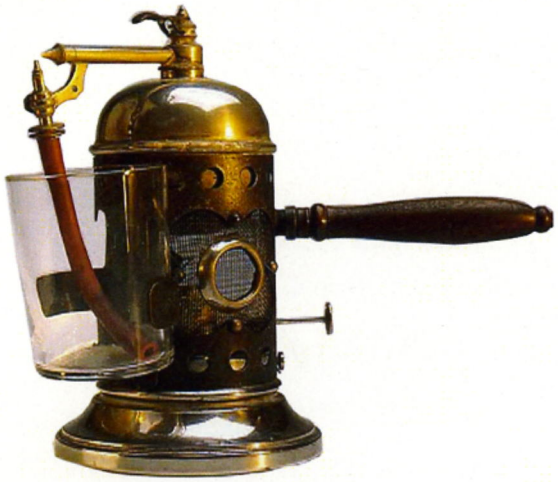
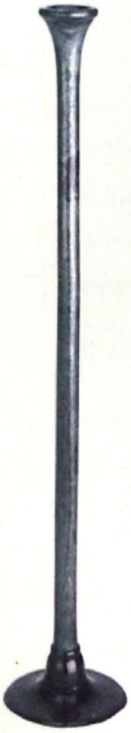


The Historical Medical Equipment Society



BULLETIN NO. 17 ISSN 1366 - 4719 FEBRUARY 2007

EXECUTIVE COMMITTEE

CONTENTS

FUTURE MEETINGS

EXETER - Saturday, 12th May 2007

VISIT to Hospital of Notre Dame à la Rose, Lessines, Belgium – 5-7th October 2007

EDITORIAL

Our meeting at the Association of Anaesthetists, London last October, our first on a weekday, was well attended and also distinguished by informative papers presented by guest lecturer Dr David Zuck and members. Adrian Padfield introduced us to the Association's collection, including items not on display, Peter Mohr discussed the history of leucotomy and the contribution of the Warlingham Park Hospital leucotome deposited in the Manchester Medical School Museum, Nasim Naqvi introduced us to several unusual anaesthetic items from the same Museum strongly associated with Manchester anaesthetists, and finally Dr Zuck and Tim Smith emphasised the surprisingly long historical background to control over the anaesthetic airway with gags, tongue forceps and, eventually, tubular devices. These papers are published in somewhat shortened form due to financial restrictions on space, for which the editor apologises.

The meeting included an Annual General Meeting (minutes of which have been forwarded to you), a visit to the Association Museum and our usual identification session. Evident enthusiasm for an overseas meeting in the spring, to the ancient L'Hopital Notre-Dame a la Rose, Lessines, Belgium, to be led by Sue Weir, was dashed slightly due to postponement until 5th-7th October, 2007. Meanwhile Christopher Gardner-Thorpe came to the rescue and agreed to arrange the spring meeting in Exeter for 12th May, 2007; Exeter has deep medical historical roots including ancient medical books in the Cathedral Library which we can visit. On the question of future meeting venues, we depend on Society members to act as hosts; if in doubt about possibilities our dedicated Secretary is always pleased to help. Any subject which you feel has been overlooked so far, let Committee Members know; the more diverse our meetings, the better for us all.

As noted in the last editorial, the Society achieves its tenth year in April. Although no specific celebration is suggested, I would like to thank members for their support and anticipate their continuing participation and contributions. If your museum has not featured in the Bulletin, please let me know; all I need is a brief description, opening times and a few relevant illustrations. And please remember your impressions of visits to foreign museums with medical equipment are of interest to our members who may have no idea of their existence. For closer links with Europe, there is a European Association of Museums of the History of Medical Sciences which also has a number of American members; it also publishes a useful Bulletin bi-annually. Their next meeting takes place in Edinburgh in September, 2008. For further information please contact : Secrétariat de l'AEMHSM, Musée d'Histoire de la Médecine, 12 rue de l'Ecole de Médecine, 75006 PARIS or e-mail : marie-veronique.clin@univ-paris5.fr

PS. Yet another postscript with reference to another book by your editor! Some of you may be interested in *A History of Limb Amputation* just available from Springer. In particular this explores, perhaps for the first time, the long prelude of natural, accidental, punitive and ritual amputations before elective surgical operations were attempted towards the end of the 15th century. There are also chapters on instrumentation and artificial limbs (see page 12).

THE WARLINGHAM PARK HOSPITAL LEUCOTOME

PETER & JULIE MOHR
(MANCHESTER MEDICAL SCHOOL MUSEUM)

A 'leucotome' is a surgical instrument designed to cut the white-matter of the frontal lobes of the brain and disconnect them from the rest of the brain. Known as 'pre-frontal leucotomy,' or in America as a 'lobotomy,' this was first performed in Portugal, in 1935, by Egas Moniz (1857-1955), professor of neurology at Lisbon, and a neurosurgical colleague. Their first patients were extremely disturbed paranoid schizophrenics from a nearby asylum. Moniz hoped that disconnecting the pre-frontal cortex would interrupt abnormal neuronal circuits, thought by some researchers to cause psychotic disorders. Moniz's first leucotome was a modified cannula, passed through a burr-hole, to cut through white matter when the cannula was rotated (fig. 1.) A later model had a double loop, said to be based on an apple-corer. Moniz became known as the 'father of psychosurgery' and received the Nobel Prize in 1949. [1]

During 1936, the operation was promoted by neuropsychiatrist, Walter Freeman (1895-1972), and neurosurgeon, James Watts (1904-94), at the George Washington University Hospital (D.C.) Initially they used a modified Moniz leucotome but later Watts designed a

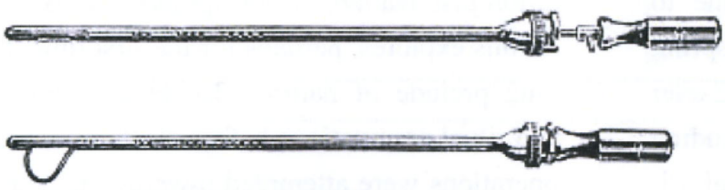


Fig. 1. Moniz leucotome

simple blunt-edged instrument, based on a straightened Killian periosteal elevator (fig. 2.) Freeman also developed the highly controversial 'trans-orbital lobotomy,' which he

Fig. 2. Killian periosteal elevator

performed without any neurosurgical assistance, with the patient under local anaesthetic

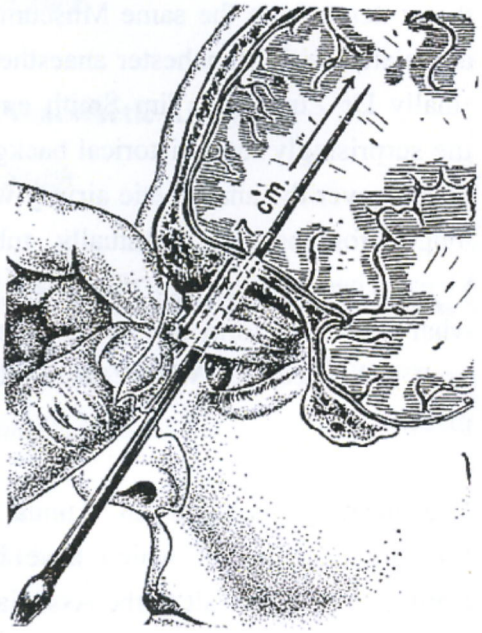


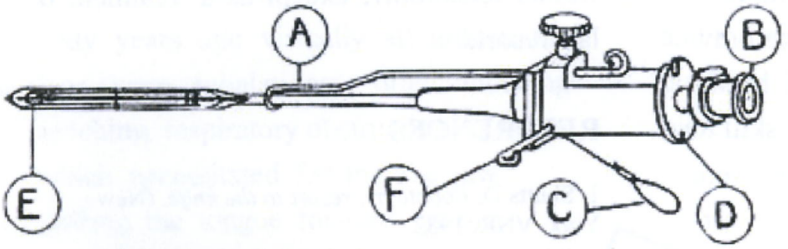
Fig. 3. "Ice-pick" transorbital leucotomy

(fig. 3.) Others techniques followed and by 1950, despite strong medical and ethical criticism, about 30,000 lobotomies had been done in the USA.[2]

The Warlingham Park Hospital leucotome

Warlingham Park Hospital was a large county asylum in Surrey where James McGregor (1904-83), the senior psychiatrist, and also a trained engineer, designed a leucotome, hoping to reduce potential dam-

age to the cerebral cortex. The prototype instrument, made by the hospital's Clerk of Works, was described in 1941 (fig. 4.) as a cannula about 10cm. long with a terminal rotating blade of 2·5cm, which cut through a disc of white matter rather than the sphere of the Moniz instrument.[3] With this John Crumbie (1905-1979), a visiting surgeon from Croydon General Hospital, performed 20 leucotomies, unfortunately with two deaths from cerebral haemorrhage as the blade tended to catch small cortical blood vessels. A version with a 2cm. blade was safer and, passed via a burr hole to a depth of 6cms, the blade was rotated by a trigger wire; however this sometimes jammed, and for a later model the blade was turned by a knob on the handle, which worked a small gear (fig.5.) The Museum's model is fitted with a depth guard and a side-cannula for aspiration of cerebrospinal fluid if the frontal horn was inadvertently punctured (fig.6.) Overall, it was cumbersome to use.



Leucotome, lateral view. A, adjustable stop; B, hollow stylet; C, traction wire; D, notch for reception of wire at limit of excursion; E, guttered cutting blade; F, guide to plane of cutting blade.

Fig.4. Prototype Warlingham Park leucotome

Wylie McKissock, neurosurgeon at the National Hospital, London, advised a simple brain cannula, swept side-to-side, as the best instrument to perform leucotomy and condemned the Warlingham Park model as: 'more nearly resembling a mechanical egg-whisk than an implement of modern surgery.'[4] The Warlingham leucotome gradually receded from use, last appearing in the *Down Bros. Instrument Catalogue* for 1955.

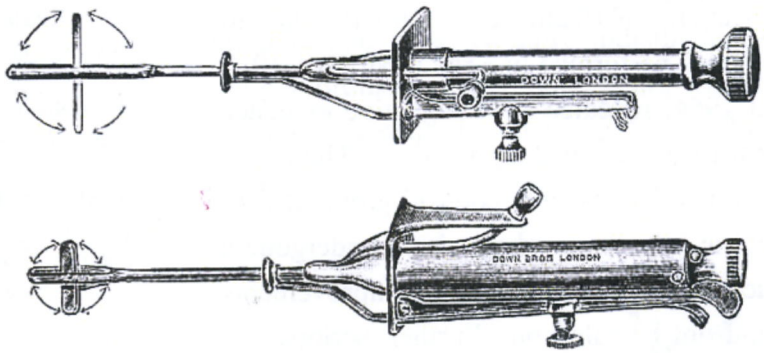


Fig. 5. Subsequent Warlingham Park models

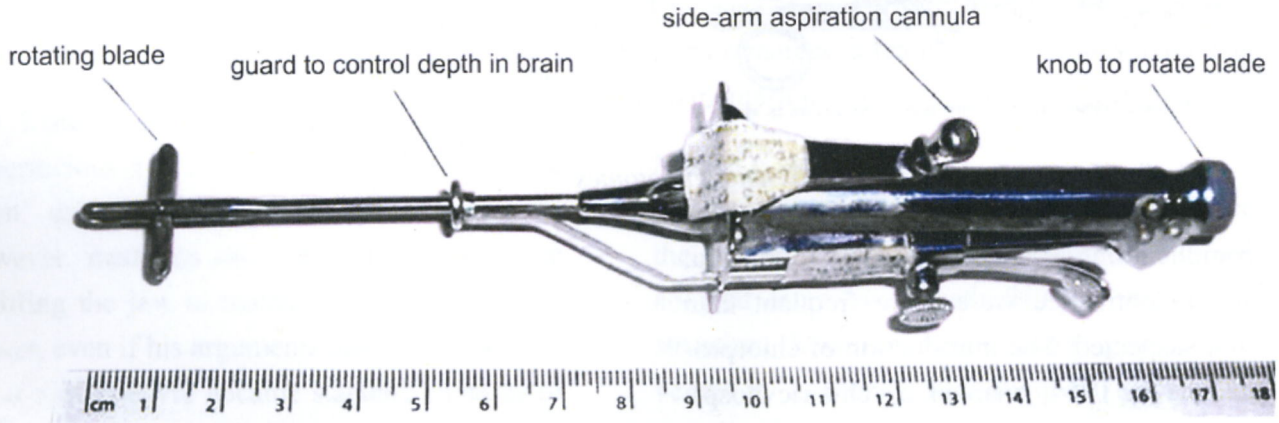


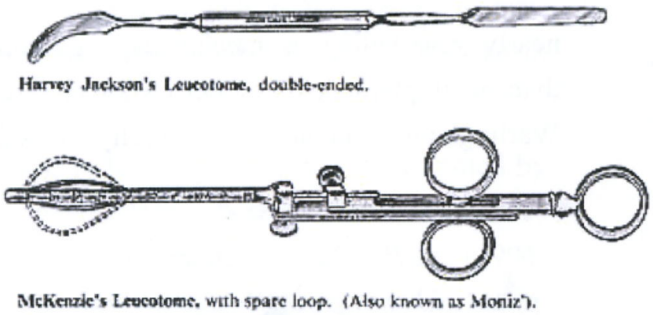
Fig. 6. Warlingham Park leucotome at Manchester Medical School Museum

Neurosurgeons and leucotomy

Many techniques were developed to improve the safety and effectiveness of leucotomy. The main concern was intra-cerebral haemorrhage. Only a neurosurgeon had the skill to deal with this complication and some were unhappy to operate through a small burr-hole. Although several techniques were described in the literature, the *Downs Bros. and Mayer & Phelps Ltd. Neurosurgery Catalogue* for 1960 shows only two leucotomes for pre-frontal leucotomy (fig. 7.)

The decline of pre-frontal leucotomy

A Ministry of Health report into 10,000 leucotomies performed in Britain between 1942 and 1954, revealed little objective evidence for the efficacy of the operation.[5] There was no comparison with a 'control' group of psychiatric in-patients who had not undergone a leucotomy, so spontaneous improvements could not be ruled out. Further, serious late complications such as epilepsy, dementia, and incontinence were more frequent than first suspected. The introduction of chlorpromazine in 1954, enabled psychiatric hospitals to discharge more patients and effectively abandon lobotomy. In Britain over 30,000 leucotomies were performed before falling to about 150 operations per year in the 1970's. Finally, the *Mental Health Act* (1983) made it impossible to perform a pre-frontal leucotomy, except as a treatment of last resort.[6]



Harvey Jackson's Leucotome, double-ended.

McKenzie's Leucotome, with spare loop. (Also known as Moniz').

Fig.7. Harvey Jackson and McKenzie leucotomes

REFERENCES

1. Shutts D, *Lobotomy, resort to the knife*, (New York, VNR, 1982.)

2. El-hai J, *The Lobotomist, a maverick medical genius*, (New Jersey, Wiley, 2005.)

3. McGregor JS & Crumbie JR, 'surgical treatment of mental diseases,' *Lancet*, 5 July 1941, p.7-8; ibid, 'An improved leucotome,' *Lancet*, 30 May 1942, p.654; ibid, 'Prefrontal leucotomy,' *J. Mental Science*, **88**, 1942, p.534-40.

4. McKissock, W, 'Technique of pre-frontal leucotomy,' *J. Mental Science*, **89**, 1943, p.192-201.

5. Tooth GC & Newton MP, *Leucotomy in England & Wales 1942-1954*, HMSO, 1961.

6. Hussain HS, Freeman H, Jones RAC, 'A study of psychosurgery cases from a defined population,' *J. Neurol. Neurosurg. Psych.*, **51**, 1988, p.345-52.

TONGUE FORCEPS AND MOUTH GAGS

DAVID ZUCK

Until sixty years ago virtually all anaesthetic inductions were inhalational, often inducing teeth clenching, respiratory obstruction, and cyanosis which necessitated forcing the jaw open, pulling the tongue forward, giving oxygen, and inserting an airway. Before introduction of the laryngoscope, and muscle relaxants in 1946, the mouth gag and the tongue forceps were vital items always present on Boyle's anaesthetic machine.

Tongue Forceps

Pulling on the tongue to relieve airway obstruction was brought into general use by Joseph Lister, who in 1862 contributed the section on general anaesthesia in a textbook of surgery. He advised that 'artery forceps are the most convenient means of drawing the tongue forwards. The puncture which they inflict is of no consequence; the patient, if he notices it at all, supposes that he has bitten his tongue under the chloroform.' Joseph Clover, the leading anaesthetist, disagreed strongly adding he merely raised the chin from the sternum, and the spasm almost always ceased spontaneously; he had never drawn out the tongue, and had never lost a patient. Lister vigorously accused Clover of 'about as pernicious a piece of advice as can well be given' on the administration of chloroform.' However, medicine owes the basic manoeuvre of lifting the jaw to maintain a clear airway to Clover, even if his arguments did not prevail, for Lister's manoeuvre became standard in cases of airway obstruction.

To mitigate the crushing pressure of artery forceps, various tongue forceps were designed. The earliest was Woodhouse Brain's, but a more secure model, by Probyn Williams, had a ratchet, and a ring-type jaw to improve the grip. A similar forceps was listed as Guy's (fig.1). Tongue piercing forceps, claimed to be less traumatic,

Fig.1. Guy's tongue forceps

came later, the most popular gripped the dorsum only and were virtually indistinguishable from an ordinary towel clip, being variously named as Corbould, Backhaus or Mayo. (Fig 2) Tongue forceps stimulated by Lister's observations remained a feature of the anaesthetist's armamentarium for more than half a century.

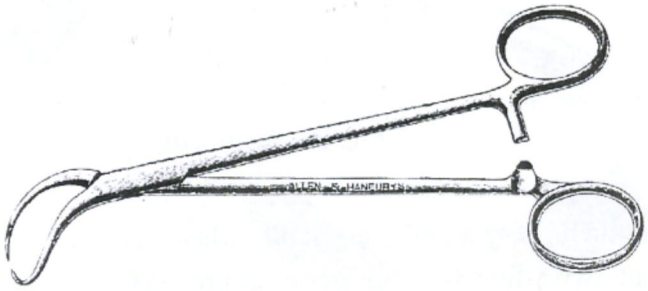


Fig.2. Mayo tongue forceps

Mouth Gags

The earliest mouth gags were introduced to keep the mouth open during operations and only adopted later by anaesthetists for airway obstruction; however a pioneering gag was invented by Lorenz Heister about 1718 for tetanic spasm. The first of the anaesthetic era was introduced by an innovative dental surgeon, Alfred Coleman, in 1861 and although his gag was well known to dentists, I have not located one in any museum. Further development was associated with cleft palate repair for which Thomas

Smith combined the gag and general anaesthesia in 1868, greatly improving his results. Smith pointed out the disadvantage of the standard practice of delaying operation until patients were old enough to cooperate without anaesthesia, as speech habits were already formed and difficult to remedy. Chloroform and his gag permitted operations at a younger age, with speed and accuracy. Smith's complicated gag was replaced by a simpler model in 1870 (fig. 3), by Francis Mason, formerly Sir

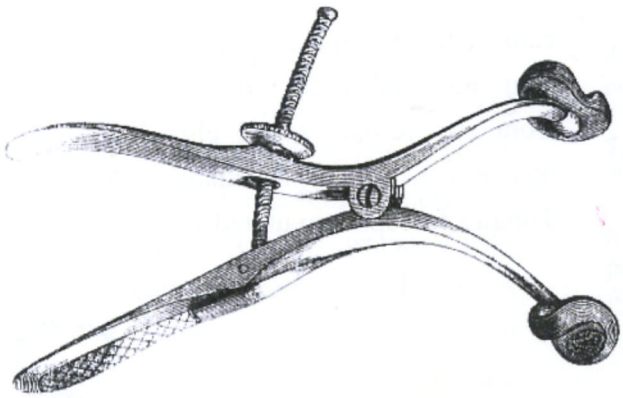


Fig. 3. Mason gag

William Fergusson's assistant. Mason's gag had swivelling jaws to attain secure positioning on the teeth. Fergusson who introduced several operative techniques, reviewed cleft palate surgery in 1876, stating he now used a modification of Mason's instrument. As the illustration shows, his jaws were narrower (Fig 4). When Fergusson died in 1877, a published

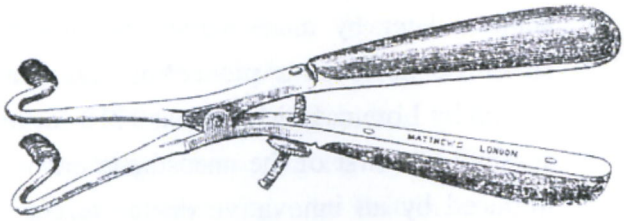


Fig. 4. Fergusson gag

reference to the gag as Fergusson's stimulated Mason to assert his priority, claiming there was 'a very slight difference between the one and the other,' when in fact the jaws were quite different.

Gag design then developed in two directions, surgical and anaesthetic. Surgical innovations included gags with tongue plates. Anaesthetic developments included the addition of two small tubes to Fergusson's gag by Hewitt, in 1891, permitting anaesthesia to be maintained without impeding the surgeon's access and modification of the jaws to make them narrower and easier to insert, described in 1898 by W.R. Ackland. In 1907 a paper by G.H. Colt, analysed 21 gags described in medical journals, and set out four essential requirements, concluding with a description of his own gag, designed on anthropometric principles.

Study of the development of gags reveals that the early anaesthetists weren't too concerned about respiratory obstruction, unlike Hewitt who wrote in 1893: 'The importance of maintaining a free air-way during anaesthesia needs no comment. It is a curious fact, however, that very little attention has been bestowed upon this point.'

[NB: a fuller account with references appears in Volume 36 of the *Proceedings of the History of Anaesthesia Society*]

THE ANAESTHETIC AIRWAY

TIM SMITH

A variety of devices have been used to help maintain the airway during anaesthesia. These include i) gags, props and tongue forceps ii) oral, oropharyngeal and nasopharyngeal airways, and iii) endotracheal tubes. Of these principally oral and oropharyngeal airways will be considered in this paper.

During the second half of the nineteenth century as surgery became more complex the depth and duration of anaesthesia increased. Problems arose with maintenance of a free airway and with laryngospasm. Anaesthesia could be a rough and dangerous undertaking and a variety of gags, props and tongue forceps were used to help keep the airway open.

"The livid face, pulseless wrist, motionless thorax and locked jaws supervening in anaesthesia make it by commonest imperative that instantly by whatever amount of violence the tongue be forcibly pulled forward." Howard 1880. [1]

This state of affairs was not fully resolved until the advent of muscle relaxants (curare in 1946 and particularly suxamethonium in 1951). However even before this much of the trauma could have been avoided by the judicious use of the various techniques of airway maintenance then available. By 1901 Esmarch had described his manoeuvre for maintaining the airway *"In asphyxia, open the mouth at once, and press the lower jaw forwards with both hands by placing the forefinger behind the ascending ramus, so that the lower teeth project in front of the upper"*. Esmarch stated that only if this failed should props, gags and tongue forceps be used.

Frederick Hewitt was an early advocate of the importance of the airway. He himself had been severely tested when anaesthetising Edward VII in 1901 for drainage of an appendix abscess following postponement of the coronation. The king was a poor subject for anaesthesia being bearded, obese and a heavy smoker and drinker. The royal patient turned deep purple during induction of anaesthesia but Hewitt remedied the situation by pulling on the royal beard and re-establishing the airway.

Oral airways

In 1908 Hewitt described the first artificial 'air-way'(fig.1a). The original Hewitt airway

Fig. 1a original Hewitt airway

was straight but later versions were curved (fig.1b). They were made of red rubber with an aluminium mouth-piece which was de-

Fig. 1b Modified Hewitt airway

signed so that the patient's teeth fitted in the v-shaped circumferential groove. The Phillips airway (fig.2a) had a metal mouth piece that was oval rather than circular in cross-section

Fig. 2a Phillips airway c. 1920

and its shape conformed more to the anatomy of the oropharynx. It became the standard airway in the United Kingdom during the 1920s and 1930s. Several stoppers and attachments

to the Phillips mouth-piece were described. One of these, the Clausen stopper, is illustrated (fig.2b).

Fig. 2b Phillips airway with Clausen stopper

In the United States of America the early airways were invariably of metal construction. The Connell airway (fig.3a) was the

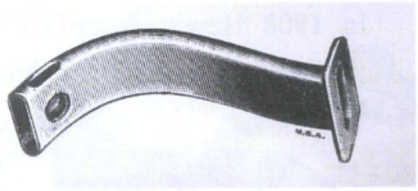


Fig. 3a Connell airway c. 1912

forerunner. The Lumbard airway (fig.3b) was the first of the open metal cage types of

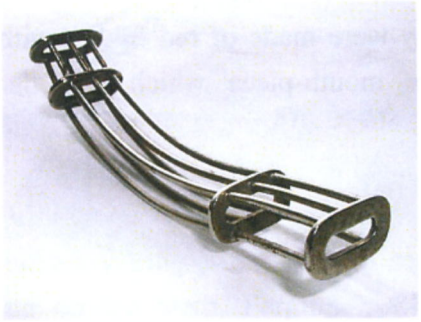


Fig. 3b Lumbard airway 1915

airway. The later Mayo airway (fig.3c) was of a similar pattern. The only English metal airway to achieve popularity was that designed by the Liverpool anaesthetist Mona Roberts (fig.3d). This was modelled on the

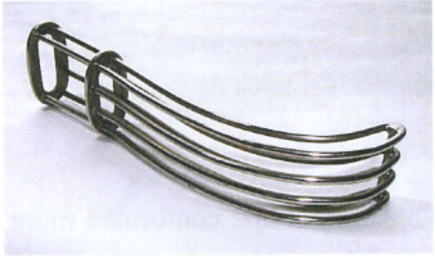


Fig. 3c Mayo airway c.1930

Connell airway with one or two minor modifications including a slit in the flange through which a tape could be threaded and tied

Fig. 3d Mona Roberts airway 1916

round the patient's neck. The first airway to achieve widespread international use was the all-metal Waters airway (fig.3e). Of identical

Fig. 3e Waters airway 1931

shape but constructed of rubber or plastic, with a metal insert to prevent occlusion by the teeth, was the Guedel airway (fig.3f).

Fig. 3f Guedel airway 1933

This was less traumatic to the teeth and gums than the Waters airway and to the present day remains in universal use as the standard oral anaesthetic airway.

Oropharyngeal airways

Oropharyngeal airways were designed not only to maintain a free airway but also to prevent soiling of the lower airway by secre-

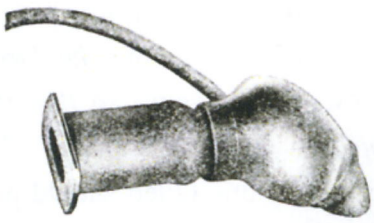


Fig.4aShip way Cuffed oral Airway 1935

tions, blood or stomach contents. In 1935 Shipway devised a cuffed oral airway (fig.4a)

for intranasal surgery. It was partially effective but the larynx was not fully isolated from the pharynx. The first true oropharyngeal airway was described by Leech in 1937

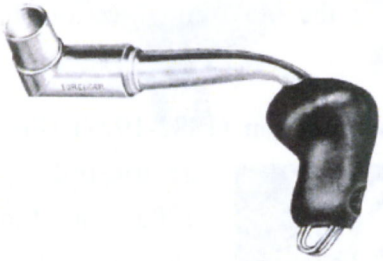


Fig. 4b Leech pharyngeal bulb 1937

(fig.4b). His "pharyngeal bulb gasway" had a solid rubber bulb that occluded the pharynx. It did not achieve widespread popularity.

A cuffed oropharyngeal airway the "Laryngeal Mask Airway" (LMA) was first described by Brain in 1983[2] and came into commercial production in 1986 (fig. 4c). Its introduction followed years of meticulous

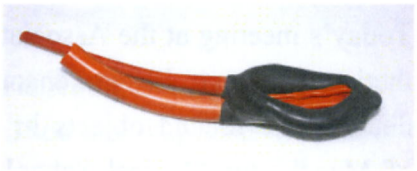
Fig. 4c Laryngeal mask airway 1983

research into the anatomy and physiology of the pharyngo-glottic area. Brain had noted the similarity between the size and shape of

Fig. 4d Goldman nasal mask

a Goldman dental mask cuff (fig.4d) and the available size and space in the pharynx as demonstrated in plaster models taken from cadavers. He incorporated a 10mm plastic tube into the floor of the mask thereby producing the earliest prototype of the LMA (fig.4e). The standard LMA (fig.4c) is ar-

Fig. 4e Prototype LMA



guably the most important advance in anaesthesia in the past fifty years and is now used extensively in resuscitation and in eighty five percent of all elective anaesthetics given in the United Kingdom.

REFERENCE

1. Howard, B "Observations on the upper air passages in the anaesthetic state" *Lancet* 1880; May 22: 796-8

2. Brain, A "The Laryngeal Mask - a New Concept in Airway Management" *Brit. J. Anaesthesia* 1983; 55. 801-806

INTERESTING ANAESTHETIC ITEMS IN THE MANCHESTER MEDICAL SCHOOL MUSEUM

NASIM NAQVI

Today's meeting at the Association of Anaesthetists of Great Britain encouraged me to demonstrate related objects in the collection of Manchester Medical School Museum. Of the items selected, most were invented, manufactured, used and described by anaesthetists working in Manchester.

Pinson Ether Bomb.

In 1921 a joint paper by SR Wilson and KB Pinson, anaesthetists at Manchester Royal Infirmary, was titled "A warm ether bomb", describing a solid metal container tested to stand a pressure of 250 lbs. per square inch and a capacity for 500 mls. of ether[1] .On its side was a filling inlet with screw plug and, on top, a needle valve and an outlet for rubber tubing to deliver 100% ether vapour to a mask for anaesthetic inhalation when immersed in a bath of hot water. The authors claimed successful use for more than three years before publication. A second model had a safety valve, a filling inlet, a control valve and a holding knob all sited on the top. A third model, seen in a surgical instrument catalogue of 1930 had the holding knob on the side. This model is in the Museum collection (Fig. 1).

Fig. 1. Pinson ether bomb

Stanley Rawson Wilson (1882-1927) (Fig.2) graduated in 1905 from Manchester and became its first lecturer in anaesthesia. He also started the *British Journal of Anaesthesia* in 1923 serving as its first editor but died tragically of asphyxia while experimenting with nitrous oxide[2]. Kenneth Bernard Pinson (1890-1985) (Fig.3) qualified from Birmingham in 1914 both in medicine and engineering[3]. The ether bomb was associated with his name probably because of manufacture by his own company, as with all his other inventions.

Fog. 2 S.R. Wilson

Fig. 3 K.B. Pinson

Pinson Gas Regulators.

Among other devices, Pinson invented gas regulators, first described in 1922[4] . The museum holds two regulators one for oxygen and other for both carbon dioxide and nitrous oxide (Fig. 4). He claimed these were accurate, graduated, leak proof and rust proof.

Pinson also described a continuous oxygen

Fig. 4. Two gas regulators manufactured by Pinson

and nitrous oxide anaesthetic apparatus in 1921 to which ether from Pinson's bomb was delivered into a mask to maintain anaesthesia for long periods[5]. He also invented a water container calling it Pinson's Hopper for nitrous oxide cylinders to prevent them freezing.

Kurer's Narkophor.

This unusual object described in a handwritten note as a vaporiser for ethyl chloride in dental anaesthesia was invented in Austria, in 1936, by Dr. Jacques Kurer who migrated to work in Manchester. This double walled cup-shaped device was filled with ethyl chloride through the inlet secured by a screw cap. When hot water was poured into the cup, pure vapour of ethyl chloride was delivered to rubber tubing connected to one half of an angulated double lumen metal tube, the other lumen being used for suction to clear secretions (fig.5).

Fig. 5. Kurer narkophor

Ellis Obstetric Analgesia Vaporiser.

Dating from 1866 this vaporiser was used for the administration of an anaesthetic mixture of alcohol, ether and chloroform for obstetric analgesia[6]. The vapouriser is in its original box and stamped with the name of Savigny, associated with the manufacture of surgical instruments since the late 18th century. It dismantles into three components and is graduated to increase or decrease the concentration of vapour inhaled by the patient when mixed with atmospheric air (figs.6a and 6b) through a mask that is not in the box. A control to dilute the mixture with air is provided.

Fig. 6a. Ellis obstetric analgesia vapouriser

Fig. 6b The Ellis vapouriser in its case

An Unused Clover Inhaler.

A Clover inhaler which is perhaps unique, as it is unused and still packed in its velvet lined black box. There are two adult size breathing bags, a filler for ether and a clear mask all wrapped in the original thin white paper, probably the only one of its kind in mint condition[7].

Blueprint of a Ventilator dated 1941.

This blueprint of a ventilator is significant historically. On its back is a hand-written note:

"Drawing of anaesthetic respirator pump built at the Royal Navy Artificers Training Establishment, Torpoint, Cornwall in 1941-1942 at the suggestion of Surgeon Lt. Tom Dinsdale RNVR".

Mechanical ventilators were first used clinically in Scandinavia in 1952 during a polio epidemic. Although various methods of mechanical ventilation were suggested, no evidence of a working British machine appeared before 1941. The equipment made during World War Two for Dr. Tom Dinsdale, Consultant Anaesthetist, of Manchester Royal Infirmary, deserves recognition and due credit.

References

1. Wilson SR, Pinson KB. A warm ether bomb, *Lancet* 1921 Feb.12;**1**: 336.
2. Obituary, Sydney Rawson Wilson, *BMJ* 1927 Sep. 24; **2**: 570.
3. Obituary, Kenneth Bernard Pinson, *BMJ* 1985 Oct. 26; **2**: 1212.
4. Pinson KB. Fine adjustment valve for oxygen, *BMJ* 1922 Sep. 9; **2**: 476.
5. Pinson KB. Continuous gas and oxygen apparatus, *Lancet* 1921 April 23;**1**: 866.
6. Bryn Thomas, K *The Development of Anaesthetic Apparatus* (Blackwell Scientific Publications) 214-219.
7. Lee JA, Joseph T Clover, *Ann. Roy. Coll. Surg* 1960; **26**: 280.

WHAT IS IT? [February 2007]

This instrument has tiny grooved jaws controlled by the bow handles; thus the leverage is considerable. It is nickel-plated and marked 'Krohne & Sesemann, London' and probably made about 1895.

Please phone, email or write your answer to the editor.

WHAT IS IT? [August 2006]

ANSWER

This instrument, illustrated in Bulletin 16, is an angled laminectomy saw which can be adjusted or replaced by means of the lever at its base. It was made by Hilliard of Glasgow probably about 1895 – 1900 and designed by Professor William Macewen to divide the bony laminae of the spinal canal when explored for tumours; he was a pioneer of spinal surgery. Each handle was supplied with two saws and two rasps.

John Kirkup.