeley Street house that afternoon. At about 5.30 p.m. James Parkes, assistant salesman at Ryder's, arrived at the Upper Berkeley Street address. He brought with him items of jewellery to the value of between five and six thousand pounds, a very substantial sum indeed. He was surprised when Tyrrell opened the door himself, an interesting piece of social history. Parkes's evidence continued:

'The man who had called at the shop, and gave his name as Mark Tyrrell, opened the door. He apologised for his servant's absence. I left my hat in a room on the ground floor, and went up to the drawing room.'

A photograph was shown to him, which he identified as of Mark Tyrrell.<sup>5</sup>

Parkes continued:

'The prisoner was sitting by the drawing-room fire, and I took out of my bag the items that the man had seen at our establishment, putting the bag with the remainder of the jewellery under a small round table. I stood on the nearest side of the table to the door, and Tyrrell stood on the other. I showed a necklace worth £1100, which Tyrrell admired and said he would like his wife to have, or one with a diamond pendant, which was worth £550, and one of two diamond rings. The value of the things on the table was £2600. Tyrrell said he thought his wife's sister should see the things, and asked his wife to go and call her. I continued standing with my back to

the door, and she came back, in, I think, about two minutes and said her sister was coming. Then she came very quickly behind me, and placed a handkerchief saturated with something over my face and mouth – there was a smell to it – and as she did that the man rushed at me, caught me round the arms, and clasped me. The handkerchief was still over my face, and I struggled to get clear of the man and the handkerchief, but he continued to hold me, and the prisoner kept the handkerchief to my face. This went on for some minutes, and I was forced back onto the sofa, and became unconscious. I was strapped across my chest, and another strap went two or three times round my legs. I am not certain whether the prisoner was then in the room, but the man stood over me and said, “If you move, I will murder you.” That was when I had partially recovered my senses, and began to struggle. I asked him to loosen the strap across my chest, and he did so, one hole. He said that if I remained quiet someone would be sent to me in ten minutes. I then heard him say, “Quick, Lucy, with my hat.” After that I heard the street door slam. I ultimately got the straps around my wrists undone, then loosened those around my chest and legs. I broke a window, and called for help. I missed the jewels from the table, all except a small gold chain, but the jewellery in the bag was left. The prisoner was dressed in fashionable style, as you would expect to see a lady. When assistance came there was nobody in the house but me.’

At 7.45 that evening Miss Pitt received a telegram from Martha Torpey saying ‘We have just missed the train, and will be home by the mail train at 4 o’clock in the morning;’ and at about eight o’clock in the evening Susan Cook arrived back at Upper Berkeley Street. She found that the Torpeys had gone, and the house was in the possession of the police.

Actually the Torpeys arrived home at 2 a.m. on Friday morning, 13<sup>th</sup>, in a cab, having taken a train as far as Rugby, some fifteen miles from Leamington, and Mr Torpey borrowed a sovereign

from Miss Pitt to pay the cab man.<sup>6</sup> Miss Pitt noticed that Mr Torpey had shaved off his sideboards and moustache, and trimmed his beard, and that he was carrying a small parcel which he kept closely at all times. She noticed also that Mrs Torpey had a small mark on her forehead, and that they started to lock their bedroom. Apparently the London business was unfinished, because after a couple of days Mr Torpey asked where he could get a timetable for the continental boat trains. It was the Torpeys' misfortune that Miss Pitt was very observant, and also very inquisitive, because she noticed a bunch of keys in their bedroom and unlocked a drawer, in which she saw two small bottles labelled 'drug,' a small box of dye, a brush for applying it, and a new razor and strop. Two hours later she found that the drawer was empty.

On Sunday 15<sup>th</sup> an overseas copy of Bradshaw<sup>7</sup> was delivered for Mr Torpey, and he left on Monday. Mrs Torpey had brought back a copy of a London evening newspaper, and asked Miss Pitt whether she would like to borrow it – she was in the habit of lending her newspaper - and Miss Pitt noticed a prominent report of a jewellery robbery. Several days later, after having tea with Martha, and having put two and two together, she communicated with Superintendent Land, of the Leamington Police.

In the meantime Martha Torpey had posted an arch, patronising letter, which she signed 'Pattie,' to a cousin, Emma Jane Goderich, in Southampton, accompanied by a small packet which she asked her to look after for a short time. Emma opened it, found that it contained some diamonds, and took it to the police. Martha Torpey must have visited her to retrieve the packet, because she was taken into custody in Southampton. She appeared at the Marylebone Police court on 23<sup>rd</sup> January. She was described as soberly dressed and holding a baby. She was remanded in custody, brought before the court again a week later, and on 9<sup>th</sup> February she was charged with robbery with violence, and committed for trial; bail was refused.



Meanwhile Michael Torpey had crossed the Channel and proceeded to Ghent then Antwerp, the centre of the diamond industry. He had removed all the stones from their settings, and was trying to sell them, with little success. The news of the robbery had been published widely on the continent, with an illustrated description of the items. Ryder had offered a reward of £100 for information leading to the recovery of the jewellery, and Scotland Yard had sent two detectives to Belgium. Torpey had intended to try his luck in Amsterdam, but learning from the English newspapers that his wife had been arrested, he returned to London.

### **Martha's Trial<sup>8</sup>**

Mrs Torpey's trial was at the Central Criminal Court, the Old Bailey, on 27<sup>th</sup> February 1871. Her defence lawyer, Montague Williams, was one of the more flamboyant members of the Bar.



Figure 1: Montague Williams QC



He was the fourth generation of a well-known and respected family of lawyers, had been a schoolboy at Eton, had volunteered during the Crimean War and fought at Sebastopol, and had a great enthusiasm for amateur dramatics. He was called to the Bar in 1856, and became sufficiently distinguished to have been the subject of a Spy cartoon in the magazine *Vanity Fair's* gallery of the famous. (Fig. 1) In 1884 he started to have trouble with his voice, but soldiered on until a year later, when, towards the end of a long speech for the defence, it gave out. He was advised to consult Felix Semon, a leading laryngologist, who had invented the operation of laryngofissure. In his autobiography Semon describes him as an anonymous eminent legal patient, and comments on his courage and stoicism during his operation for cancer of the larynx. Williams's friends found him a less strenuous appointment within the legal establishment, and he was made a QC in 1888. He published his reminiscences, a most entertaining collection, in 1890.<sup>9</sup> He included an account of the trial of Martha Torpey, describing her as a very good-looking, engaging woman, exceedingly well dressed, who carried in her arms a very pretty baby, only a few months old; and 'I think that this interesting little person had a good deal to do with the subsequent finding of the jury.' He was teased by his colleagues who thought that he had arranged the theatrical effect in the dock but he said that as a matter of fact he had had nothing to do with it. All the credit must go to Mrs Torpey.

The prosecution's account of the robbery, and the evidence of the witnesses, were, as described above. It is pretty clear that Montague Williams was enjoying himself when he began the case for the defence. Because, he said, the prisoner had been indicted not as a *femme sole*, (which was the legal expression for an unmarried woman), but as the wife of Torpey, he had no need to call witnesses to prove the marriage. And being a married woman, a *femme couverte*, or covered woman, whose legal liabilities had been absorbed on marriage into those of her husband, and who had acted in the presence of, and therefore under the compulsion

of her husband, she was, according to the legal authorities, entitled to be acquitted. There followed a long legal argument. The prosecution contended that as the prisoner had committed violence she must be held responsible, in spite of the fact that her husband was present. The Judge ruled that Williams must prove that she acted under her husband's coercion. So, as Montague Williams describes in his memoirs,

'I proceeded to address the jury, strongly commenting on the cowardice of the man who had fled from justice, leaving his wife with a helpless little infant in her arms, to bear the brunt of the robbery which he had planned, and of which he was no doubt at that very moment enjoying the proceeds. The more eloquent I grew, the louder the prisoner sobbed. I thought at the time that this grief was in consequence of the picture I was painting of the brutal husband; but I subsequently learned from her solicitor that she was distressed by the abuse I was showering upon the partner of her life, of whom she was exceedingly fond.'

The woman received a very good character reference. The Jury expressed their belief that the whole thing had been prearranged by the husband, and that the prisoner had acted under his coercion; the verdict therefore was Not Guilty.

The case created a great stir. There was an outraged editorial in The Times, and it was debated in both the Commons and the Lords. Some members blamed the Judge, and others the Jury; all called for a change in the Law. If any of this sounds familiar, it is because the same defence was offered by Vicky Pryce during the Chris Huhne trial some two years ago.<sup>10</sup>

So Martha Torpey left the Court without a stain on her character, and was immediately placed under surveillance by a very bright member of the Police Detectives Department, as it was then called, Inspector John Shore. After several weeks the surveillance team noticed that Martha had started to pay regular visits to a

house in Marylebone Road, and on the afternoon of 14th April Inspector Shore, accompanied by a police sergeant and several constables, surreptitiously followed her there. She had dyed her light blond hair black, and was dressed in deep mourning. The report states that when Inspector Shore entered the house at 3pm the couple were sitting in the drawing room. He saw that Michael Torpey's appearance was much changed from the police photograph. As Miss Pitt had observed, he had shaved off his sideburns and moustache, and most of his beard, leaving a small goatee. Inspector Shore said 'Good morning Mr Torpey,' but there being no reply, he continued, that he was taking him into custody. Torpey then stood up and started walking towards the bedroom, but the Inspector stopped him and started searching his pockets, where he found a small pocketbook, and some English and Dutch money. Torpey told him to be careful with the pocketbook, as it contained some jewels. Shore found that there were two packets containing 37 diamonds, and asked whether he had the mounts and rings from which he had removed them. Torpey replied that he did not.

The following morning Torpey was immediately picked out in an identity parade by the jeweller, Mr Ryder, who also recognised and swore to the identity of the diamonds. Torpey, who appeared to take the court proceedings lightly, and not to be affected at all by his situation, was remanded in custody. At a subsequent hearing he was committed for trial. Afterwards he asked to see Mr Ryder, and apologised. He also gave him information about the disposal of the property, but jewellery to the value of £1500 was still unaccounted for.

### **The Trial of Michael Torpey** <sup>11</sup>

Michael Torpey was tried at the Old Bailey on 1<sup>st</sup> May 1871. It seems very likely that he was born in Ireland – there are Torpeys in the 1841 and '51 Census returns for County Clare. According to an Australian periodical he was educated for the Church of Rome, but 'disappointed the hopes of his friends by refusing to

enter the priesthood.' He became the cashier of a manufacturer in one of the large Yorkshire towns, but lost his job when his employer went bankrupt.<sup>12</sup>

He was charged with robbery with violence. His defence council was Montague Williams, but he had little to do because Torpey pleaded guilty. He was sentenced to eight years penal servitude, and he and his family disappear from history. (Fig. 1) The only representation that I could find of the Torpeys was an engraving on the front cover of the Illustrated Police News, but it tells the whole story, and I am grateful to David Capus, Manager of the Metropolitan Police Public Records Act, for guiding me to it.

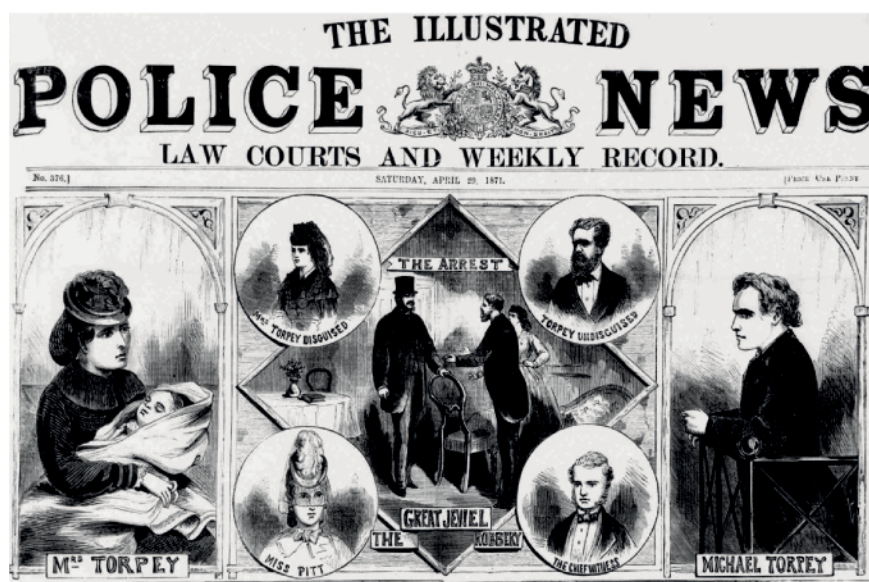


Fig. 2: The Illustrated Police News - front cover for 29 April 1871.

## Comment

As John Snow wrote in his well-known Letter to Lord Campbell,<sup>13</sup> it is very difficult to chloroform anyone against their will. Anaesthetists of the older generation will testify that a smooth induction required a rapport between anaesthetist and patient, and a cooperation that is inconceivable during the progress of a jewellery robbery.

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2. For example The Irish Times and Daily Advertiser, 15 April 1871, Vol 13, issue no. 5414, p. 2; and The Teesdale Mercury, Wednesday 19 April 1871. Reports appeared also in the Pall Mall Gazette, the Illustrated London News, The Bolton Evening News, the Cincinnati Enquirer, the Sacramento Daily Union, the Melbourne Colonist, and the Queanbeyan Age, published in New South Wales.
3. The telegram service, the Victorian means of rapid communication equivalent to email, was abolished in the early 1980s.
4. A guinea was £1-1-0, (one pound one shilling). Only the lower classes used pounds. Professional fees were always in guineas or half guineas.
5. The production of photographs of Martha and Michael Torpey by the Police is surprising, because it seems very early for the police to be using photography, but research disclosed that the Birmingham police were photographing criminals for identification purposes as early as 1848. That the police had photographs of the Torpeys, together with the action of the cousin in Southampton, makes one wonder whether the couple already had what the lawyers call ‘form.’



6. A sovereign was a very attractive small gold coin with the monetary value of £1; there were also half sovereigns.
7. George Bradshaw (1801-1853) first published his compilation of railway timetables in 1839. It remains the favourite reading of the ex-MP for Enfield. Bradshaw's Continental Railways Guide dated from 1847.
8. Martha's trial: Proceedings of the Old Bailey: t 1871 0227-230
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# **The influence of Osler and Sigerist on Clinicians and Medical historians with the History of Medicine**

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## **Background**

Two groups of individuals often write about medical history: clinician historians and medical historians. In general, the former usually consist of physicians without formal training in history, whereas the latter are usually non-physicians trained in historical study. The difference between these groups, however, largely lies in their divergent approaches when examining research topics. Clinician historians typically write about biographical topics and celebrate major events in medical history, following the example set by the legendary internist Sir William Osler, who along with surgeon William Halsted, pathologist William Welch, and gynaecologist Howard Kelly founded Johns Hopkins Hospital and Medical School in 1889.<sup>1</sup> Meanwhile, academic historians are heavily influenced by the methodology of William E. Sigerist, a prominent medical historian who founded the social history of medicine, whereby he framed historical discussions around broader contexts of society. Today, although he may be considered guilty of having authored at least one biographical book about great doctors,<sup>2</sup> Sigerist's approach and that of other medical historians is to go beyond biography and description of events and instead to concentrate on the broader interactions of society and health. In the past, the two camps have distanced themselves, but many bridge-building efforts have highlighted common ground. The joke remains – the professionally trained medical historians state that the work of clinician historians has medicine but no history, while clinician historians state that work

of medical historians has history but no medicine. Our intention is to highlight the Osler/Sigerist dichotomy in the context of how clinician and medical historians write about the history of anaesthesia, and how differences in educational background are reflected in a writer's historical approach. Ultimately, we comment on what such a duality suggests about the very nature of historical writing.

### **The beginnings**

The differences between clinician and medical historians begin with Sir William Osler and Henry E. Sigerist in the early twentieth century. Characterised by many as the 'Father of Modern Medicine', William Osler was one of the four founding fathers of the Johns Hopkins Hospital. He also established the first formal residency program for training internists and was a pioneer in bedside clinical training for medical students.<sup>3 4</sup> In addition to his illustrious medical career, Osler was also a prolific author in the history of medicine, though he did not turn seriously to the field until he had reached his forties and was at the pinnacle of his career as Physician-in-Chief of Johns Hopkins Hospital and Professor of the Theory and Practice of Medicine.<sup>5 6</sup>

Osler's historical writing focused on important laboratory-based scientific discoveries that advanced the medical field as well as the researchers who made them. He combined his admiration for ancient Greek medicine with his praise for experimental investigation by holding up Galen as the father of experimental medicine. Osler traced Galen's legacy through Harvey, Hunter, and Jenner to the last half of the nineteenth century.<sup>6</sup>

More importantly, Osler wanted medical history to be used as a practical tool for shaping the future of medicine, claiming that it was 'most important in its utilitarian pedagogic application to the shaping of young medical professionals'.<sup>6</sup> Over time, Osler's biographical and event-based method of doing medical history became the standard for clinician historians writing the history of their field with the overarching goal of improving medicine. As a

result, clinician historians are often critical of scholarship by medical historians, claiming a lack of clinical relevance and therefore no future utility. To this day, most clinician historians follow not only Osler's model for writing medical history, but his career path as well, turning seriously towards the history of medicine only after becoming well established in their respective fields.

Unlike Osler, Henry E. Sigerist devoted his life to the study of medical history. From 1932-1947, Sigerist served as Director at the Johns Hopkins University Institute of History of Medicine. Sigerist's style of historical writing can best be described as follows: '[Sigerist] experimented and utilised very different methodological forms of historical writing throughout his career, ranging from high-culture explanations of medical discoveries to the employment of economic theory to explain poor public health'.<sup>7</sup>

Hence, Sigerist was one of the early pioneers of the social history of medicine, a school of thought valuing society and social forces as being influential in shaping historical developments, as opposed to individuals or distinct events. Consequently, in direct contrast to Osler, Sigerist represented the 'anti-biography stance in medical history'.<sup>7</sup> In addition, Sigerist expressed aggravation with the methods and means by which clinician historians were writing the history of medicine.

In a 1936 letter to George Sarton, historian of science, and chief editor of *ISIS*, the journal of the History of Science Society, Sigerist admitted frustration with 'amateur historians,' who did not know that 'historical research had exact methods', just like scientific research did.<sup>7 8</sup> Sigerist further served as a mentor to notable medical historians such as Erwin Ackerknecht (1906-1988) and George Rosen (1910-1977). Sigerist had long guided each of them, helped shape their scholarly interests, and assisted at critical junctures in their careers.<sup>6</sup>

Today, Sigerist has become a standard-bearer for medical historians who view his methodology through the lens of Ackerknecht and Rosen. Rosen, for example, extolled Sigerist's *History of Medicine* as a 'masterful, commanding synthesis 'on a grand scale'.<sup>69</sup> Interestingly enough, like Sigerist, most medical historians devote their careers to the history of medicine and show frustration with those whom they regard as amateur historians, especially clinician historians with no historical training.

### **Writings of clinician historians**

The differences outlined above have led to a major division between these two groups within the history of medicine. Following in the Osler tradition, clinician historians typically produce biographical and event-based histories. This methodology is clear in the way in which clinician historians address the history of anaesthesia. For example, in discussing obstetric anaesthesia, most clinician historians will allude to Sir James Young Simpson, noting, 'Sir James Young Simpson of Edinburgh became famous for his discovery of the anaesthetic qualities of chloroform and his championship of obstetric anaesthesia'.<sup>10</sup> Similarly, Alistair McKenzie mentions Simpson in his description of the history of obstetric anaesthesia as follows.

'Thus, he was the first to use ether in obstetrics (January 1847)...Finding that ether was not ideal for obstetrics (slow induction, flammable and explosive), he searched for a better agent – experimenting with numerous potential chemicals. On the suggestion of David Waldie he tried chloroform in November 1847. In two weeks, he published a pamphlet on its clinical use'.<sup>11 12 13</sup>

In both instances, the historical framework of analysis centres on Simpson as a great medical man as well as the events surrounding the medical breakthrough of obstetric anaesthesia. This biographical and event-based approach to history predominates clinician historian scholarship. Another paper even begins by

claiming, 'This is an essay about William Thomas Green Morton and Ebenezer Hopkins Frost'.<sup>14</sup> The clinician historian's account is therefore characteristic of the approach championed by Sir William Osler, with little to no mention of broader societal and cultural influences. Hence, clinician historians generally place less emphasis on social history analysis and more on celebrating an important historical person or event in medical history.

### **Writings of medical historians**

On the other hand, medical historians of anaesthesia tend to follow Sigerist's social history of medicine framework, contextualising and explaining their historical writing within societal and cultural frameworks. Medical historians, therefore, analyse the history of obstetric anaesthesia using a markedly different approach than that of clinician historians. Consider the following example by historian Mary Poovey in her book *Uneven Developments: The Ideological Work of Gender in Mid-Victorian England*:

'The anaesthesia debate constitutes an important episode in the mid-Victorian discussion of the 'woman question' because of the crucial role played by medicine in formulating a scientific justification for what was held to be woman's natural reproductive function and circumscribed social place'.<sup>15 16</sup>

Poovey's approach and style to the history of obstetric anaesthesia contrasts sharply to that of the clinician historians mentioned above, as there is not a single mention of any famous physician in the medical historian's account. Instead, Poovey organises the anaesthesia debate within a framework of the 'woman question' and the means by which society views 'woman's natural reproductive function'.<sup>16</sup>

Perhaps more tellingly, her thesis suggests,

'Not incidentally, I will argue, the "drama" or childbirth – or, more specifically, the display staged by chloroform and theoretically directed by medical men – simultaneously justified confining women to a single social role and disclosed the ways



in which the medical treatment of the female body rendered such confinement problematic'.<sup>16</sup>

Hence, her history of obstetric anaesthesia embraces a social history methodology, with its heavy emphasis on social and societal dynamics. Once again, 'medical men' are only passively alluded to, further complementing the anti-biography stance that Sigerist exemplifies.

In a 2002 article about Humphry Davy, Jacob and Sauter explore why Davy and his associates did not pursue the pain relieving effects of nitrous oxide.<sup>17</sup> They approach this issue from three perspectives – the social milieu in which Davy and his associates worked and lived, their theoretical commitment and protocols, and finally, the technology available to them in 1800. Their report concludes, 'For Davy and company the gas was akin to poetry, and both were keys to a better more sublime consciousness'. They add, 'The discovery of surgical anaesthesia would come with other scientists in another time and in other places'.

In 1974, de Moulin explored the historical-phenomenological aspects of bodily pain in Western man.<sup>18</sup> He introduces the topic by stating that pain is a subjective phenomenon, and that modern man takes offence at many things that were previously taken for granted – growing old, being sick, and even with death. Pain was just another aspect of life that modern man was dissatisfied with, as evidenced by the ever-increasing turnover of analgesics. He proceeds by showing that writers throughout history have commented upon various aspects of pain and that this has been a ubiquitous symptom through the ages. His research convinced him that there was no evidence that the sensitivity of nervous system has changed over time, and he was forced to conclude that modern man is just not willing to accept pain as a result of a change in attitude towards this symptom.

In 2010 Tousignant described the rise and fall of an instrument designed to measure pain – the dolorimeter.<sup>19</sup> Her work



‘connected the social and material configuration of analgesic evaluations to the rise of clinical trials as well as the increasingly psychological understandings of pain in order to frame the rise and fall of the dolorimeter’. Instead of pressure or electrical stimulation, the Hardy-Wolff-Goodell dolorimeter focused the heat of a beam of light onto the forehead of the subject. The claim was that the sensation of pain was stripped of its affective content and was impermeable to variations in mood, experience, or personality. They studied the role of industry sponsors, and that of Henry K. Beecher who advocated the clinical trial to test the efficacy of any analgesic in a controlled experiment. Beecher suggested that the clinical trial of analgesics was superior to any tests conducted with the dolorimeter, and over time sales of the machine dwindled. Tousignant studied the societal, commercial, medical, and experimental aspects of these opposing methods and wondered whether superior technology or salesmanship prevailed. Most anaesthesiologists today are not even aware of the existence of the dolorimeter.

### **Discussion and Conclusion**

Such discourse is characteristic of the clinician versus medical historian (Osler versus Sigerist) debate. Clinician historians are concerned with profiling people and recounting events; in this case Humphrey Davy mentioned nitrous oxide’s potential usefulness in surgery in the 1790s, but it took half a century before this recommendation was taken seriously. Medical historians, on the other hand, ask the reason behind such a delay and look to social history in the form of broader culture and society for the explanation. Distinctions between the two camps are reflected in differences in education. Clinician historians, for example, devote years of study to clinical science and medicine. Hence, in the case above regarding nitrous oxide,

‘It is tacitly understood by anaesthetists that nitrous oxide was the wrong agent. It was suitable for the uncomplicated

extraction of a small number of teeth or the lancing of an abscess, but for nothing more'.<sup>20</sup>

Such prior knowledge provides insight into why a clinician historian would not question why nitrous oxide was not readily adopted for use in surgery, whereas a medical historian with little to no medical training would. Moreover, educational differences shed further light on why medical historians, who are well versed in the humanities, tend to be more analytical in their writing than their clinician historian counterparts.

Ultimately, the clash between clinician and medical historians centres on one question: What is more influential in shaping historical developments, individuals and events, or society and social forces? It is therefore a debate about 'true history', a power struggle for what has ultimate jurisdiction over the past. For medical historians, only detailed historical analysis of surgical anaesthesia within its 'broader therapeutic context' can accurately depict the reality of the mid-nineteenth century. To gloss over any nuance of aesthetic history is to preclude anaesthesia from informing a larger historical understanding of nineteenth-century medicine as well as the larger culture and society within which it existed. Hence, medical historians are inclined to put anaesthesia under a 'wider historical lens'. Clinician historians, on the other hand, view the history of anaesthesia as a means to use facts regarding the past to guide the future of their field.

According to British historical writer Philip Guedalla, 'History repeats itself. Historians repeat each other'.<sup>21</sup> Although satirical, this epigram holds true when considering the influence of Sir William Osler and Henry E. Sigerist on clinician and medical historians, respectively. We have examined the differences between the approaches taken by these groups in examining research topics. As demonstrated above, clinician historians derive their biographical and event-based method of historical writing from the work and legacy of Sir William Osler. Likewise, Henry E. Sigerist was an important influence on medical

historians Erwin Ackerknecht and George Rosen and set the standard for other medical historians using societal frameworks of analysis. We also acknowledge a link between the clinician historians' educational training in the physical sciences and their likewise practical approach to the history of medicine. Likewise, medical historians' training in the humanities may shed light on their inclinations toward social history of medicine analysis. At the heart of the dispute between these two groups is the question of whether individuals and events, or society and social forces, are more influential in shaping historical developments—a question that remains unanswered.

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**Citations for Honorary Membership at the AGM of the  
History of Anaesthesia Society, West Dean College  
20<sup>th</sup> June 2014**

**DR C NEIL ADAMS**

Dr Jean Horton, Past President, the History of Anaesthesia Society

It gives me great pleasure to give the citation for Dr Neil Adams to become an Honorary Member of the History of Anaesthesia Society (HAS).

I do not propose to dwell on his successful career as an anaesthetist, but on his significant contributions to the History of Anaesthesia, and our Society.

Neil's debut as a historian, dressed in a top hat and frock coat, he delivered a presentation on 'Anaesthetic literature of 1887' to the Second International Symposium on the History of Anaesthesia held in London in July 1987.

After the success of this presentation Neil joined the History of Anaesthesia Society the following year in 1988, and has presented several papers to the Society and been very instrumental in the encouragement of anaesthetists in training to present papers at meetings of HAS, the subjects of which he probably thought of himself.

He was elected Honorary Secretary in 1999 and served as such until 2004, and then was elected President from 2010 to 2012.

It was while Neil was Honorary Secretary that he organised successful meetings, one of which was a combined meeting of the American History Association with HAS at the Faculty Club of McGill University on the occasion of the World Congress of Anaesthetists in Montreal in 2000.

Then at the Fifth International Symposium on the History of Anaesthesia, held in Santiago de Compostela in September 2001,



that, having put together details of the next Symposium to be held in Cambridge in 2005, his bid was successful. So the very successful Sixth International Symposium on the History of Anaesthesia was held at Queen's College, Cambridge in September 2005.

Neil's final duty as President of HAS was the organisation of the 25<sup>th</sup> Anniversary Meeting of HAS at Wokingham in 2012.

Therefore it is with great pleasure that I recommend that Dr Neil Adams should be elected to Honorary Membership of the History of Anaesthesia Society.

## **DR DAVID J WILKINSON**

Dr I McLellan, Member of Council, the History of Anaesthesia Society

I am delighted to give this citation for David as he is a stalwart in the history of anaesthesia as well as the speciality as a whole. I do not intend to deal with his recent positions including being a Wood Library Laureate and President of the World Federation or his publications and presentations as it would take 24 hours.

David was a few years behind me as a student at Barts, I did not know him then but even in those days he stood out in the crowd.

I want to begin with a letter David had published in Anaesthesia in 1978 starting the debate about collections of historical apparatus. I believe this letter actually was the catalyst for starting the process of the more general study of the history of anaesthesia leading to the setting up of this Society rather than previous individual pioneering work as it brought like minds together. He was then a mere senior registrar.

I met him first at the World Congress in Hamburg in 1980 and we had a discussion helped by the beer. This process continued with the first international meeting in Rotterdam in 1982, he and I

working with Tom Boulton in the Association of Anaesthetists offices in BMA House, the planning and work with others for the 1987 meeting at the Royal College of Surgeons, the move to Bedford Square and the setting up of the museum there. These were exciting times.

But that is not the History of Anaesthesia Society. Following an exploratory meeting in 1985 the Society was set up in 1986 and David was its first Editor continuing to 1996. This was a period in which his work and enthusiasm for the Society was pivotal in its success and this continued. With this enthusiasm continuing he has many rôles associated with both with the Society and history in general and of course as a Past President of our Society.

David walks tall in our speciality and in the History of Anaesthesia Society. President, Members of the Society, I give you Dr David Wilkinson for Honorary Membership.

## **THE HISTORY OF ANAESTHESIA – SECURING THE FUTURE**

**Should the Societies for the History of Anaesthesia  
show more leadership in pursuing an international, long-  
term strategy?**

**M.W.Strätling, C.M.Ball, D.J. Wilkinson, D.R.Bacon**

This is largely a reprint of the authors' international discussion and strategy paper. It was originally published on the Website 'Anaesthesia History – Making Connections' (<http://www.anaesthesiahistoryconnections.com/>) in February 2014. Its aim is to develop and pursue a long-term strategy to secure the future of our specialty, to inform and engage our wider community and to encourage our individual members and our organisation to contribute actively. To this end, this publication of an updated version has been approved by the Council of the History of Anaesthesia Society (HAS) during the Annual Meeting 2014 at West Dean College, Chichester (19<sup>th</sup> – 21<sup>st</sup> June 2014). Further presentations and discussions will be facilitated at the next Annual Meeting in Falmouth (3<sup>rd</sup> – 4<sup>th</sup> July 2015). In the meantime the authors are more than happy to be approached by any member of our community with regards to additional information, discussions, proposals and hopefully also active contributions.

### **Background**

The authors of this paper are concerned about the future of our sub-specialty (i.e. the history of anaesthesia). The paper has been prepared to highlight some of the issues, propose some solutions and facilitate further discussion.

## **Studying the History of Anaesthesia**

The history of anaesthesia is an attractive and interesting subject and provides many opportunities for scientific study, professional education and historical research:

- Most doctors share an interest in the history of medicine, notably with regards to their particular specialty or area of interest. An awareness of history provides an important sense of identity.
- The history of medicine provides us with an important interdisciplinary bridge, linking the natural sciences, the humanities and medicine. These links include the theories and methodologies of medicine and science, philosophy, ethics, law, educational science and communication - all of which are of paramount importance in the practice of medicine and professionalism.
- During medical training and specialty training in anaesthesia, a historic approach is helpful for teaching and can help explain the complexities of modern medicine.
- Scientific and clinical developments seldom occur along straight lines. Often concepts are abandoned only to be re-explored in a different context, or in light of other developments. A thorough knowledge of one's history can keep present and future issues in context and guard against complacency and a repeat of previous mistakes.
- Given that the history of anaesthesia is not solely retrospective, it provides fertile grounds for future research - nationally and internationally.
- It is an attractive academic subject for study as it is not constrained by the time consuming, burdensome administrative regulations of clinical research (ethics approval, informed consent, insurance, etc.).

- Funding requirements for historical research are relatively small.
- Historical study allows projects to be tailored to suit the skill level, commitment and time schedule of potential researchers. Similar customising can be applied to the methodology, design and scope of the project. This, in turn, means that trainees especially have the opportunity to engage in a project from beginning to end, including potential presentations and publication.
- There are fewer disruptions to career plans and advancement when engaged in historical projects.
- There are multiple opportunities, local, national and international, for research to be presented (and even prizes to be won), all of which can significantly enhance the CVs of trainees or younger consultants.
- In many other areas of medical research and academia the constraints previously mentioned are creating a fragmented, frustrating experience for many of our trainees. Not only are they deprived of gaining valuable experience, but may be dissuaded from pursuing any sort of academic career.
- Undergraduate and postgraduate education, clinical teaching, continuing professional education, academia and research will always be an important part of a medical career. Studying the history of anaesthesia, and medicine, more generally, can open more career opportunities.
- Anaesthetists are under ever increasing pressure to justify their non-theatre activities, in the UK, for example, defending their protected time for 'Supporting Professional Activities' (SPAs). History has always provided a way to engage with the much wider field of Medical Humanities (e.g. Ethics and Law, Theory of Science, Education, Psychology, Sociology etc.). The importance of these in clinical practice, care and education is undisputed, as is the role of the anaesthetist in these disciplines.

Younger colleagues have the potential to establish a defined clinical or academic role in the field of Medical Humanities. Formally defined within their department and organisation, embedded in their job-plans and properly endorsed, appraised and reviewed as part of the revalidation process, this would be all encompassing and include history by definition.

- The history of anaesthesia as a discipline currently has the support of a very active, devoted and competent scientific community, on a national and international level. Existing networks for co-operative research and education are currently quite robust.

## **Problems and challenges**

Despite all of these positive aspects, there is also cause to be concerned about the future.

- The communities of those actively involved in the history of anaesthesia, particularly those represented in education and research, are ageing and decreasing in numbers.
- In time, this will result in a loss of experience, expertise and competence.
- Already this trend means that those studying the history of anaesthesia are under-represented in teaching institutions, depriving us of opportunities to engage the next generation.
- Conversely, academic anaesthesia is missing the significant potential that history provides to teaching and training.
- Interdisciplinary co-operation could also be significantly improved.
- Many efforts by individuals and communities to encourage and recruit younger colleagues have met with limited success. Although many young trainees have been encouraged to make one presentation, they seldom return for another.



- Not all of the contributions of young trainees have been of high quality, many have been surveys with very little original contribution by the trainee.
- This situation is not surprising as postgraduate training and education has been subject to many curriculum changes, all of which have increased the work load and knowledge requirements. Simultaneously working hours are often substantially reduced. Where curricular items have been removed, it has usually been those regarded as 'soft' subjects - such as history.
- The situation is similar in undergraduate medical education. As a result the history of medicine and science no longer feature on the curriculum in many countries.
- Despite the current obsession with continuing professional development and education (CPD/CPE), many medical colleges and governing bodies do not adequately acknowledge the importance of the non-clinical disciplines in medicine and medical professionalism.

Everyone involved in academic medicine is aware of the problems and challenges above. Rapid progress in scientific medicine has provided many more effective treatments. However, administrators, educators and individual practitioners are all struggling with the logistics of maintaining appropriate clinical services, defining educational goals and providing the required practical experience – whilst keeping up with the ethical challenges of cutting edge therapies. History has an important role to play in all of these areas and we, as an international community, need to provide some practical solutions and demonstrate that we can contribute in a meaningful way.

The purpose of this discussion paper is to promote and facilitate conversation around these issues and to develop some strategies for the future. Most of these strategies will be long term but there will be some short-term objectives.

## **Primary aims**

- To secure a future for the History of Anaesthesia as a discipline.
- To secure a future for the national and international societies and associations devoted to the History of Anaesthesia

In order to achieve these aims we will need

- Active individual commitments
- Broad international/national consensus
- Corporate prioritisation of this issue by societies and associations
- Creation of a supportive infrastructure
- Coordination of efforts internationally and, where possible, between associated disciplines.

## **The immediate objectives of this discussion paper are to:**

- Facilitate discussion around these issues
- Provide a comprehensive analysis of the current situation nationally/internationally
- Establish what consensus can be reached at present
- Define the operational base, networks, etc. currently in existence
- Attempt to create a framework to draw up and implement a plan for the future.

## **Proposed activities.**

### **A. Education**

This falls into three categories

1. Undergraduate
2. Postgraduate

### 3. Continuing Professional Development

#### **Aims**

- To reinstate the history of medicine in the undergraduate curriculum
- To reinstate the history of anaesthesia in anaesthesia training programs
- To see these subjects included in the associated assessments.
- To achieve active recognition of historical and related teaching and research in the established frameworks of continued professional development and education (CPD/CPE) and contractual supporting professional activities (CSPA).

It is suggested that history should be reintegrated into these programs as part of a broader focus on ethical and professional issues (e.g. ‘Theory, History and Ethics of Medicine’). This process will require recruitment of enthusiastic clinical and academic colleagues, a review of curricular content and development of educational material.

#### **B. Interdisciplinary networking**

These educational aims will only be achievable with considerable networking – both within the specialty and in the broader community.

At a national level, selected academics, clinicians and departments need to be recruited to promote the History of Anaesthesia as an attractive subject for professional education and academic research.

Relevant governing bodies, e.g. Royal College of Anaesthetists UK, should be approached regarding inclusion in future research strategies. In turn we should cooperatively provide contributions to seminars, courses, research, auditing processes, etc.

Networks need to be fostered with sister organizations and communities with similar interests and problems – within the

medical world and in the broader historical community (e.g. Medical history associations, historical societies, museum professionals, archivists, medical ethics and law communities and other humanities). Possibly the creation of an interdisciplinary working group would facilitate this networking – and even lead to the creation of a new organisation (e.g. a College of Medical Humanities).

### **C. Practical support with educational and research projects.**

To achieve all of the above we first need a robust network within our own subspecialty. To be effective, this needs to be international and web based. In practice this can be achieved by a shared website, hosted, financed and maintained by our various organisations, working together.

Such a website could provide support for both research and education. Suitable teaching and curricular materials could be shared through the website. For more advanced teaching, standardised designs for basic research projects could be provided.<sup>2</sup>

More comprehensive research could be facilitated by such a site by providing a forum for consultation, reference and cooperation on many projects. This would be particularly useful for projects that require access to sources in foreign languages or the compilation of international surveys and bibliographies. Such a website may eventually be able to attract some sponsorship by firms or academic institutions. A long term goal of such a network would be to eventually conduct some international summer schools or seminars, and to commission specific research projects.

### **D. The Consultation Process (2012 – 2014).**

In conclusion, we propose

- A phased stepwise approach
- A long term strategic plan, which will seek

- The encouragement of interdisciplinary and international cooperation

#### **E. Current activities.**

1. This paper was presented for discussion at the 8th International Symposium on the History of Anaesthesia in Sydney, Australia, 24<sup>th</sup> January 2013. It was also submitted for consideration and consultation within the wider anaesthetic community. There was broad agreement with regards to the overall assessment and intention. Additionally
  - a. International cooperation was deemed essential.
  - b. Web-based communication and technologies were seen as central to the success of the project.
  - c. Various decentralised, international organisational structures were suggested. These need further consideration.
  - d. Other suggestions such as options for funding or support for educational courses were broadly discussed.
2. A website entitled '**Anaesthesia History – Making Connections**' has been launched (<http://www.anaesthesiahistoryconnections.com/>). It has received enthusiastic support from the international community, with many contributing excellent suggestions and links, and from clinical colleagues who have found the research links useful for contemporary clinical research. It may be that the website is therefore able to engage others, just by making it a useful site worthy of visiting. At this stage it does not have the functionality to incorporate a forum, but this will be possible in the future. Feedback is currently possible via an email account.

3. First steps have also been taken to explore the re-instatement of the History of Anaesthesia and Medicine to under- and postgraduate curricula.

In several countries (e.g. USA, UK, Germany) efforts have been made or are under way to actively engage the respective communities, notably by promoting the initiative at their own national meetings.

## **E. Conclusion.**

1. Considerable progress has been made since this discussion paper was first circulated. Now that we have broad international support, we invite all interested people and groups to engage with the discussion and to actively contribute to the future of this project. You can contribute to the discussion by visiting the website at <http://www.anaesthesiahistoryconnections.com/> and sending us an email.

2. These could focus, for example, on historic anaesthetic equipment, on biographies, or smaller (e.g. educational) audits. Such standardised projects could be pursued by students and trainees on different levels, providing an early introduction to the subject of anaesthesia, its history and many of the most important, basic methodologies of research and science overall. Additionally, publication and presentation of the results and their presentation and publication, either at meetings, in regular publications, or in a gradually built up online-archive, would also provide incentives for others to take on such projects. Many trainees are required to conduct some forms of minor research or audit projects in the course of their education and training and these would fulfil the criteria. Standardized designs would also assist supervising senior colleagues, and the societies and their members would gain a robust mechanism for providing basic teaching and training, attracting younger generations and of eventually building up a wealth of useful online materials.

July 2014.