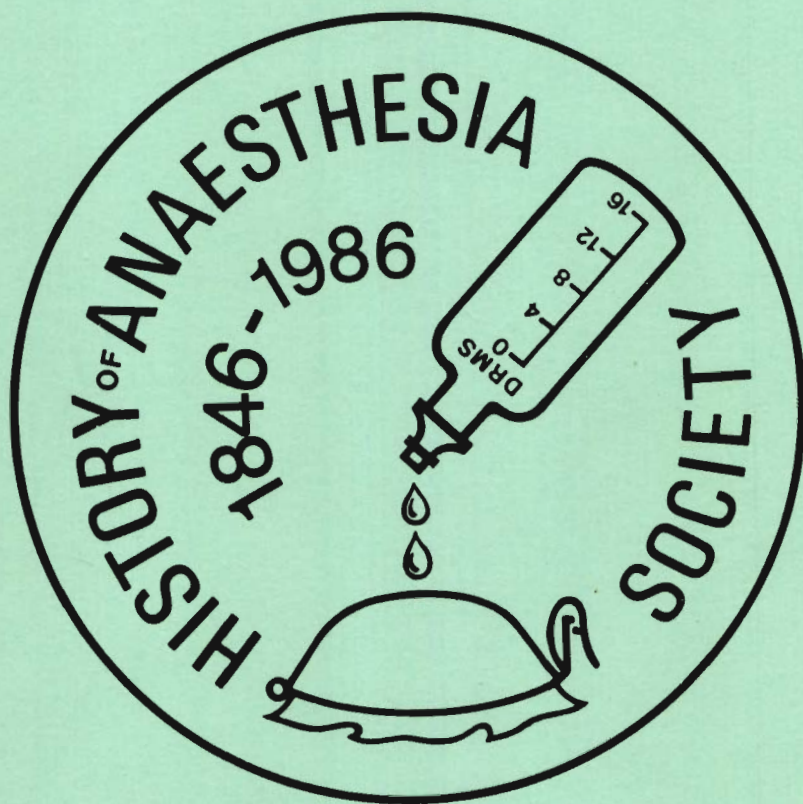


**THE HISTORY OF
ANAESTHESIA SOCIETY**



Volume 5
Proceedings of February 1989 Meeting -
Mayday Hospital Croydon

The History of Anaesthesia Society Council and Officers – February 1989

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Dr Mansfield rises to speak at the Mayday Hospital Meeting.

VOLUME 5

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Mayday Hospital, Croydon
on Saturday, 4th February 1989**

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MEMBERS ATTENDING THE MEETING AT THE
MAYDAY HOSPITAL, CROYDON ON
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HERALDRY AND ANAESTHESIA

Dr T.B. Boulton

Heraldry (the art and science of personal identification) originated spontaneously in Europe and the British Isles for utilitarian reasons in the twelfth century. The heavily armoured knights of the period with their faces concealed by the visors of their helmets could not be easily identified as friend or foe. They therefore painted and embroidered distinguishing devices on their shields, clothes and accoutrements. (Fig)¹.



Fig. 1. The Arms of King John of Bohemia killed by the Black Prince at Crécy in 1346. King John's massive crest consisted of the wing of an eagle intertwined with linden leaves.

These devices were very soon artistically formalised and used to identify individuals and their retainers, for opulent display at sporting tournaments of prowess in the martial arts, and on great ceremonial occasions such as coronations. They were also used on seals to authenticate and approve documents in an era in which the ability to write was given to few people whatever their station in society. At first heraldic devices were adopted at the whim of the individuals, but very soon their use had to be rigorously controlled by Royal command to avoid duplication, and from then on, the right to bear arms became strictly hereditary.

The actual use of heraldry on armour in war was comparatively short-lived because of the introduction of the use of gunpowder in Europe in the early fourteenth century. This made heavy armour obsolete in the face of cannon balls. Despite this the main purposes for which heraldry originated survive to this day. Aircraft, tanks and warships carry flags and other identification marks, football and other sporting teams proudly display their unique emblems on their distinctively coloured shirts, seals are still used on state and other formal legal documents, and heraldic arms appear on banners and robes on state occasions and on notepaper, buildings and official vehicles.¹

Anyone can design and use a logo or register a trade mark, but the right to bear heraldic arms is an honour bestowed only on eminent people or institutions by the Monarch under the Royal prerogative. This is exercised through the College of Arms; an institution which was founded in 1484 by Richard III. It is under the jurisdiction of the Earl Marshal and its function is to regularise and control the use of arms, and to avoid unauthorised usage.

It is natural that in our British tradition that institutions incorporated under Royal Charter should petition the Sovereign for a grant of arms. The new College of Anaesthetists is no exception and its Council has applied to the College of Arms for the grant of a coat of arms reflecting its history, commitments and historical status.

The term 'coat of arms' is derived from the surcoat which was worn over armour with the object both of keeping the wearer cool and of displaying his armorial bearings. Nowadays it is more usually applied to armorial bearings displayed or blazoned on a shield. An 'Achievement of Arms' consists of the armorial bearings on a shield surrounded by various adjuncts which denote the interests and status of the person or institution which is entitled to the arms.

The Arms of the Association of Anaesthetists of Great Britain and Ireland.

The Arms of the Association of Anaesthetists granted by Royal Warrant in 1945 will serve as an example to demonstrate the various elements in the achievement.²

The field of the shield itself is red, which is the traditional medical colour. The charges on it are, the staff of Aesculapius the god of medicine signifying the status of British anaesthetists as physicians, and 'in chief', two golden poppy heads or seed boxes. These symbolise morphia, one of the principal drugs used by anaesthetists.

The helmet above the shield is turned to the right and its visor is closed. This helmet is that of an esquire or gentleman and acknowledges the professional standing of anaesthetists. The language of helmets is an interesting study in itself. Different forms of helmet are used to distinguish the arms of knights, peers, and the Sovereign.

The 'crest' is fixed on the top or 'skull' of the helmet. The whole coat of arms is sometimes referred to as 'the Crest'; this is incorrect. The crest was a three dimensional object mounted on the helmet. It was originally of metal, like the mascot on a Rolls Royce car, and its purpose was to distinguish the wearer when his visor was closed. A crest is frequently used on its own, as a badge or as a device, on a tie for example. The Association of Anaesthetists' crest consists of two mandrake plants – mandrake roots being a herb, the extract of which was traditionally used as a soporific in surgery.

The 'mantling' or 'lambrequin' depicted as being a piece of cloth secured to the helmet under the wreath is nowadays decorative and can be used to display symbolic colours, but it originally had the function of keeping the hot sun off the metal helmet. A similar piece of cloth to protect the neck hangs from the back of the cap of the French Foreign Legionnaire.

The Supporters are on either side of the shield. The grant of supporters is an additional honour. Supporters are hardly ever granted to esquires and rarely to knights bachelor, but in recent years, it has become customary to allow more eminent institutions to use them. In the case of the Association the choice had led to some criticism. They are not drunken or sleeping anaesthetists, but Somnus the god of sleep on the dexter side, and his son Morpheus the god of pleasant dreams on the left or sinister side. The inverted torch of learning represents both the academic function of the Association and the diminished but surviving flame of life under anaesthesia.

The Origin of the College of Anaesthetists

The Faculty of Anaesthetists was formed by the Royal College of Surgeons of England as a diploma granting body at the instigation of the Association of Anaesthetists of Great Britain and Ireland about the time of the introduction of the National Health Service, and it is the Faculty which has now become of age and assumed the status of a College.

The Arms of the Company of Surgeons

The Royal College of Surgeons of England itself is descended from the Company of Surgeons. This came into being in 1745 when it separated from the Barber Surgeons Company formed by Henry VIII in 1569.³

The Company of Surgeons of 1745 established itself in the City of London in Old Bailey and adopted an achievement of arms, the shield of which bore a blue engrailed cross on a silver field. Various charges were placed upon the shield; in the quarters were the knotted serpents of healing, and lions which probably represented professional vigilance. The blue cross displayed a portcullis and an anchor. These probably represent the function of the Company in training and examining surgeons for the Army and Navy. The central crown symbolises the Royal Charter of 1745 under which the Company was incorporated.

The supporters were Machaon the surgeon, and Podalirus the physician, who were the twin sons of Aesculapius the god of medicine. They were the legendary Chief Medical Officers at the siege of Troy. Machaon holds the arrow which he extracted from the side of the Royal General Menalaus, and Podalirus carries the physicianly staff of his father Aesculapius. The crest was the Royal bird (the eagle).

The motto proclaims 'the skills which are of service to all'.

The Arms of the Royal College of Surgeons

George IV was greatly interested in the Royal College of Surgeons and did it the signal honour of granting them an augmented coat of arms himself by Royal Command. The cross of St. George replaced the blue engrailed Cross of the Company, and an additional lion, one of the lions of England, was added in Chief on a red field. The eagle was now crowned with the imperial crown and carried the mace which George IV presented to the College.³

Interestingly enough, by a coincidence, the anchor and the portcullis now gained added significance. The Royal College of Surgeons moved to Lincoln's Inn Fields about this time in the parish of St. Clement Danes (symbolised by the anchor of St. Clement who was martyred by being thrown into the sea attached to an anchor) in the City of Westminster, the coat of arms of which include the portcullis.

The Ancestry of the Association of Anaesthetists

The Association of Anaesthetists of Great Britain and Ireland can trace its ancestry back, through the Section of Anaesthetists of the Royal Society of Medicine, to the original London based Society of Anaesthetists – the first such body in the world.

The Society of Anaesthetists did not bear arms, but those of the Royal Society of Medicine consist of a shield divided 'per pale' (vertically) into red and green divisions bearing an unusual Aesculapian staff. The floral crest of the herb all-heal is used as

a badge on ties and brooches. The supporters are the Saints Cosmos and Damian – twin brothers who practised medicine and surgery for the benefit of the poor without fee. Saint Cosmos, with his jar of ointment, is medically inclined and Saint Damian stands ready to wield the knife. The motto can be translated ‘not so much life but the quality of life’.

Proposed Arms for the College of Anaesthetists

It is a frequent practice in heraldry to proclaim the origins of the bearer, either by ‘quartering’ the arms of their ancestral families, or by using charges from previous arms. This, as we have seen already, was the case with the arms of the Royal College of Surgeons. The President and Council of the new College of Anaesthetists have suggested to the College of Arms that their coat of arms should have links with its predecessors in addition to some novel features.

The Shield. It is proposed that the general format of the arms of the Royal College of Surgeons should be retained but first, that in chief should be the golden poppy heads on a red field of the arms of the Association of Anaesthetists of Great Britain and Ireland. These poppy heads can now be taken to represent both general anaesthesia and intensive care. Secondly the St. George’s cross may be replaced with the blue engrailed cross of the original 1745 Company of Surgeons. Blue also happily reflects the French blue of the anaesthetists’ nitrous oxide cylinders.

The Charges. The knotted snake in the first and last quarters of the shield symbolising physicianly status is taken from the surgeons’ Arms, but the other two quarters contain the cocaine leaves of local analgesia. The lion’s head at the fez point represents the lions of the surgeons’ arms and appropriately reflects the vigilance which must be exercised by anaesthetists. The mantling is in the red and green colours of the arms of the Royal Society of Medicine.

The Crest. The new College of Anaesthetists has an advantage over the surgeons’ college in being a United Kingdom college, and the floral crest, echoing that of the Royal Society of Medicine, will be designed to incorporate the tudor rose of England and Wales, the thistle of Scotland, and the shamrock of Ireland, together with the poppy head and the cocaine leaf. This crest could be used as a badge in a way similar to the manner in which that of the Royal Society of Medicine is used.

The Supporters. The tradition of having a physician and a surgeon as supporters is carried on by introducing John Snow, that stalwart Yorkshireman from the North who was primarily a physician, and Joseph Clover from East Anglia who was a surgeon by origin. Snow is invested with the robes of M D of the University of London, a degree of which he was one of the earliest recipients, and Clover wears the gown of the Royal College of Surgeons of England. John Snow will carry a copy of his famous book *On the inhalation of ether vapour* and Joseph Clover his portable inhaler.

There have been almost as many suggestions for a motto as there are members of the College Council but the consensus choice is ‘Divinum depellere dolorum’ (‘It is divine (or praiseworthy) to drive away pain’).

Conclusion

The College of Anaesthetists is a new institution born out of compromise and representing the endeavours of many anaesthetists.

Heraldry is an ancient science but it is right and proper that the new College should have the dignity of a coat of arms which represents its past and its future aspirations.

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MY VICTORIAN PREDECESSORS AT THE MIDDLESEX HOSPITAL

Dr O.P. Dinnick

Jacob Bell

John Tomes, later Sir John, and the doyen of English dentistry, gave the first documented anaesthetic at the Middlesex on January 25th 1847 for a long and difficult lithotomy.¹ Yet no small part of the credit for that achievement must be attributed to another equally great man – Jacob Bell, the founder of the Pharmaceutical Society and editor of its journal. For though Tomes was nominally the anaesthetist, the ether inhaler (Fig. 1) was 'invented by Mr Bell, Chemist, of Oxford Street, who was present and assisted Mr Tomes in its application'.²

Bell had described his inhaler twelve days previously³ but the contemporary accounts do not say why Tomes chose it from the many others then available. The implication is that Tomes chose Bell and that the latter preferred his own inhaler, with the further implication that the two men had previously worked together, as it is extremely unlikely that Tomes would have chosen an unknown assistant for his first anaesthetic for a major procedure. By then Tomes had already given some dental anaesthetics – not all successful⁴ – using 'sulphuric and sometimes chloric ether'⁵ and only a few days later on February 1st, Bell reported that 'chloric ether had been tried in some cases with success'.⁶

It was not until after Simpson had announced his use of chloroform in November that the editor of the *London Medical Gazette* revealed that Bell's January trial had been made at the Middlesex.⁷ Some further information was later given by Alfred Coleman who said 'Mr Bell employed it – (chloric ether) at the Middlesex Hospital where several dental operations were performed under its agency'.⁸

Although Coleman gave no date for these operations the surgeon could only have been Tomes, who described how 'Mr Bell brought to the hospital a little chloric ether that its effect might be tested'⁹ but on that occasion the test was unsatisfactory. Tomes

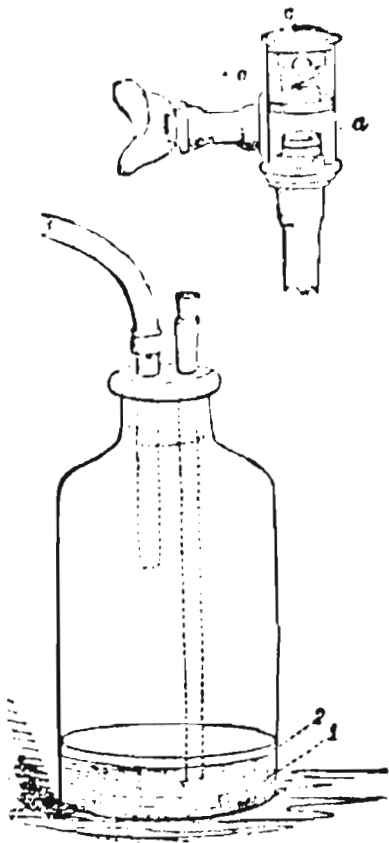


Fig 1. Bell's ether inhaler. 13th January 1847³

operations were performed under its

devoted over half a page to the description of this one case, but he did not state how, or by whom the anaesthetic was administered – neither did he record the date. However, his concluding remark ‘that I did not again use this drug’ suggests that this incident occurred before January 25th, by which time Tomes had used chloric ether more than once according to his diary which made no later reference to this drug. Moreover, for his early dental cases Tomes had also administered chloric and sulphuric ether together¹⁰ – a combination also used ‘repeatedly’ by Bell.¹¹

Even though some of the evidence is circumstantial, it would indeed seem that Bell’s January trial of chloric ether was made on those early dental patients of Tomes, and while there are no clinical records at the hospital to prove this assumption there is another, and compelling reason for believing it to be correct. When I wrote my paper on Tomes, I could find no evidence that Tomes and Bell had ever met before January 24th or, more importantly, that Bell had any connection with the hospital at that time, other than that his firm had supplied the ether used on that day. I have now discovered that evidence. Not only were both men present at the Weekly Board Meeting on January 19th, but Bell was a member of the Medical Committee (though Tomes was not).¹² He had been appointed by February 1846 and continued to serve until the end of 1848. (Fig 2) That advisory committee did not consist solely of physicians

OFFICERS OF THE ESTABLISHMENT.

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Assistant-Surgeon.

MITCHELL HENRY, Esq., 5, Harley Street.

Dentist.

JOHN TOMES, Esq., 41, Mortimer Street.

Medical Committee.

DR. HAWKINS.

DR. CRAWFORD.

DR. THOMPSON.

ALEX. SHAW, Esq.

C. DE MORGAN, Esq.

CHARLES H. MOORE, Esq.

MITCHELL HENRY, Esq.

JAMES CLAYTON, Esq.

JOHN PROPERT, Esq.

W. R. VICKERS, Esq.

JACOB BELL, Esq.

OSCAR M. CLAYTON, Esq.

H. M. ROWDON, Esq.

Fig 2. From the Middlesex Hospital Annual Report 1849

and surgeons and Bell, as an expert pharmacist (then known as a chemist and druggist), was well qualified to serve on it, especially as he had also studied anatomy, physics and the arts and was an influential and respected figure in the contemporary medical world. His close association with the Middlesex (his firm had been a subscribing governor for many years) and apparently with that hospital only, makes it virtually

certain that his January trial of chloric ether took place there. Snow's statement¹³ that this drug was 'exhibited occasionally' at the hospital later in the year may well be correct but I could find no evidence to confirm it.

Bell must have known in January 1847, if only from the papers¹⁵⁻¹⁹ which he had previously edited, that chloric ether contained chloroform, though he may not then have recognised that the latter drug was the most important ingredient of the mixture. Nevertheless, when Simpson reported his use of chloroform, Bell's unequivocal comment was 'Dr Simpson re-introduced the same drug in more concentrated form'.¹¹ Bell predicted that chloroform would be extensively used, and in January 1848 his firm produced a simple wicker mask containing a sponge for giving this agent,²⁰ but this would seem to be his last contribution to practical anaesthesia, apart from his professional interest in the preparation of pure chloroform.

One apparent contradiction remains to be explained: the *Medical Gazette*,⁷ Snow¹⁴ and Coleman⁸ all implied that Bell had personally administered the chloric ether in the January trial and, indeed, it is likely that he did. Yet Tomes claimed that distinction, as he would have regarded the anaesthetic as an adjunct to the treatment which he was giving to his patients and therefore that he was responsible for it. (He would not be the last surgeon to invoke that argument).

Bell was not a clinician and did not contest that claim; the two men remained friends and Bell later assisted in the foundation of the Odontological Society⁸ of which Tomes was a founder.

Bell's outstanding achievement was his creation of the Pharmaceutical Society with its school of pharmacy and its journal, as part of his life-long campaign to further the interests and professional status of pharmacists, for which purpose he entered Parliament in 1850. Yet he had many other interests: he was a Fellow of the Linnean, Chemical and Zoological Societies and of the Society of Arts as well as being an honorary member of various foreign societies. Quaker and philanthropist, he was a patron of the arts and left his own collection to the nation. When he died in 1859 aged 49 'nearly all the chemists in the country closed their shops'.²¹

In 1847 Bell was an influential figure in anaesthesia through his reports of the Pharmaceutical Society meetings and his two specific contributions to the specialty. The first was his inhaler – which was described in a contemporary journal²² as 'having the merit of efficiency, compactness and elegance'. It was used on a number of occasions at the Middlesex and, I think only there.

The second, of course, was his introduction of chloric ether, and the trial of this agent by his pupil Furnell in the 'late spring' of 1847 at St. Bartholomew's is now well known.²³

I have presented some new evidence to support the claim that an earlier trial took place at the Middlesex and in so doing I have also shown that Jacob Bell was one of my more illustrious predecessors.

Septimus Sibley

In 1853 the hospital created the new post of Registrar – (later Medical Registrar) at £50 a year with 'the specific duty of administering chloroform', though without

the title of chloroformist. The man appointed was Septimus Sibley (1851-1893) who had qualified from U.C.H. and the Middlesex with the Gold Medal in Surgery and the Silver Medal in Medicine and had been a house surgeon for a year

In the following year he had the misfortune to have a death on the table – no. 41 in Snow's book²⁴ – but it was not a typical chloroform death. The patient was a stout, muscular and florid man of 65 – the oldest in Snow's series. The anaesthetic had proceeded uneventfully for 10 minutes when there was a violent spasm which continued for 3 minutes, after which the pulse became irregular and ceased. At post mortem he was found to have an enlarged heart – in which 'fat formed three quarters of the thickness of the wall of the ventricle'. To me, the story is suggestive of gastric regurgitation followed by death from the hypoxic strain on the diseased heart; though Snow concluded that because the patient had died he therefore must have received too high a concentration of chloroform.

I would absolve Sibley of blame – his resuscitative efforts were exemplary – mouth to mouth ventilation within a few seconds and galvanism within two minutes. ('Electric shocks to the thorax' had been used at the Middlesex in 1794 when they restored the pulse of an apparently dead woman who had been brought to the hospital having fallen from 'one pair of stairs window' and 'Her health was restored'.²⁵)

Sibley became FRCS in 1857 when he was appointed Lecturer in pathological anatomy for the medical school and visiting Apothecary to the hospital – posts which he held for 14 years. During his time at the Middlesex he was a member of the drug and medical committees and also wrote a number of papers²⁶⁻²⁹ as well as a description of the hospital's response to the cholera epidemic in Soho in 1854, when Florence Nightingale came to assist the overwhelmed nursing staff: 281 cases were admitted and 53% died but only 3 of the staff were affected.³⁰

Sibley later had a distinguished career in general practice, and was a member of the BMA council and President of its Metropolitan Counties branch. He was also Chairman of the managing committee of the Dental Hospital of London and Vice-president of the New Sydenham Society and was the first general practitioner to sit on the Council of the Royal College of Surgeons. With Tomes and Bell, he is commemorated in the Dictionary of National Biography.^{31, 32}

It is not clear whether Sibley continued to give anaesthetics after he ceased to be Registrar in 1860 but it would seem that this task had fallen to others by 1867 when there was a Board minute which said 'it is inadvisable that chloroform should be administered by the house physician or non-resident officer until an RMO be appointed'. The RMO would also be called upon 'to administer chloroform on other occasions than the normal time for operations' which was on Wednesday afternoons. Andrew Stephen, an Edinburgh graduate was appointed RMO in the same year, a post he held for two years, but anaesthesia was not his main interest.

John Murray

In 1867, the hospital appointed its first staff member with the title of Chloroformist as well as that of Medical Registrar – John Murray. This remarkable man had attended classes in the faculty of arts for two years at Aberdeen University, then studied medicine there and at Edinburgh, Paris, Vienna and Berlin as well as at the Middlesex where he qualified MRCS and became a house physician in 1865. He then proceeded to MD Aberdeen in 1867 and MRCP in 1870.

Murray made two contributions to our specialty. The first was a neat folding chloroform mask which, with a 1½ ounce bottle of chloroform, fitted into a small case which could be carried in a breast pocket.³³ There is an example in the Charles King collection.

His second contribution was more important. In the spring of 1869 T.W. Evans gave his celebrated demonstrations of nitrous oxide anaesthesia in London³⁴ and on 13th May Murray³⁵ was among the earliest to adopt this technique which had aroused considerable controversy, as several authorities maintained that the apparent anaesthetic effect of the gas was simply due to deprivation of oxygen.³⁶

Murray, in conjunction with John (later Sir John) Sanderson FRS, then Assistant Physician and Lecturer in physiology at the hospital, soon put that hypothesis to the test. On 26th May he administered pure nitrogen to six patients of the dental surgeon J S Turner at the Middlesex.³⁷ This demonstration clearly showed that to produce insensibility with nitrogen took 3-4 times longer than it did with nitrous oxide while recovery was slightly prolonged. Sanderson confirmed these differences with some animal experiments.³⁸ Murray gave a further demonstration of nitrogen inhalation three months later at the BMA meeting in Oxford.³⁹ Meanwhile, Clover had shown that his chloroform apparatus was well suited for nitrous oxide administration and Murray had one purchased for the Middlesex in July 1868. However, anaesthesia was but one facet of Murray's abounding energy. He was an active member of the London Pathological and Clinical Societies and served as President of the Middlesex Hospital Medical Society – the second oldest in London, having been founded in 1774. He took a keen interest in the Volunteer Medical Association of which he was the honorary secretary, and after he had completed his two years as chloroformist, he worked with the Red Cross Society around Sedan in the Franco-Prussian war. He had previously become one of the Hospital Reporters of the *British Medical Journal* and was later one of its sub-editors 'and as a large contributor to its columns was closely identified with its utterances on most of the questions of the day'.⁴⁰ He was a prominent member of the BMA and 'the obliging secretary of the Medicine section'.⁴¹ He also led a number of campaigns to improve conditions in several hospitals.

In 1871 he was appointed Assistant Physician to the Hospital for Sick Children at Great Ormond Street and shortly afterwards to a similar position at the Middlesex. He was also Lecturer in pathology in the Medical School, of which he became Dean in 1873. A truly remarkable career, as he was then only 29.

Alas, he then died after being ill for less than a week. The manner of his death was described in great detail in his obituaries – and is not without interest to anaesthetists. In short, he had 'hospital sore throat' tonsillitis, oedema of the larynx and respiratory obstruction. He was constantly attended by his colleagues who called in Morell Mackenzie who proposed to scarify his epiglottis and went to his nearby home to collect his instruments – prudently including those for a tracheotomy. The latter operation proved to be necessary immediately on his return, but though respiration was restored, Murray died two days later.

Apart from these gory details, his obituaries^{40, 41} were glowing testimonies to his character, friendliness and ability. He is remembered at the Middlesex by a portrait bust⁴² and an eponymous annual prize endowed jointly by the Medical School and by the University of Aberdeen.

Murray was succeeded as chloroformist by another Middlesex man, Osman Vincent who resigned after eighteen months to become Surgeon to the Great Northern Hospital.

George Norton

In 1870 the hospital appointed the first of its graduates to follow a career in anaesthesia – though he combined that career with that of a general practitioner, as indeed did nearly all anaesthetists up to the time of the last war – and even later. He was George Everitt Norton who had previously spent two years as a house surgeon and the resident obstetric physician at the Middlesex.

Norton was among the first to report his experiences with ether after its virtues had been so forcefully advocated by the American visitor, Jeffries,⁴³ in August 1872 and three months later by the *British Medical Journal*.⁴⁴ On 7th December he wrote 'In accordance with a wish expressed by the Editor of the BMJ, I have for the last month administered ether in hospital and private practice, in place of chloroform in all those cases in which it has seemed possible.'⁴⁵ He noted the frequency of salivation with ether and that the incidence of post-operative vomiting after it was similar to that after chloroform but, though more violent, did not persist for so long. The patients who had received both drugs preferred chloroform. He felt that it was 'too soon to give an opinion of the superiority of ether'. Five weeks later⁴⁶ he confirmed his previous clinical observations and concluded that 'ether does not appear to have any advantages over chloroform unless it be proved to be safer'.

For his first few patients Norton followed the method of Jeffries – using a towel and sponge, but because 'the theatre became full of ether, and the amount used very large' he thereafter used an inhaler, which he described and illustrated.⁴⁵ This was a very compact device in which the inspired air passed over five metal shelves which were covered with flannel saturated with ether, which was intermittently replenished from a small reservoir. This inhaler also proved unsatisfactory, partly because it was difficult to tell when the flannel became dry and presumably also because it got too cold, and it is clear from his January report that he was by then using a better one, although it was not described until March 1873.⁴⁷ This inhaler was based on a Wolf's Bottle which was surrounded by a water bath at 70°F and, as with the much later 'Boyles's bottle', the inspired vapour could be drawn either from above the surface of the ether or bubbled through it. Norton was ahead of his time in another way, when he described an accessory which did not become widely used until nearly 100 years later: - 'I have now fixed to the expiratory valve of the inhaler a long India-rubber tube which conveys the expired ether to the floor. This prevents the operator and assistants from being annoyed by the vapour'.

By 1876 he had concluded that ether was indeed safer than chloroform and was his choice for normal adults. He still used the same inhaler. However, he preferred chloroform for elderly bronchitics, eye operations, obstetrics, children and operations round the mouth, but nitrous oxide he reserved for dental extractions.⁴⁸ He also reported unhappy experiences with two other drugs – bichloride of methylene⁴⁹ and bromide of ethyl⁵⁰ The former had for a year 'been always used at the hospital for small operations' (when a brewer's drayman died under its influence galvanism to the phrenic nerves failed to revive him); while the latter drug caused excessive vomiting and did not always produce relaxation.

Norton was also Anaesthetist to the National Dental and to St Saviour's Hospitals and Surgeon to the Royal Humane Society. In his younger days he had been a keen volunteer and Surgeon-Major to the West London Rifles and also Surgeon to the Western General Dispensary. He was a member of the Harveian Society and of the BMA and was a founder member of the Society of Anaesthetists and served on its first Council. Moreover his stature was reflected in an unusual way which I shall mention later. He died in 1906, still in harness, 'held in high esteem by his colleagues,⁵¹ and with this warm tribute 'There is no-one who has ever worked at the Middlesex but has look on Mr Norton as his personal friend'.⁵²

During Norton's long service as Chloroformist – a title he never renounced – there was, of course, an increasing demand for anaesthetics, especially after 1882 when a second regular operating session was instituted. That demand was first met by the RMO, and later by the housemen finishing the lists after 3.30 pm – a custom still present when I was a student, though the time had become 4.30 pm. So in 1885 Norton was required to instruct every resident in practical anaesthesia and to issue him with a certificate of competence, for which services he could charge one guinea. Even so, later that year an additional post of 2nd Chloroformist was created.

With one exception I will deal only briefly with the holders of that new appointment. The first – W.F Dixon – was a Middlesex man, but he resigned after six months 'for personal reasons', became FRCSEd. and entered general practice. He was followed by Henry Davis – another Middlesex man – who stayed nearly two years and was also Anaesthetist to the Dental Hospital of London and Teacher and Administrator of Anaesthetics at St Mary's where he remained. He too, was a founder member of the Society of Anaesthetists, serving as first Auditor and on its second Council.

Then came Andrew McAusland, a Glasgow graduate who, though he held the post for three years did not pursue an anaesthetic career. Then there were two men who had each been Assitant Administrator of Anaesthesia at St Bartholomew's Hospital where they had qualified, but the first, A.L. Bright tendered his resignation after only a few months when he had a chloroform death. However the second, Theodore G.S. Burns stayed for 27 years becoming the senior Anaesthetist on Norton's death, until his resignation in 1919. He was the third member of the staff to be a founder member of the Society of Anaesthetists and he served on its Council in 1896-97 having been Auditor for the previous year. Later he was on the Council of the Anaesthetic Section of the RSM.

The century was drawing to its close when the hospital opened two new operating theatres, with forced ventilation and with anaesthetic rooms, so in 1899 a third anaesthetic post was created. It was filled by H.P. Noble – a Middlesex man with an entrance scholarship and who qualified with honours and the major student prize. He was also Anaesthetist to the Metropolitan, Paddington Green Children's and the National Dental Hospitals and continued at the Middlesex until his premature death in 1914. He too was a member of the Society of Anaesthetists and later served on the Council of the Anaesthetic Section of the RSM.

Charles Sheppard

But I am now moving beyond Queen Victoria's reign and must return to that ealier 2nd Chloroformist whom I did not name. He was, of course, Charles E. Sheppard who held that office for a little over a year until his death in June 1891 at the age

of 35. He had a brilliant early career, with an exhibition in zoology before entering St Thomas's where he gained many prizes culminating in the Treasurer's Gold Medal and the Solly Medal and Prize. He qualified in 1879 with honours in both medicine and surgery and two years later proceeded to MD with the Gold Medal as well as becoming FRCS, after which he was appointed resident Assistant Physician and Medical Registrar.

This double appointment (it was afterwards split into two posts) was particularly arduous and this, together with a family bereavement, led to his health breaking down after a year. Indeed he gave up medicine for several years before returning to clinical appointments at St Thomas's, the Children's Hospital and the National Hospital for Paralysis. It was only then that he took up anaesthesia having enjoyed his earlier experience in this field when a houseman and he did so with determination and success. He became Anaesthetist to Guy's Dental School, the National Orthopaedic, the Victoria Hospital for Children and the dental department of his alma mater – St Thomas's as well as to the Middlesex.

He was described as a man with an encyclopaedic knowledge of literature and of many other subjects outside medicine and had an extensive collection of old books. He made a particular study of Scottish poetry and compiled a glossary of Robert Burns's work. He was an accomplished musician and built himself an organ and could play to concert standard on many instruments, including the bagpipes. He was happiest when playing music, yet he was a very retiring man, who 'had many friends and no enemies'.⁵³

Sheppard's only significant publication⁵⁴ on anesthesia described a device to enable a Clover's inhaler to be used with the patient in the prone position. The device itself is delightfully simple and is one which is now in universal use – the angle piece which fits the face mask. His paper, however, was more than just a description of the angle piece, as he discussed the physiological changes and practical problems which occur in the prone patient and he gave a sound rationale for using ether rather than chloroform in those circumstances.

Sheppard's other contribution to our specialty was indirect – namely, his unpublished collection of 'most carefully recorded notes of 2350 administrations' as Frederick Hewitt put it, in the preface of his text book.⁵⁵ Hewitt then referred 'to all the valuable observations' which his friend Sheppard had made 'upon the pupil under chloroform and upon many other points connected with the effects of anaesthetics', and ended 'I have incorporated these observations with my own'. That Hewitt's book was influential cannot be denied – Sheppard's contribution to it must not be forgotten.

In concluding this tribute to my Victorian predecessors, I must again refer to Norton for he had something which put him 'one-up' on his contemporaries and, I suspect also, on the current leaders of our profession; this was his telegraphic address: 'Anaesthetic, London'.

I am grateful to Miss K. Arnold-Forster, Museum Officer of the Royal Pharmaceutical Society of Great Britain and to Mr S.W.F. Holloway, Senior Lecturer in the Faculty of Social Science, University of Leicester for their help concerning Jacob Bell, as well as to the former archivist at the Middlesex Hospital, the late Mr W.R. Winterton, FRCS, FRCOG.

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A CASE OF REPEATED ANAESTHESIA

Dr O.P. Dinnick

This case concerns an unnamed anaesthetist of the 1860s whose activities are recorded by a man known to members of this society for his defence of Crawford Long's claim to have discovered anaesthesia¹ – J Marion Sims, the famous American gynaecologist.

In his book on Uterine Surgery² Sims devotes a section to painful intercourse due to vaginismus – a term which he devised – and it is in that context that he wrote as follows (though I have omitted parts of his lengthy account):-

‘I will here relate a most remarkable case that fell under my observation a few years ago. A lady aged 30 was married at 21. Vigorous attempts at copulation were made fruitlessly for five or six weeks. The husband and wife were both young and of course, ignorant on the subject and were not surprised that there was difficulty at the beginning; but soon they began to debate the point of asking for medical advice. . . . The family physician was called . . . and advised sexual intercourse while the wife was etherised. This was soon done and the wife knew nothing of it. But when the act was attempted the next day, and the next, it was found to be utterly impossible again; and again she was etherised and coition effected with the greatest ease. But it was subsequently impossible when she was not etherised’.

Sims then digresses – and after finding no fault with the husband's performance he continues:- ‘Suffice to say that it became the business of the physician to repair regularly to the residence of this couple two or three times a week to etherise the poor wife for the purpose above alluded to.

They persevered, hoping that she would become pregnant and that delivery would cure her. This etherisation was continued for a year, when conception occurred. But during the whole period of utero-gestation, etherisation was necessary to coition. After the birth of the child there were a few copulations without ether – but it was exceedingly painful . . . and they were compelled to resort to the ether again. At the end of another year of ethereal copulation, there was another conception, which resulted in an abortion at the third month. After this, she was etherised constantly for nearly another year, when at last they saw no hope of a cure and, becoming alarmed at the frequent repetition of the anaesthesia, they concluded to give it up altogether. And when they consulted me, there had been no effort at copulation for 3 or 4 years’.

This strange story had a happy ending. Sims operated on her after which ‘sexual intercourse was performed for the first time without pain’.

This case has three points of particular interest for anaesthetists:

1. This lady appears to have had no malaise suggestive of liver damage.
2. She conceived twice under anaesthesia and the conceptus was repeatedly exposed to ether. That she aborted once is not surprising but that she had a full term child is astonishing. Unfortunately we do not know if it had any

congenital abnormalities – dare we assume that ‘no news is good news’? Sims was an honest reporter.

3. She must have had, in just over 3½ years, at least 350 anaesthetics and possibly well over 500.

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WALTER STOECKEL (1871-1961)
A Pioneer of Regional Analgesia in Obstetrics
Dr A. Doughty

The earliest report of the use of regional anaesthesia for the relief of labour pain was published in 1900 by Oskar Kreis¹, an assistant obstetrician at the Women's Hospital in Basel. He achieved immediate and total anaesthesia of the lower part of the body in six parturients by the subarachnoid injection of cocaine; but it was at the cost of nausea, vomiting and post-partum headache in all but one of his patients. In 1909, Walter Stoeckel of Marburg described a series of 141 cases of obstetric epidural analgesia² in an article entitled 'Über Sakrale Anästhesie'. Here is offered an English translation of that historic paper which could have been the foundation of current practice had its implications not been ignored. But first it would be appropriate to give some personal details of the man himself.

Walter Stoeckel was born in 1871, the son of a farmer. He was educated at the grammar school at Insterburg in East Prussia, that small enclave of pre-war Germany on the Baltic coast sandwiched between Poland and Lithuania. Stoeckel was not a bright scholar; he even had to repeat one year's study and he only just scraped through his university entrance examination; but his early personal experience and his later observation of undergraduates led him to believe that performance at school was an unreliable guide as to suitability for higher education. He had intended to qualify as a veterinary surgeon and ultimately to become manager of a stud farm, but his father persuaded him to take up medicine. He studied at Königsberg in East Prussia and then in Munich and Leipzig.

In his memoirs³, he recalls the profound impression made on him when he witnessed childbirth for the first time during his clinical training. He qualified in 1895 and, after compulsory military service and a year as a ship's doctor, he worked for five years as an assistant in the gynaecological clinic at Bonn University. In 1904 he became Chief Assistant to Professor Bumm at the Charity Hospital in Berlin and a year later he was appointed as honorary professor in Berlin University. After a further three years, and much to the surprise of his colleagues, he was simultaneously offered the chairs of gynaecology by no less than three universities, Greifswald, Erlangen and Marburg. He accepted the chair at Marburg, a city 80 kilometres north of Frankfurt; Stoeckel held this post for three years and it was here that he carried out his pioneer work on obstetric analgesia.

Caudal Analgesia

A special interest in gynaecological urology drew his attention to the therapeutic use of caudal injections described in Paris by Cathelin⁴ in 1904. Admittedly Cathelin envisaged relief of labour pain as one of the possible therapeutic applications of the procedure but he never used it for this purpose himself, indeed, as a urologist it was unlikely that he would have had the opportunity; but let Walter Stoeckel himself tell the story.

'The idea of injecting anaesthetic drugs into the sacral canal stems from the French urologist, Cathelin⁴. His technique was reported in a paper translated by Strauss of Barmen entitled 'Epidural injections by sacral canal puncture'. Cathelin's hope of

finding a method equally effective as and safer than spinal anaesthesia has not been fulfilled. The effect of sacral injection is so inferior to spinal anaesthesia that there is no comparison between the two methods for operative surgery. The superiority of Bier's procedure (*i.e. spinal anaesthesia*) must be emphasized without any reservation. Nevertheless, the epidural technique cannot be dismissed as completely useless.

'Cathelin himself first used a solution of 30-40 ml of physiological saline, not as a surgical anaesthetic, but as therapy in various disorders of the urinary tract. In particular he stated that it was effective in a high proportion of adolescents with urinary incontinence. He believed that the injection caused an increased sensitivity of the bladder to normal stimuli and that the pain of cystitis and of urethritis seemed also to be temporarily alleviated. Among German workers, Kapsammer⁵ of Vienna reported satisfactory results in the treatment of enuresis. I myself have treated with epidural injections a number of bed-wetters, children and adults of both sexes; the results will be reported elsewhere.

'I have the impression that it is possible to affect the innervation of the pelvic viscera by the direct action of fluid on the nerve plexus within the sacral canal. Because of the close relationship between the innervation of the bladder and the uterus, it occurred to me to use the method for gynaecology and midwifery and to find out if the sensitivity of the uterus could be affected by an epidural injection. As I felt certain that the pain of labour was due to the uterine contractions, I decided to make use of Cathelin's epidural injections during parturition. By this means it might be possible to achieve the ideal of painless childbirth by a temporary interruption of the nerve pathways carrying labour pain, thus avoiding the need for a general anaesthetic. Cathelin had not used this application of his technique, but he had warned of the danger of cocaine intoxication particularly in late pregnancy: but now we have in Novocaine an excellent and safe substitute for cocaine and as I know that we can safely undertake *spinal* Novocaine injections, I could see no danger in using it for epidural injections. I therefore injected into the sacral canal of a primigravida in the expulsive stage of delivery, 3 ml of the same Novocaine-adrenaline solution that we use for spinal anaesthesia. The result exceeded my expectation. (*Here it is difficult not to suspect an inadvertent subarachnoid injection*). The labour pains vanished, while the progress of labour remained unimpaired. The birth of the child followed so painlessly that the mother was totally unaware of it. Inspired by this initial success, I decided to abandon the Scopolamine-morphine combination then in use in my clinic and to test sacral anaesthesia further; but before reporting on my results up to the present I must briefly review the anatomy and technique of the method.

'The anatomy of the sacral canal has been well demonstrated by Cathelin and I would recommend reading of his work to anyone interested. (*Then follows a short description of the bony landmarks and contents of the sacral canal.*)

Spinal versus sacral injection

'It is clear that there are important differences between the spinal and sacral methods both as to the site of injection and to the spread of the injected solution. With spinal anaesthesia, the fluid injected into the subarachnoid space can spread within the meninges right up into the cranium, but with Cathelin's method the spinal cord and meninges remain inviolate as the fluid spreads between the dura and the periosteum of the vertebral canal. It always remains outside the dura and is therefore 'epidural', or more accurately, 'extradural'.

'I have attempted to demonstrate in a cadaver the height attained by sacral injections in the epidural space. Methylene blue was found to spread up the vertebral canal sometimes up to the lower thoracic region. The solution also flowed along the course of the sacral nerves through the sacral foramina into the retroperitoneal connective tissue of the posterior pelvic wall, but on one side only.

'I do not wish to extrapolate the results of post-mortem experiments to living patients. Live tissues are able to absorb and hold injected fluids. How far the fluid spreads upwards and laterally from the sacral canal must depend on the quantity and fat content of the connective tissue and on the volume of injection. Cathelin's view that fluid cannot possibly track along the sacral nerve roots because of a dense connective tissue block in the foramina, I do not consider to be adequately substantiated.

'As regards technique, I have followed Cathelin's directions. The patient lies on the left side. Knees and thighs are fully flexed the latter being pulled up against the abdominal wall. In the lateral posture the line of the sacral vertebral spines is not contiguous with the natal cleft, so the sacral hiatus lies above the apparent mid-line. This knowledge is particularly important for the accurate identification of the bony landmarks. The right hand inserts the needle through the sacro-coccygeal membrane; there is little difficulty in finding the correct path with absolute certainty but in advancing the needle one must avoid impinging upon the periosteum of the anterior or posterior wall of the sacral canal. After piercing the sacro-coccygeal membrane, the direction of the needle must be altered by gradual depression of its hub. The needle, when correctly sited, lies almost immobile. The injection should be given slowly. If the skin over the hiatus swells at the first push of the plunger of the syringe, it is a certain sign of incorrect placement of the needle as the fluid is being deposited subcutaneously; the needle must then be withdrawn and correctly re-inserted. Pain is caused either by an inordinately rapid injection or by the incorrect siting of the needle.

'The solution injected was physiological saline mixed with varying percentages of Novocaine with or without adrenaline. The most effective mixture proved to be 30-35ml of 0.5% Novocaine with 1 in 300,000 adrenaline. The management of the various changes of volume and composition of the fluid injected and the observation of its effect was made possible only with the close co-operation of my assistants, Drs Bierhoff, Mayer, Esch, Heinrichsdorf and Sieber to whom I am grateful for their support and for their helpful suggestions for modifications of technique during the research.

'In this work we tried to remain objective; we did not wish to be so impressed by good results as to be blinded to unwelcome side-effects and complications. It was not always easy to maintain this resolve. The intellectual level of women delivered in our hospital is sometimes low or at least inadequate to enable us to decide on the quality of the pain relief achieved by the injection. One must guard against biased suggestions and avoid asking leading questions of the mother so that she gives the desired answer solely to be rid of the importunate interrogator. We observed 141 cases, 89 primigravidae and 52 multiparae. The injection was used only in normal pregnancies and we excluded all women in whom a complication was recognized or suspected. Usually only one injection was given but in two cases a second injection was given after a lapse of time. Ninety six patients received the injection during the first stage and 45 in the second stage of labour.

Effect on labour pain. In 18 cases there was no noticeable beneficial effect and in a further 12 the relief of pain was minimal. Positive relief was obtained in the remaining 111 cases but to varying degrees. It became apparent that labour pain is not a single entity but is made up of two distinct components which became recognizable by our experience with sacral anaesthesia. A non-anaesthetized mother usually states that the pains in the lower back are the most severe and they radiate forward like a belt. When the head has passed the pelvic brim the site of the pain changes as a result of the stretching of the perineum. After an effective sacral block the pain of uterine contraction disappears or at least diminishes and becomes quite tolerable. Women often state that, instead of back pain, that which is now perceived over the pubic symphysis amounts only to a very minor discomfort. Of course, the woman has now become aware of it after the injection because it had previously been masked by the very much more severe back pain. We have obtained complete relief or reduction to a tolerable degree of the back pain in 72 cases and of both back and hypogastric pain in 39 cases. The considerable degree of relief was evidenced by the behaviour of the mothers in whom the pains were no longer accompanied by loud crying and rolling about in bed; the contractions could then only be perceived by abdominal palpation. Many mothers with previous experience of labour stated that there was no doubt as to the difference between the present birth aided by sacral anaesthesia as compared with other confinements.

Pain sensitivity in the perineum was mostly but not always obtunded when tested with a needle. Thus the passage of the head through the vulva was painless in 9 cases and only very slightly painful in 16. Three women were delivered by forceps and two had perineal tears sutured quite painlessly. In two other cases, sacral anaesthesia was insufficient for the application of forceps and these patients had to be helped with a few drops of chloroform. In many cases there was a marked relaxation of the pelvic floor musculature.

The onset of the effect of the injection was usually after three to five minutes; its duration was very variable, between a few minutes and six hours. The average duration of pain relief was one to one and a half hours.

Effect on Uterine Contractions. Any method of pain relief that interferes with the progress of labour is unacceptable and a danger to both mother and child. This danger exists with several of the established methods of anaesthesia as there is unquestionably a relationship between the strength of the pain and the progress of the labour. Early in labour the mother's pain is due to the uterine contraction but towards the end, the pain is of perineal pressure and stretching of the vulva. This is the afferent stimulus for the bearing-down reflex; the stronger the pain the more strongly does the mother bear down. It is difficult to determine whether the experience of pain has a similar role in the progress of the first stage but it is possible that complete abolition of pain could adversely affect the whole progress of labour. For this reason, we watched the uterine contractions very carefully after the sacral injection. In 23 cases the contractions became weaker and less frequent and this depressive effect was especially noticeable if the injection had been given too early in labour; in one case the contractions ceased with the pain and did not return for four days. This suggested to us that perhaps a threatened abortion or a premature labour could be suppressed by sacral anaesthesia, but unfortunately the opportunity to test this hypothesis has not arisen. However, if labour had been well established, neither the uterine contractions nor the expulsive forces were affected as a general rule; but in a few cases where perineal sensitivity

had been greatly reduced, the bearing down effort was diminished – a striking proof of its reflex dependence on vulval stretching. In four cases we ended labour with forceps because of undue delay in the delivery of the head; in one of these foetal bradycardia was a clear indication but in the other three a spontaneous delivery could well have been achieved.

'In the post-delivery period we had a few cases of uterine hypotonia; we blamed this on the sacral injection, perhaps unjustly, for in 141 deliveries, a few cases of hypotonia must be expected fortuitously; but we justified our assumption for the sake of scientific integrity. However, since we added adrenaline to the injected solution there were no further cases of uterine hypotonia. Since using adrenaline the blood loss at delivery was markedly reduced. Of the 141 cases, 100 lost under 500 ml, 33 lost 500-1000ml, 6 lost 1000-1500 ml and only 2 lost over 1500 ml.

'Side Effects and Complications. There was little evidence of harm to the foetus. In only three cases was there slowing of the foetal heart rate but the infants were delivered in good condition without any sign of asphyxia.

'It was particularly gratifying that no case of urinary retention was seen in the puerperium so none required catheterisation. This is not easy to reconcile with the known therapeutic effect of epidural injections in enuretics. The condition of the mothers in the puerperium confirmed our view that, in general, sacral anaesthesia is a method completely without danger and without coincident or subsequent ill effects. Nevertheless our confidence was shaken by the following case of an infected injection.

'The woman had complained of pain during the injection and, as labour pain had not been relieved, more local anaesthetic solution was injected. It was then realised that the total dose of 60 ml must have been given through an incorrectly sited needle although there was no obvious reason for this suspicion. During the puerperium an abscess appeared in the right gluteal region requiring a large incision. Quite clearly, the tip of the needle had been inserted under the periosteum of the posterior wall of the sacral canal as a few small flakes of necrotic bone were discharged during the granulation and healing of the wound. Bacteriological tests on the solution of Novocaine-adrenaline solution supplied by the pharmacy showed the presence of streptococci and the same organism was isolated from the pus discharged from the abscess. This was certainly a double error – a gross lapse of asepsis and a technical fault, the latter excusable, the former not.

Conclusions. In summary I would particularly like to stress that, on the results so far, I am not recommending sacral anaesthesia as an ideal procedure. I have tried it out because it seemed logically well-founded and because it offered a new approach to the problem of the relief of pain in labour. I have drawn attention to the shortcomings of the method in its present form and I readily admit that equal or more profound effects are obtainable by general anaesthesia, by Scopolamine-morphine or by the spinal anaesthesia recently used by us. On the other hand I doubt whether any of these methods is as safe as sacral anaesthesia. They cause constant anxiety to the doctor, they affect the woman's well-being to a greater or lesser extent and they add side-effects which mar their clinical application. With sacral anaesthesia the pain relief, generally speaking, is not so complete, but the mother shows no sign of stress. She remains conscious, she is neither cyanosed nor restless, her central nervous system is totally unaffected, she shows no sign of shock and has no post-partum headache.

In short, she buys her freedom from discomfort cheaply and is not a source of anxiety to her doctor'.

Comment

So ends this translation of Walter Stoeckel's paper published in 1909. Now, 80 years on, what can we say of this man who discovered and appreciated the potential of regional obstetric analgesia years before other pioneers in the field? It is surprising that he did not persevere in developing his discovery. He stayed in Marburg for only three years; perhaps it was only there that conditions were ideally suited to his research. He moved on to Kiel and then in 1925 he succeeded his former professor in the prestigious chair at the University of Berlin. There he busied himself with the creation of ideal working conditions in his clinic, constantly stressing the importance of keeping pace with modern developments and insisting on the provision of the necessary equipment and facilities. He became the leading German gynaecologist of his time, establishing a world-wide reputation in the treatment of uterine cancer. His particular interest was in gynaecological urology, in fact he held strong views that *all* urology in women should be managed by the gynaecologist. He wrote a book on cystoscopy and published a massive text-book of gynaecology which ran to 14 editions. For many years he was editor of *Zentralblatt für Gynäkologie*, the journal in which his paper on sacral anaesthesia had appeared in 1909². From his department emerged no fewer than 20 professors of gynaecology and 34 heads of other gynaecological departments.

Something of Stoeckel's character may be discerned from his paper on sacral anaesthesia. Here was no autocratic professor taking for himself alone the credit for work done in his department. He readily acknowledges his debt to Cathelin and others for developing the technique of sacral injection and he mentions the help received from his juniors, naming them individually. Despite his humane compassion for the suffering of mothers in labour, he displayed also a mature scientific detachment, refusing to be dazzled by the drama of his discovery. He recorded his observations with honesty, both the successes and the setbacks.

Stoeckel enjoyed a happy family life, retaining to the end a deep interest in current affairs, in horses and a great love of music. He died in 1961 and his memoirs were published four years later³; it is from these that most of his personal details have been gathered. But the mystery remains: the memoirs give little more information concerning his work on sacral anaesthesia than can be gained from reading his paper published in 1909.

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CHLOROFORM FOR MRS DICKENS

Dr B.M. Duncum

In March 1847, before the birth of a seventh child, Charles Dickens brought his family back to London from Paris where they had recently been living. Their house, just south of Regent's Park, was still let, so Dickens took a furnished house in Chester Place, looking into the park on one side and Albany Street on the other. There, on a Sunday in mid-April, Kate Dickens suddenly found herself in labour of a most alarming nature. Dickens, as he described events to his actor friend William Macready, rushed wildly off to fetch Kate's obstetrician, Dr Henry Davis, and at the same time got hold of the top London man, the Queen's accoucheur Dr Charles Locock.

Locock and Davis evidently coped effectively with the emergency – whatever it was – for Dickens' report that 'next day Kate, thank God, was as well as ever she had been at such a time, though Davis', Dickens said, 'had seen only one other case of the kind; and of course my dear Kate suffered terribly'.¹ Had Dickens not been living abroad during the previous few months he might well have heard of Dr Protheroe Smith who could have prevented Kate's ordeal. In the spring of 1847 Smith was one of the few London obstetricians resolutely following James Young Simpson in believing that since women could now safely be spared the pain and anxiety of childbirth by inhaling ether vapour, they should be offered the opportunity to do so.

Besides being in private practice, Smith taught midwifery at St. Bartholomew's, and if he had had any doubts about the safety of ether, there to reassure him was that notable pioneer anaesthetist Mr Samuel John Tracy, the hospital's surgeon-dentist. Since the end of December 1846 Tracy, quietly, resourcefully, and very successfully, had been acting as etherist for various colleagues in and out of hospital, including Protheroe Smith. Smith's first account of his own etherized patients appeared in the *Lancet* on May 1 – just too late to enlighten Dickens. In his article he acknowledged the valuable services of Mr Tracy, and seems also to have been one of the first obstetricians to suggest that in natural childbirth it would be sufficient and safer not to carry etherization beyond the second stage, keeping the patient conscious though insensible to pain.²

By the autumn of 1847 Kate Dickens was, as usual, pregnant again. Charles had not forgotten the alarms of that dreadful Sunday in April, nevertheless he took Kate with him when he travelled north by train on December 27 to preside at the opening of a Workingmen's College, the Glasgow Athenaeum. At that time neither of the main lines from Euston to Scotland was fully open. On the western route the track was incomplete between Carlisle and Glasgow, and on the east-coast route to Edinburgh the rail-bridges over the Tyne and Tweed were still under construction. Though his destination was Glasgow Dickens chose the eastern route, possibly because in bleak mid-winter it would be a little less gruelling than the long cold haul over Shap Fell, but chiefly so that he could spend a few days in Edinburgh with his friend Lord Jeffrey and break the homeward journey at York to meet his brother Alfred, a railway engineer working in the locality.

Charles and Kate spent what remained of the night of December 27 at the Royal Hotel in Edinburgh and next day caught a train to Glasgow. Some of the most popular music-

hall jokes then in circulation suggested that females in an interesting condition might precipitate labour by being jolted about on the railway. Dickens himself had thought the idea funny enough to rough out a sketch featuring Mrs Gamp in a train, on the look out for business. Between Edinburgh and Glasgow it ceased to be funny: poor Kate started a miscarriage. Fortunately, their sympathetic Glasgow hosts lived in a warm and comfortable house and Kate was put to bed and cosseted. Dickens went off to be acclaimed at the Athenaeum but not before, as he put it in a letter to Alfred, he had been obliged to call in a famous Doctor – who that doctor was Dickens didn't say.

After two days in bed Kate felt better and they caught the train back to Edinburgh and Lord Jeffrey's house. On New Year's Day they went out shopping to look for a little present for Alfred's wife, but Kate was taken violently ill in the street and had to be hustled into bed once more, to be attended by famous Doctor No. 2³ This time there can be no doubt about his identity. Famous Doctor No. 2 must have been Professor James Young Simpson. Jeffrey would certainly have recommended him; and it later became evident that Dickens had already heard a good deal about Simpson's much publicized use of the new wonder-anaesthetic chloroform in childbirth, and was eager to learn all he could about it at first hand.

When a year later, on January 16 1849, Kate was brought to bed with their eighth child, everything had been carefully pre-arranged. Reporting again to Macready, then on tour in the United States, Dickens wrote at some length as follows:

'You have heard, perhaps, how that I now stand seised and possessed of six sons and two daughters. . . . Kate is wonderfully well – eating mutton chops in the drawing room – and sends you her dear love. The boy is . . . a 'moon faced' monster. He did not, however, come into the world as he ought to have done (I don't know in what we have offended Nature, but she seems to have taken something in us amiss) and we had to call in extra counsel and assistance. Foreseeing the possibility of such a repetition of last time, I had made myself thoroughly acquainted in Edinburgh with the *facts* of Chloroform – in contradistinction to the talk about it – and had insisted on the attendance of a gentleman from Bartholomew's Hospital, who administers it in the operations there, and has given it four or five thousand times. I had also promised her that she should have it. The doctors were dead against it; but I stood my ground, and (thank God) triumphantly. It spared her all pain (she had no sensation, but of a great display of sky-rockets) and saved the child all mutilation. It enabled the doctors to do, as they afterwards very readily said, in ten minutes, what might otherwise have taken them an hour and a half; the shock to her nervous system was reduced to nothing; and she was, to all intents and purposes, *well*, next day. Administered by some one who has nothing else to do, who knows its symptoms thoroughly, who keeps his hand upon the pulse, and his eyes upon the face, and uses nothing but a hand kerchief, and that lightly, I am convinced that it is a safe in its administration, as it is miraculous and merciful in its effects. This the Edinburgh Professors assured me, and certainly our experience thoroughly confirms them'.⁴

This was Dicken's first mention of more than one professor. Who else then had he encountered in Edinburgh? In all probability it was James Miller, Liston's former pupil and Simpson's friend and colleague and the first general surgeon to test chloroform for him, in a case at the Royal Infirmary on November 12 1847. A more

important speculation concerns the identity of the 'gentleman from Bartholomew's Hospital'. The editors of the fifth volume of the Pilgrim Edition of Dicken's letters, usually impeccable in their annotations, suggest that he was Protheroe Smith, on the grounds that he was one of Simpson's earliest converts and connected with Barts; but there I can't agree with them. Had Smith been present on January 16 Dickens surely would not have written as he did that 'the doctors were dead against it,' and Smith himself would have been most unlikely to affront his confrères by chloroforming their patient against their expressed wishes. It seems to me that all those particulars about the chloroformist and his methods described by Dickens add up to the unmistakable likeness of S.J. Tracy.

As to the dissenting but defeated doctors, my guess is that once again they were Locock and Davis who had certainly done very well by Kate in April 1847 – apart from her suffering. But if it was Locock who had been browbeaten into letting Kate have a little chloroform, the success of that venture did not persuade him to alter his original stance. When in the following year he attended the Queen during the birth of Prince Arthur, he safely delivered Her Majesty but let her suffer as usual.

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A BUSY WEEK FOR JOHN SNOW

(16-22 December 1850)

Dr R.H. Ellis

Dr John Snow recorded details of much of his clinical work in what are referred to as his Casebooks. Several years after Snow's death the Casebooks were presented to the Library of the Royal College of Physicians of London¹. There are 3 Volumes, and they cover the period from mid-July 1848 until a few days before his death almost 10 years later. They are in poor condition and in need of preservation and careful restoration. It is possible that the Association of Anaesthetists may be able to help with this work.

I am currently just over one third of the way through the task of transcribing the whole of Snow's Casebook material, hopefully for publication. This publication will mean that those wishing to study Snow's case material will no longer need to refer to the fragile, original volumes: in the meantime a photostat copy of the original work is available to those who wish to peruse Snow's notes at the Royal College of Physicians.

It is often thought that, in the Casebooks, Snow has recorded details of almost every case to which he gave anaesthesia during the years which they cover. However, I am sure that this is not true; Snow certainly gave anaesthesia on other occasions even though no details of these appear in his records.

When the call for Free Papers came for the Meeting of the History of Anaesthesia Society held in February 1989, I was working on Snow's entries for the week of Monday the 16th to Sunday 22nd December, 1850. I thought that it might be of interest to describe one of Snow's working weeks, and chose this one virtually by chance – although it does coincide with the fourth anniversary of anaesthesia's first use in Britain.

Information about the pattern of John Snow's work is to be found principally, but not only, in his Casebooks. Other sources have included Benjamin Ward Richardson's 'Memoir' of Snow², published Case Reports, and the proceedings of various medical meetings in London.

It is instructive to learn what we can of Snow's work during this week for this tells us about John Snow as a family doctor, as an anaesthetist, and as a scientific researcher. His interest in the epidemiology of cholera was in abeyance at this time. It should be emphasised, however, that it would be quite wrong to assume that this week was a typical one for him. During the week in question Snow was involved with his medical work on each day. In his capacity as a family doctor, he made no less than 26 separate domiciliary visits. He gave nine anaesthetics, and performed two animal experiments. He may also have attended a medical meeting.

That Snow made so many visits unconnected with anaesthesia emphasises that the oft-quoted notion that he was the first full-time physician anaesthetist³ is clearly not correct. During the rest of his life, in addition to his involvement with anaesthesia, he continued his work as a family doctor, researcher and epidemiologist.

Case Book entries – Monday – operative haemorrhage

The first of Snow's Case Book entries for the week shows that on Monday 16th December 1850 he made three visits in his capacity as a family doctor, and gave one anaesthetic. He made two visits to a baby. The mother, a Mrs Bent, had been a patient of Snow's for at least two and a quarter years. The family lived in Castle Street, near Leicester Square. The baby whom he saw on this occasion was five months old and had been delivered by him in July, 1850 (without the aid of chloroform). On the same day, he also saw a Mrs Hillier, whom he had first attended at least seven months earlier in May 1850. Mrs Hillier lived in Cecil Court which was also near Leicester Square.

Snow rarely recorded further details of his domiciliary visits unless he prescribed for his patients, but he did make notes about the patients to whom he gave anaesthesia. Although he did not refer to it specifically in this section of his Casebooks there can be little doubt that the apparatus used for the anaesthetics during the week was Snow's usual chloroform inhaler with Sibson's face-piece⁴.

Snow's anaesthetic note for Monday 16th December 1850 reads as follows: 'Administered chloroform to Mr Little, 28 Middleton Square (Snow mis-spelt the name of the Square; it should be spelt 'Myddelton'), whilst Mr Bransby Cooper removed the right testicle on account of fungoid disease. The patient who did not appear more than 35 years of age is very fat'. Nothing is known of the patient, Mr Little, apart from his address but the house to which Snow was called to give his anaesthetic is still standing, although it appears to have undergone modifications recently. It is near the Angel, Islington. The surgeon, Mr Bransby Cooper, was then a senior surgeon at Guy's Hospital⁵. In an article which he had written shortly before this episode Cooper had equated 'fungoid disease' with what was then called 'sarcoma of the testis'⁶. Snow's patient was in his mid-thirties, and this particular tumour was almost certainly a seminoma. Snow's narrative continues: 'There was great difficulty in arresting the haemorrhage; the patient consequently lost a great quantity of blood and was very faint, being at one time without pulse'.

It is possible to discover how Snow and Cooper would have reacted to this situation. The treatment of surgical haemorrhage which was current in the 1850s is well-documented in contemporary textbooks – of which that by John Lizars of Edinburgh (published in 1847) is typical⁷. From this it is clear that the usual management was for the surgeon to do what he could to arrest the haemorrhage with ligatures or direct pressure. If this proved ineffective then it was enough to await the signs of fainting, at which time the flow of blood would be so reduced that local coagulation and haemostasis would follow. In these circumstances the patient was rested, with nothing active being done lest the slowly-forming clot should be disturbed. Further intervention was discouraged and the patient was merely observed, and fortified with stimulants. Snow, himself, recommended that this course of action should be followed in similar situations⁸. He ended this case note by remarking that 'Brandy was given to him and he rallied in a satisfactory manner. No sickness'. (In passing, Snow was always very careful to note whether or not sickness had occurred after his anaesthetics).

Tuesday – Lithotripsy

On the following day, Tuesday 17th December, Snow again made three visits – two to Mrs Bent's baby, and one to Mrs Hillier. In addition, he gave one anaesthetic – this time to an army officer. 'Administered Chloroform today to Major Fawcett,

apparently near 60, whilst Mr Coulson performed lithotrity; Dr. Rowe being present' . . . Nothing is known of Major Fawcett, although various military records have been consulted. The surgeon was Mr William Coulson who lived near the Guildhall in the City of London. He was surgeon to The German Hospital and to the City of London Lying-in Hospital. Later, in 1851, he was also appointed Senior Surgeon at the newly-opened St. Mary's Hospital in Paddington⁹. A few years earlier he had written a textbook on diseases of the bladder and prostate¹⁰.

Coulson was one of those who had recently introduced the operation of lithotrity to this country, claiming that it carried far less risk than the severe and open alternative of lithotomy. He gave a contemporary account of lithotrity in his textbook. The patient would have been held securely in the lithotomy position by attendants who would also have restrained him had Snow's anaesthesia been less than perfect. Snow always insisted that whenever patients were operated on in the lithomy position they should – on each side – have their hands, and the soles of their feet, bound firmly together by restraining bandages⁸. Before the operation began the pelvis would have been raised on cushions and the bladder distended with warm water. Snow recorded elsewhere that the usual time for this operation was about 20 minutes.

Dr. Rowe was almost certainly Dr. George Rowe, who had been a surgeon in the army¹¹. This probably explains his connection with Major Fawcett. By 1850 he had left the Army and was in practice in Cavendish Square. The patient, Major Fawcett, must have been quite pleased to see John Snow, for Snow records 'The stone had been crushed twice before without the chloroform' and he continued 'No excitement, very little rigidity, but after becoming unconscious and not yet insensible the breathing was very deep and rapid'. Coulson would probably have used two lithotrites (one for crushing the stone, the other for scooping up the debris) which he, himself had designed and described in his textbook a few years earlier¹⁰. At the end of the operation Snow records 'No sickness although he had dined on a chop two hours previously'. Snow did not stipulate that patients should starve before anaesthesia, although he knew of the connection between post-operative (and intra-operative) vomiting and the recent taking of food¹². The fact that the Major had 'dined' may imply that this procedure was carried out in the evening.

Wednesday – research

On the Wednesday, Snow made six visits – two of which were to Mrs Bent's baby, and one to Mrs Hillier. He made no less than three visits during the day to a George Hogarth whose family (according to his Casebook entries) Snow had first attended some two and half years earlier. He also administered one chloroform anaesthetic on this day, and – in addition – found time to perform a lengthy and sophisticated animal experiment on a rabbit. Snow's account of the anaesthetic case reads 'Administered Chloroform. . . to a gentleman apparently about 30, lodging in Down Street, Piccadilly whilst Mr Avery removed the left testicle on account of fungoid disease. Very little excitement or rigidity. No sickness'. (This was, presumably, another seminoma). Down Street was, and still is, just off Piccadilly near Hyde Park Corner. Mr John Avery, lived in Mayfair¹¹, and was a Surgeon at the Charing Cross Hospital. He had qualified in both London and Paris, had invented a very ingenious endoscope, and had written on the surgery of cleft-pla¹³.

The experiment which Snow performed was one of a lengthy series on carbon dioxide excretion and chloroform anaesthesia in various animals; on this occasion he used

a rabbit. The series began earlier in 1850 and ended in 1851. Each experiment must have occupied him for at least 3 hours. Some of them may have been performed with Dr. Benjamin Ward Richardson². Where they were performed is unknown. In brief outline, Snow's experiment consisted of placing an animal in a large, sealed jar. He measured the carbon dioxide which it breathed out in half an hour, and then anaesthetised the animal with chloroform and again measured the carbon dioxide produced. He also repeated his measurements during recovery. His results were remarkably consistent, and his deductions about the effect of anaesthesia on what we now know as the metabolic rate were reasoned and perceptive¹⁴.

Thursday – dental extraction

On Thursday 19th December Snow made 5 domiciliary visits. He made one visit each to Mrs Bent's baby and Mrs Hillier, and was still sufficiently concerned about George Hogarth to see him on three separate occasions during the day. He gave two anaesthetics. Firstly, he returned to Down Street, Piccadilly to give an anaesthetic to another of Mr Avery's patients. 'Administered Chloroform to a gentleman, about 30, lodging in Down Street whilst Mr Avery removed some cicatrices caused by a burn from the root and side of the penis. No sickness.' After this he travelled several miles to Upper Holloway (now in North London, but then some distance from the metropolis) to give a dental anaesthetic. 'Administered Chloroform to a son of Mrs Jourdain, aged 20, at Upper Holloway whilst Mr Catlin (Snow mis-spelt this surname; it should be spelt 'Cattlin') extracted a lower molar tooth'.

The relevant Kelly's London Directories¹⁵ show that the Jourdain family lived at 2 Lansdowne Place in Holloway which is, presumably, where Snow gave this anaesthetic. Lansdowne Place no longer exists as such. The surgeon was Mr William Cattlin, who was a Fellow of the Royal College of Surgeons, and a Licentiate of Dental Surgery. He lived in Islington, and was Surgeon-Dentist to the Islington and Holloway Dispensary, and to the Royal Caledonian Asylum¹¹. There was an onlooker at this operation, for Snow's record continues 'Mr Kesteven was present. No sickness or other sequelae'. Mr Kesteven seemed, then, not to have a hospital appointment and was a surgeon in private practice. He lived nearby in Upper Holloway¹¹. He had written in the medical journals on diverse subjects, including croup and some aspects of anaesthesia¹⁶.

Friday – Fistula in St. John's Wood

On the following day, Friday 20th December, Snow made a total of 5 visits – one each to Mrs Bent's baby and to Mrs Hillier, and three to George Hogarth. During the day he also went off to give an anaesthetic. 'Administered Chloroform to a lady at St. John's Wood whilst Mr Fergusson operated for fistula. No excitement, rigidity, or sickness. (A spare lady, about 45)'. Mr (and later Sir) William Fergusson was the colleague with whom Snow worked most frequently. He was the senior surgeon at King's College Hospital¹⁷, and was London's most celebrated surgeon having inherited that mantle on the death of Robert Liston.

Saturday – a dead baby, operative haemorrhage and death

Saturday 21st December was the longest and busiest day of the week for Snow. He attended a confinement and saw George Hogarth twice and Mrs Bent's baby and Mrs Hillier once each day. He also administered two anaesthetics, and performed another of his experiments on carbon dioxide production during anaesthesia – this time on a dog. He may also have gone to a medical meeting for Snow was a regular attender

and speaker at the weekly meetings of the Medical Society of London. He was later its President. The reports of the meeting which was held at 8.00 pm on this particular Saturday do not mention his having taken part¹⁸⁻²¹. He may have decided to miss this particular meeting since I doubt that the subjects discussed would have been of particular interest to him, and there had been a very early start to his day.

Very early in the morning Snow was sent for to attend a confinement. His Casebook entry begins 'Sunday 21 December. Mrs Desmajeu, 63 King Street, Westminster. Delivery, Mas' (presumably Masculine) 'DC' (by which Snow presumably meant 'dead child') First labour. Pains commenced about 4 am. I was sent for soon afterwards, and found the liq. amnii evacuated and the os uteri rather larger than a shilling. Between six and seven the os was quite obliterated and soon afterwards the head began to bear on the perineum. The child was not born till between 10 and 11 owing to resistance of the perineum, the patient being over 30. Within the last hour before the birth of the child some meconium was discharged. The child was still-born, and its limbs were in a state of post-mortem rigidity, both the superior and inferior extremities being semi-flexed. The head was elongated and compressed. The mother said that she had not felt the child for a day or two, and that the day before the labour her abdomen felt cold. She had not mentioned this before'. The patient's rooms, incidentally, were above the premises of either a hairdresser or a tailor¹⁵.

Space does not permit a detailed discussion of the many points raised by this case note of Snow's. Suffice it to say that while his conduct of this labour would nowadays be criticised severely, it was in accordance with the practice of midwifery in 1850. He decided not to intervene actively to deliver the child, nor – surprisingly – did he give chloroform which he must have known had been used when progress was held up at the perineum since it was said to relax the tissues and ease delivery²². During most of the time he spent with the mother, Snow it seems, had no reason to think that the baby had succumbed in utero. Even so, he did not attempt resuscitation of the child, despite his long-standing and published expertise in the technique²³.

On each Saturday Snow had a regular appointment to give anaesthesia at King's College Hospital, which was then close behind the Royal College of Surgeons. On this occasion there was just one case waiting for him. 'Administered Chloroform at King's College Hospital to a muscular, thin man, about 40, whilst Mr Luxton – the house surgeon – amputated the thumb at the first phalanx'. The house-surgeon was William Luxton who had qualified at King's a short time before. He later became a general practitioner in Wiltshire²⁴. This administration of chloroform was somewhat eventful and, as frequently happened 'The patient struggled violently after losing his consciousness. No sickness'.

After this, Snow left King's College Hospital and travelled once more to meet Mr Coulson who had sent word that he wished to repeat the lithotrity which he had carried out on Major Fawcett 4 days earlier. This was a quite usual sequence, and Major Fawcett's operation was repeated several more times in the next few weeks. 'Administered Chloroform again to Major Fawcett whilst Mr Coulson repeated the lithotrity. He breathed deeply and quickly between losing his consciousness and becoming insensible; exactly as before. No sickness'. At some time on this Saturday Snow performed another, similar, 3 or 4 hour long experiment with his apparatus, but this time on a dog.

Snow seemed to take little if any, notice of weekends as far as his professional work was concerned, and his notes for Sunday 22nd December record that, while he made no visits to the Hilliers, Bents or Hogarths he did anaesthetise another of Mr Coulson's patients. 'Administered Chloroform to Mr MacKenzie (Snow may have mis-spelt this surname; elsewhere it has been spelt 'McKenzie'¹⁵) at 10, Lower Calthorpe Street whilst Mr Coulson performed lithotomy'.

The house in which this drama occurred is still standing, and despite changes in the naming of the road and numbering of the houses, it can still be identified from the Local Authority Records^{25, 26}. It is now number 44 Calthorpe Street which is just off Grays Inn Road. The relevant Kelly's Directories, incidentally, tell us that the patient was a Mr John McKenzie and that he worked as a diamond setter¹⁵, possibly, I suppose, in nearby Hatton Garden. The house is now decrepit but, with a little imagination, one can picture that Sunday morning and the horse-drawn carriages arriving outside the door, Snow being admitted with his bag containing the inhaler and the chloroform, Coulson arriving with his instruments, and several assistants carrying in such ominous things as restraining bandages and sawdust to mop up the blood. Perhaps Mr McKenzie's neighbours watched as the drama began, some in the street itself and others from their windows nearby.

Snow's records tell us that Mr McKenzie was far from fit. 'The patient was an elderly man, very fat and asthmatic, having to rest himself for 2 or 3 minutes in order to recover his breath after walking up stairs'. Despite this, and even though the patient must have been held securely in the lithotomy position by two of the assistants and had his hands tied to the soles of his feet with Snow's obligatory restraining bandages, the anaesthetic proceeded uneventfully. The surgery, however, was far from straightforward. 'He became insensible without struggling or rigidity. The first calculus which was removed was embedded in the prostate; two others were afterwards removed from the bladder after some difficulty and delay'.

Snow's next comments will hardly surprise us. 'There was a great deal of blood lost during the operation, very large coagula being found on the sawdust afterwards. The patient became very faint from haemorrhage before the end of the operation'. Coulson would have been familiar with the problem for, a few years earlier he had written in his textbook 'If any haemorrhage occur we must endeavour to compress the bleeding vessel with the finger. It is always a most untoward circumstance when it happens'¹⁰. Clearly, having operated to remove a stone from within the prostate there must have been a huge loss of blood. Snow and Coulson seem to have followed the usual plan by trying to stop the bleeding directly, but as this failed they relied on fainting to reduce the haemorrhage and permit haemostasis, and were content to give routine stimulants.

Snow's record continues 'A good deal of sherry and some hot brandy and water were given to him, although he made great objection to swallowing, and in the course of 15 or 20 minutes after the operation he rallied in a great measure'. I am not surprised that Mr McKenzie made great objection to swallowing the sherry and hot brandy and water. He was not only elderly, wheezy and hypoxic, but was still partly under the influence of Snow's chloroform, may well still have been trussed up like a turkey, and in a state of haemorrhagic shock.

It was not Snow's normal custom to remain with his patient for long after his

anaesthetic had worn off; whatever subsequent care was needed was the province of the surgeon, or of the patient's relatives. Nonetheless, he learnt of the outcome, and the last note in his casebook for this particular week records 'He died suddenly about 3 o'clock on the morning of the 24th whilst being lifted up in bed'. This was 2 days post-operatively. The most likely cause of death was – in the circumstances of late 1850 – the effects of continuing post-operative haemorrhage superimposed on the major blood loss which occurred at the time of the procedure itself. Coulson, the surgeon, would not have been surprised at this, and had written in his book on the bladder and prostate '... it is rare that patients die immediately from loss of blood... but the draining sometimes continues for hours... and gradually exhausts the power of the patient'.¹⁰ Nor, I think, would Snow have been surprised at this sad outcome for, elsewhere, he records that 75 per cent of his private patients undergoing lithotomy had died as a result of the surgery⁸.

I hope that this brief study of just one, busy and eventful week in John Snow's busy and eventful professional life is of interest. The 'Memoir' of Snow, written by his great friend Benjamin Ward Richardson², is of great importance to us, having served as the main biographical source on Snow for some 130 years. However, I feel certain that by studying Snow's Casebooks in detail, and reconciling their contents with other material which is still available, a more detailed and informative account of his life will emerge.

I am equally certain that such an account will lead us to realise that John Snow deserves even more admiration and even more respect than we now accord him.

Acknowledgements

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JOSEPH BLOMFIELD (1870-1948)

Dr D.D.C. Howat

I first met Joseph Blomfield when I was a clinical student at St. George's Hospital during the last war. Ours was a small medical school in those days. Only a skeleton crew of senior students remained at Hyde Park Corner, whilst I and some others were evacuated to the West Middlesex Hospital in Isleworth. Dr. Blomfield had bought a house there after retiring from the staff of George's ten years before and had returned to work in the Emergency Medical Service at the West Middlesex for the duration. I remember him as a pleasant elderly gentleman who was very kind to us students and who allowed us to give anaesthetics, mostly open ether, under his direction.

My most abiding memory of him is of looking through the oval window of one of the doors leading into the anaesthetic room and seeing one of my fellow-students pouring ether on to a Schimmelbusch mask, while Jo Blomfield stood over him, a theatre cap perched on his head. In one hand he held a cup of tea, while in the other was a lighted cigarette. In those days, there was little movement of air in the theatre suites, so relative safety was assured by the fact that ether vapour is two and a half times heavier than air.

Some years after that, at a nearby hospital, when Jo was administering cyclopropane, there was an explosion, but I do not know what the source of ignition was on that occasion.

I was unaware in those days that he had played a significant rôle in the development of our specialty and it was another five years before I took up anaesthesia. I have only recently discovered that his life and work are well worth recording, if only for the part he played in the development of our specialty in the first half of this century.

Joseph Blomfield changed his name from Blumfeld in 1916. He was born in London in 1870, the son of Louis and Salie Blumfeld.¹ After being educated at University College School and Gonville and Caius College, Cambridge, he came to St. George's in 1891 and immediately entered into the life of the Medical School. He played three-quarter in the 1st XV and was frequently congratulated on his excellent performance, indeed he was given a presentation cup. It is said that, after the end of the 1914-18 war, he turned out for the first game of the revived School team and scored a try – at the age of fifty. He followed the fortunes of the Rugby Club from then on and was its President from 1941 until his death.

He was also fond of playing bridge, but I am told he was not very successful and was not popular as a partner. He was a prolific contributor to the Hospital Gazette, which was started soon after his arrival; after a proposal that it should appear ten times a year, he made the more realistic suggestion that it should appear only once a term. His forte was the recital of humorous poems, usually of his own composition, with what is now called a dead-pan expression. This he did at students' and nurses' concerts, often being pressed to give encores, which he did with some reluctance.

Blomfield qualified MB Cambridge in 1894, did various house jobs in St. George's and elsewhere until 1896, but returned to the hospital in the following year as Assistant

Anaesthetist, when he obtained his MD. All this time he was writing in the *Gazette* and was soon editing it. He continued to perform at hospital concerts and in the occasional play and he was usually the success of the evening. At one concert, it was reported, 'Mr. Blomfield with serious face told the pathetic history of *Aurelia's Sweetheart*. Indeed, at this stage, one gentleman appeared to hover between tonic spasm and apoplexy. Luckily he was revived by soft music'.²

Between 1898 and 1905, Blomfield was also appointed anaesthetist to the Grosvenor Hospital for Women and Children, the Metropolitan Hospital and the National Dental Hospital (all now gone) and to St. Mary's Hospital, where he worked for some years and was a popular teacher.^{3, 4, 5, 6}

In 1902, his first book was published, a small handbook of anaesthesia which ran to four editions, although it dealt only with nitrous oxide, chloroform and ether. The reviews described it as being excellent for students, though rather conservative in its outlook.⁷ In the *Hospital Gazette* there is a photograph of him at the age of thirty-two and of the other anaesthetists on the staff at the time: Henry Menzies, Llewellyn Powell (who later became a President of the Section of Anaesthetics) and the most senior, who is easily recognisable.

Avertin

Blomfield's publications were many. Papers were read before the Society of Anaesthetists, the predecessor of the Section of Anaesthetics of the R.S.M., and before the Chelsea Clinical Society, which has an anaesthetist, Ronald Green, as its President this year. He published papers on postoperative vomiting, caudal and spinal anaesthesia, the influence of narcotics on general anaesthesia and the ignition points of various anaesthetic vapours. His best known paper was published after the war, with Sir Francis Shipway, in 1929 in the *Lancet*, on the use of rectal Avertin as a basal narcotic. They advised its use in very nervous patients and various major procedures, particularly for those with hyperthyroidism undergoing thyroidectomy, but stressed that it should be used with care and in moderation.⁸

Although at first supplied in powder form, Avertin or tribromethanol was soon made available in solution in amylene hydrate, which had to be kept away from heat and light; this was diluted to 2½% in distilled water by the anaesthetist, who had to test it with a few drops of Congo Red before administering it, as it was liable to break down to dibromacetic aldehyde and hydrobromic acid. If the dye turned blue, the solution was discarded.

When I was resident anaesthetist at St. George's, toxic patients undergoing thyroidectomy were operated first on the morning list, so we used to make the solution up last thing in a thermos the night before and deliver it to the ward with the Congo Red already in, giving the nurses instructions not to administer it unless it remained pink. This gave us a few more precious minutes in bed in the morning.

Blomfield wrote frequent letters to the *Lancet* and the *British Medical Journal* on a wide variety of subjects connected with anaesthesia and there were few meetings which he attended which did not hear his voice raised in discussion. His views tended to be conservative, but his comments were modest and full of common sense. He was particularly concerned with the status of anaesthesia and its practitioners and for the safety of the patient.

In 1919, in response to a letter in the *Lancet* advocating the training of nurses as anaesthetists, Blomfield wrote that nurses 'will perforce remain rule-of-thumb administrators, often no doubt perfect administrators in one particular method they have acquired'. He added the pithy comment: 'They helped the war machine – they will be a brake on the progress of the car of peace'. It is interesting that in the same number there was a letter from a surgical nurse who wrote that her experience had led her to realise that trivial operations could be associated with serious effects from the anaesthetic, that, had she wished to be an anaesthetist, she would have become a doctor, not a nurse, and that a nurse administering an anaesthetic might reasonably feel she should receive the same fee as a doctor.⁹

Dr. Zuck, in his recent account of Alcock's chloroform vaporiser, reports Blomfield's rather scathing comment that it was a useful instrument to have in hospital, but of little use for teaching students, who would be unlikely to employ it. In private practice, where surgery was often performed in the patient's home in those days, he said 'If each anaesthetist could be supplied with a boy to work the bellows, or with an electric fan, or with a motor car to carry the boy, machine, and the fan, conditions would be about ideal, and he would always take Dr. Alcock's apparatus with him.' This, in spite of the fact that he was full of praise for the vaporiser.¹⁰

On several occasions, Blomfield sounded a note of caution about the indiscriminate use of spinal anaesthesia, pointing out that the danger of general anaesthesia in cases of heart disease had been greatly exaggerated.

Finally, he always stressed that the anaesthetist was more important than his apparatus. Just before the last war, in 1939, he wrote 'Anaesthetists are more prone to invention than judgment. Every anaesthetist (myself alas! excepted) has invented a bit of apparatus, or has modified someone else's bit' and he was anxious that apparatus should be kept simple and compact.¹¹ In 1944, when he was 74, he wrote that there were two great faults in the teaching of anaesthetics: a persistent mortality and ineffective teaching. There were not nearly enough experts to go round and medical schools should take notice.¹²

Blomfield's last paper was published in the 1948-9 number of the *British Journal of Anaesthesia*; it was intended to be the first of a series on Famous Anaesthetists and was about Frederic Hewitt, his old chief.¹³ On the following page appears Blomfield's own obituary by R.J. Minnitt.

Anaesthetics in Practice and Theory

Apart from the small handbook published in 1902, Blomfield wrote two textbooks which became well-known. The first was his *Anaesthetics in Practice and Theory* which appeared in 1922. It was very well reviewed and was possibly the last comprehensive book on anaesthesia by a single author. It mentions every anaesthetic agent available at the time, including hypnosis and electronarcosis. It has sections on resuscitation, the treatment of shock and the relief of pain and also local anaesthesia. The book closes with chapters on medico-legal aspects and on education.

He describes the different arrangements then prevailing for anaesthetists at different hospitals. He wrote: 'At one we find the anaesthetists placed on a level with the other honorary officers of the hospital. They manage their own department and are not subject to annual election. At another the position is very different. The anaesthetists

have a place on the staff of the medical school, but not on that of the hospital' (This was the case at St. George's, his own hospital, at that time). 'At none, I believe, is there any stipulation as to the quality of degree which a candidate for the post of anaesthetist must hold. The more attractive the post of anaesthetist at a hospital can be made to the best type of student, the better, of course, will be the men who hold these posts. And it is on the ability and enthusiasm of the holders of these posts that progress in anaesthesia, the training of students, and consequently the public safety ultimately depend'. He quotes Frederic Hewitt on the unfortunate tendency of coroners to blame the anaesthetist for deaths on the operating table and praises the Scottish system with the Procurator-Fiscal's investigation.¹⁴

His second book was *St. George's 1733-1933*, a definitive history published by the Medici Society in 1933. Much of the first part, as he admits, was transcribed from George C. Peachey's history of the hospital, which was never completed. Peachey had published six parts, the first appearing in 1910, with the help and support of Clifford Dent, the surgeon. Unfortunately, Dent died in 1912, when Peachey had only reached the year 1753. In his book, Blomfield relates how, in spite of John Snow's having worked in the hospital, a qualified doctor was not appointed to give anaesthetics there until 1879, when W.H. Bennett (later, Sir William Bennett, a well-known surgeon) was appointed 'chloroformist', with a salary of £20 a year.

Society of Anaesthetists

Now I shall turn to perhaps the most important aspect of Blomfield's career. I have shown that his comments and letters demonstrate his concern for the status of the anaesthetist as a safeguard for the public and he gave practical expression to that concern.

The Society of Anaesthetists was founded in 1893. Blomfield first attended as a visitor to a meeting in 1898 and was elected a member in the following year. He was made an auditor in 1903 and was elected to Council in 1904 and was made secretary the year after. As senior secretary, he represented the Society at the meeting of medical societies to consider their amalgamation; as a result he proposed that the Society of Anaesthetists should be amalgamated with the Royal Society of Medicine and this was approved in April 1908.¹⁶ The first meeting of the new Section of Anaesthetics took place in November, with Richard Gill as President. Blomfield was made Editorial Representative of the Section in 1916, following Francis Shipway, and remained so continuously until 1947, when the late Dr. (later Sir) Geoffrey Organe took over. He was much in demand as an editor, as his later experience shows.

Blomfield was elected President of the Section in 1912, but gave no Presidential Address. The custom of giving such an address did not become established until much later. However, he took part in the discussions of all the papers, which included one by Goodman Levy on 'Sudden Death under Chloroform Anaesthesia'. During his presidency the question of the reaction of coroners to deaths under anaesthesia was discussed; it was a matter which exercised anaesthetists and was of particular interest to Blomfield.¹⁷

In 1909, the British Association for the Advancement of Science formed an Anaesthetic Committee of its Section of Physiology, with the purpose of investigating various anaesthetic agents, especially chloroform, ether and alcohol, with special reference to deaths under anaesthesia and their possible diminution. The chairman was A.D.

Waller, FRS, the secretary Frederic Hewitt and the other members were J.A. Gardner, G.A. Buckmaster and Sir Frederick Treves. When Treves soon afterwards resigned, pleading pressure of other work, Blomfield was elected in his stead.

In the next few years, the Committee reported on the rate of uptake of chloroform by the blood, the percentage of ether obtainable by the open method of ether anaesthesia and on Waller's chloroform balance, which was tested in the Out-Patient Department of St. George's Hospital. In its fifth report in 1913, the committee offered the following resolution: 'that in view of the fact that numerous deaths continue to take place from anaesthetics administered by unregistered persons, the Committee appeals to the Council of the Association to represent to the Home Office and to the Privy Council the urgent need of legislation'. Unfortunately the imminent World War put paid to it.

The Committee's deliberations are mentioned only by title in the Section of Physiology's minutes after this. Blomfield is mentioned in 1916 as a member who should receive copies of reports, but the work seems to have ceased.¹⁸ During all this time, Blomfield played an active part in discussions at all major anaesthetic meetings and wrote many letters to the medical press, as well as contributing articles on anaesthesia in various surgical textbooks. From 1913 he was editor of the *Medical Annual*, a post he held until Dr. Langton Hewer took it over in 1938.

During the 1914-1918 war, Blomfield was anaesthetist to several officers' hospitals, the most famous of which was the King Edward VII Hospital for Officers, then in Belgravia. This is still called 'Sister Agnes', after its first formidable matron; it is said that no anaesthetist was permitted to work there without Blomfield's approval, as they were great friends.

In the early 1920s there was considerable concern about the purity of anaesthetic agents, particularly nitrous oxide, and about the possibility of ensuring the manufacture of some of the newer ones in this country. Accordingly, a combined anaesthetic committee of the Royal Society of Medicine and the Medical Research Council was set up in 1924. The MRC members were three FRSs, H.H. Dale, F.G. Donnan, and M.S. Pembrey; the RSM's members were Blomfield, Shipway and Hadfield. Blomfield was appointed chairman and Hadfield secretary.

The committee investigated such matters as the ignition points of ethylene, dimethyl ether, divinyl ether, cyclopropane, acetylene and also did some work on Avertin and Evipan. Incidentally, Dr. Ernest Landau, who took part in the trial of Evipan at St. George's Hospital, tells me that Blomfield never seemed very enthusiastic about it and the report on its clinical value, which was published in the *British Medical Journal* in July 1933, is severely factual.¹⁹ In later years, the committee considered explosions, problems connected with respiratory exchange and ether convulsions. Blomfield resigned from the committee in 1945, when Nosworthy replaced him.^{20, 21}

Editor – British Journal of Anaesthesia

In January 1923, the first number of the *British Journal of Anaesthesia* appeared, under its American editor, H.M. Cohen, who practised in Manchester. Contributors to the first number included James Gwathmey, Wesley Bourne, McKesson, Dudley Buxton, Langton Hewer and Joseph Blomfield, who described the use of between 30 and 100 ccs of 2% stovaine with adrenaline 1:100,000 for sacral analgesia.²² In the third

number, in January 1924, Blomfield wrote an editorial on 'Some remarks on post-operative lung trouble'²³. At the end of August 1929, Cohen died suddenly of a heart attack and no autumn number appeared.

Blomfield was appointed editor and, in his first editorial as editor, in April 1930, he wrote under the title 'Machines and Men' on a subject which recurred in several of his publications and lectures, the danger of the anaesthetist becoming a technician rather than a doctor: 'not a doctor clad in a sterile overall inside the operating theatre, but an engineer in dungarees with oil-can and spanner working outside it, with no direct knowledge of the patient's condition, watching machines recording respiration, pulse rate, blood pressure and muscle tone'. Although he did not question the benefits of new apparatus and methods, he was concerned at the younger anaesthetists' lack of clinical observation and acumen. He stressed the importance of teaching the anaesthetist to observe and estimate the condition of his patient, before, during and after operation. 'It is no use perfecting the gun if we neglect in any respects the training of the man who is to fire it'²⁴.

Joseph Blomfield was active in the formation of the Association of Anaesthetists. In an editorial in October 1932, entitled 'Scope for Reform', Blomfield expressed his concern at the widespread tendency for deaths associated with operation to be attributed to the anaesthetist, particularly by coroners; he deplored the fact that there were no proper statistics available of the circumstances under which patients died during or soon after operation. Detailed accounts of the drugs and methods employed during anaesthesia were needed and these were sadly lacking. He advocated the establishment of a proper system of recording anaesthetics, with their immediate and late sequelae, and recommended that the newly-formed Association should find the time to study this.²⁵

Blomfield continued to edit the *BJA* until the year of his death in 1948, when Falkner Hill and Cecil Gray took over as joint editors.

Association of Anaesthetists

It was resolved to form an Association of Anaesthetists of Great Britain and Ireland at a preliminary meeting at the Medical Society of London's rooms in April 1932 and a provisional committee of ten was elected, including Blomfield as Editor of the *BJA*. The Association was formed on the 1st July and, at its first Annual General Meeting in October, Featherstone was elected President and Blomfield Vice-President, Zebulon Mennell Treasurer and Howard Jones Secretary. In February 1934 Council proposed that Blomfield should approach Sir Bernard Spilsbury, then President of the Medico-Legal Society, to discuss the practice of coroners dealing with anaesthetic deaths; Blomfield was invited to submit a paper on this subject and reported this at the next Council meeting, when Magill also put forward his subcommittee's proposal for the new Diploma of Anaesthetics. At a meeting of representatives of the Council of the Royal College of Surgeons and the Association's representatives, Featherstone, Magill, Blomfield and Hadfield, The President of the College, Sir Holber Waring, suggested that the Conjoint Board be approached; that body agreed to the idea of holding an examination.

Meanwhile, Magill took on the negotiations about coroners' inquests, as in July, Blomfield was nominated President and took office at the AGM in October 1935. At that meeting, Howard Jones' sudden tragic death was reported, the assets of the

Association were reported to be £397-17-10, the question of the payment of honoraria to anaesthetists for work in hospitals was discussed and the President reported that there had been hard arguments to convince the Conjoint Board's Examining Body that teaching hospital anaesthetists of 10 years' standing should be allowed to apply for the DA without examination. It was later agreed that this exemption should also apply to non-teaching hospitals of the least 100 beds. Blomfield and others turned down the suggestion that the *British Journal of Anaesthesia* should become the organ of the Association, but offered its full help. It will hardly surprise you that the inadequacy of anaesthetic fees, particularly of dental fees, was also discussed.

In Blomfield's last year as President, the colour coding of gas cylinders was agreed, the matter of discussions with the Central Midwives Board was raised, and even the possibility of reducing the subscription to the Association. At the end of his presidency in 1938, Blomfield remained on Council until 1943²⁶.

Personal Life and Later Days

I have little information about Joseph Blomfield's personal life, for nearly all his relatives are dead. He had connections with Fleet Street, for his sister Daisy had married Ralph Blumenfeld, who was well-known as Editor and later Chairman of the *Daily Express*, and Blomfield used to take parties of students to the paper's offices to see it being 'put to bed'. In 1912, he married Sheila Lehmann and in 1920, a son, Derek, was born;²⁷ he later became an actor, who appeared in 'The Lady's not for Burning' in 1948 and from 1957 to 1959 as Detective-Sergeant Trotter in the 'Mousetrap'.²⁸ In 1933, Blomfield was married for a second time to Miss Dorothy Kathleen Bell, who was a distinguished Secretary of the Genealogical Society. At the time of writing, Mrs. Blomfield is still alive in her 90s, but is in failing health. His son, Derek, died suddenly in the 1960s while on holiday in France with his family.

I have already mentioned Blomfield's popularity as a student and young doctor at St. George's. His genial personality and his command of English, together with his thoughtful, if somewhat conservative outlook, made him much sought after as a member and chairman of committees, as an author and lecturer, and especially as an editor. I have already given examples of his epigrammatic comments in speech and in print. He had a highly developed sense of humour. I hope you will allow me to digress for a little to give you an example which typifies it.

In a poem called 'A Maiden Effort', the first verse goes:

'It was a winter meeting of a certain grave Society
Where learned men had listened to a learned Doctor's word.
Discussion had been opened with the usual propriety
And much had been orated while a little had been heard.
And that meditative silence that appropriately follows
Such eloquent descriptions of cases rarely seen,
Was broken by my hero, young Dr. Easy-Swallows –
He was nervous though just qualified, his cheek was smooth and clean'.

There are seven more verses which I will not give in full, with a similar refrain in the last line of each. He describes the case of a young lady with indigestion, although 'Her mother is alive and well, her tongue was moist and clean'.

He then obviously becomes increasingly nervous, saying
'My patient had of late severe attacks of indigestion-
Er- her tongue was full and bounding and her pulse was moist and clean'.

He discovered some swelling of the abdomen and, still rather confused, adds
'There was in fact distension – but there were no spots upon it, and the tongue
was 98.4, the pulse was moist and clean'.

He was very puzzled about the diagnosis, saying again in mid-stanza
'I ought perhaps to mention that the tongue was moist and clean'.

He describes how he looked round for a simple explanation
'The history was full and yet the illness beat detection –
I think I did observe the tongue was clean as well as moist?'

Next day she had some pain in her back; he re-examined her, fearing he had missed
an enlarged spleen, but it was normal,
'And just as on the day before the tongue was moist and clean'.

In the last verse, next day all was made clear in a message from the girl's mother,
reporting that the nurse
'Says both of them are quite as well as ought to be expected –
The baby's pulse is 90 and its tongue is moist and clean!²⁹

Blomfield's handwriting was such that, when he presented one of his recitations for publication to the Hospital Gazette, the editors wrote: 'We hope to publish it when the MS has been deciphered. Our readers are at present down with nystagmus through persistent endeavour to interpret the orthography'. Mennell reported in his obituary of Blomfield in the *Lancet*: 'as an editorial contributor to our own columns, he was for many years a valued and entertaining colleague. In those relatively spacious times it was his habit to drop into the office after lunch, wearing a button-hole, smoking a cigar, and bearing a manuscript which could be deciphered only by the expert. (When he bought a typewriter the results were so remarkable that our printer begged him to return to the pen)³⁰.

In a lecture to the students at St. Mary's Hospital in 1908, he told an anecdote about Joseph Clover, who you will recall had a rather sepulchral visage and wore a skull cap and a black apron. One of his patients, on recovering consciousness, caught sight of Clover, a look of horror appeared on his face and, thinking the worst had happened, he shouted 'The devil!³¹.

When Blomfield retired from St. George's Hospital, his vigour was unimpaired: indeed, much of his valuable work was done after that date. He had a serious illness and operation in 1945 and, although he recovered, he was never so active again. He died on the 11th November, 1948, in his 79th year. There is no memorial, as his body was cremated.

You will realise from this account of Joseph Blomfield's life and work he was responsible for no great advances in the theory or practice of our specialty, yet he played an important part in the raising of the status of its practitioners from untrained chloroformists to qualified specialist anaesthetists. He was very conservative in the

drugs and methods he used to anaesthetise his patients, but he recognised the real advances which were being made; however, he did not hesitate to point out their disadvantages. He appreciated the value of monitoring apparatus, but always stressed the necessity for the anaesthetist to watch his patient closely.

The obituary in the *Times* a week after his death described him as 'an eminent anaesthetist who had taken a prominent part in the modern development of his speciality'³². That is why I felt it worthwhile to record his achievements.

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MEMORIES OF ANAESTHESIA IN CROYDON (1938-1952)

Dr R.C. Mansfield

Before the war anaesthetics at Croydon General Hospital at the Oakfield Lodge site in London Road were given by honorary staff and most emergencies looked after by house physicians. Then, honorary staff were usually in general practice for a livelihood, although there was a private ward in the hospital and a private nursing home in the town. The 'General' was rather like a converted country house, with wards, outpatients department, two theatres and two very small anaesthetic rooms, the latter being equipped with Boyle's machines, endotracheal tubes, laryngoscopes and the basic drugs then available.

The Mayday, known originally as the Croydon Union Infirmary had 643 beds and was in Mayday Road, with Queen's for geriatrics nearby and St. Mary's for normal maternity cases. At Mayday the anaesthetics were given by the physicians, like Dr Spearing or by the house physicians whether they knew anything about it or not. Dr Spearing has just told me a relevant story. One of the house physicians, giving an anaesthetic for Dr Tamlin who exclaimed 'This patient is dead', assured him 'No, he is not, he is still warm'. Fortunately Dr Spearing was able to take over and resuscitate the patient.

War and the Mayday

That was in 1937-1938 but in 1939, with the outbreak of the second world war, the Emergency Medical Service was set up. Our sector was administered by King's College Hospital in a mental hospital at Horton, Epsom, with Mr John Hunter in charge. Volunteers were asked to work in the E.M.S. and I was appointed to anaesthetise casualties at the Mayday Hospital.

There was an interview with the Medical Superintendent who told me he would send for me when needed! I assumed this would be when casualties arrived. Asking about equipment, I was shown a few bottles and masks in a cupboard and a gas and oxygen machine that the orderly, who was called Watson, warned me never worked and that the surgeon, Mr Walsh, had told him to throw down the stairs. This he had refused to do unless he had the order in writing!

When the Blitz started in earnest in 1940 Mr Swinton had been appointed Surgeon Superintendent, and better equipment such as a Boyle's machine, laryngoscope and rubber tracheal tubes, was available. Watson stored the rubber endotracheal tubes in a biscuit tin to keep their shape, and labelled them 'Mrs Mansfield's tubes for Incubating'. The top floor theatre just under the water tower was abandoned for the gynaecological theatre on the ground floor opposite Ward 16; gynaecology cases had their surgery in the Maternity Block. Two receiving wards, 3 and 7, were organised for the assessment, resuscitation and premedication of air raid casualties. We soon realised with the severely shocked cases we were asked to anaesthetise, that intravenous premedication was safer and more effective than the intramuscular route, because of slow absorption. The day rooms off these wards were used as dormitories by staff on call and were sandbagged on the outside in an attempt to provide protection during air raids. Similar precautions were applied to the ground floor wards.

From home, we saw the first dog fight over Croydon airport, and were soon called on duty. In that raid, 64 people were killed and many injured.¹

In September 1940, there were so many casualties it seemed best to sleep-in on call and as the schools were closed, my family went to a cottage we had on the North Wales coast. After a month they rang me up and asked if I could join them for a weekend. An Australian, Dr Taylor, offered to stand in for me and I travelled by night train with my father to join them.

On return, I found a bomb had fallen down the lift shaft opposite Ward 7, keeping the blast inside the building, the effect of which was increased by the sandbagging on the outside. The telephonist who was sleeping in the bed next to mine was killed. Dr Taylor on the other side of the day room had a radial artery severed by glass and two nurses in the damaged ward 7 receiving ward were also injured. This was not the only bomb to fall on the hospital, of course.

Bombs on Croydon

Numerous incendiary bombs were dropped on the hospital. Twentysix were extinguished on the night of January 11th 1941, including one which was initially unnoticed in the Chapel. In April 1941, a bomb fell on the Maternity isolation block, fortunately empty at the time, but a woman in labour had a ruptured abdomen from flying glass. This unusual obstetric emergency was difficult to treat as all theatres were out of order due to a power cut. Also, many other casualties from the town had arrived and there were only torches and hurricane lamps in the receiving ward. On arriving at the hospital after many diversions, I wondered why I couldn't get into the Ward 16 theatre by my usual backdoor entrance. This too had been damaged.

Queen's, the geriatric hospital, was hit in 1941, and again in 1944 by a landmine. I will never forget that night, nor one particular casualty who remained unrecognised because she was covered by debris. She was noisy, as she had cerebral irritation, and had been scalped as well as suffering a fractured pelvis, left arm and both legs. By the evening, after morphia, she was quiet and could be recognised as the Queen's Hospital night sister, so with a drip in the one visible vein and endotracheal oxygen, two surgeons got to work on her, stitching her scalp with 90 stitches and dealing with the fracture. Perhaps it was a blessing she didn't remember anything for a month.

In 1944, the doodlebugs fell thick and fast on Croydon, dropping short of London. From June to August, 485 casualties were admitted and 248 outpatients treated, so Mayday was virtually a casualty clearing station. Patients were transferred as soon as possible to sector headquarters at Epsom, which had been reserved for D-Day wounded until it was too dangerous for them, and so these latter patients were taken from the beaches straight to Scotland. I was told to go to Horton leaving Dr Spearing to cope at Mayday. Nothing much happened there at first so when free I was able to return to the Mayday to help out.

I was, however, involved in one of the transferred cases, a woman with shrapnel in the mediastinum. It had been arranged that whoever was on duty, regardless of specialisation should cope. It happened the senior gynaecologist was on duty, and he was asked to give the anaesthetic. The surgeon removed the foreign body with a pair of Volsellum forceps in a split second. He was so pleased. 'What a fuss these chest surgeons make', he observed!

During the war, oxygen cylinders were fitted with 'Endurance' reducing valves and on one occasion when a small boy was waiting for his anaesthetic the oxygen was turned on vigorously and a flame 3 - 4 feet long appeared, so we pushed the boy out into the corridor while we sprayed the cylinder and the anaesthetic machine with a CO₂ fire extinguisher. The boy, most impressed, enquired 'if that was usual before going to sleep'.

During this time, regular lists at Mayday, Croydon General and other hospitals continued so we were kept pretty busy, but it is interesting that in such times of stress, how the atmosphere was so friendly and co-operative between everyone, so that 'on' and 'off' duty was often disregarded when urgent needs required it.

Working single handed, one was glad of a theatre orderly such as Watson, an ex-naval sickbay attendant, who often entertained us with his naval stories. (I quote one. He noticed the rum disappearing faster than it should so decided to fix the culprit by putting a few drops of croton oil (a potent laxative [Ed.]) in the bottle, but was horrified when the Captain looked as if he was going to die!) Watson was very upset, and so were we, when the administration retired him at the age of 65.

Mr Rufus Thomas was in charge of the gynaecological and midwifery departments when I first went to Mayday. He did all his cases under spinal analgesia with 2ml of 1/200 Nupercaine then positioning the patient in steep Trendelenburg. I was asked to anaesthetise any problem cases, eg. with a heart condition, and used a general anaesthetic technique on principle. Writing up his method, he stated that its chief advantage was that an anaesthetist was not required!

The Post-War Mayday Hospital

After the war and with the introduction of the N.H.S. in 1948, surgery and anaesthetic staff increased. General surgery returned to the top floor, gynaecology and midwifery remained at the north end of the long corridor, with orthopaedics at the south end, making staffing of both nursing and anaesthesia difficult. Perhaps it would have helped if we had been issued with bicycles! I remember Mr Swinton asking for a single theatre block in the '40s, but it took another 40 years for the excellent theatre complex and I.C.U. to materialise.

The tonsil and adenoid sessions took place three times a week in children's ward 3. Using two tables and a screen, Mr Swinton guillotined the tonsils, helped by a team of part-time nurses and the ubiquitous orderly Watson. Dr Spearing anaesthetised with A.C.E. in a 'Top Hat', telling me his record was 14 cases in 28 minutes. My method was with N₂O, O₂ through 5ml Vinesthene in a Goldman inhaler, my fastest being 12 cases in 20 minutes. The child was turned on the side for adenoids and Watson carried them out to the recovery room. It was surprising with this old fashioned method that there was so little bleeding.

In the early 1950s, there was a polio epidemic in Croydon, and I remember one teenager with respiratory paralysis being ventilated in an old type tank ventilator who developed a respiratory infection needing suction. We decided to bronchoscope him, but found we could not extend his head sufficiently to do this so had to take him out of the ventilator for the procedure. The ventilator had to be hand pumped, I believe for 24 hours, when there was a power cut. So you see, in those far off days, there was hardly ever a dull moment.

As surgery grew, both at Mayday and Croydon General, anaesthetic staff had to increase in number and drugs, equipment and monitoring became more sophisticated. I hope they have not forgotten how important it still is to watch the patient's colour, pulse and BP, and remember how much patients appreciate pre and post operative visits. I understand that there are now 11 consultant anaesthetists, 3 registrars and 6 SHO's.

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ON THE RESUSCITATION OF THE APPARENTLY DEAD

Professor J.P. Payne

My interest in the history of anaesthesia was stimulated by my experience as an examiner in the Fellowship examinations when I discovered that many candidates were under the impression that essential resuscitative procedures were introduced in 1962 or thereabouts. This paper is based on an Arnott demonstration entitled 'On the Resuscitation of the Apparently Dead' given in the Royal College of Surgeons exactly twenty years ago last month.¹

In preparing my demonstration I was fascinated to discover that in his Hunterian Oration of 1843² John Arnott paid tribute to the memory of Baron Dominique Larrey, the French army surgeon who had just died, and in commemorating his achievements Arnott drew attention in particular to Larrey's introduction of the 'ambulances volantes' which made possible the rescue and resuscitation of the wounded on the battlefields, and which led in due course to the development of the ambulance service as we know it. However, the main thrust of Arnott's oration was to focus attention on the scope of John Hunter's activities and to draw attention to his work on resuscitation.

It is not clear how Hunter came to be involved in the study of resuscitation but it is possible that he became aware of the work of John Fothergill and William Cullen in Scotland and his own natural curiosity did the rest. Certainly his first experiments on artificial ventilation carried out on a dog in 1755 followed the description of mouth to mouth resuscitation published by Fothergill in 1744.³ Later William Cullen, His Majesty's First Physician in Scotland, had drawn up recommendations⁴ for the management of drowned persons which were incorporated in a memorandum ordered on 11th August 1774 to be printed and circulated to all Sheriffs of Counties, Magistrates of Royal Burghs and Moderators of Synods and Presbyteries in Scotland.

Perhaps Fothergill's greatest contribution was to insist that all and sundry could be trained in the act of resuscitation and that it should not be left to physicians and their assistants. Fothergill's views were taken up by Alexander Johnson who emphasised that knowledge of resuscitation should be taught to all classes and should not remain the prerogative of the physician,⁵ a plea that was later taken up by Curry⁶ in 1792 of whom he wrote that 'it needs scarcely to be said that whatever concerns the preservation of human life cannot be too generally known'. The views of these enlightened doctors contrast markedly with those of some modern clinicians who would restrict knowledge of resuscitative techniques to members of the medical profession and even to special groups within it.

Royal Humane Society

But to revert to the work of Alexander Johnson; Johnson was influenced by the example of a Dutch society set up in Amsterdam in 1767 to provide instruction in life saving measures in cases of drowning. Johnson was so impressed by the Amsterdam society that he introduced their ideas into England and was the first to propose that a similar society should be set up in London. It is ironic that when the Humane Society, later to be called the Royal Humane Society, was founded at the Chapter Coffee House in St. Paul's Churchyard in 1774 by Dr William Hawes, Dr Thomas Cogan and a

few friends and colleagues, Alexander Johnson was not among them and one cannot help wondering if his advocacy for widespread training did not contribute to his exclusion. Whatever the reason, Johnson's contribution was not recognised in his lifetime.

The new society had as its aims the encouragement of the greater dissemination of knowledge concerning resuscitation, by sponsoring lectures, instigating research and awarding prizes. Among the first to be commissioned by the society was John Hunter himself who published his essay 'On the Resuscitation of the Apparently Drowned' in 1776.⁷ Hunter's views were contrary to the established wisdom of the day and there can be little doubt that his essay provoked dissent, if not downright antagonism, not least among the members of the society. Even today his essay makes remarkable reading; not only did he emphasise that in drowning the primary cause of death was the cessation of respiration with cardiac arrest secondary, but also that if proper steps were taken to inflate the lungs such a manoeuvre would be sufficient to effect recovery but that every moment of delay would render this recovery more precarious.

On the basis that ventilation of the lungs was the primary requisite, Hunter devised:

'a pair of bellows so contrived with two separate cavities that by expanding them, when applied to the nostrils or mouth of a patient, one cavity may be filled with the common air and the other with air sucked from the lungs; and by shutting them again, the common air may be thrown into the lungs, and that which is sucked out of the lungs be discharged into the room. If during the operation of the bellows, the larynx be gently pressed against the oesophagus and spine, it will prevent the stomach and intestines being too much distended with air. This pressure however must be conducted with judgement and caution so that the trachea and the aperture of the larynx both be left perfectly free. I would advised lessening the application of air to the lungs and enjoin those employed to observe with great attention when the muscles of respiration begin to act, that our endeavours may not interfere with their natural exertions yet that we may be still ready to assist'.

Hunter then added as a footnote:

'Perhaps the dephlogisticated air described by Priestly (oxygen gas) may prove more efficacious than common air. It is easily procured and may be preserved in bottles or bladders for that purpose'.

Apart from its intrinsic value this essay probably contains the first published description of an artificial positive pressure ventilator with a negative phase.

New resuscitation techniques

Hunter went on to express the view that when other methods failed, the heart should be stimulated electrically and he further suggested that logically, the injection of stimulating substances into a vein should be effective but he admitted that he had been unable to demonstrate such a beneficial effect in his experiments. He was opposed to blood letting on the grounds that it weakened the circulation further and he was adamant that tobacco fumes did nothing but harm. Depending on the route of administration they weakened the victim still more by vomiting or purging.

It has to be remembered that John Hunter was essentially an experimentalist and it

is unlikely that he concerned himself much with the priorities of discovery. It mattered little to him whether the technique of mouth to mouth resuscitation had a biblical origin⁸ with Elijah, as some would have us believe or whether the method had been introduced by one of his contemporaries. What did matter to Hunter was that the technique was properly tested on a scientific basis and he had little patience with those whose contribution was mainly theoretical. Witness his advice to Edward Jenner who was debating with himself whether or not vaccination would prevent smallpox: 'Why think? Why not try the experiment?'

Hunter's influence is to be seen in much of the work of his contemporaries such as Dr. Charles Kite, an early Humane Society prize winner whose essay published in 1788⁹ on 'The Recovery of the Apparently Dead' contains probably the first description of a DC defibrillator designed to restore the heartbeat. Kite also collaborated in 1789 with a surgical instrument maker, John Savigny, to produce a pocket set of instruments, some of doubtful value, to be used for the recovery of the apparently dead. It has to be accepted that many of the published instructions of the period often made no distinction between essential management and trivial remedies and it was only too obvious that many of the authors had little understanding of the principles involved in resuscitation practice. Nevertheless the greater emphasis placed on a proper scientific approach by Hunter and others provided a more rational basis for the management of resuscitative procedures and towards the end of the century further encouragement was to come from a historical review of the subject by two Danish authors, J.D. Herholdt and C.G. Rafn in 1796¹⁰ who once again drew attention to the value of mouth to mouth resuscitation. There can be no doubt that we owe a great debt of gratitude to those 18th century scientists who without the benefit of modern technology were able to lay the foundations of modern resuscitation techniques on the basis of experiment, observation and logic.

Today I like to think that if Baron Dominique Larrey were alive he would have rejoiced to see the use of true 'ambulances volantes' bringing the wounded to safety and treatment, and never better demonstrated than in the Falklands campaign. There the deployment of helicopters to airlift casualties from the battlefield direct to the hospital ship, and their subsequent transfer in suitably modified VC10 aircraft to the United Kingdom, put into practice as never before Larrey's original concepts.

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SOLUTIONS TO MEDICAL PROBLEMS MAY BE FOUND IN PROFESSIONAL WRITINGS FROM THE PAST

Dr J. Ruppreht

It is not uncommon in medicine to treat ailments on the basis of symptoms experienced instead of treating the cause of those symptoms. If a disease is not understood this is all one can do. However, it is worthwhile considering the possibility of a previously established but forgotten aetiological treatment. The fact that a certain disease had not been understood in present day terms may be a cause for forgetting treatments which had been effective in the past. It may also be that medical professionals were not genuinely prepared for new knowledge and treatment remained unnoticed and did not become established.

I would like to test this hypothesis in two anaesthesia and resuscitation related fields of interest. In both cases an excellent solution to the problem had been described, but for some reason was forgotten and only rediscovered at a much later date.

Central anticholinergic effects and treatment with physostigmine

In an amazing short time after Fraser's description of the 'ordeal' poison from Calabar beans¹ Dr Kleinwachter from Prague reported his findings on the action of the Calabar bean extract in atropine poisoning.² He explicitly mentioned that reversal of atropine toxicity was no coincidence but a clear pharmacological action. According to his discussion, this specific treatment could and should replace the current practice which was totally inefficient and was purely symptomatic treatment of atropine poisoning. Only 22 days passed in 1864 between the description and publication of Kleinwachter's findings.

For some reason, this knowledge was forgotten. For decades to come the treatment of atropine poisoning and poisoning with other centrally acting anticholinergics remained symptomatic. As late as 1970, the 4th edition of *The Pharmacological Basis of Therapeutics* advocated only symptomatic treatment of anticholinergic poisoning, which we would now consider insufficient and obsolete.³ It was only in 1975 that this outstanding book updated recommendations for treatment of atropine poisoning. Physostigmine salicylate was recommended, being nothing else than the chief component of the Calabar bean extract.

Everyone knows that poisoning with anticholinergics has been quite common. In medicine, anaesthesiologists would prescribe anticholinergics before operation and patients would suffer from their central effects postoperatively. However, no anaesthesiologist or surgeon bothered to deal with the problem. This is quite curious, as cholinergic nervous transmission was adequately established early in the 1900's and physostigmine played the major role as investigatory tool. Fortunately, in psychiatry atropine-induced coma was treated with physostigmine.⁴ Psychiatrists again stressed in 1970 that central anticholinergic effects of drugs should be recognised and may be treated by physostigmine.⁵ From that time, this much needed treatment became widely published and entered standard anaesthesia literature. The 9th edition of the *Synopsis of Anaesthesia* (Atkinson, Rushman, Lee) included information on the central anticholinergic syndrome (CAS) and the use of physostigmine in anaesthesia or intensive care. (Table 1) Knowledge of CAS has now reached many anaesthesiologists

who may regularly encounter it in their practice. It had become standard anaesthesiological knowledge by the time of its appearance in the 5th edition of *General Anaesthesia*.⁶

The origin of forgotten but much needed knowledge about the effect of physostigmine on the actions of anticholinergic drugs has been brought to the attention of readers of *Anaesthesia* in a historical paper published in September 1988.⁷ The two authors wrote about early knowledge on physostigmine and translated Kleinwachter's paper from German. It's English title is 'Observations on the effect of Calabar bean extract as an antidote to atropine poisoning'.

Table 1: Essentials of chronology on anticholinergics and physostigmine

1863: Fraser (<i>Edin. Med. J.</i>)	– actions of the Calabar bean.
1864: Kleinwachter	– extract of Calabar bean in atropine poisoning.
1958: Forrer and Miller (<i>Am. J. Psychiat.</i>)	– abolition of atropine coma with physostigmine.
1982: <i>A Synopsis of Anaesthesia</i> (9th Ed.)	– treatment of CAS with physostigmine.
1989: <i>General Anaesthesia</i> (5th Ed.)	– Chapter 95: CAS in postoperative period.

Closed-chest cardiac compression

One may get the impression that closed-chest cardiac compression in resuscitation from apparent death is a recent innovation. Nothing is further from the truth. Early in the era of surgery under chloroform such a technique was known and applied, sometimes with success. In 1892, Dr Maass a surgeon in training at the Gottingen clinic, referred to his teacher's book⁸ mentioning that Professor Koenig had advocated closed-chest heart compressions for chloroform deaths. The original idea was to compress at a rate of gasping respirations.

Maass described two cases of chloroform death in *Berl. Klin. Wochenschrift*, in 1892.⁹ He referred to the slow rate of compression as advocated by Koenig. In the two described cases, resuscitation failed and the patients were considered to be lost. In a side room, Maass, 'somewhat agitated' continued cardiac compressions, but at a higher rate, at least 80-100 per minute. An interesting report on 'The method of resuscitation in cardiac death after inhalation of chloroform'⁹ included a recommendation to apply this high rate closed chest compressions, which appeared quite logical as this was the cause of fully successful resuscitations in the two patients considered lost. The article is of interest also for its description of the 'blue' and 'white' appearances of the patients in whom chloroform 'syncope' occurred.

In retrospect, it is difficult to understand why this report of successful cardiac resuscitation remained without subsequent clinical application. For years to come the accepted technique was open chest heart massage, even in cases far away from the surgical environment.

The contemporary guidelines for cardiac resuscitation can be traced back to Kouwenhoven, Jude and Knickerbocker in 1960 (Table 2). Their recommendation was for about 60 closed-chest/heart compressions per minute.¹⁰ The success of this approach in the reversal of apparent death has been self evident, especially with a simultaneously applied adequate ventilation of the patient. Further studies, however, have shown that even greater improvement of artificial circulation is possible by increasing the rate of closed chest compressions to 80-100 per minute. This finding forms one of the essential changes in the latest standards and guidelines for cardiopulmonary resuscitation.¹¹

The circle again is closed. Correct observation on a certain treatment far away in time was lost, only to be rediscovered and widely applied at a later date. How many people have died unnecessarily in the meanwhile? How many have survived the resuscitation, but with cerebral damage?

Table 2: Resuscitation: Frequency of closed-chest cardiac compressions

1889: Koenig, Gottingen (<i>Lehrbuch der Allg.Chirurgie</i>)	– > 60 min ⁻¹
1892: Maass. Gottingen (<i>Berl.Klin.Wochenschr.</i>)	– approx. 100 min ⁻¹
1960: Kouwenhoven, Jude, Knickerbocker	– 60 min ⁻¹
1986: <i>JAMA</i> – Standards and Guidelines for CPR	– approx. 100 min ⁻¹

Lessons to be learned from these descriptions of how needed treatments are forgotten

The thought occurs almost immediately that in various medical fields doctors could use discoveries from the past, had they only been aware of them. It is easy to find another parallel in surgery and anaesthesia. It was widely known that curare had been given to a mule who survived the effects because somebody ventilated it. Every doctor and physiologist knows that Claude Bernard established that curare only affects tissues outside the central nervous system, predominantly muscles. But nobody thought of applying curare during operative procedures. Was it ignorance of basic pharmacological knowledge? Was it lack of imagination by surgeons and anaesthetists alike? Again, it was psychiatrists who used curare first, and only much later it happened that a brave doctor – H. Griffith – applied the arrow poison in anaesthesia where it caused historic changes. These facts are universally known, and do not need detailed references.

It may be worth contemplating why medical men may not apply existing knowledge for the benefit of their patients.

Osler was correct in being surprised at how little knowledge was needed for one to practice medicine. The author of this paper is surprised how conservative and often ignorant, doctors can choose to be. One wonders about how many more needed medical treatments have long ago been discovered, applied and described. Not all of them may be known to the self-assured contemporary medical community. It is suggested that study of medical writings from the past may yield acceptable answers to some

present day medical enigmas. A circle, again, would be closed; an answer to a correctly formulated question could be given. The main difficulty lies in keeping an open mind.

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A NEGLECTED PIONEER – SOPHIA JEX-BLAKE

Dr F.M. Ulyatt

The marriage of the younger children of two Norfolk gentry, Thomas Jex-Blake and Maria-Emily Cubitt, resulted in the birth of six children of whom the three youngest grew up. The eldest, Thomas William pursued an academic career in holy orders and became successively headmaster of Cheltenham and Rugby. The second, Caroline Anne pursued a quiet life as an elder daughter. The youngest, Sophia Louisa opened the medical profession to women.

At the time of her birth on 21st January, 1840 the Jex-Blakes were living in Hastings, to which town they had moved from Cumberland Terrace, Regents Park because of Mr Jex-Blake's ill health. Thomas William, aged 8, was at preparatory school in Brighton, and six year old Caroline Anne had not yet gone to school.

Sophia Louisa was educated at a series of boarding schools where she proved a difficult pupil, despite very considerable intelligence. She left at the age of 18 and felt that her education had been defective. On discovering that she could learn more at Queen's College in Harley Street, she argued with her father until he agreed to let her go there. She did very well and quickly became a tutor in mathematics. At Queen's she met and became very close to Octavia Hill. Unfortunately they quarrelled as a result of an action of Octavia's mother and never made it up.

Sophia's prime interest was the education of young women. She went for a year to the Grand Ducal Institute at Mannheim to teach English and observe the local methods. Next, in 1865, she went with a friend to see American Colleges for women and write a book on the subject, which was subsequently published and was very successful. She met notable figures such as Emerson and was introduced to Dr Lucy Sewall who ran the New England Hospital for Women.

Sophia Jex-Blake was impressed by the work and after helping with the paperwork and the dispensary, formed the intention of studying medicine. She returned to England, where her parents were now living in Brighton, to discuss this possibility and received their support; she returned to the States, coming back for a visit in 1868. Her father was ageing but took great pleasure in seeing her. She went back to New York to work at a school run by the Drs Blackwell. By a fortunate chance Dr Elizabeth Blackwell had been in practice in England in 1858 at the time of the Medical Act which formed the Medical Register and prescribed the regulations for qualifications and registration.

Medical education for women

Unfortunately, no sooner had Miss Jex-Blake settled in New York than she received disturbing news of her father's health. She left with all speed only to find that he had died before she received her sister's letter indicating that he was very ill. She was pleased to find that her mother was in a reasonable state of mind and was carrying on, with Caroline Anne's assistance, as she had been before. There was no real place for Sophia in the household and she grew bored and, frustrated. She began to get out her books and work at histology. The question of training in England was raised with friends and acquaintances but Cambridge proved unwilling, London had shut

off any access to women after the qualification in 1864 of Miss Garrett, who obtained the L.S.A. Scottish Universities were not collegiate and as she had friends in Edinburgh and knew the city Miss Jex-Blake decided to try her fortune in the northern capital. She arrived in March, 1869 with an introduction to the professor of English Literature (Masson) who arranged for her to meet Simpson. She approached the Dean (Dr Balfour) and the senior professor Sir Robert Christison, Bart. (Medical Jurisprudence and in post since 1822). The Dean was helpful but Christison was cold and also very influential, as he was on all the administrative bodies of the University. The system was complex. The students had to matriculate by taking examinations in the usual school subjects and were then given red tickets of admission. The faculties arranged their own affairs. Above them the Senatus Academicus included all the professors and the University Principal. The University Court was a higher authority of elected representatives from the town and the university; the Lord Provost of Edinburgh, five members appointed severally by the Chancellor, the Rector (elected by the students), the Senatus, the Town Council and the General Council of the University which consisted of all the graduates. The Chancellor, Sir Robert Inglis, was the ultimate authority. All had to be consulted if important regulations were to be changed.

Sophia made a few friends in the medical faculty – the Dean, Professor Bennet and one of the medical professors. These were backed by at least six professors in the arts faculties.

Christison carried a number of the medical faculty with him, but a formal application to the Dean in March was accepted by the Faculty and agreed by the Senatus in May. The opposing staff appealed against their decision to the University Court and it was reversed – a temporary arrangement for one lady should not be upheld.

Her university friends suggested that Miss Jex-Blake should appeal for other women to join her. A letter to *The Times* resulted in the applications of four other women – all sensible middle and upper class women in their thirties. Mrs Thorne, Miss Chaplin and Miss Pechey were all to play important parts in the subsequent history of the work in Edinburgh. It was expected that separate tuition in anatomy would get over a difficulty. Sophia approached the Rector with this point and the information that there were five others willing to join her in studying medicine. She applied to the Senatus and agreed with the Dean of Medicine to meet necessary fees and that lecturers should not be out of pocket. Luckily Christison was away at the time and the Senate and Council agreed, in July 1869, to let the women start. The General Council and Chancellor agreed by November to regulations as follows:

1. Women should be admitted to the study of medicine.
2. Instruction should be in separate classes only for women.
3. Professors were permitted to have separate classes for women.
4. Other women, not intending to qualify, might be admitted to such classes as approved by the University Court.
5. Fees for a full course shall be four guineas and if the class is too small the professors may raise fees.
6. Women to have the same regulations as all other matriculated students over classes and organisation.
7. These regulations to take effect from commencement of the session 1869-70.

The women had worked for and passed their matriculation examinations and began the Autumn term's work of physiology and chemistry. They did well in the class examinations and Miss Pechey came third in chemistry. The top four students were usually given scholarships (the Hope Scholarships) to work in the laboratory. As she was taught in a separate class Professor Crum Brown withheld the scholarship from Miss Pechey but gave her the Bronze Medal. He was then in a dilemma over the women's class certificates. As a result of a decision of the Senate these were awarded. The whole affair made nasty press headlines for the University and accusations of injustice were freely made.

Separate classes in anatomy proved impossible at the University but there was an arrangement to approve tuition in four subjects at the Extra Mural School of Medicine centred at the College of Surgeons. The lecturer there Mr Handyside, agreed, with the class's approval, to accept the women and they worked with the men.

The more serious students began dissection in October, 1870 and classes began in November with regular oral examination at intervals.

The women had made applications to the only teaching hospital which was recognised, The Edinburgh Royal Infirmary, to pursue their clinical work but this was meeting with opposition from the Medical faculty. The influence of the Faculty began to be felt as some of the men students, previously polite, began to behave rudely towards the women. On the afternoon of the first oral examination the women walked together towards the college and found some 200 men students, some from the University – identified probably by their red gowns – outside the gates. They were singing student songs and some appeared drunk. The gates were shut as the women arrived and they were trapped in the crowd briefly, until one of their friends ran out of the college and opened the gate, when they walked in quickly and went into the anatomy theatre. The lecturer ejected some University men. There was a lot of noise outside the door and the college pet sheep was pushed in. Mr Handyside said 'Let it alone, it has more sense than those who put in there'. When the oral examination was over Mr Handyside was concerned for the women's safety and suggested that they should leave by the back door. Sophia had other ideas and appealed to the gentlemen in the class to escort them. Some thirty, armed with long bones, saw the women home. They continued to escort the women for some time afterwards.

Clinical training and litigation

Clinical instruction was becoming urgent and as the Managers of the Royal Infirmary changed yearly the newly elected body had to be approached. Elections occurred in January and Sophia subscribed to the Infirmary, intending to secure a vote. Subscribers met under the chairmanship of the Lord Provost in the Council Chambers on 1st January, 1871. There were too many people and the meeting moved rather angrily to St. Giles Church. Two sets of managers were put up for election, the medical staff supporting the six opposed to the women. Sophia obtained permission to speak. She explained that the women had worked in harmony with the men until the problem of clinical work had arisen, and accused her opponents of prejudice. She gave an account of the riot at Surgeons' Hall saying that a Mr Craig who was Christison's class assistant had been using foul language 'which could only be excused on the supposition, which she had heard, that he was intoxicated'. Outraged bellows from Christison did not indicate whether Craig had been there or not and the Lord Provost in the chair suggested that the word 'intoxicated' be withdrawn. Sophia, nettled and

always quick to make a score, remarked that she had said it was the only excuse for his conduct. She added that if Dr Christison would prefer her to say that Craig had used the language when sober she would withdraw the other supposition. The shrieks of laughter which resulted did the women no good as the opposing group of managers, were elected with the resultant loss of access to the Infirmary for the rest of the year.

Litigation being very common in Victorian times the resulting libel action against Sophia by Mr Craig is scarcely surprising. To offset this she must have been comforted by the formation of a committee of well-wishers from all over the country to secure the Complete Medical Education of Women in Edinburgh, who began to accumulate funds for all contingencies.

The libel case was heard at the end of May, 1872. The modest ladylike appearance of Mrs Thorn, Miss Pechey and Miss Jex-Blake struck everyone in the court. The jury found for Mr Craig and awarded a farthing damages. The judge added the costs of the action, about £980. The money was quickly found by the Edinburgh Committee.

At each stage in their training the women were opposed and frustrated. Examination fees were paid and then returned as unacceptable. The University authorities continually tried to find ways of avoiding their obligations to the women. The only clinical teaching the Seniors could obtain was at times such as Sunday mornings, when friendly medical staff would teach them on their own wards in the Infirmary. They could get no access to out-patient work.

The next two years were spent in trying to get access to regular hospital teaching and in trying to consolidate their position as matriculated students of the University. In the end the women decided to test the actions of the University in the courts and brought an Action of Declarator against it. Their faculty friends declined to be associated with the University defence. Lord Gifford (the Lord Ordinary) found for the women but the University authorities appealed and the case was heard in November, 1872. There was a tremendous amount of publicity and most of it adverse to the Edinburgh University.

Political moves in the Commons were being made but a change in Government prevented progress.

When they were again prevented from using the Infirmary facilities fully in January 1873, the women were driven to try for access elsewhere, but found no one would help them. The University's appeal about the Action of Declarator was heard in June, 1873 and went against the women. Further Parliamentary moves were also frustrated.

A move to London – qualification

By July, 1874 it was clear to the women that there was no further possibility of progress in Edinburgh and a decision was made to move to London where they had friends amongst the staff of several teaching hospitals. These had encouraged the idea of building a new school for the theoretical courses. Dr Anderson felt this move unwise and Mrs Thorne was opposed, however there was enough support for Sophia Jex-Blake to obtain the lease of 30 Henrietta Street, Brunswick Square, get a room licensed as an anatomy school, recruit recognised University teachers part-time from the men's schools, and open the London School of Medicine for Women on 12th October, 1874. Over the next year a proper set of administrative bodies were set up for the school.

There were two serious problems. The senior students were ready to take Finals and no-one would examine them. The next most senior required clinical tuition and there was no hospital to which they could go for this purpose. These two problems were severally resolved in 1877. James Stansfield MP managed to prevail on the board of the Royal Free Hospital in Grays Inn Road close to the school, to accept the women students at a premium of £700, Sophia who had taken her MD Berne in January was the only person taken into his confidence.

The Dublin schools had no formal regulations to prevent women taking their examinations and Miss Pechey went to negotiate. The King's and Queen's College of Physicians inspected the London School and accepted the women for the qualifying examination. The first Edinburgh students, with the exception of Mrs Thorne thus qualified and were registered.

The Secretarial work for the school had been in Sophia's hands, but the amount of administration needed someone who would relieve the Dean of day to day problems. The Executive Committee decided to appoint an honorary secretary. What happened at their meeting is not recorded – two pages are missing from the minute book at this date. It may be supposed that Sophia would have liked the post. It has been said that Mrs Anderson was proposed. In the end Mrs Thorne accepted it, to everybody's relief.

Practice in Edinburgh

As Sophia had been the moving spirit behind the school she suddenly found herself with a good deal of spare time. After obtaining some post-graduate experience at various London Hospitals she returned to Edinburgh.

She set up in private practice in June, 1878 and soon opened a dispensary in a poor part of the town.

In due course Miss Jex-Blake moved into a large elegant Georgian house at the top of Bruntsfield Links. She retained her interest in the affairs of the medical school in London and attended meetings of the Executive Council. The Dean, Mr Norton resigned. Dr Anderson was proposed to succeed him. Dr Jex-Blake felt insulted when someone who had initially opposed the school was elected to this position.

Dr Jex-Blake's house at Bruntsfield was large enough to take in occasional patients, but in January 1884 she began a public appeal to establish the first women's hospital, to be staffed by women, in Scotland. Next month a house was purchased near the original dispensary and set up as a hospital. There was accommodation for a medical officer and outpatient facilities and two small wards. Like all charitable foundations the hospital had continual financial difficulties. It also found difficulty in obtaining resident staff as there were only a few young qualified women. Non-resident medical staff lived at Bruntsfield Lodge with Dr Jex-Blake.

By now the Medical Bill which required qualification in both medicine and surgery had become law and the Scottish Colleges had combined to examine for the Scottish Triple qualification and opened their examinations to women. Sophia wrote to the *Times* to this effect, hoping also that classes in Edinburgh would be available to women. By March, 1886 she had a dozen applicants who were being taught in separate classes in the Extra Mural School, but without access to dissection. This was so unsatisfactory

that an appeal was launched in March 1887 for funds and with the help of the Edinburgh Committee previously established, a new school for women was set up at 1 Surgeon's Square – the scene of Dr Knox's anatomy school to which Burke and Hare had supplied murdered bodies. Since 1876 the building had been in the hands of Sophia and two other trustees, so only required to be cleaned and refurbished. Arrangements were made for clinical work at the Leith Infirmary. Relations with the nursing staff were delicate. All modern doctors know that students are not welcome on the wards at all times. The Edinburgh School of Medicine was a new collegiate type of institution. Dr Jex-Blake as Dean had strict ideas about her students' conduct, so when she received from the Lady Superintendent a complaint of rudeness by the students, she took this seriously and asked those accused to write and apologise. The students (old enough to know better at 27-30 years old) wrote rudely and the apology was rejected. Another student did poorly in her preliminary examinations obtaining only four out of six certificates. She appealed to the lecturers on grounds of personal distress over her father's death and was given the other two certificates. The Dean was furious as she had always gone on the principle of absolute fairness and no favours for the women. Student opinion was divided. The two first offenders over the Leith Infirmary were ringleaders. Sophia said that if they were not asked to leave the school she would resign. The board upheld her. The girls were asked not to return for the next session and sued the school. Unfortunately the Judge found for the students.

Another student, subsequently famous for her medical work in Serbia in the first world war, Elsie Inglis, became the focus of the feeling that Sophia was high handed and dictatorial. Miss Inglis's friends organised a 'Scottish Society for the Medical Education of Women'. Sir Alexander Christison (Sir Robert's son) gave his support against a monopoly on the education of women and the Medical College for Women was founded and given access to the Children's Hospital and the Royal Infirmary.

The Edinburgh School of Medicine lost a few students to the new college and also to Queen Margaret College in Glasgow. The University and St. Andrews were planning to admit women students. Edinburgh at first insisted on separate classes for women and five of the women's school's students qualified MBChM in 1897. Regulations were relaxed and by next year half the women studying medicine were doing so in mixed classes; in particular the Medical College for Women had access to eight mixed classes and the Edinburgh School of Medicine only two. The financial disadvantages of this were so obvious that the Edinburgh School decided to close in August, 1898, returning any excess fees.

By this date the finances of the Edinburgh Hospital for Women and Children were relatively secure but there was a need for larger premises. Sophia was 58, she had struggled incessantly since 1869 to establish women in medicine and had succeeded. She had an adequate income – her mother had left her well provided – and people in her family seemed to retire quite young. She had already been searching for a suitable residence in the South and had one in mind. It would suit everyone's purposes if she sold Bruntsfield Lodge, which was a suitable size and had large grounds, to the Hospital Board. They purchased it for £5,000.

Retirement to Sussex

In April, 1899 a farewell reception was held for Dr Jex-Blake and many presentations were made to her. She left Edinburgh to settle in a large Victorian house set in some six acres of grounds at Mark Cross just south of Tunbridge Wells. The house is

beautifully placed with a wonderful view across the Weald to Fairlight Church just above the old town at Hastings where she was born. One of her former students Dr Margaret Todd, had latterly become her companion and came with her. Dr Todd did little medicine after her resident appointments and wrote novels under the name of Graham Travers. They called the house after the title of one of these and settled down with an orchard and enough meadow for the horses, to lead a country life. There were plenty of visitors, relations and inlaws – Tom's wife's family, old friends and other doctors who had taken part in the Edinburgh struggles.

Sophia, always inclined to put on weight grew very stout. One views with sympathy the unfortunate colleagues asked to care for her when she had some sort of surgery in 1902.

Dr Jex-Blake continued to watch the progress of the London School and in particular its finances. She had seen some disasters to colleges in the States. When stock was sold to defray the cost of a new building she resigned from the executive and the proposal to sell endowments to rebuild entirely and raise a mortgage in 1896 caused her to resign as a trustee. A chilly vote of thanks for her early efforts was passed. Her anxiety was not unreasonable. The School owed £7,000 in 1902 when Mrs Anderson was made President. No-one offered any such recognition to their founder.

The two lady doctors made local friends in Sussex and Sophia's health gradually deteriorated. She had a heart attack while still in Edinburgh and despite medication she progressed into cardiac failure. She pottered about and went for drives, often dropping off to sleep during these, but was perfectly clear in her mind. She died quite suddenly on 12th January, 1912.

There was a large family funeral at Rotherfield, the nearest church. Thomas William aged 80 and Dean of Wells was too ill to come, but Caroline Anne was chief mourner. She was accompanied by five of her nieces, all clever girls, one to be Mistress of Girton, one Principal of Lady Margaret Hall and another qualified in medicine. Her nephew, Arthur – a physician at the Brompton and St. George's, and several of Tom's inlaws who had all been very close are also listed in the local paper. Dr Pechey was dead and Mr Phipson her widower was moved to come, as well as the friends Sophia had made in the locality.

In Rotherfield churchyard Sophia Jex-Blake is buried quite near to the grave of Sir James Stansfield, a reminder of their united efforts.

Her will was complicated and very specific but her residual legatee was Dr Todd, who wrote a pious biography of her friend, published in 1918. It is unfortunate that she obeyed her friend's instructions and destroyed Sophia's papers after using them, so very little that is authentically hers is left apart from her published works.

What would Sophia Jex-Blake think of a world where half the entrants to the medical schools are women and mixed classes have been going on in her own school since the late 1940's?

We cannot guess for, as she must have often heard 'ubi sunt qui ante nos in mundo fuere?' We may hope that she would be content, not least to know that in our own branch of medicine, anaesthetics, in her time in its infancy, women would be very

successful. The women who are here are her heirs and we do well to honour her courage and tenacity. She herself always said that they had wonderful help from others in their struggles. Hers, however, was the initiative, the drive and the imagination behind every move.

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A SORT OF APPRENTICESHIP

Dr V.P. Wordsworth

Dr Wordsworth pointed out to the members of the Society that as well as remembering the 'Good kings and noble deeds' in our specialty's history, there should be a balance whereby those bad kings and less-noble practices have some mention.

He recounted in vivid terms his own introduction to anaesthesia, which he confessed was a decision 'thrust upon him' rather than an active choice. His time in anaesthesia was not all spent at major hospitals and he told of techniques and practices which were not to be found in the textbooks of that era but which might, he suggested, return at some future date. This was an age when some of the more senior anaesthetists had an unusual perspective of physiology which they applied clinically with varying success. The physicians of that time did however have their considerable diagnostic triumphs. He wonderfully described the effects of atropine poisoning skilfully disguised by the poisoner by injecting the atropine into a breakfast grapefruit which was then eaten. This had not been the standard teaching at his medical school!

Although techniques on the use of ether were legion and could be found in any textbook on anaesthesia there were several which had not been committed to paper. He outlined how to etherise a large man with acute appendicitis on board a troopship with an impatient surgeon and no apparatus. The answer to this challenge involved the use of a stock bottle of ether and a bath towel which when soaked in the ether was, without warning, wrapped around a patient's head. The patient was restrained with a blanket and having passed through a considerable excitatory stage, rapidly permitted surgical access. This he described as an 'ether crash induction'.

An unusual use of the Guedel airway was also mentioned whereby the airway was inserted with the patient awake and then liquid ether was poured into the hole. Again this provoked a noticeable excitatory phase prior to the onset of surgical anaesthesia.

These two techniques of etherisation were not personally practised by the speaker, but he did illustrate from his own experience how to provide anaesthesia for a 'dangerously' uncooperative person tied to a plank 'in casualty to keep him under control. Lissive anaesthesia with gallamine had permitted intravenous access to be achieved with subsequent successful anaesthesia.

Dr Wordsworth finished his discourse 'Bad Kings' by reminding his audience of the advantages of some older techniques. Particularly useful had been refrigeration anaesthesia for amputation of the leg – on one occasion the analgesia and the effect of the tourniquet in preventing toxin release to the rest of the body had converted an unconscious man into an alert and oriented patient who then underwent successful surgery.

Editor

THE ALCOCK CHLOROFORM VAPORIZER – THE PROTOTYPE DISCOVERED

Dr D. Zuck

At the meeting of the History of Anaesthesia Society in February 1988 I gave an account of the production model of the Alcock vaporizer that had been found in Toronto.¹ Since then a prototype has been discovered. About six years ago the authorities at St. Mary's Hospital, Paddington deposited in the store of the Science Museum, South Kensington a collection of items that had been associated with Professor A.D. Waller. Among these was an example of his chloroform balance, some of the devices based on toy clockwork trains that he had used to transport film while recording the electrical activity of the heart, a Dubois anaesthetising machine, presumably the one he described using during his researches, and an apparatus made out of sheet copper to which no one was able to attach an identity or a purpose.



The prototype.

Dr Alan Sykes, a retired lecturer in physiology and an active historian of that subject, to whom I had supplied photographs of the production model of the Alcock chloroform vaporizer, inspected this collection of Walleriana in the course of his researches into the life of A.D. Waller, and informed me that he had seen something that bore some resemblance to the photographs, but was rather different. As a result I arranged to visit the store which is in the old Post Office Savings Bank Headquarters at Olympia, and was able to confirm that the apparatus was indeed a prototype of the Alcock vaporizer.

It conforms to the original description published by Alcock.² It differs from the production model in being calibrated not in percentages of chloroform, but arbitrarily from one to ten, and also being without any arrangement for temperature compensation. Otherwise it corresponds exactly to the description, and even has the name of the manufacturer, C.F. Palmer, stamped on the top. The photograph shows the structure of the vaporizing chamber and controls. (Fig).

Acknowledgements: I am indebted to Dr Alan Sykes; to Mr Tim Boon of the Science Museum; and to the Photographic Department of that institution.

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OBITUARY

Reginald Austin Binning MA, FCAnaes, FFARCS, MRCS, LRCP, DA

The sudden death of Dr 'Rex' Binning on 19 November 1988 in his eighty first year deprived the History of Anaesthesia Society of one of its most eminent founder members. He was a distinguished member of a generation which saw the historical development of anaesthesia in the United Kingdom from a part-time general practitioner specialty to full collegiate consultant status and he contributed to the metamorphosis at every stage.

Dr Binning was born in Southampton and went to school in that city at King Edward's Grammar School and later at Wycliffe College in Gloucestershire. He qualified in medicine from St John's College, Cambridge and St George's Hospital in 1934. Rex had an interest in anaesthesia from the start of his career but, as was the case with the majority of contemporary anaesthetists, economic pressures compelled him to combine it with general practice. He resided in Hove and was appointed as Honorary Anaesthetist to the Hospital for Sick Children and to the Royal Sussex County Hospital in Brighton in 1937.

Major Binning had a distinguished military career in the Second World War. He served as an anaesthetist with field surgical units from the earliest days with the British Expeditionary Force before Dunkirk, later in the North African Italian campaigns and again in Europe after D-Day. His services were recognised by a mention in dispatches. The advent of the National Health Service after the War enabled him to devote himself entirely to the practice of anaesthesia as a consultant, and thereafter he worked tirelessly to develop the Department in Brighton into a widely acknowledged clinical and postgraduate teaching centre of considerable excellence.

These are the important facts of Dr Binning's medical career which have been more fully reported in the *British Medical Journal* (1989; 298: 43) and elsewhere, but they do not do justice to him as a man. His interests were very wide and included sailing, travel, civic affairs, photography, antiques and history (general, general medical and anaesthetic) as well as an epicure's knowledge of food and wine. He was a loyal and contributory member or officer of many organisations, both medical and lay, and a keen protagonist of the formation of the History of Anaesthesia Society.

There was however still more to Rex Binning than all this. He was kind and considerate to contemporaries and junior colleagues alike and an attentive listener to their accounts of their aspirations and problems, an interesting and likeable companion on social occasions, and an excellent host. He is survived by this third wife Geraldine and four children; we mourn with them but at the same time give thanks for the full life of a friend who devoted himself to solicitude and care for others.

T.B.B.