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THE HISTORY OF ANAESTHESIA SOCIETY PROCEEDINGS

Volume 33

Autumn Scientific Meeting,
Chequer Mead Arts Centre, East Grinstead
8th November 2003

Contents of Volume 33

HISTORY OF ANAESTHESIA SOCIETY

2003 Autumn Scientific Meeting, Chequer Mead Arts Centre, East Grinstead

8 November 2003

Organisers

Dr C Barham, Dr Ali Diba, East Grinstead

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HISTORY OF ANAESTHESIA SOCIETY

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EDITORIAL

A recent Television programme about the Guinea Pig Club was a reminder of the part played by the Queen Victoria Hospital (QVH), East Grinstead in the development of plastic surgery, especially in the treatment of burns inflicted during World War II. This was supported by advances in anaesthetic management, notably the use of hypotensive agents and an increased role in peri-operative care. It was therefore of great interest that the 2003 Autumn Meeting of the HAS took place at East Grinstead.

The venue for the meeting was the Chequer Meads Arts Centre, formerly a school which had been imaginatively developed into real local community asset. Our own Honorary Member, Jean Horton, gave an account of her SHO job at QVH, and former members of staff Joan Brown and Tony Edridge also spoke of their experiences. Two Sisters from the Russell Davies Unit described its history; it could be claimed that the recovery ward opened in 1946 was the first of its kind in the UK. Other subjects included carbon tetrachloride, both in its anaesthetic and criminal uses (McKenzie and Payne) Frederick Hewitt's account of Edward VII's appendicectomy (Howat), and an approach to designing a book cover (Lai).

Visitors were also able to have a tour of the QVH museum, guided by Bob Marchant, for many years a Senior ODA at the hospital, and now the curator of the museum.

The Society's thanks are due to Chris Barham and Ali Diba, and their assistants Jenny Moss and the Staff Development Centre for organising this meeting.

PMED

FUTURE EVENTS

2004 13th November. HAS Autumn Meeting, Liverpool Medical Institution.
Contact Peter Drury (pmedrury@aol) or
Anne Florence (gasflow@btinternet.com)

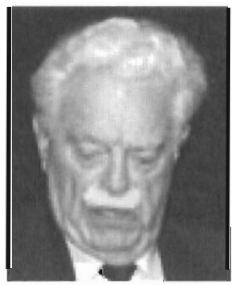
2005 4th March. Joint Meeting with Section of Anaesthesia, RSM.

14th-18th September. Sixth International Symposium on the History of Anaesthesia, Queens' College, Cambridge.
Contact Neil Adams (adams118@keme.co.uk)

2006 Provisional: HAS Summer Meeting, Rochester, Minnesota. Joint meeting with the American Anesthesia History Association and possible visit to Wood Library-Museum, Park Ridge, Illinois.

Speakers at East Grinstead

Dr A McKenzie



Prof J Payne

Dr D Howat

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Dr J Horton

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Meeting of the History of Anaesthesia Society

East Grinstead, 8 November 2003

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CARBON TETRACHLORIDE AS AN ANAESTHETIC

Dr A G McKenzie
Consultant Anaesthetist, Royal Infirmary, Edinburgh

Introduction

Carbon tetrachloride was first prepared in 1839 by the French chemist H V Regnault, who obtained it by chlorination of boiling chloroform, the final step in 'de l'action du chlore sur l'éther hydrochlorique de l'esprit de bois'.[1] At that time knowledge of the chemical bonding of carbon was in its infancy. In his formulae Regnault used double the number of atoms that we now denote; thus his formula for carbon tetrachloride was C_2Cl_8. Chloroform had been first prepared in 1831 and became famous as an anaesthetic in 1847. In contrast carbon tetrachloride remained in relative obscurity during this period.

In the early years of ether and chloroform anaesthesia there was a search by many medical practitioners for the 'perfect anaesthetic'.[2] In 1849 Thomas Nunneley, senior surgeon to the Leeds Infirmary, published a paper on over 30 different substances which he tested experimentally.[3] One of these he called 'chloride of carbon' or 'protochloride of carbon'. Barbara Duncum, in her famous book *The Development of Inhalation Anaesthesia* identified this as tetrachloro-ethylene $CCl_2{:}CCl_2$[2] however in the index to the same volume it is designated as carbon tetrachloride.[2] Nunneley stated that the fluid 'very strongly resembles chloroform and Dutch liquid', but gave neither chemical formula nor physical constants by which one could now identify it. He went on to say: 'The chloride is a safe and not unpleasant anaesthetic, in action not dissimilar to chloroform and chloride of olefiant gas, but not, I think, quite so powerful as either of these'. Nunneley devoted only a single paragraph to 'chloride of carbon', but added a considerably longer footnote in which it is clear that he was unhappy about the purity of the liquid he had tested; hence he wrote: 'I would wish these experiments upon the chloride of carbon not to be regarded as altogether satisfactory and final'. He thought the fluid might in fact be Dutch liquid mixed with spirit.

Could Duncum have been correct in identifying Nunneley's 'chloride of carbon' as tetrachloroethylene, and was the index to her book done by someone else? Nunneley's alternative name of 'protochloride of carbon' was that given to tetrachloroethylene when it was first prepared in 1821 by Michael Faraday.[4] In 1839 H V Regnault referred to tetrachloroethylene as 'chlorure de carbone', and to carbon tetrachloride as 'perchlorure'. In the absence of further information the exact liquid tested by Nunneley remains in doubt. Hitherto this has been overlooked.

Anaesthesia

The first *definite* work on carbon tetrachloride as an anaesthetic came from Arthur E Sansom in 1864. He was physician-accoucheur's assistant to King's College Hospital, London, and he mentioned the 'tetra-chloride of carbon' in his handbook *Chloroform: its Action and Administration* published in 1865. Therein he gave the chemical formula as CCl_4.[5] On 4 July 1864 Sansom and Dr John Harley tried the effects on a frog: a few drops over its nose led to near anaesthesia for half an hour and reduced circulation. On 7 July four fluid drachms was administered to a dog, which became completely anaesthetised and died. The third case, a guinea pig, received carbon tetrachloride vapour by pouring the liquid on lint which had been

wrung out in hot water: full anaesthesia occurred, followed by death. Next, Sansom inhaled the vapour himself and reported pleasant smell and taste, surface warmth, tingling up to the tips of the fingers, half-consciousness without headache.[6]

In May 1865 Sansom tried inhalation of carbon tetrachloride in midwifery: pain was subdued, yet consciousness retained. Trying it again on a similar case in August 1865, he had great difficulty in administering a sufficient dose, and the pain was imperfectly soothed. In a surgical case there was much muscular excitement and chloroform had to be substituted.[6]

Simpson

Later in the same year the famous Professor James Young Simpson tried carbon tetrachloride in Edinburgh. He called the agent 'bichloride of carbon' or 'chlorocarbon' and compared it with chloroform:

	chlorocarbon	chloroform
Chemical constitution	C_2Cl_4	C_2HCl_3
Specific gravity	1.56	1.49
Boiling point	170°F	141°F
Vapour density	5.33	4.2

Simpson first experimented on himself, others and animals. Then he and Dr Black administered it to a midwifery case for over an hour; the anaesthetised patient's pulse became extremely weak. However in their next case the pulse remained firm. In four surgical cases Simpson found the anaesthesia quite good, though the fourth case (an infant) had a weak pulse and took over 1½ hours to awake. Simpson felt that 'chlorocarbon' was more dangerous than chloroform as a general anaesthetic, because of its greater depressing influence on the heart.[7] In 1866 Sansom published notes on carbon tetrachloride in *Transactions of the Obstetrical Society of London*, using the name 'bichloride of carbon' in the title. Noting Simpson's paper, he proceeded to give the correct boiling point and specific gravity of carbon tetrachloride. The summary of his impressions was:[6]

- though difficult to procure, it would soon be attainable cheaper than chloroform;
- being considerably less volatile than chloroform, it was best administered on lint, wrung out in warm water;
- it seemed initially to stimulate the circulation, the cardiac depression noted by Simpson being attributable to the deeper stages of narcotism;
- it would be valuable in midwifery practice as a means to reduce sensibility, but maintain muscle power;
- *not* advisable to induce deep narcosis with it as eliminated more slowly than chloroform, and that stage associated with enfeebled circulation.

Protheroe Smith

The next to report on the tetrachloride of carbon as an anaesthetic was Protheroe Smith, the founder of and first physician to The Hospital for Women, London. Introduced in the *Lancet* of 11 May 1867,[8] he published a series of four articles in the June issues. The first of these dealt with the chemistry of carbon tetrachloride and the difficulties with nomenclature:[9]

C = 12	C = 6
Tetrachloride of carbon CCl_4	Bichloride of carbon C_4Cl_4.

Describing his own experience of inhaling carbon tetrachloride as 'agreeable', he reported nine experiments on four guinea pigs, two of which were intentionally killed; one by the tetrachloride and the other by chloroform. The article then reproduced Dr John Harley's July 1864 experiments.[9]

In Smith's next three articles in the *Lancet* the use of carbon tetrachloride in fifty two cases was reported. These included fifteen cases of abdominal pain, ten cases of headache, seven afflictions of the nervous system, five cases of natural labour and five cases of toothache or facial pain - distress was eased in all but one case.[9]

A report on carbon tetrachloride by Thomas Nunneley appeared in the 15 July 1867 issue of the *British Medical Journal*; this was at the mid-point of Protheroe Smith's four articles in the *Lancet*. Referring back to his own comments on 'chloride of carbon' nearly nineteen years earlier (1849 essay in *Transactions*), Nunneley declared: 'I had some reason for suspecting that one person supplied me with a fluid under this name, which was an admixture of chloroform with a little alcohol'. Returning to his current supply of tetrachloride of carbon, he wrote the chemical formula as Cl^4C^4 and gave the correct physical constants. He then reported three experiments on cats and six on rabbits; three of the animals died. He proceeded to breathe the tetrachloride of carbon himself, and gave a graphic account of how ill it had made him feel. He concluded that the new agent was inferior to others in use and had a narrow safety margin.[10]

In August 1867 Protheroe Smith read a paper to the Section of Midwifery of the BMA, in which he opined that the carbon tetrachloride was more suitable than chloroform for midwifery, being less liable to incur inertia uteri, haemorrhage or sickness[11]. He also exhibited his inhaler for administration of anaesthesia and gave an easy method of detecting impurities in carbon tetrachloride.[11]

All these authors had had difficulties with the chemical formula of carbon tetrachloride. This problem was to persist until the introduction of the Periodic Table by Mendeléeff in 1869 and the subsequent development of the concept of valence.

In September 1867 Arthur Sansom, recommended (in the *British Medical Journal*) a mixture of 1 part of carbon tetrachloride in 6 of chloroform.[12] The following year (in *Transactions of the Obstetrical Society of London*) he summed up that the tetrachloride of carbon was not the best anaesthetic for 'the pains of natural labour', but that it was the best (as pointed out by Protheroe Smith) for 'headache and the slighter manifestations of pain'.[13]

Uses of Carbon Tetrachloride

Carbon tetrachloride did not become popular as an anaesthetic; it was not even mentioned as an anaesthetic in either the *British Medical Journal* or the *Lancet* between late 1868 and mid 1907. However, during this period it became largely used as a solvent in industry, especially dry cleaning clothes. By the early 1900s its excellent grease-solvent, yet non-inflammable properties became known to hairdressers, who soon favoured it as a dry shampoo. In 1907 the *Lancet*[14] and the *British Medical Journal*[15] reported separate incidents of a lady becoming unconscious during shampooing. The editor of the *British Medical Journal* warned that 'a serious and even fatal accident might easily occur'.[16] Less than two years later on 12 July1909 it did. A lady of 29 died while having her head dry-shampooed at Harrods. After

two minutes she became pale and collapsed. She was placed on the floor (where unfortunately the heavy vapour would have fallen) and medical assistance called; but the artificial respiration was to no avail. An enquiry was held three days later: the jury returned a verdict of 'Accidental death accelerated by the fumes of tetrachloride of carbon' and added a rider: 'Harrods were not justified in employing an unskilled operator to perform this dangerous operation'. At that time 90-100 customers had carbon tetrachloride shampooing at Harrods daily. The editor of the *BMJ* could not find any anaesthetist who currently used it. [17] Early the following month the *Lancet* featured a paper by Augustus Waller and V H Veley to the effect that carbon tetrachloride was more toxic than chloroform; also the hair-wash (which contained carbon disulphide in addition) was even more toxic.[18] Within three weeks a prosecution was instituted on the charge of manslaughter against the manager of the hairdressing department of Harrods and the assistant who gave the fatal shampoo. However this was withdrawn because Messrs Harrods gave orders that carbon tetrachloride was never again to be used in their establishment.[19]

Definitive work on the toxicity in relation to dose of carbon tetrachloride was done by Lehmann in 1911 and by Lamson in 1924.[20]

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JUGOSLAV PARTISANS IN WWII

'The girl partisans are something you will never have seen before. In fact, one of the medical officers told me that many of them had ceased to menstruate. Some were barely more than schoolchildren when they ran away to the mountains leaving their bourgeois families to collaborate with the enemy. I have seen spectacles of courage of which I should have been sceptical in the best authenticated classical text. Even when we have anaesthetics the girls often refuse to take them. I have seen them endure excruciating operations without flinching, sometimes breaking into song as the surgeon probed, in order to prove their manhood. Well, you will see for yourself. It is a transforming experience.

Evelyn Waugh. *Unconditional Surrender.* London: The Folio Society, 1990.

THE CRIMINAL USE OF CARBON TETRACHLORIDE

Professor J P Payne
Emeritus Professor of Anaesthesia, University of London

The introduction of general anaesthesia was not confined to patients. The potential advantages were not lost on the criminal fraternity who were quick to attempt a variety of crimes, including rape and robbery, under its influence. Unlike the use of the cudgel, the garrotte and the pistol, it was not a felony in English law to administer chloroform unless the purpose was murder or abortion. As early as 1851 it was common knowledge that chloroform had been used for various criminal purposes, as witnessed by a well-known cartoon in *Punch* magazine of that year.[1]

Among other drugs tested for anaesthetic properties was carbon tetrachloride, and although it was fairly widely used over a number of years, the general view was that as an anaesthetic it was inferior to chloroform, and its use was virtually abandoned in the late 1860's.[2]

My involvement with the criminal use of carbon tetrachloride occurred nearly 45 years ago when I was approached by a colleague at Hammersmith Hospital on behalf of a barrister friend of his. Apparently the barrister had been asked to defend a client accused of the manslaughter of his mistress by the administration of carbon tetrachloride. It would seem that the purpose was to heighten the victim's sexual arousal prior to intercourse. This property of anaesthetics was perhaps fortunately not widely known, but certainly Dudley Buxton in his text book stated categorically that chloroform, ether, nitrous oxide gas, cocaine and possibly the other carbon compounds employed in producing anaesthesia possess the property of exciting sexual emotions, and in many cases produce erotic hallucinations. It is undoubted that in certain persons sexual orgasm may occur during induction of anaesthesia.[3]

Apparently the defendant, who was employed as a gasman in the Woking area of Surrey, apart from reading gas meters also offered a more personal service to any housewife who was interested. For this purpose he employed carbon tetrachloride as an aphrodisiac, and unfortunately the victim was one of those housewives.

I realised at this stage that if I was going to assist the barrister in the defence of his client I needed to know a great deal more about the defendant's knowledge and experience of the use of carbon tetrachloride. It was arranged that I should interview him as soon as possible before the trial. He informed me that he had learned to use the drug while serving in the Pioneer Corps, not for any military purpose, but he and a corporal in the RAMC had been carrying out abortions on young women in the Aldershot area for some years. The defendant provided the anaesthesia and the corporal carried out the abortions, and apparently it was during the induction process that he realised that some young women were sexually aroused. However I was unable to elicit exactly how he learned to use the drug.

The trial first took place at the Surrey Assizes in Kingston in November 1960, when the prosecution case amounted to three allegations; firstly that carbon tetrachloride caused the victim's death, secondly that it was administered by the accused, and thirdly that in using the drug the accused behaved recklessly.[4]

The problem for the defence was that although we now knew that the accused had very extensive experience of the use of carbon tetrachloride, such experience could hardly be offered as evidence since the process of learning involved criminal activity. Fortunately the prosecution introduced the subject by presenting evidence to the effect that the accused had made other women unconscious with the drug, and therefore he must have known that it was dangerous. However the defence argued that because in the past the drug had made other women unconscious with no ill effects, the accused could not be expected to appreciate any risk. In addition, carbon tetrachloride could be freely purchased in any household store, under the proprietary name of 'Thawpit', as a common household cleaner; moreover there was no special warning attached other than that it should not be used in a confined space.

In his summing up the judge pointed out that it was not an offence for a couple to use a bottle of gin to enhance their sexual pleasure, and he pondered whether or not it was an offence to use a bottle of Thawpit for the same purpose. The consequence was that the jury failed to agree, and a new trial was ordered which took place at Lewes Assizes in December 1960.[4] My services were not required at the retrial, and the accused was convicted of manslaughter and sent to prison.

The case then came before the Court of Criminal Appeal in June 1961 but the appeal was dismissed, largely on the grounds that the accused could be described as the effective cause of the action that led to the death, that he knew of the danger involved in such action, and had therefore behaved recklessly.[5]

This case taught me a number of lessons. Firstly, if you become involved in a criminal case you must strive to know exactly how the situation developed. Secondly, you must focus on how the judge might consider the evidence presented to him (in this case by his comments the judge was far from satisfied with the prosecution's interpretation of the facts). Thirdly, it is necessary to recognise the weaknesses of the adversarial system which dominates the procedure in English courts of law. It was clear to me that the prosecution was unwilling to explore avenues that might assist the accused, and the defence on the whole adopted a policy of damage limitation. The result is that facts that might assist the processes of law are suppressed and justice suffers. An inquisitorial approach might resolve these problems.

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FREDERICK HEWITT'S ACCOUNT OF EDWARD VII'S APPENDICECTOMY

Dr D D C Howat
Past President HAS, London

'Appendicectomy' is of course a misnomer, for it was actually drainage of an appendix abscess. We do not know the date on which Hewitt wrote the account which I am going to read to you. He headed it 'June 24 1902', which was the date of Edward VII's operation, two days before the date arranged for his coronation. It must have been very soon afterwards, for the first part is written in pencil and continues in pen after a few lines, as if Hewitt had taken up the first thing he could find to write down his experience. He used many abbreviations and made many crossings-out, but I shall read his account as if they were not there:

"I had been warned the day before that I might be wanted to anaesthetise the King. I was 'ordered' by the great Sir Frederick not to leave the house after 10 am. About 11.30 Sir Frederick called. He said he was in a great hurry. He told me I should be required almost at once. Seeing my Victoria outside he asked if I could get the brougham round as soon as possible and then pick up his nurse at Wimpole St and drive her on. Chilton (Hewitt's coachman) went off to get the brougham and returned in about 10 minutes. I said that there was one thing I considered important from my point of view, and that was that I should be allowed to examine the King before giving the anaesthetic.

"Sir Frederick said that he could tell me all about him and rather hinted that any examination would be unnecessary. But I felt determined in my own mind not to give way on the point. Sir Frederick drove off to his house and I followed in a short time. When I got there the great surgeon was in his shirt sleeves eating a good luncheon, with Lady Treves helping him in a thousand and one little ways. I confess I felt inclined for luncheon as I had had a very early and light breakfast, but a poor anaesthetist is not supposed to sit at great men's tables, and so I held a watching brief. The last glass of claret having disappeared the great man started off, directing me to follow with nurse in about 5 minutes.

"This I did, but I stopped at a pastrycooks and got some chocolate, which I ate as we drove through the unsuspecting throngs in and around the Park. The great event of the year was to come off in a few days. Everything was in a state of ebullition. The weather was glorious; the finishing touches were being put to triumphal arches and stands; flags were flying in every street and square; house decorations were in progress even in the remotest suburbs; the whole world was on the tiptoe of excitement and expectation; men, women and children jostled against one another in the main thoroughfares, not knowing whether to ascribe their ecstasy to the newly concluded peace (Vereeniging at the end of the Second Boer War), or to the forthcoming coronation of the King - and yet, lying in his palace on a sick bed lay the very man to whom the whole universe was looking for the consummation of its happiness.

"We were instructed to enter at the Privy Purse entrance to the palace, and this we did, and no time was lost in getting us into the lift and landing us on the King's bedroom floor. There I met Sir Thomas Barlow who seemed rather excited. I told him I was anxious to examine His Majesty before giving the anaesthetic. This he thought a reasonable request

and promised to see if it could be carried out. Everything was in a bustle; everybody was rushing about. This rather tended to make me cool and deliberate – a fortunate result of experience.

"I now entered the King's dressing room, where I found Sir Frederick Treves, Sir Thomas Smith, Sir Thomas Barlow and Sir Francis Laking standing over the operating table that a short time before had been fetched from 51 Welbeck St. Right glad was I to see the table. I was told, as I entered, that it had been agreed that the best course would be to give the King a little anaesthetic as he lay in bed and to move by means of the sheet, when partly anaesthetised, from the bedroom to the operating table. Now I had made up my mind, in the event of any plan of this kind being proposed to strongly oppose it, for I know how likely such a procedure is to lead to difficulties in certain types of subject. I therefore pointed this out. I am very grateful to Sir Frederick for giving way on the point.

"I was then taken in by Sir Francis Laking to His Majesty's bedroom through the intervening door. I bowed as I passed the Queen. Sir Francis Laking said 'This is Dr Hewitt, Your Majesty. You may remember Your Majesty you gave him an appointment as anaesthetist to Your Majesty' or something to that effect. The King held out his hand and I really don't know whether I did right in taking it (as I did) in my own, or whether I should not have presented my sleeve for it to rest on. Anyhow I did as I should have done in other circumstances and hope I was right. The King very graciously said 'the name seems familiar to me: have I met you before?' Foolishly forgetting the fact that I had been presented at a levee I said 'I don't think I have had the honour, Sir'. I then asked if I might examine his Majesty and he at once assented. 'Certainly' he said 'anything you like'. He was most amenable and kind.

"Sir Francis fortunately relieved me of the artificial teeth question by saying 'Your Majesty has no artificial teeth? And the king answered in the negative, opening his mouth and displaying, to my satisfaction (as an anaesthetist) several defective teeth. I then asked him to breathe through his nose and observed that the airway was not very free, although free enough for the avoidance of difficulties. I then placed my stethoscope over the heart area, but owing to the well-covered chest wall and bed attire could hear no sounds. I also tested the chest expansion which was very defective, breathing being chiefly abdominal. I then bowed and returned to the dressing room where everybody was busy with the final preparations.

"The King's dressing gown was sent to him; everyone cleared out of the dressing room except myself and (I believe Sir Francis) and His Majesty walked in. He was rather out of breath but splendidly plucky. There was not the slightest trace of fear or nervousness. He got on to the table and Sir Francis came in and helped. We had to prop the patient up as he could not breathe well lying flat. This made it a little awkward for me but by means of one or 2 velvet cushions I raised myself to nearly the proper level.

"Since it was rather inconvenient, I began with CE mixture (2 of E to 3 of C) on a Skinner's mask,[1] allowing plenty of air and encouraging His Majesty as I went along. I changed to a Rendle's mask[2] in a couple of minutes. The Queen was standing by and this I now regret, for however one gives an anaesthetic to such a patient it is impossible to avoid a little rigidity and so-called struggling, which to the lay mind may be distressing. I could see that the Queen was, in fact, distressed although there was no need for anxiety from

see that the Queen was, in fact, distressed although there was no need for anxiety from first to last. She appealed to Sir Francis who tried to reassure her. She either caught sight of the King's strange look or else she thought some of the anaesthetic was getting into His Majesty's eyes for she exclaimed 'His eye, his eye!' I told her that everything was quite right and Sir Frederick Treves called for a towel which was at once placed over His Majesty's eyes.

"I had determined from the first to choose CE mixture and to give it slowly and considering the type of my patient we did very well. There was of necessity some rigidity and slightly suspended breathing, with an inclination for the upper part of the body to rise and come forwards. But I steadily and gradually continued the administration, removing the inhaler as the respiration became suspended (the so-called 'holding the breath') and separating the contracted lips with my fingers. At this stage I added about ½ drachm (2.5 ml) of ether to the Rendle mask and the stage of rigidity soon subsided.

"Almost immediately after the towel had been placed over the King's eyes the Queen was persuaded to leave. I very much regret that I did not think of suggesting she should be absent from the beginning of the administration, as the rigid stage and slight change of colour (inevitable in such a patient) must have alarmed her I fear. We had now got into smooth water and about 13 or 14 minutes after my administration had begun Sir Frederick Treves made his incision. The abdomen was very large and its wall thick so that it was about 8 or 10 minutes before the pus was reached. A few ounces of very offensive pus were now evacuated to everyone's relief.

"A magnificent flunkey in red was called in to hold the irrigation which he proceeded to do standing on a chair. The flushing lasted some time - from start to finish, i.e. from beginning the anaesthetic till bandages were put on, the whole affair took 40 minutes. During the operation Sir Thomas Smith held His Majesty's right arm to be out of Treves' way and once or twice confided to me 'he would not have my job for all the world'. He also very considerately said if I didn't want to keep him deeply under he (Sir Thomas) would hold him but I simply did as I was in the habit of doing with other cases.

"The operation over we wheeled His Majesty on the operating table into his bedroom and lifted him back to bed. Soon after the Queen came in and seemed rather anxious at the King being still deeply asleep. I noticed that he was only breathing through his nose and he was not getting as much air (as) if free oral breathing were present; this indeed helped to account for slightly delayed recovery. I explained to the Queen that by applying a little iced water breathing would probably begin through the mouth, and this I did with the result I had anticipated and the King immediately woke up. He heard that all was satisfactorily over and expressed himself as very pleased. He did not feel sick nor was he sick till quite late at night.

"I waited in the dressing room for some time and then went down with Sir Frederick Treves and Sir Francis Laking and we did ourselves very well at luncheon. The champagne, as one might have expected, was very good, being ....."

This last sentence was crossed out, which makes me wonder if Hewitt had intended to give the talk to a private audience.

Present at Edward VII's operation:

Frederick William Hewitt MD
Consultant, The London and St Georges's Hospitals

Sir Frederick Treves FRCS
Consultant Surgeon and Emeritus Professor of Surgery, The London Hospital

Sir Thomas Barlow MD FRCP
Professor of Clinical Medicine, University College Hospital
Consultant Physician, Great Ormond St Hospital

Sir Thomas Smith FRCS
Consultant Surgeon, St Bartholomew's Hospital and Great Ormond St Hospital

Sir Francis Laking MD MRCP
Consultant Surgeon, St George's Hospital

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TURNED-UP TROUSERS

Sir, - Turned-up trousers are absurd. Upon one of the few occasions when I have been asked out to afternoon tea, I gingerly sat down on a Sheraton chair and hitched up my trousers in approved fashion.

A large, decayed molar tooth was immediately projected upon the carpet and came to rest in front of my hostess. I explained that the object was not normally inside my mouth, but was the product of a dental clinic where I laboured for my daily bread. I have not been asked to tea again.

AN ANAESTHETIST
April 9, 1936.

From 'Past Letters to the Editor, A selection of correspondence from our Archives' *The Times*, 9 April, 2004.

BARRELL OF LUNATICS: YOU CAN JUDGE A BOOK BY ITS COVER

Dr D C Lai
Consultant Anaesthetist, Allenmore Hospital, Tacoma, Washington, USA

Introduction

Barrell of Lunatics: Places Associated with the First Public Demonstration of Ether Anesthesia by David C Lai MD, with a foreword by Donald Caton MD, was published by the Wood Library-Museum of Anesthesiology (WLM) in 2003. This newest publication by the WLM features a sophisticated cover design by Christine Kim Mihevc, who also drew the cover art for *Holding Court with the Ghost of Gilman Terrace: Selected writings of Ralph Milton Waters MD* (WLM 2002). The inspiration, creative process, trials and tribulations behind this innovative cover design are chronicled.

Christine Mihevc's Commission

During the History of Anaesthesia Society's November 2002 meeting in Sheffield, conversations with the President, Adrian Padfield, fuelled my desire to reprint *An Historical Guide to New England Pertaining to the Discovery of Anaesthesia*. This historical pamphlet, first published by the WLM in 1972, was reprinted in 1996. On 10 February 2003, Mihevc was asked to draw three pictures for the revised third edition: *William TG Morton, the Ether Dome, and Etherton*. All pictures were to be in pen and ink, and would include the name of Mihevc's daughter Zoe somewhere in the picture, as was done with the drawing of Ralph Waters for *Holding Court with the Ghost of Gilman Terrace*. When it was decided that the original photograph of Morton should be used for the front cover, Milhevc was asked to replace it with a drawing of the Joseph Barrell House. The first picture, the Ether Dome, was delivered on 14 February, 2003; Mihevc had never designed a book cover before, but requested to design it if a professional was not already doing one. Patrick Sim, the WLM Librarian, designed the cover for *Holding Court* and would have been the default cover designer for the new publication. Mihevc's enthusiasm, artistic ability and professional qualifications were impossible to ignore, and she was awarded the cover design. For three drawings at $200 each, as well as the cover design, she would be paid $750. All work was to be completed by 31 March, a mere 50 days later.

Cover Design

The initial step was choosing a colour scheme. Black and white, whilst more affordable, required great skill to come up with an acceptable design using greyscale. Colour, while affording greater artistic creativity, was a costly luxury for a project with a limited and uncertain budget. In the interest of creating something special for this once in a lifetime project, colour was chosen.

The next step was deciding the style. Christine Mihevc sent several representative cover designs to see if any were of interest. One was a bad example, but other possibilities revealed were a simple cover to which sections of drawings could be added, the use of image and text together, the use of background photography, and a portrait photograph. The most influential cover design came from a Valentine's day gift from my wife Marianne. She gave me the poem:

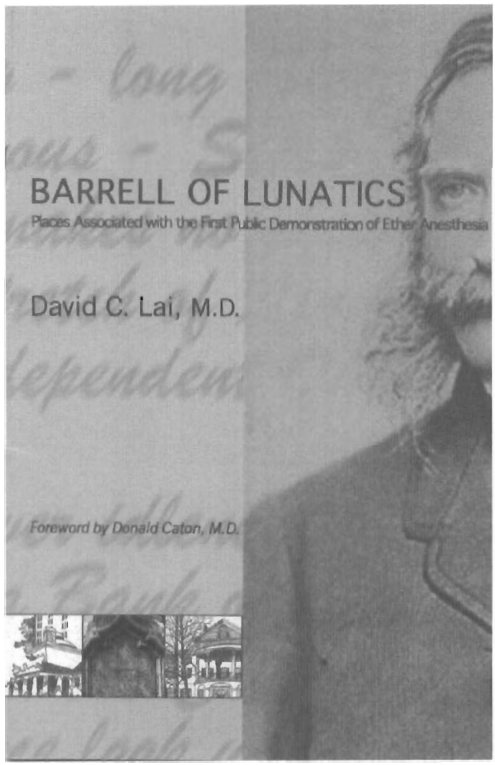


Figure 1
Paper by Lai

It's all I have to bring today-
This, and my heart beside-
This, and my heart, and all the fields-
And all the meadows wide-
Be sure you count – sh'd I forget
Some one the sum could tell-
This, and my heart, and all the Bees
Which in the Clover dwell. **by Emily Dickinson**

Unbeknown to her, it was wrapped in another gift; the book dust jacket. I had never before seen such a striking book cover until this, *The Poems of Emily Dickinson*, Reading Edition, edited by R W Franklin. It utilised different text styles, colours, photography, and manuscript poetry to create a uniquely original cover. This design, along with the use of background photography and portrait photography, would be the three main influences for the cover design of *Barrell of Lunatics*.

Title Selection and Front Cover Text

While working on the Barrell House, Mihevc jokingly suggested that the book be called 'Barrel of Crazies'. (Charles Bulfinch designed the Joseph Barrell House, as well as its later conversion to the McLean Asylum for the Insane). I liked the sound of the title, but wasn't sure whether Christine was serious or not. She told me that 'Barrel of Crazies' was completely in jest, and not to use it: 'It would be a witty title if it was not a medical book written by a doctor. Otherwise it might be taken by more stiff-necked colleagues as bad taste'. Bad taste perhaps, but more intriguing than *An Historical Guide to New England Pertaining to the Discovery of Anaesthesia* 3rd Edition. An alternative to 'Crazies' is 'Lunatics'. Neither word, however, is socially acceptable in polite conversation today. As an example, when requesting permission from Miss Porter's School to use an 1836 illustration of Farmington in *Barrell of Lunatics*, I was initially turned down; the school did not wish to be associated with 'a publication using derogatory language'. Only when I explained that my intentions were entirely honourable, and that 'Lunatics' was historically correct, was I given permission.

My thought processes in coming up with the title were:

- Many lunatics would be a 'barrel' of lunatics.
- A 'barrel of lunatics' lived in the McLean Asylum.
- The McLean Asylum was formerly the Barrell House.
- '*Barrell of Lunatics*' describes where a large number of mentally ill patients used to live, alluding to its early origins.

The original pamphlets were entitled *An Historical Guide to New England Pertaining to the Discovery of Anaesthesia.* The revised 3rd edition was originally going to include the previous text, as well as updated and new material. Due to financial and time restrictions, this was not possible if the new pamphlet was to be finished in time for distribution at the 2003 Anesthesia History Association 10th Annual Spring meeting in Boston. As a result, only the new material was published in a separate but complementary volume. The original subtitle to the new pamphlet, *Places Associated with the First Public Demonstration of Ether*, refers to the events of 16 October, 1846 at the Massachusets General Hospital, as portrayed by R J Wolfe's *Robert C Hinckley and the Recreation of the First Operation under Ether.* Patrick Sim, the WLM Librarian, added Anesthesia to clarify the title. This new pamphlet attempts to shed further light on events and places of this era, and reveal new connections that might not be readily apparent. The unifying theme is the Ether Dome and two men; William Morton the Dentist, and Charles Bulfinch the Architect. For those not intimately familiar with the early history of inhalation anesthesia, reading Barrell of Lunatics: *Places Associated with the First Public Demonstration of Ether Anesthesia* with *An Historical Guide to New England Pertaining to the Discovery of Anaesthesia* will provide a more complete picture. Perhaps a single, integrated volume, as originally planned will be published in the future.

Front Cover Background

The Poems of Emily Dickinson, Reading Edition, features her poems in her own handwriting on the book jacket. I wished to do something similar for *Barrell of Lunatics*. The only

problem was finding an appropriate poem to use. By a stroke of luck I discovered poem 463, *A long, long sleep*. This wonderful poem, which is printed in its entirety on the back cover, forms the background of the front cover. The poem text continues on to the right side of the cover. Quite clear on the original cover proof, it does not reproduce as well on the published book cover. If one looks closely, however, faint outlines of the poem may be seen in the background on the right. Brush Script MT was chosen as the font most closely resembling Dickinson's handwriting.

Front Cover Photograph

A cabinet photograph from the famous studio of Rockwood, New York City was offered for sale on ebay. Recognising the importance of this item as a previously unpublished picture of William Thomas Green Morton, it was successfully obtained by the author. In a similar fashion to *Out of Place: a Memoir* by Edward W Said, the Morton photograph was used on the front cover. Due to restrictions of space, only part of the image was used. Vertical division of the head and torso conveys the concept of a split personality. In addition, 'Lunatics' from the book title is strategically placed next to Morton's right eye. This hints at the idea that sanity, like beauty, is in the eye of the beholder. The front cover is further divided by the use of two distinct background colours, which Christine Mihevc chose with specific themes in mind. Sepia was used for the Morton photograph to allude to its age. Light blue for the left half of the cover was used to contrast with the old-fashioned photograph on the right. Besides being airy and associated with breathing ether, the light blue was also meant to evoke the sensation of floating in clouds. Examining the cover as distinct divisions, one sees 'Barrell of Places' with associated buildings on the left, and 'Lunatics Ether Anaesthesia' with a haunting half portrait on the right.

Front Cover Artwork

The three pictures in the lower left hand corner of the front cover are based upon the *Poems of Emily Dickinson* cover, which has a single picture. *Barrell of Lunatics* has a collage of three images. From left to right they are Ether Dome, Morton's grave at Mount Auburn Cemetery, and Barrell House. These images are cropped and modified from the full-size original drawings and photographs. Ether Dome is taken from the first original drawing by Christine Mihevc, seen on the title page of the book. If one looks to the left of the building behind the Ether Dome, at the level of the chimney in front of the top of the Ether Dome, the hidden 'Zoe' is revealed. This is better seen if the page is turned 115 degrees clockwise.

Morton's grave at Mount Auburn Cemetery is seen on p18 of the book. The four-sided monument has an inscription on each side. 'Before whom in all time Surgery was Agony' was chosen for the front cover. Christine Mihevc added the rich green patina to convey the sense of history and age to the picture. Perhaps it will attain that appearance with time; unfortunately this is unlikely. As visitors to Mount Auburn Cemetery during the May 2003 Boston AHA meeting witnessed, Morton's gravesite is falling into disrepair; harsh New England winters have taken their toll. Many of the surrounding tombstones of Morton's relatives have weathered poorly, with many inscriptions already illegible. Gerald Zeitlin has made an appeal for a restoration project. However, without the support of the Massachusetts Society component of the American Society of Anesthesiologists and substantial private sector financial backing, as was done with the Ether Monument in Boston's Public Garden, the Morton family plot will continue to erode away. (The pictures of Morton's gravesite from the author's collection date from the 1970's).

Barrell House, seen on page 1 of the book, is taken from the second original drawing by Christine Mihevc. The hidden 'ZOE' may be seen in the shadows of the Bulfinch designed mansion. Following the trunk of the 2nd tree from the left (exposed roots next to the front steps) to the 1st branch, 'ZOE' in black ink is seen in the corner of the shadow to the immediate right of the down-turning branch and to the left of the 2nd storey window. The photographic basis for this picture is seen on page 22 of the book. Etherton Cottage, the third original drawing by Christine Mihevc for this book. is seen on page 10 of the book. It was to be the middle picture on the front cover before being replaced by Morton's tombstone. The hidden 'ZOE' may be seen by looking at the trees to the left of the drawing, turning the page 45 degrees clockwise, and looking for the outlines in the white background.

Back Cover Photograph and Poem 463

Poem 463 by Emily Dickinson was chosen because of its simple beauty and appropriateness for the book.

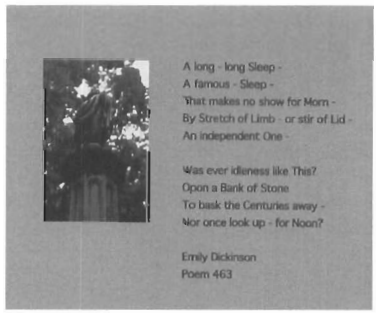


Figure 2
Lai Back Cover

Geneva font was used to give a clean, open appearance. The accompanying photograph is the top of the Morton Memorial, Mount Auburn Cemetery. The original picture is seen on page 15 of the book. Two other relevant Emily Dickinson poems are found in the Prologue, along with an 1846 picture of the Massachusetts General Hospital.

Poem 156
Surgeons must be very careful
When they take the knife!
Underneath their fine incisions
Stirs the Culprit – Life!

Poem 308
I breathed enough to take the Trick –
And now, removed from Air –
I simulate the Breath, so well –
That One, to be quite sure -

The Lungs are stirless – must descend
Among the cunning cells
And touch the Pantomime – Himself,
How numb the Bellows feels!

Summary

Barrell of Lunatics: Places Associated with the first Public Demonstration of Ether Anesthesia has an innovative cover design by Christine Mihevc. Knowledge of the thought process affords deeper meaning and fuller enjoyment of the book within.

Biographical Sketch

At the time of the book's publication, the author lived in Davis Square, Somerville, three blocks away from Seven Hills Park and the Barrell House monument. His commute home from work, at the Beth Israel Deaconess Medical Center in Boston, took him past the former site of the Barrell House on Cobble Hill, as well as the Somerville Museum, current home of the Bulfinch Flying Double Staircase from the Barrell House. Dr Lai currently resides in Gig Harbor, Washington, and is a Consultant Anaesthetist at Allenmore Hospital, Tacoma, Washington.

NOT CONTEMPORARY ANAESTHESIA

'Good morning,' said the Anaesthetist, breezing in, followed by the porter wheeling the gas and oxygen apparatus. 'Now, old man, you're not going to mind this a bit'.

'Course I'm not – I don't mind,' Siddons waved that aside. 'What you going to give me, though? Ether, gas, general anaesthetic?'

'Now just *breathe* in,' said the doctor, taking no notice and clapping the gauze mask over Siddon's enquiring face.

'Yes, but what you - ' He raised a hand to push it aside.

'All right, all right, old chap - nothing to be afraid of. Just breathe in and see what you can smell.'

'I want to know - ' came thickly from under the mask.

'Better watch out he doesn't struggle, Nurse' said the Anaesthetist. 'Nervy type'. He did struggle. He had told me that he was going to take the anaesthetic slowly and calmly, so as to notice his reactions, but he was so infuriated at not being in the know that he tried to resist the gas, and went under choking, and finally turned dark blue and stopped breathing. 'The damned ignorance of these people,' said the Anaesthetist, after we had got him going again with artificial respiration and a gale of oxygen. 'If they knew a bit more about it, they wouldn't panic so.'

Monica Dickens, *One Pair of Feet* (1942)

EAST GRINSTEAD 1951-1952 - A JUNIOR ANAESTHETIST'S TALE

Dr Jean Horton
Past President, History of Anaesthesia Society
Emeritus Consultant Anaesthetist, Addenbrooke's Hospital, Cambridge

In September 1951, I was about to come to the end of a year as a resident anaesthetist (house officer) at Addenbrooke's Hospital in Cambridge and having then decided to pursue a career as an anaesthetist, started to look in the *British Medical Journal* and the *Lancet* for a suitable job. One advertisement which attracted me was for a resident anaesthetist (house officer) to the Plastic and Jaw Injuries Unit at the Queen Victoria Hospital in East Grinstead.

I knew about the work and reputation of this hospital for these three reasons, which inspired me to apply for the post:

1. The hospital was famous for the work of Sir McIndoe with airmen who had been severely burned.[1-3]

2. I had read the classic war book *The Last Enemy* by Richard Hillary who was one of the 'Guinea Pigs'.[4] The title comes from 1 Corinthians Chapter 15 verse 26: 'The last enemy that shall be destroyed is death'.[5]

3. 1951 was the year of the 'Festival of Britain', and the Section of Anaesthetics of the Royal Society of Medicine organised a special celebratory afternoon which I attended. The presentation which attracted me most was one on 'The use of drugs to produce elective hypotension in surgery', and was given by a handsome young anaesthetist, Dr Hale Enderby.[6]

Having applied for the job I was interviewed at East Grinstead by Sir, Dr John Hunter and Dr Russell Davies and started work on 20 November 1951. As is well known, the Plastic Unit was built in the grounds of and attached to the local cottage hospital, The Queen Victoria Hospital, East Grinstead, which was run by the local general practitioners.

Surgeons

In 1951, six years after the end of World War II, the ethos of the Plastic Unit was still very much influenced by the presence of Sir McIndoe (Figure 1) and the other consultant plastic surgeons. Percy Jayes had been resident surgeon throughout the war, and lived in one of the EMS (Emergency Medical Services) huts (subsequently known as Percy Lodge) where the house officer to the cottage hospital and I lived. The other surgeons, all ex-RAF and trained as plastic surgeons by Sir, were F T (Gerry) Moore, Redmond McLaughlin, John Watson, the dental surgeon Terence Ward (later Sir Terence Ward) and the ophthalmic surgeon Ben Rycroft (later Sir Ben Rycroft).

There were no resident house surgeons attached to the Plastic Surgery Unit, only senior registrars or Marks Scholars who were all ex-servicemen and very experienced; David Wynn-Williams, Robin Dale, Leonard Schofield and Tommy Faulkner.

Figure 1.
Sir Archibald McIndoe operating; taken in 1952 by Jean Horton with a Box Brownie

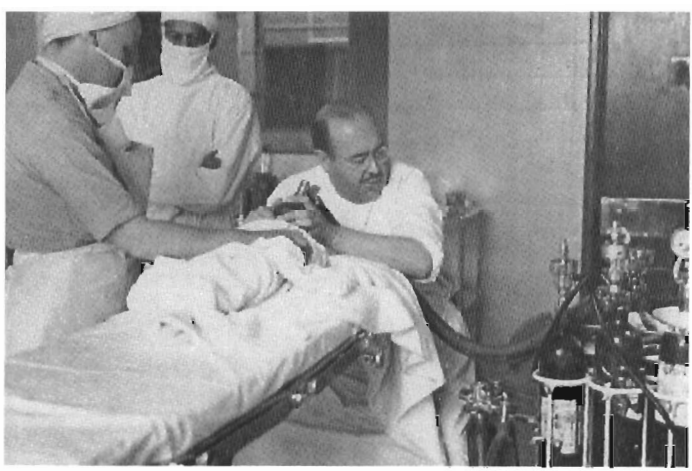


Figure 2.
Dr John Hunter

Anaesthetists

The senior anaesthetist was John Truscott Hunter (Figure 2), who had been Sir Archibald's friend and anaesthetist for many years.[5,8] He was a jovial, tubby, loveable man, very skilled, particularly with children, but when I knew him he was already a severe diabetic and in heart failure. I always helped him with his lists. He did not feel able to use hypotensive anaesthesia for McIndoe's private practice and so was gradually dropped in favour of Hale Enderby.

Russell Davies was a full time consultant and had been at East Grinstead ever since his initial training at the Westminster. He had designed the recovery ward together with John Hunter, and always took his lunch there instead of going to the 'Mess' so that he could look after any postoperative problems. He was also one of the prime movers of the 'Guinea Pig Club' that did so much for the welfare of burned airmen.[5]

Hale Enderby had come to East Grinstead from Sir Harold Gillies Unit at Rooksdown House in Basingstoke, where he had already started to develop techniques for hypotensive anaesthesia for surgical procedures using pentolinium and then hexamethonium.

John Pelmore had been a senior registrar at East Grinstead and was a part-time consultant there and at Pembury in Tunbridge Wells. He later went to the Frenchay Hospital in Bristol. There was one senior registrar, a competent lady from the Royal Free, who after marriage gave up the practice of medicine and anaesthesia altogether. The registrar was Albert Mason, who had formerly been the resident anaesthetist. He was already gathering a formidable reputation in the practice of hypnosis in medicine. He also subsequently gave up anaesthesia and became a professor of psychiatry in the United States.

One of my duties as resident anaesthetist was to visit, examine and prescribe premedication for all the patients on the operating lists for the next day, and then inform the anaesthetists concerned. These included the patients to be anaesthetised by the registrar and senior registrar. I do not recall seeing another anaesthetist on the wards during my year at East Grinstead. The standard premedication at that time was of course, 'omn and scop' (omnopon 1/3gr and scopolamine 1/150gr). Children received barbiturates, usually Seconal.

The operating theatres

The operating theatres were in the American Wing opened in 1946 and funded by the War Relief Society of America. There were five theatres, all more than state of the art for that period. There was and still is a large central communal anaesthetic room, which opens into a corridor leading to the four main theatres, surrounding it. Two legendary operating theatre assistants, Cyril Jones and Ron controlled the anaesthetic room and the anaesthetists. The theatre sister in charge was Mary Rae. It was the custom to call every member of staff by their Christian name, a habit which it took me some time to get used to.

Anaesthetic techniques

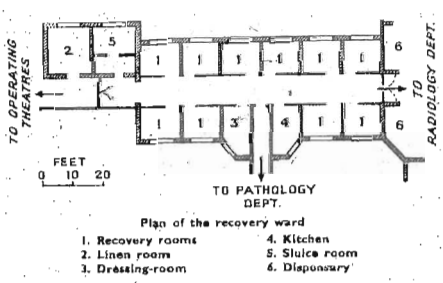
In the communal anaesthetic room, the standard induction was 1g thiopentone in a large glass syringe. The practice of adding 80mg Flaxedil (gallamine) was introduced later. Blind nasal intubation assisted by Cyril or Ron followed. Cuffed tubes were not used, but the mouth and throat were packed with gauze. There were no piped gases. A Gordh needle was inserted

into a vein on the dorsum of the foot. When the patient was ready we took the Boyle's machine into theatre with us. Maintenance of anaesthesia was with nitrous oxide, trichloroethylene or ether, with spontaneous respiration. The only monitor was a blood pressure machine with a dial. I used my own Nosworthy cards for keeping a record of the anaesthetic.

Hypotension

When I was at East Grinstead we were using hexamethonium and the technique described by Hale Enderby.[9] I was allowed to use the technique unsupervised after a very few weeks in post. Hexamethonium 50-100mg was given into the Gordh needle, and then a head up tilt until the required blood pressure was achieved. Later in that year, for refractory cases, procainamide 100-200mg was given.[10] Much use was made of the magnitude of the flick of the needle on the dial of the blood pressure machine to denote the correct pressure. John Hunter used to say that when the pulse disappeared at the wrist, the systolic BP was 60mm!

Recovery ward[11]



Plan of the recovery ward

1. Recovery rooms
2. Linen room
3. Dressing-room
4. Kitchen
5. Sluice room
6. Dispensary

The recovery ward was the first to be opened in the United Kingdom and consisted of ten single rooms attached directly to the operating suite. The excellent sister in charge paid frequent visits to the operating theatres to discuss any problems with an errant junior anaesthetist.

Sir Archibald McIndoe

One of my greatest memories of that year at East Grinstead is the privilege of having administered anaesthetics for Sir Archibald or assisting John Hunter. 'Archie' was a master craftsman, like an artist at work, and a delight to watch.

Duties in the cottage hospital

The duties of the resident anaesthetist also included administering anaesthetics in the cottage hospital for visiting surgeons such as Sir John Peel and Sir Edward Muir. The anaesthetic machines were old Heidbrinks left behind or donated by the Americans.

Conclusion

Like many of those of us who spent some time at East Grinstead, we regarded it as one of the most formative periods in our anaesthetic careers.

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CONTEMPORARY ANAESTHESIA

'.. postgrad, the exams are broken up into parts; two for medicine, three for anaesthesia...'

'Why does it have three?'

'It's the new kid on the block, with a chip on its shoulder and a point to prove. It needs to have one more part than the others to demonstrate that its even more fartily academic than they are'.

Brookmyre, C. *Quite Ugly One Morning.* Abacus (1996)

HISTORY OF THE RUSSELL DAVIES UNIT

Sister A Gurnett RGN and Sister C van der Valk RGN
Queen Victoria Hospital, East Grinstead

Origins

In 1863 Dr Rogers, an East Grinstead general practitioner opened a cottage hospital in a house owned by him, providing seven beds for the local community. East Grinstead Cottage Hospital was only the fifth such hospital in the United Kingdom. Until 1859, when the first cottage or community hospital was opened, patients were looked after in their own homes, the home of their employer or in the workhouse. Only those who lived in major towns or cities had access to hospitals.

1936 saw the opening of the third cottage hospital in East Grinstead, in Holtye Road; it was named the Queen Victoria Cottage Hospital. This provided the local community with 37 beds. Despite changes over the years, the same building continues to serve the local population.

At about this time there was civil war in Spain. The UK government began to realise that war with Germany was inevitable, and that following lessons learnt from Spain it would be fought in the skies. Casualties from such a war would be different from anything previously experienced.

Archibald McIndoe and the Guinea Pig Club

Archibald McIndoe, a New Zealander, was Consultant Plastic Surgeon to the Royal Air Force at the time. He was approached to find a suitable site for a unit that would treat facial injuries and burns. It was to be one of four such regional units around London. Queen Victoria Cottage Hospital provided up to date facilities and plenty of land for expansion. It was also equidistant from London and the south coast, leaving the site well positioned to receive casualties without itself being at too great a risk of bombardment.

Sir Archibald (as he was to become) arrived in 1939; not long afterwards, in 1940, the Battle of Britain was fought. Hurricane and Spitfire pilots began arriving at the hospital with severe injuries, predominantly to their faces and hands. Burns that occur within a closed environment also lead to injuries to the airways. The needs of these men helped to develop the services for which the hospital remains well known today.

These patients created the Guinea Pig Club. They were after all guinea pigs in the treatment of burns. Originally a drinking club, it was not expected to continue beyond the war, but it still exists today.

Memorials

A Guinea Pig Roll of Honour was unveiled by HRH the Princess Royal on 5 November 2003, when the newly rebuilt Canadian Wing was officially re-opened and re-named. The male plastic and maxillofacial ward has been named Ross Tilley after the Canadian surgeon; the female plastic and maxillofacial ward has been named after Margaret Duncombe, a former Matron, and the corneoplastic ward has been named after the surgeon Sir Benjamin Rycroft.

In appreciation of the care given to Canadian pilots, and as a memorial to men who had lost their lives in the war, the Canadian Government raised funds to build a ward. In 1944 the Canadian Wing was opened, providing 43 beds and six private rooms. Until then plastic surgery patients had been cared for in huts, built next to the community side of the hospital.

The British War Relief Society in America funded a further memorial; the American Wing was built and opened in 1946. Within the unit were included four operating theatres, a recovery area with 10 rooms, X-ray, pathology (with blood bank) and photography departments, a dispensary, library, lecture theatre and out-patients.

Recovery Area

Why a recovery area? John Snow as far back as 1858 had identified that 'a room might be set aside in which the patient who has undergone surgery and anaesthesia could recover under skilled care and free from outside disturbance'. When planning the design of the theatre complex the issue of patient safety following a general anaesthetic was raised. At that time patients were travelling up to 400 yards from the operating theatre to their wards. There were many post-operative incidents as well as deaths, predominantly respiratory in origin. Dr Russell Davies, an anaesthetist and colleague of Sir Archibald, had spent time in America and was aware that a recovery ward had been opened in 1942 in St Mary's Hospital, Rochester Minnesota. This provided one bed per operating theatre from 9am to 5pm.

In view of the distances patients would be travelling between theatre and ward, it was felt to be appropriate to include a recovery area when building the complex in Queen Victoria Hospital. This would be open 24 hours per day, 365 days per year. Advantages included the close proximity of recovering patients to theatre, not dispersed across the hospital site; the possibility of providing medication tailored to need; and close monitoring. A smaller team of specially trained staff could care for a greater number of dependent patients than would be possible on a ward. Equipment sited in one place benefited a greater number of patients. Effectively, Dr Russell Davies had designed and developed a high dependency unit.

The Russell Davies Unit

Dr Russell Davies' Unit opened in February 1946 and was the first of its kind in the United Kingdom. It consisted of ten rooms, each with piped oxygen and suction, a wash hand basin and call bell, capable of accommodating 2 beds or 3 cots when the need arose. The design is still evident today despite modifications over the years.

In 1958 Dr Russell Davies wrote that after twelve years experience in recovery he had established certain principles that should apply. These reduced the death rate after surgery, no extra nurses were needed, it was possible to economise on equipment (in comparison with that required if the patient returned to the ward), and it was easier to provide optimum medication post-operatively.

- The unit should be staffed 24 hours a day
- All patients having had a general anaesthetic should be provided for
- The standard of nursing care should equal the best in the hospital

- The nursing staff should never be moved from the unit as a group
- The level of record keeping must be high
- The recovery ward must be close to the operating theatre
- The recovery unit must be equipped with resuscitation equipment
- Medical staff must be available at all times
- The patient should be able to stay as long as necessary
- The recovery ward should be run by the anaesthetic department

In 1989 the recovery ward was named The Russell Davies Unit. Dr Russell Davies attended the ceremony and said that he was surprised and delighted that it had happened in his lifetime.

Patients

Our patients are aged from 3 months upwards, and the surgery they have undergone includes plastic reconstructive, maxillofacial, corneoplastic and burns dressings. Surprisingly little has changed since 1946. Our patients are allowed to wake up in their own time and they stay as long as needed. The unit is anaesthetically led. There is a high standard of effective nursing care with excellent record keeping. The unit is situated close to the main (American Wing) theatre complex, and is equipped with adult and paediatric resuscitation equipment. Medical staff are readily available.

Our philosophy is 'all patients are treated as individuals. The post-operative phase will be unhurried, pain free and as comfortable as we can make it'. This reflects Dr Russell Davies' philosophy, and is related to the type of surgery being done today and the need for airway management and expertise.

Recent Developments

Seat belt legislation and the increase in substance abuse has radically changed the type of surgery done today. Complex facial fractures have been replaced by complicated hand trauma. Pedicle flaps have been replaced by free tissue transfer. There is an increase in head and neck tumours requiring microvascular reconstruction. There has also been an increase in patients having breast reconstruction, both secondarily and immediately after mastectomy.

Advances in anaesthesia and other technical developments have increased the numbers of patients having surgery on a day case basis, some of whom will recover in The Russell Davies Unit. Another change has seen bag, mask and Guedel airway replaced largely by laryngeal masks. There is a wide range of monitoring equipment available to us now. Oscillometers were used to measure low blood pressures accurately following hypotensive anaesthesia, and recovery nurses were taught the importance of bed rest for 24 hours, the use of oxygen, and gradually raising the head of the bed as the patients' blood pressure rose (a technique not commonly used today). Our anaesthetic records are computerised and linked directly with theatre, so that the record is printed out in the unit as the patient arrives.

We have successfully recruited and retained many overseas nurses who are creating their own community within a community hospital.

The unit is participating in national research. We will shortly be taking part in the Cannabis for Post-operative Pain (CANPOP) trial, and also contributing to the development of British Anaesthetics and Recovery Nurses Association Standards of Practice.

Conclusion

In September 2003, the Chief Executive of Queen Victoria Hospital (Mr Ian Bergman) said: 'from our roots as a cottage hospital to what we are today – a successful Trust with international recognition, maintaining the highest standards of care and innovation in research and practice'.

The hospital started out as a leader and continues to be so.

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THE QUEEN VICTORIA HOSPITAL MUSEUM

The Queen Victoria Hospital, East Grinstead, became world famous for its treatment of burns and for reconstructive plastic surgery. Founded in 1863 as a cottage hospital, it moved to its present site in 1936. In 1939 Archibald McIndoe, a Consultant in Plastic Surgery to the Royal Air Force, was appointed to run the 120-bed Maxillofacial Unit which treated over 500 wounded serviceman per year. As a result of these patients' shared experiences the Maxillonian Club was formed, later to become the Guinea Pig Club.

Shortly before McIndoe's arrival 17year-old Cyril Jones joined the staff as a Theatre Technician, and over his forty seven years in the Department he rescued a large amount of obsolete anaesthetic equipment. He eventually became the Senior ODA, receiving the Queen's Jubilee Medal in 1977, and the Pask Award on his retirement in 1985.

In the 1970s John Bennett and Tom Cochrane, plastic surgeons, suggested that there should be a proper display of the accumulated plastic surgery ephemera and equipment, and also Guinea Pig Club and Hospital memorabilia. It took until the 1990s to find space and funds to establish the basis of the present museum. Display cabinets and new lighting units were fitted to the old Library Annex, which had previously housed books and just a small cabinet with items of historical interest. This work was funded by the League of Friends, the Guinea Pig Club and a donation from Cyril Jones' widow, and the museum opened in this form in 1994. Subsequent closure of the viewing galleries in the American Wing Theatres has allowed the use of the corridors for further displays.

Cyril Jones' successor, Bob Marchant, already associated with the Guinea Pig Club Annual Reunions, had retained anaesthetic items as they became obsolete, and was involved with the project from the beginning. He retired in 1992, and is now the Curator of the Museum.

The Museum walls are hung with photographs of past surgical, anaesthetic and nursing staff, and of members of the Guinea Pig Club. Many Guinea Pigs wrote about their memories of the war and their time at East Grinstead, and their books are displayed here. Dominating one wall is an oil painting 'Restoration', commissioned from the artist Tim Easton to celebrate the fiftieth anniversary of the Maxillofacial and Plastic Surgery Units; on another is a portrait of Sir Archibald McIndoe. (Figure 1) There is a photograph of the world's first successful toe-to-thumb transfer by John Cobbett in 1966. Many albums contain photographs and newspaper cuttings covering the entire life of the hospital and that of the Research Unit, which was established in 1961 through the generosity of the Blond family.

Anaesthetic equipment on display ranges from wire-frame masks and chloroform bottles to Magill and Boyle anaesthetic machines, ventilators, and monitoring equipment from the Boulitte Oscillotonometer to modern automatic machines.(Figure 2) The Anaesthetic Department Library has a collection of old books on anaesthesia, and the Museum houses the Nosworthy Anaesthetic Record Cards from the 1940s to the 1980s, when they went out of use. Incidentally, the hospital was one of the first in the UK to have a British designed computerised anaesthetic record system, an updated version of which is still in use.

John Blizzard

Figure 1.
Wall of the main room of the Museum with portrait of McIndoe and photos - bottom right L to R – of Joan Brown, H Patel, A Edridge, Hale Enderby and Russell Davies

Figure 2.
Museum of old equipment

AN INTIMATE VIEW OF CHARLES EMPSON AND JOHN SNOW
Some Anecdotal Notes

Dr David Zuck
Past President, History of Anaesthesia Society

Charles Empson was John Snow's uncle.[1] *These notes are transcribed from anecdotes written in 1941 by Andrew Lancelot Simpson, grandson of Empson's niece Mary Ann, who was the daughter of his brother, John. Simpson sent them to his sister, and a Xerox has been supplied by her grandson, Simpson's great nephew, Robert Mimmack. A L Simpson was born in 1860, the year before Empson died, and much of this account must have derived from what he had heard from his parents, who knew Empson well. A copy of a letter that Empson wrote to Mary Ann from his home, 7 Terrace Walk, Bath, on 10 August 1856, just before her wedding to Andrew Simpson, was also supplied. For some reason she had decided that Empson should not be invited, a decision with which he reluctantly concurred, although, as will be seen below, he had met, 'screened,' and approved Simpson before the wedding: another mystery.*

The script has been transcribed exactly as it is written, except that '&' has been expanded to 'and' throughout. The first section, a mistaken genealogy that places three generations between Charles Empson and his parents, has been omitted, as are notes about more distant branches of the family.

* * * * *

Charles Empson made the best of his education and became Cashier for a London firm - taking the money to the Bank he was sandbagged and robbed. Mother said it cost his father £200. Chas came home to Mill Bank to recover later he went to some relatives in Newcastle here he met Robert Stephenson who had obtained a Government appointment he required a companion who would be able to keep a Duplicate record of their research Chas accepted the post and they sailed for Columbia in the North of South America, I think they were under secret orders for his book (Narratives of South America) gives no direct allusion to their work, they stayed 3 years were ship wrecked on the South coast of North America and returned home via New York on arriving in England, George Stephenson gave each of them a 50 guinea Gold watch and that was all Chas Empson received for his 3 years work, I think old George Stephenson and his Son Robert did very well but Chas Empson must have been a bit slow.

However Chas Empson proved himself a very capable man. He had to make his report to a Government committee with the result that the Duke of Wellington asked him if he would hold himself ready for Government service he said he would, meantime he opened a business for curios in Newcastle the Duke sent for him in 12 months he sold out his business for £100 and entered Government service his father must have started in that business but he also must have handled it very well

For the present we leave him in the Government hands
To be continued

P.S. You must read the Narratives of South America I have only the large edition Charles got the small edition

His Government appointment was of a private nature I think as a diplomat he had to smooth out any difficult problem. He was at the Palace in Italy and I saw a letter he wrote saying how foolish it was of the Pope to excommunicate the King and how they asked him the morning after if he could still enjoy a cigar after breakfast, In another letter he was enjoying himself in Paris and had a royal carriage at his disposal. He spent a winter in St Petersburgh and in summer he was sent to Italy. here he had a fever Mother used to say the contrast was too great and the fever aged him perceptibly.

He seems to have had much leasure and amused himself by tracing family records. The Empsons He traced back to Henry VII Empson was chancellor of the exchequer. Henry VII was a miser and left 2,600,000 when he died Empson made him the money by taxation and so annoyed the taxpayers that they had his head chopped off after the king died.

Simpson continues with a long tale of how the Askham side of the family was traced back to Roger Askham, tutor to Queen Elizabeth, and says that Charles Empson claimed a marked resemblance to Askham's portrait, concluding ("I think Chas Empson must have been rather clever to have enabled them to see the likeness")

I think it was before Father and Mother were married a sort of visit of inspection. Chas Empson invited Father to spend a fortnight in London. He met him at Kings Cross Station your train is half an hour late and it has upset my plans, come quick they shot into a handsom Chas gave the driver ½ a sovereign and said get to the Houses of Parliament quick, as you pass John O'Grotes hotel drop this bag they soon arrived but in the visitors hall the door was closed Chas interrogated the Usher he said you are too late Chas said would a golden key open the door, No.

There follows an account of how Empson managed to get access, finding another door with an Usher who did respond to the golden key. They also visited the Chapel Royal, a high class restaurant, and the London Zoo. One day he said Andrew I am going to introduce you to the proudest man in London today - Father said all right I think I can stand almost anything they went to the British Museum and Chas introduced him to the Curator - Carpenter by name Father said he was as nice as pie and could not do too much for them. On leaving Chas was most complimentary to Father and said he had been delighted to have him and was both surprised and glad. Father told me he believed someone had been trying to put a nail in his coffin but he said Chas E. certainly pulled it out.

An unflattering view of Empson's personality was provided by another author.

Mrs Lyn Linton in one of her books on Bath mentions Chas Empson as one of Bath's notables and she concludes by saying C.E. todied to the aristocracy, this sentence annoyed my mother and she wrote Mrs Linton complaining of her treatment of her Uncle Mrs Linton gave mother a suitable reply.

As a diplomat it was C.Es. business to ingratiate himself into the favour of notable people and I have no doubt of his ability to do this contributed in no small measure to his success. This quality was not inherent in every member of the family for Dr John Snow was decidedly of the uncouth type C.E. was there to see John honoured with a diploma from the London Medical fraternity (you can imagine C.E. fussing about to introduce John to the most important people) all to no purpose actually when John received the diploma C.E. noticed he

took it without thanking the donors C.E. called his attention to this omission. John replied I have earned it myself it is no real gift. (*This may have been his M.D. diploma*). Notwithstanding this drawback John proved himself capable and on Queen Victoria's Jubilee the Medical Journal in the Jubilee number stiled John Snow as the medical man who had done the most to alleviate suffering in her Majesty's Reign. He was the man who when collera was raging in London and the Vestry was sitting in Red Lyon Square opened the Vestry door and said you men studying what to do about Collera "Yes" then take off the pump handle. Also when the Government was framing a bill to do away with bad smells which they stiled as injurious to health he told them to alter it and stile it against nuscences because several very bad smells were not injurious to health.

In a lecture given to medical men he claimed that Collera was a living organism, they said where did the first Collera germ come from He replied first tell me where the first Bengal tiger came from, Where did you first come from.

In a lecture on Chloroform they said you claimed ether was safer why switch off on to chloroform, you smokers have done the same you used to carry a flint and tinder box now you use Lucifer matches, more dangerous but more convenient.

However he was soon at the top of his profession and his fee was £50/50/- a case, he twice administered chloroform to Queen Victoria in consequence he had to appear at Court of course C.E. would be there and he recorded how the Prince Consort selected John out of the crowd and said I must have a conversation with that extraordinary man, he had a big practice but would never leave a free client for a 50 guinea case. He died suddenly in his chair at 45 years age.

The Snow Branch is noteworthy

My grandmothers sister (*this is a mistake - Frances Askham was his grandfather's sister*) married William Snow a dealer in hay and provinder. he also had a farm at Rawcliff he was an upright rather stern man he had 7 children they often exchanged visits between Rawcliff and Hewarth (*The Empsons' home*) Mother was staying there over a week and Mr Snow had all the children on Sunday to repeat a chapter of Scripture to him, when it came to Mother's turn she had not one ready Snow expressed his surprise in a manner which made an impression on Mother consequently on her next visit which included a Sunday Mother went into the dining room with the other children when it came to Mother's turn Snow said now Mary Ann I hope you have a chapter today "yes Uncle William I have and she repeated St Mathew's Gospel from beginning to end, when she was 80 she told me she could repeat it yet all but the Chapter of names only her voice would give way.

He brought his family up the Good old Christian way which would be jeered at in our lapse to heathenism. today some have the cheek to pray for Divine help and to legalize the further robbery of the Lord's Day having Football matches, Cinemas, and Theater's open on Sundays.

Simpson concludes this section with a brief summary of the careers of John Snow's brothers. With the exception of Thomas, who became a clergyman and lived to the age of 80, they all died young "I think under 50 years. nevertheless they had each provided for their family." *William, who had a temperance hotel in York*, "left a Wife and 2 daughters with sufficient to retire on and go to Australia they lived in Sydney, N.S.Wales. the last daughter died 82-3 years ago."

Comment

It is impossible to know how reliable these memoirs are; certainly there are several genealogical and factual errors. For example, Queen Victoria's Diamond Jubilee was celebrated by lengthy reviews of medical progress in both the *Lancet* and the *British Medical Journal*, but neither eulogises Snow in the terms expressed above. The *BMJ*, in its account of the Queen's obstetric history and medical advisors, mentions that Snow administered chloroform during her last two labours,[2] and the *Lancet* says that "to Snow's historical reports in connexion with the distribution of cholera we must trace our knowledge of the manner to which certain diseases are water-borne."[3] If Empson was employed by the diplomatic service it would explain how he came to be acquainted with Louis Napoleon. It is known from other sources that John Snow was devoted to him, and that he was very highly thought of, especially for his philanthropic activities, by his friends in Bath. Perhaps he was another of those where familiarity bred contempt; but was not without honour, save in his own country, and in his own house.

Acknowledgement

I am most grateful to Robert Mimmack for permission to reproduce these anecdotes.

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CORRESPONDENCE

The Editor

Sir,

Fluothane

May I add an addendum to the interesting paper on the discovery of halothane by Doctors Dronsfield, Hill and Pring[1]

What was remarkable about the introduction of 'Fluothane', as it was first called, was the clinical assessment of the drug before it was put on the market. The person responsible for this was James Raventos,[2] the pharmacologist at ICI who gave samples to Michael Johnstone at Manchester Royal Infirmary. The latter was one of the few anaesthetists in the country who had the facility and experience to study ECGs in theatre. Michael Johnstone[3] (Figure 1) produced the definitive clinical evaluation of halothane in a memorable paper in the *British Journal of Anaesthesia* in 1956. Subsequently the company distributed a sample to every anaesthetist in the country.

The photograph of Michael Johnstone, and of James Raventos with two members of the Society (Figure 2), was taken at a meeting of the Portuguese-Spanish Congress of Anaesthesia in Lisbon in 1963.

Richard Bodman
(rbodman@eircom.net)

Figure 1.
Michael Johnstone (2nd from left)

Figure 2.
James Raventos with Profs J Payne (left) and R Bodman (right)

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The Editor

Sir,

MERSEY SCHOOL - ANAESTHESIA AND PERIOPERATIVE MEDICINE

With the advent of the Working Time Directive and the abundance of Waiting List Initiatives as Trusts pursue turnover figures, it has become much more difficult to recruit examiners for the Mock Viva and OSCE sessions, essential ingredients of our Primary Prep Courses. These courses are held three times a year and, following the approach by the Honorary Secretary of the Society, in 2002 an informal agreement was made with the Mersey School whereby, in return for the contribution of fifteen sessions per year from members of the society acting as examiners, the Mersey Society would donate £1000 to the Society. To date, this arrangement has worked well and I am pleased to have this opportunity to register my appreciation of the support the Mersey School has received over the last eighteen months, in particular from Adrian Kuipers, Eryl Rouse, Robert Rouse and Miles Rucklidge. It will be a pleasure to present a cheque behalf of the Mersey School to the President of the Society at the forthcoming AGM.

David Gray
June 2004

Book Review

This is no Humbug. Reminiscences of anesthesia at the Massachusetts General Hospital. A history. Richard J Kitz Ed. Published privately 2003.

This is a personalised history of the development of the Department of Anesthesia in Boston, Massachusetts, USA. In the first section of the book Richard Kitz describes his experiences as Chairman of the Department from 1969-1994, and as the Harvard Medical School Faculty Dean for Clinical Affairs from 1994-9. There are then 19 chapters contributed by past and present members of the department, most of whom have been associated with it for 30 years or more.

With such an array of talent one expects an interesting read. But this is not just a history: it is an insider story told by those who fought the daily battles that are inevitably associated with the running of a major department. These veterans have now grasped the opportunity to describe the conditions in the trenches as they really were. The result is an amazingly frank history of this unique department and its contributions to anaesthesia.

One theme runs throughout the book; the relationship between the anaesthesiologist and the surgeon. By the 1930s the combined influences of Harvard University and Bostonian society had produced a unique breed of surgeon; academic in approach, controversial in discussion, powerful in medical politics, and arrogant in the operating room. In 1928 Henry K Beecher, with a Master's degree in chemistry from the University of Kansas, moved to Harvard to study medicine. By 1931 he had won the Warren Triennial prize for publications on the effect of laparotomy on lung volume and on pulmonary collapse, and in 1932 he joined Edward D Churchill's surgical training programme. In 1935 he went to work with Nobel Prize-winner August Krogh in Copenhagen and shortly after his return he was appointed as Chief Anesthetist to the Massachusetts General Hospital. During the next five years he taught himself anaesthesia, was awarded the Warren prize for the second time for his book on the physiology of anaesthesia and, in 1941, was appointed to the Henry Isaiah Dorr Professorship of Anesthesia that had been vacant since its inception in 1917.

With such an extraordinary beginning it is perhaps, not surprising that Beecher should be an unconventional chief. He was not a natural clinician, but on most mornings when he was in Boston he anaesthetised patients in the private wing. Beecher was a great believer in deep ether anaesthesia, the uncuffed tube and two intravenous infusions, and if anything went wrong the world soon knew about it. At about 10am his faithful secretary, Miss Studley, arrived with the mail and took dictation while sitting on a high stool in the corridor outside the operating room. However, residents rarely received the benefit of his advice on clinical matters.

Beecher's major contribution to medicine was to change the pattern of medical practice in a number of key areas. He was one of the first to study physiological responses to anaesthesia, and his own research at the Anzio beach-head revolutionised the treatment of the wounded and led to new concepts in the understanding and treatment of pain. He pioneered the application of scientific principles for the ethical study of drug effects in the human, and catalysed the early discussions on the criteria for defining brain death. But Beecher was no politician and relied heavily on senior staff members such as Donald Todd, John Bunker, Bernard Briggs, Henrik Bendixen, and others he had recruited on his regular European tours.

It is the individual stories of their colleagues - Henning Pontoppidan in respiratory intensive care, I D Todres in neonatal and paediatric intensive care, Edward Lowenstein in cardiac anaesthesia, to name but a few, that convey the flavour of the department as it evolved. They are preceded by chapters on the development of anaesthesia in the pre-Beecher era and on Beecher himself, by Bucknam McPeek. There are also fascinating chapters by Keith Miller on research into molecular mechanisms of anaesthesia, and by Jeffrey Cooper, an engineer who has done so much to promulgate safe practice in anaesthesia. Warren Zapol provides a thought-provoking final chapter on the role of the department in the new millennium. All these chapters could provide useful background reading for today's specialists. They will certainly provide a wonderful resource for future historians.

Those of us who were privileged to spend some time in the MGH department recognise that the experience changed our careers. It is fascinating to learn how others responded to this environment and how they have contributed to progress over the past half-century. Finally, it is a joy to read E M Papper's Foreword, which puts the whole story into perspective.

Keith Sykes

Note: The book can be purchased on line at:

http://www.bookmasters.com/marketplace/00850.htm

A multimedia presentation with the index is available on the Humbug! Website:

http://www.EtherDome.org/Humbug.html

OBITUARY

G E Hale Enderby

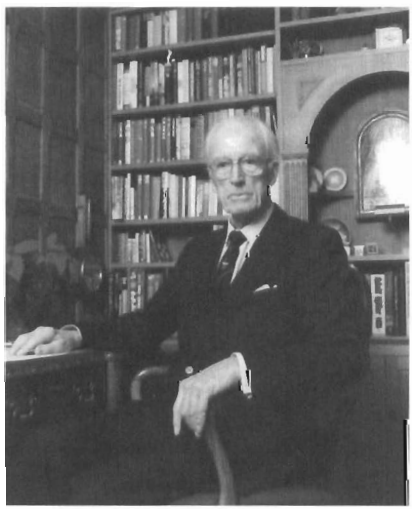
George Edward Hale Enderby, Consultant Anaesthetist at the Burns and Plastic Surgery Unit at the Queen Victoria Hospital in East Grinstead for nearly 30 years, and best known for his original work in developing hypotensive anaesthesia, died on 30 December 2003 at the age of 88.

He was born on June 9 1915 at Boston, Lincolnshire, the son of the local optician, and was educated at Boston Grammar School and Kingswood School, Bath. In 1934 he was awarded a scholarship to study Medicine at St. John's College, Cambridge, and his clinical studies were completed at Guy's Hospital in London.

At the outbreak of the war he joined the emergency medical service, initially at Guy's, and then at Pembury Hospital in Kent, to where much of the work from Guy's was moved after it was bombed. It was at Pembury that he took up anaesthesia, and shortly after, he moved to Sir Harold Gillies' Unit at Rooksdown House, Basingstoke, where for the rest of the war he worked alongside the surgeons repairing injured and burned servicemen.

At the end of the war he continued to work at Rooksdown House, but also took sessions at the Royal National Orthopaedic Hospital in Stanmore, and the Metropolitan Ear, Nose and Throat Hospital. In 1951 he moved to the Plastic Surgery and Jaw Injuries Unit at the Queen Victoria Hospital, East Grinstead, which had been established at the outbreak of the war by Gillies' nephew, Archibald McIndoe.

He had already published his first paper on hypotensive anaesthesia in 1950, and the surgical demands of Mcindoe for a bloodless field gave him the ideal opportunity to develop this research. His technique, using a combination of ganglion blocking agents, head-up tilt and positive end-expiratory pressure was later enhanced with the use of halothane and beta blocking agents, and by the end of his career he was able to report on his experience of over 25,000 cases.



It is remarkable that before the modern era of anaesthetic monitoring, he recognised the need to measure the blood pressure accurately and continuously at low systolic pressures. The mercury sphygmomanometer satisfied neither of these requirements, and so he reintroduced the aneroid oscillotonometer, a device that had been largely forgotten, and was able to detect the Korotkov sounds at systolic blood pressures below 60 mmHg. He also devised a technique whereby the cuff could be left inflated for several minutes to give a continuous indication of both the pulse and the blood pressure. Other innovations of equipment that he introduced included a tapered reinforced endotracheal tube and one of the first scavenging expiratory valves, both of which bore his name.

Hale Enderby's pioneering work on hypotensive anaesthesia gained him an international reputation, and in addition to over 25 papers on the subject he contributed a chapter to the *Textbook of Anaesthesia* edited by Gray, Nunn and Utting. Finally in 1984 he edited his own book, *Hypotensive Anaesthesia*, which remains to this day the authoritative work on the subject. He travelled widely, lecturing in many countries, and in 1963 he invited Professor James Eckenhoff from Philadelphia to East Grinstead. Together with his team of researchers they were able to add considerably to the scientific knowledge of the technique.

He combined his NHS work at East Grinstead with a busy private practice in London, where he worked with many of the eminent surgeons of the day. In 1976 he became an examiner for the Final Fellowship of the Faculty of Anaesthetists, and a year later was elected to the Board of the Faculty on which he served until 1983, and was awarded the Faculty Gold Medal. He was elected President of the Anaesthetic Section of the Royal Society of Medicine in 1981, and was awarded an RSM Medal. He was also a keen Freemason, being a founder member of the John Snow Lodge for anaesthetists.

He was an active sportsman from an early age, and was captain of his College Athletics Club at Cambridge. He played tennis to a very high standard in his early years, but it was golf that was his major sporting interest throughout his life, and for which he is remembered by many of his colleagues. He was a member of the Royal Ashdown Golf Club, and the Medical Golfing Society, of which he was Captain in 1963 and President in 1972-3. In 1980 he presented a challenge trophy, the Enderby Plate, for which the staff at the Queen Victoria Hospital, East Grinstead, compete every year.

Hale Enderby was a kind, gentle and distinguished man (earning the nickname of 'The Duke' amongst staff and trainees), and his easy manner gained him many friends throughout the world. He is survived by his wife, Dorothy, whom he married in 1940, three children, seven grandchildren and two great grandchildren.

Chris Barham