Historical Medical Equipment Society London

1953 - "ANNA MIRABILIS" OF GENETICS

(GOLDEN JUBILEE OF THE DOUBLE HELIX)

(1953 - 2003)

Pioneers: James Watson (left) and Francis Crick with their model of the DNA double helix unveiled on April 25, 1953 in the journal *Nature*

BULLETIN
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2003

MENDELISM IN HUMAN GENETICS : A CENTURY (1900 - 2000)

Gregor Mendel [1822 - 1884].
(Reproduced by courtesy of the Wellcome Institute Library, London)

"Time present and time past
Are both perhaps present in time future
And time future contained in time past".

(Thomas Stearns Eliot (1888 - 1965), Nobel Laureate in Literature, 1948 : Four Quartets - Burnt Norton - I (1935)

COVER PAGE:

[Harry Compton Francis Crick (1916 -), James Dewey Watson (1928 -) and Maurice Hugh Frederick Wilkins (1916 -) were jointly awarded Nobel Prize in Physiology on Medicine in 1962 for the discovery of the Chemical Structure of Deoxyribo Nucleic Acid (DNA) The Double Helix]

HISTORICAL MEDICAL EQUIPMENT SOCIETY, LONDON
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NEXT MEETING

Venue: Sir John Charnley Institute
Wrightington Hospital
Wigan, Lancs.
Date: Saturday October 11th 2003
Organiser: Mr Paul Hughes

Fuller details of the meeting and programme will be circulated nearer the date, but please put these in your diaries NOW!

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"A good book is the life – blood of a master spirit"
John Milton (1608 – 1674)

EDITORIAL

With considerable relief, we resume publication of our Bulletin, so long delayed for administrative reasons. Our new editor, Dr Sisir Majumdar, has been working hard with the assistance of Mr Ravi Kunzru, to catch up on papers given at Society meetings yet to be published. Regrettably, we have to report on five meetings held since May 2001, respectively at the Royal Berkshire Hospital in Reading, Green College in Oxford, the Thackray Museum in Leeds, the Worcestershire Royal Hospital and Emmanuel College in Cambridge. We are very grateful to those speakers who have produced summaries and appeal to any with outstanding material to forward this soon.

As can be recognised from papers given at these meetings (see list below), the Society continues to cover a wide field of interest, from anaesthetic, radiological, orthopaedic and spa equipment to ancient instruments from Pakistan, ophthalmoscopes, gastroscopes, needle-holders, medical treen, medical porcelain and hearing aids. We anticipate the summaries will prove of interest to members who were unable to attend particular meetings. What we cannot report, in any detail, is the enthusiastic period, at the end of each meeting, when members produce items for demonstration, identification and discussion. Bolstered by Alan Humphries knowledge and his computer input from Thackray Museum sources, this always proves to be a session of the greatest value to participants.

It is pleasing to report that meeting attendances are increasing and include a number of additional younger members; we hope this trend continues. Our next meeting will be on 11th October 2003, at the Wrightington Hospital near Wigan, where the Sir John Charnley Institute Museum reflects pioneer work on Charnley's hip replacement operation. This is organised by Paul Hughes who will demonstrate his amazing collection of emergency and resuscitation equipment; there will also be papers by Mr Howarth who designed the clean air theatre (the greenhouse) and by Mr Wroblewski on the history of hip surgery. Subsequent meetings are suggested at the Association of Anaesthetists, London and the Marjorie Brittan Museum, Bristol; more information will be available in our next number.

Do not forget that, apart from meeting papers, the Editor is happy to receive contributions on topics of interest, however short, or reports on news or new museums, either in the UK or abroad, or any observations about the conduct of the Society. I am always ready to discuss problems or queries by phone, telephone number 01225 423060, or email: john.kirkup@btinternet.com.

A final apology to you all for this gap in producing the Bulletin and my sincere thanks to those members who have continued to support our meetings so enthusiastically.

John Kirkup
CHAIRMAN

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"Be not the first when the new is tried,
Nor yet the last to lay the old aside"
(Alexander Pope - 1688 – 1744)
in "The Dunciad" (1728 – 1742)

COMMENT

℞: A MEDICAL MYTH

Medicine, throughout history, evolved as a splendid blend and a cascade of science, art, magic, folklore, fantasy, philosophy, religion and mythology. Still today, much of medicine is a myth, wrapped in mystery inside an enigma.

Nostalgia is an insatiable human curiosity. It is a virtue. The origin of "℞", which precedes all medical prescriptions till today, is still a matter of great curiosity to medical historians. Doctors of today reflexly put – "℞" at the beginning of prescriptions without knowing or thinking what it means or what it stands for. Archives of the antiquity give an insight into its origin. Wisdom and thoughtfulness of the antiquity always amazes us, even today.

The medical dictionaries describe "℞" as a symbol of recipe in a prescription. It is always used with dignity and decorum. But still it is a riddle wrapped in mystery inside an enigma.

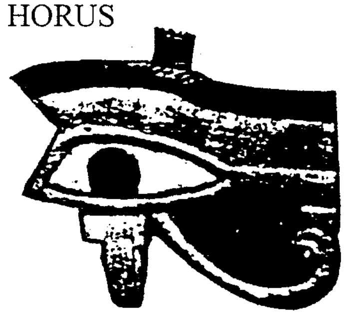
We know very little about the state of medical practice in Egypt around 4000 B.C. There were various gods who presided over the arts and sciences (Budge, 1904). KING HORUS, the son of Isis and god of health, engaged in a fight with Set, the demon of evil, and lost an eye. However, the lost eye was restored by miraculous means. The eye of HORUS formed the design for a charm or amulet, which was second only to the scarab or sacred beetle as a mascot of ancient Egypt. It is said to be the origin of the recipe ("℞") sign, which preceded medical prescriptions (Comrie, 1909).

In a more simplistic way, "℞" is an abbreviation for recipe, and the bar across its lower limb is an invocation to the god of health. However, it looks quite secular. It all originated from Greek myths.

Ancient Egyptian enamel charm is known to represent the eye of HORUS (noted below).

Originally an elaborate design, the eye of HORUS passed through various phases until it became conventionalised as something resembling a capital ℞, and it was placed on all objects associated with danger, such as ships, chariots and prescriptions. Whatever may be its origin in the antiquity, it is still with us alive and exciting. It seems history of medicine is more interesting that medicine itself.

THE EYE OF HORUS



SISIR K MAJUMDAR
EDITOR

REFERENCES:

Budge, E.A. (1904) : Gods of Egypt, Vol 1, pp 514, 525

Comrie, J.D. (1909) : Medicine among the Assyrians and Egyptians in 1500 B.C., Edin. Med. Jour. New Series, 2, 101.

x X x

"Science cannot solve the ultimate mystery of nature. And that is because, in the last analysis, we ourselves are part of the nature and therefore part of the mystery we are trying to solve."

MAX KARL ERNST PLANCK
(1858 – 1947)
NOBEL LAUREATE IN PHYSICS, 1918

THE DEVELOPMENT OF THE ANAESTHETIC VAPOURISER

TIM SMITH

[Summary of the paper presented at Reading Meeting, 12th May 2001]

The first successful public demonstration of anaesthesia occurred on 16th October 1846 at the Massachusetts General Hospital in Boston. William Morton used a glass vessel containing a sponge soaked in ether.

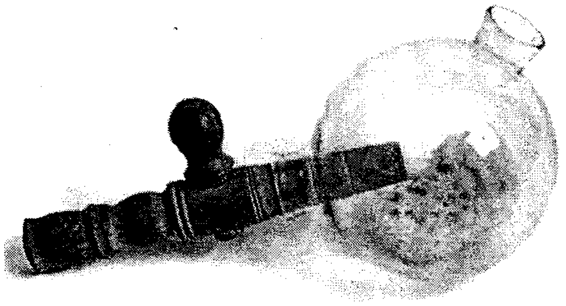


fig. 1 Morton ether vaporiser 1846

John Snow emerged as the leading anaesthetist in the UK and laid the scientific foundations of anaesthesia. Chloroform was introduced in 1847 and although easier to use and non-flammable had a higher mortality than ether. The Scottish school (exemplified by Simpson and Lister) claimed that chloroform administered on a towel was the key to safety. The English school (exemplified by Snow and Clover) claimed that specific apparatus, which delivered a known concentration of chloroform, was the answer. Vaporisers were developed in England in an attempt to deliver a known and constant concentration of vapour. Vaporisers were either "draw-over" (where the patient's own respiratory efforts drew air over the liquid anaesthetic) or "plenum" (where air or gases were delivered under positive pressure). An early "plenum" vaporiser was the Junker bottle (1867).

fig. 2 Dudley Buxton modification of Junker bottle 1890

Ether enjoyed a revival in the 1870's with the introduction of Clover's inhaler (1877)

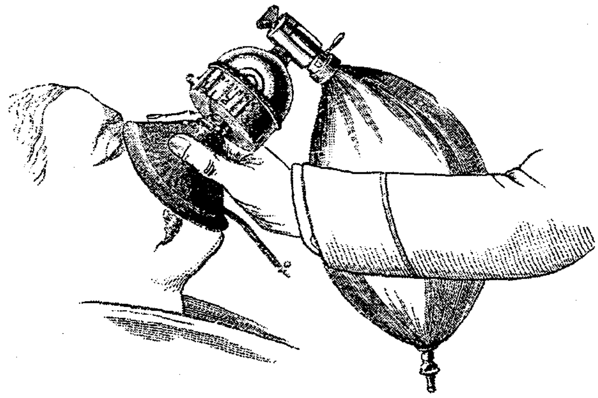


fig. 3 Clover ether inhaler 1877

The problem with all vaporisers was that as vaporisation occurred the remaining liquid cooled so that with time the delivered vapour concentration fell. Various design strategies were developed to overcome this problem. One of the most ingenious was the Vernon-Harcourt vaporiser (1903) in which the vaporising chamber contained two glass balls, one red one blue. At precisely 17 degrees Celsius the red ball floated and the blue ball sank. The anaesthetist attempted to maintain this temperature in the vaporising chamber.

Although its use gradually declined during the first quarter of the twentieth century chloroform was not finally abandoned until the 1960's.

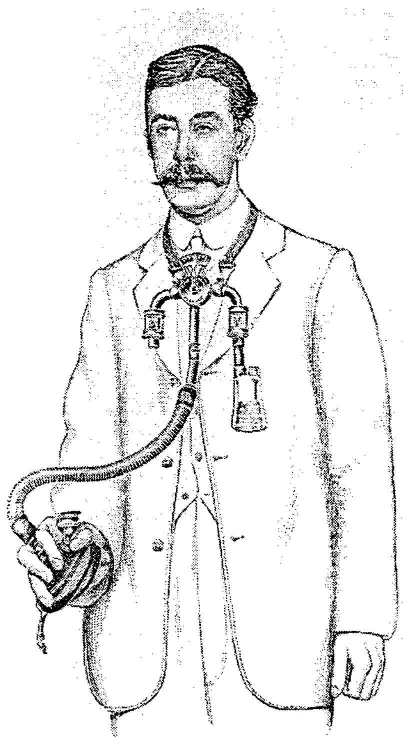


fig. 4 Vernon–Harcourt chloroform vaporiser 1903

A great advance in the accuracy of vaporisers came in 1941 with the development of the Oxford Vapouriser by Macintosh and Epstein. This ''draw-over'' ether vaporiser was used extensively in the field during World War II.

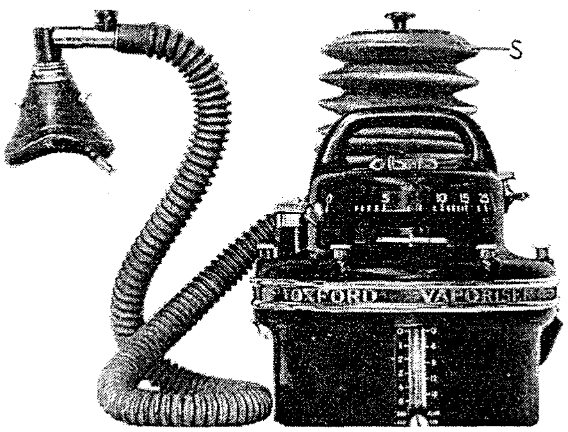


fig. 5 Oxford Vaporiser 1941

Subsequent direct developments were the EMO vaporiser (Epstein, Macintosh, Oxford) and the EMOTril vaporiser – an air/trichlorethylene device for obstetric analgesia.

Increasingly during the twentieth century plenum systems using cylinders (and later piped gases) were used. The Boyle bottle, with little attempt at temperature compensation, continued to be used for ether and trichlorethylene until the 1970's.

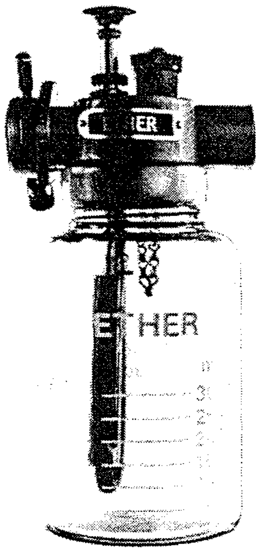


fig. 6 Boyle bottle c. 1940

With the introduction of the potent volatile agent halothane in the 1960's greater accuracy was needed. The ''Fluotec'' series of vaporisers were developed using the principle of a bimetallic strip to vary the proportion of incoming gas passing over the surface of the liquid halothane. Such vaporisers are now extremely accurate and have been adapted for use with all modern volatile anaesthetic agents.

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"The body, to be in a healthy state, must have the heart warm, the nerves cold, and the bones dry."

Abu Ali al Hussein ibn Abdallah ibn Sina – AVICENNA (A.D. 980 – 1037) : Author of "CANON OF MEDICINE OR QANUN"

A BRIEF HISTORY OF THE ROYAL BERKSHIRE HOSPITAL

A MARSHALL BARR

The Royal Berkshire was not founded until 1837, rather late in the voluntary hospital movement. Its site was decided by the donation of four acres by Lord and Lady Sidmouth, its Royal patronage granted by William IV. Since William died during construction, the hospital frontage is the last building to feature his coat of arms and Victoria was on the throne when the hospital opened in 1839.

As usual, only persons recommended by subscribers were admitted. Paupers went to the workhouse; those who could pay for medical attention were expected to receive treatment at home. Emergencies, however, could be admitted by the House Surgeon or the Superintendent (of nursing, although she was more just a domestic superintendent). The 50 bed capacity soon proved inadequate. Extensions rearwards were made in the 1840's and lateral wings added in the 1860's. In 1867 the nursing was modernised on Florence Nightingale lines. Soon afterwards a private nurses wing was added. These nurses were trained and paid by the hospital to be hired out as a money making enterprise. In the 1870's a new laundry was built which is currently the site of the Berkshire Medical Heritage Centre Museum. In 1882, as well as a new operating room and chapel, a purpose built library suite was provided specifically for the medical staff and the local medical society, the Reading Pathological Society. This library still houses the historical volumes of the RPS and was the meeting place for the Historical Medical Equipment Society.

In 1911, a new casualty and a children's ward were built, the ward becoming the County's memorial to King Edward VII who died that year. During World War I the Royal Berks provided 100 beds for the military. This was very small scale compared to Reading War Hospital No. 1, created by taking over the Oxford Road Workhouse. A nurse's home was built in the 1920's and the mansion behind, called Greenlands, was purchased as a private nursing home. Its most famous patient was Douglas Bader, who crashed his bulldog aircraft on Woodley airfield in December 1931. Bader convalesced in Greenlands under the watchful care of Nurse Dorothy Brace, who later became matron at Battle Hospital which developed from the workhouse.

In 1939, the Hospital's centenary, the Royal Berks was granted a coat of arms. This includes the royal sceptre, stags from the badge of the Berkshire militia and escallop shells from the arms of Reading Abbey. The old system of letters of recommendation was formally abolished. Lord Nuffield donated £80,000 for a new block for the treatment of women and children, which was built between the original hospital and Greenlands.

The hospital was unscathed by World War II and proceeded to rapid expansion under the NHS. Sadly this was piecemeal development, as limited funds were made available. In succession came outpatients, X-ray, eye block, maternity unit, and a large South Wing for new A&E and orthopaedics. There was no coherent plan and no architectural symmetry.

Now, the congested site is again the scene of major building works. The entire services of Battle Hospital are to be squeezed in by 2004. Financial constraints remain much as they were when the voluntary hospital relied on charitable funding. Happily, the original frontage is to be saved, the Berkshire Medical Heritage Centre is developing its museum and an Arts and Gardens Committee has been appointed to prevent the vast new hospital becoming soulless and intimidating. In a sense, hospitals themselves constitute medical equipment of importance to patients, visitors and staff. Preservation of historically and aesthetically important hospital architecture deserves the same consideration as historical medical equipment

More information is available from:
Railton M & Barr M. *The Royal Berkshire Hospital 1938-1989*
ISBN 0 9514373 0 5. £12.95
Railton M & Barr M. *Care and Compassion. Old Prints and Photographs of Hospitals and Nurses in Berkshire and South Oxfordshire.*
ISBN 0 95394417 0 1. £8.00

Both available from Dr Barr c/- Post Graduate Centre Library, Royal Berks Hospital, Reading RG1 5AN. Cheques (add £2 for P&P) payable to BMHC Book Account.

Photos. Frontage, Operating Theatre, Library.

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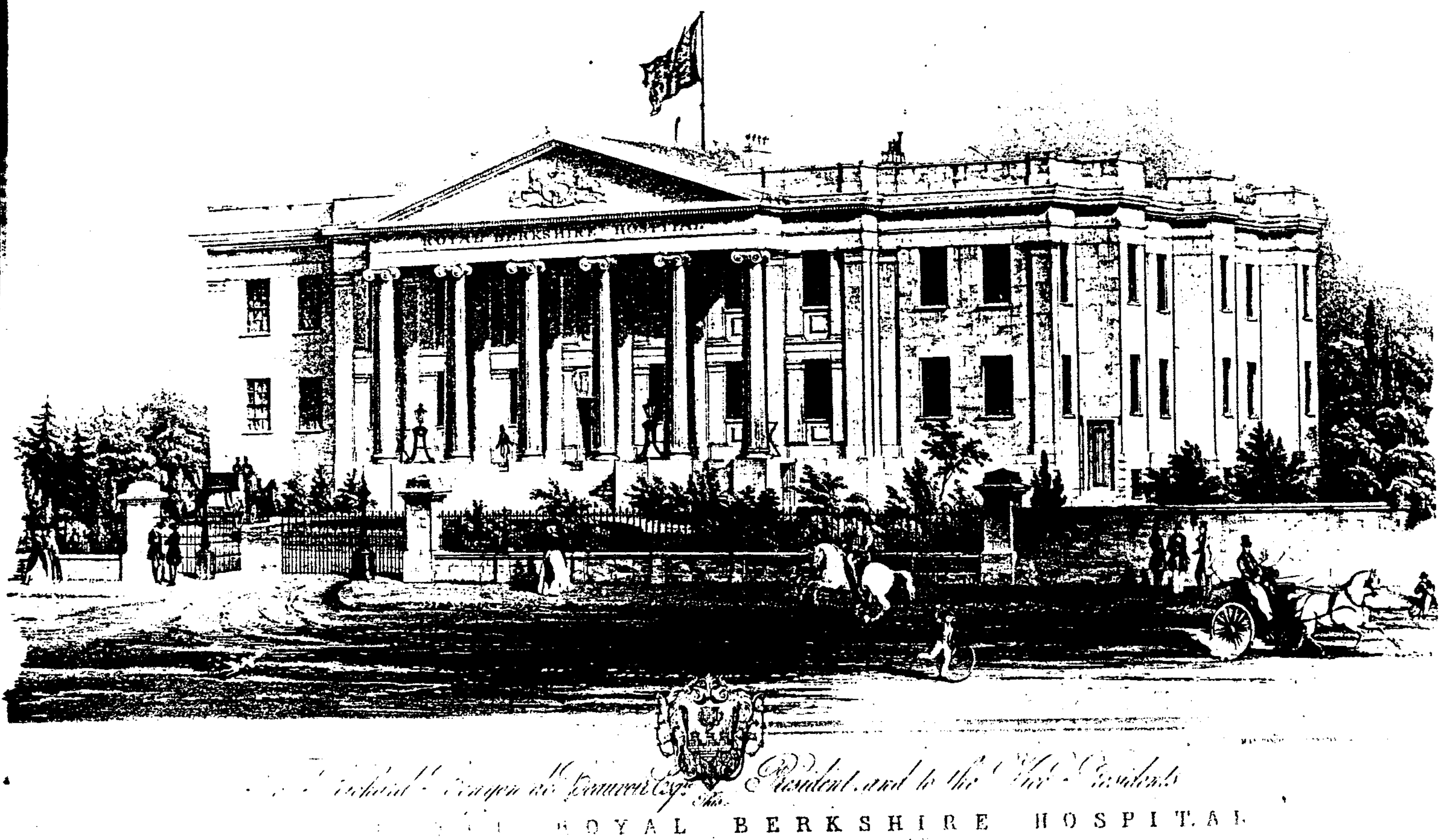
"Medicine is a social science, and politics is nothing more than medicine on a grand scale."

Rudolph Virchow (1821 – 1902)



SURGICAL INSTRUMENTS IN THE TAXILA MUSEUM COMPARED WITH GREEK AND ROMAN INSTRUMENTS

NASIM H NAQVI

The surgical instruments prior to the first millennium have been excavated only from either Greek or Roman sites. The earliest belong to the Aegean period of about 1500 BC[1]. Maximum numbers of Roman surgical instruments were found in Pompeii and rest from many other Roman sites. The excavated surgical instruments provide hard archaeological evidence of surgical practice and the level of refinement in their construction is mark of the sophistication in the surgical skills. No doubt the Roman surgical instruments are highly sophisticated and complex, an indication of high level of Roman surgery. In contrast to Roman and Greek surgical practice when we look at the evidence of surgery in ancient India we discover ample historical evidence but it is not backed by any archaeological finds. The archaeological evidence in relation to surgery documented in writings is weak and relies on the sculptures depicting mythological stories. One story often quoted by historians of ancient Indian medicine is of King Sibi who ordered his flesh to be cut off by a surgeon and fed to the eagle so that the life of the dove may be saved.[2] In his monograph Mukhopadhyaya has recorded, "as far as I have been able to trace, our museums contain no finds supplying us with any information".[3] Another statement from recent publication of history of Indian medicine is also worth quoting, "medical texts do not contain any development of surgical ideas, nor do any genuinely ancient or medieval surgical instruments survive".[4]

The paper presented in a previous HMES meeting in Reading reported an important archaeological site where 2000 years old surgical instruments were excavated. Later it was fully documented and published in *Medical History.*[5] Taxila is an ancient university town situated about 20 km from the capital Islamabad in Pakistan. Sir John Marshal (1876-1958) during the early 20th century started the excavations that are still going on bringing to surface new material from numerous sites of the Gandhara civilization.[6] The peak period was during the reign of Emperor Kanishka who ruled during 100-126 AD and laid the foundation of a new township in Taxila. Kanishka's personal physician Caraka is famous as the compiler of *Caraka Samhita.* Taxila was prestigious centre of excellence for medical education since 600 BC when legendary Atreya was revered as great teacher. At a site with this background it is reasonable to expect that surgical and medical artefacts will surface. Archaeologists have discovered among many metal objects some instruments that were used for surgery. The people of the region had advance knowledge of metallurgy and were skilful metal workers. The instruments are made of copper and are the only surgical instruments ever discovered any where out side the Greek and Roman civilizations.

All together there are 13 instruments that are exhibited in the Taxila museum, all are illustrated in the accompanying figure. One labelled E is only a handle fragment and may not belong to a surgical device. Another labelled I is a device used to present offerings to gods and not a surgical instrument. The remaining 11 are discussed below along side a comparative account with Roman and Greek surgical instruments.

Decapitators. The decapitator is a term introduced by the British obstetricians during the middle of 19th century, among the Europeans it was known by its ancient name of Hook Knife or Embryo Hook. It was used to cut the neck of a dead foetus during obstructed labour and was first described by Celsus (mid 1st century AD) in his famous book *De Medicina*. A similar instrument is also described in *Susruta Samhita*. A number of such devices were discovered in Taxila from the period of second century BC to second AD. One almost complete (Fig 1, D) and two other fragments of blades (Fig1, G and H) are included in the illustration. One that is complete is 34cm in length; tits blade is sharp inside and blunt outside with a rounded handle ending in a disc. This description applies to all such objects and also agrees with what Celsus has recorded about a similar device. Here is the quote from *De Medicina*; " the remedy then is to cut through the neck, in order that the two parts may be extracted separately. This is done with a hook, which resembles the one mentioned above, but has all its inner edge sharp. Then we must proceed to extract the head first, then the rest ".[7] Although few blunt hooks from Roman period have been excavated but no sharp hook as described by Celsus has ever been identified by the archaeologists. Milne in his book has shown a drawing of a sharp hook, which shares many features with the decapitator from Taxila.[8] The only other similar instrument of Byzantine period may be seen in the catalogue published by Künzl in 1983.[9] The decapitators were used till middle of the 20th century, these modern instruments only differ in size and quality of metal when compared with those found in excavations. The basic design of all these devices remains unchanged for nearly 2000 years and one from Taxila described above fits well in the scheme of their general design.

Probes. Three objects in the Taxila museum are probes measuring about 7 to 9 cm; one of these (Fig1, K) sustained considerable damage but the other two (Fig1, L and M) are finely made and in good condition and might had wooden handles. The probes also exhibit similarities with the Greek and Roman probes illustrated in various catalogues and displayed in museums. In ancient times probes were used to puncture boils, explore wounds and similar other surgical applications.

Spatulas. Probably the largest group of instruments excavated from Roman sites is the Spatula, these are seen in huge numbers both in collections and in catalogues. Five were excavated from Taxila but two are in the display (Fig1, A and B). All had some common features, they were uniform in length measuring about 22cm and their handles are moulded in a special fashion. The blades are flat and oblong, one had a heart shaped hole in the middle of the blade. Most of these were excavated from the layers related to the 1st or 2nd century AD.

The remaining three objects are quite unusual in shape; two are equal in size measuring about 14cm (Fig1, C and F). The third is smaller (Fig1, J) and very much resembles in size and shape with an instrument described by Milne as a 1st century Roman tongue depressor. In view of their unusual shape, size and weight it is difficult to speculate any domestic or trade function for them but considering the shape of the blade and convenient length of handles their use as a tongue depressor is quite a plausible speculation. Similarity with Roman tongue depressor further supports the view that they might have been used as tongue depressors.

Now we consider some of the object not in the display but are recorded and Illustrated in the catalogue of excavations from Taxilaj. One of these about 8cm long is a copper forceps, made from a single strip of copper bent in the middle and the loop is strengthened with a copper ring to make it springy. It was discovered in the stratum of early first century BC. This forceps when compared to one exhibited in the museum of Epidaurus in Greece look remarkably similar.

A number of iron knives of different shapes and sizes are among the exhibits; most have obvious domestic or hunting application. A few of these are razors and it is accepted that razors during ancient times were used for surgical purposes. During early seventies a scalpel was excavated by the French archaeologists from the Buddhist site in Afghanistan, which correspond to the same period as Taxila during the rule of Kanishka. This object is comparable in all respects with the Roman scalpels excavated from the sites of the same period.[10] An essential surgical device is a suturing needle; a number of these were discovered in Taxila at depth related to the 2nd century BC.

The discovery of the scalpel, suturing needles and about a dozen substantial surgical instruments fully endorse the notion that instruments were designed and manufactured for surgical uses by the people living in this region 2000 years ago. The historic fame of Taxila as a place of medical learning and association with ancient medical personalities further supports this view. Apart from the metal instruments described above a large number of pharmaceutical implements like small weighing pans, pestles and mortars, pottery medicine jars condensers and some other related objects are also displayed. These objects deserve further research and judicious investigation to establish their medical association.

[1] Arnott R, Surgical practice in the prehistoric Aegean, *Medizinhist. J*, 1997, **32**: pp.249-78.
[2] Reddy DVS, The art of surgery in ancient India, *Bull. Hist of Med*, 1938, **vol. 6**: pp.81-87.
[3] Mukhopadhyaya G, *The surgical instruments of the Hindus with comparative study of the surgical instruments Greek Roman, Arab and modern European surgeons*, ed. J B Khanna, New Delhi:
R K Naahar, 1977, p. iv.
[4] Wujastyk D, 'Indian Medicine', in Bynum WF, Porter R, eds, *Companion encyclopedia of history of medicine*, London: Routledge, 1993. p.763.
[5] Naqvi NH, Surgical instruments in the Taxila museum, *Medical History*, 2003, **47**:pp.89-98.
[6] Marshall J, *Taxila: an illustrated account of archeological excavations*, 3 vols, Cambridge:
Cambridge University Press 1951.
[7] Spencer WG, (ed and tr) *Celsus De Medicina*, London: William Heinemann, 1938, pp. 459-60.
[8] Milne JS, *Surgical instruments in Greek and Roman times*, Oxford: Clarendon press, 1907, p.154.
[9] Künzl E, *Medizinishe Instrumente aus sepulkralfunden der römischen Kaiserzeit*, Cologene, Rheinland, 1983, p.52.
[10] Guillaume O, Rougeulle A, *Fouilles D' Aï Khanoum*, Paris: De Boccard, 1987, pl. XI (6).

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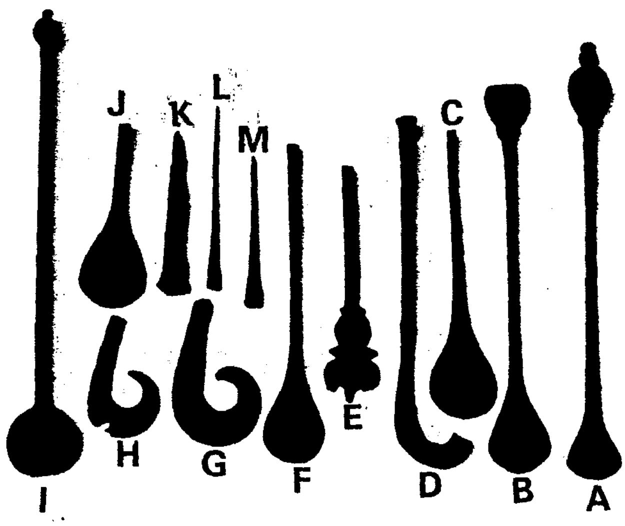
PLUTARCH (46 – 120 A.D.)
Greek Historian, Biographer, Philosopher
"To make no mistake is not in the power of man; but from their errors and mistakes the wise and good learn wisdom for the future"



ARTIFICIAL RESPIRATION IN OXFORD IN 1950'S

J M K SPALDING

Artificial respiration became important in the 1950's because of acute anterior poliomyelitis or polio. This disease has occurred for more than three thousand years if tomb paintings in Egypt have been correctly interpreted. Before the Second World War it occurred sporadically in Europe, but in the USA it caused major epidemics, victims including President Roosevelt. After infection only about 1% of people have diagnosable symptoms and the remaining 99% may excrete virus in their stools for six weeks, so that they are unwitting carriers. During the war, huge numbers of American troops came to Europe and after the war major epidemics occurred in Europe. The most serious cases were those with paralysis of the respiratory muscles so that artificial respiration was needed. At first, Europe used versions of the tank respirator, which had been developed in America before the war. This was a rigid box in which the patient was placed with only his head protruding and an air-tight seal at his neck. A huge electrically driven bellows was used to lower the pressure in the box 20 (or thereabouts) times a minute so that atmospheric pressure caused air to enter the lungs. Expiration was passive. Before the war Lord Nuffield had provided most hospitals in the country with a basic Both tank respirator but access to the patient for bedpans, skin care and physiotherapy was difficult, demanded that the patient should be able to breathe spontaneously for some time and required more space than was often available. With increasing need for respirators more convenient models were developed. A good one was the Smith-Clarke Alligator model, so called because it was hinged at the bottom and opened like that of an animal's jaw. This could be done more quickly than a Both respirator could be opened and closed, and the Alligator had ports in the side through which the patient could be reached and which even allowed a bedpan to be introduced with only brief interruption to the patient's breathing. Tank respirators saved lives but they only did so if the patient could keep his airway clear. Polio patients with respiratory paralysis, very commonly also had paralysis of swallowing. If they survived the ability to swallow almost always recovered but in the acute stage it usually caused them to inhale their saliva with fatal effects on their lungs.

Polio is spread by lack of faecal hygiene. The Danes rightly believed that their country was very hygienic and wrongly concluded that this would protect them from polio. They had a major epidemic like those that occurred elsewhere but they found themselves unprepared and with no respirators. It occurred to them that a patient with widespread polio presented much the same problem as a patient paralysed with a muscle relaxant for operation so they intubated their polio patients and maintained respiration with anaesthetic machines. They paid medical students to squeeze the bag. With the endotracheal tubes then available the vocal cords did not tolerate prolonged intubation so they substituted a tube through a tracheostome. They used cuffed tubes so that it no longer mattered if the patient could not swallow and this was a huge advance.

Medical students had been used only because of the emergency and machines were needed instead. In Oxford Dr Schuster, who had made apparatus for physiologists for years agreed to help. He mechanised the Radcliffe Inflating Bellows, which Professor Macintosh had previously devised (Fig. 1). The bellows was expanded by an electric motor and compressed under the influence of weights placed on top so inflating the patient's lungs. The amount of weight limited the pressure that could be applied to the airways and eliminated the problems associated with blow-off valves as safety devices. The alternation of inspiration and expiration was arranged by a flutter valve made by Dr Frank Stott.

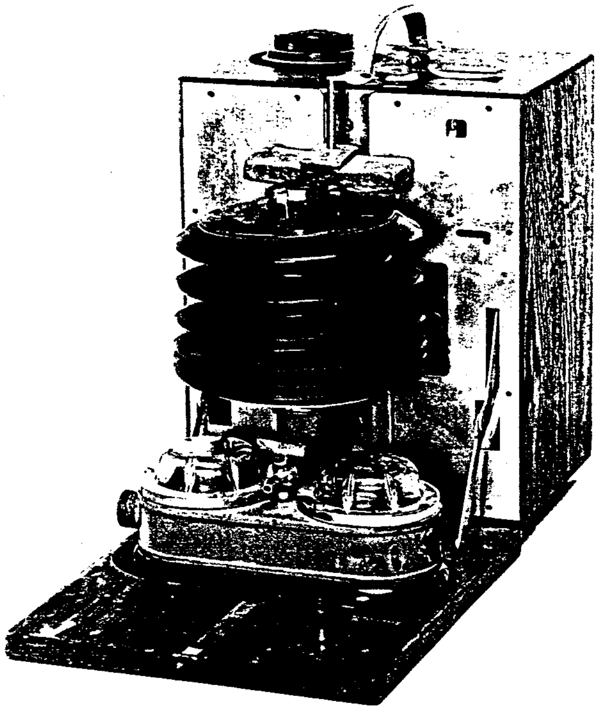
The Danes gave their patient's air or oxygen from cylinders and as these gases were totally dry the patent's secretions dried and became impossible to remove. The inspired gas, even though with our machines it was room air needed to be humidified. The traditional but untested way at the time was to bubble air through water at room temperature but we found that this did almost nothing. In the end we got about 100% humidification by passing the air over water that was warmed by an electric heater controlled by a thermostat. An early model of our humidifier is shown in use in Fig. 2. The intermittent pressure tended to crack them and commercially they were made from pressure cookers. In due course the inspiratory and expiratory valves were cam driven as in a car engine and they, the bellows, the humidifier and an expired air meter were combined in one unit (Fig. 3). A negative pressure bellows was added to assist expiration but I am not certain that it was much help. The unit could be run from the mains or from a 12-volt battery. The latter permitted travel to the x-ray department, or to another continent for we were asked to bring patients home from distant parts.

We assessed the adequacy of respiration by observing whether the patient made respiratory efforts with surviving muscles, for blood gases were not yet available. At regular intervals the nurses measured the volume of air expired using a modified form of meters designed to measure domestic gas. If the volume fell the probability was that secretions had blocked part of a lung and needed to be removed. We knew that we were over-breathing the patients and we were anxious to know by how much. The assess this we measured the end-tidal CO2. A device which took a sample of expired air at the end of each breathe fed it to a CO2 meter similar to that used by the respiratory physiologists, Drs Dan Cunningham and Brian Lloyd. It measures the difference in pressure as gases flow along two parallel channels one filled with unaltered end-tidal air and the other with end-tidal air from which CO2 has been removed. The principal is that of a Wheatstone bridge adapted for gases.

"Intermittent Positive Pressure Respiration" (IPPR) s it was then known was available in only a few places and we were asked to help with patients from elsewhere who were unfit to travel unaided. So that we could set off without delay we had a suitcase set up with the necessary equipment laid out for use and clipped in place.

Some patients with respiratory polio made satisfactory recoveries and one return to work as a don. A number however remained dependent on a respirator. To get about they needed a wheel chair with respirator and 12 battery and we built these using chairs from aircraft, as these chairs were then very comfortable.

Other respiratory equipment in use at the time included the rocking bed and the cuirass. When the rocking bed tilted foot-down the patient's guts tended to slip into the pelvis and the diaphragm descended, helping inspiration; when it tilted head-down the guts reversed their travel and pushed the diaphragm into the chest. This could be helpful for a patient with a paralysed diaphragm but useful intercostals muscles especially if they could breathe spontaneously by day but needed help at night. This situation however was not common. The cuirass resembled the cover for a very large Christmas turkey. It had a very soft rubber edge and fitted over the front of the chest and abdomen to make an airtight seal. An electric motor reduced the pressure inside the cuirass 20 or so times a minute and this caused inspiration on the same principle as with the tank respirator. It was however very much less efficient but could be useful for a patient who could breathe spontaneously by day but needed help at night.



We learned the elements of IPPR with polio patients, but very rewarding results often came with patients with Guillain-Barré syndrome, tetanus (treated with curare), and myasthenia gravis though each presented their individual problems, some of them lethal. Such problems involved the autonomic nervous system, that we had to investigate, and this brought us other patients with autonomic disease.

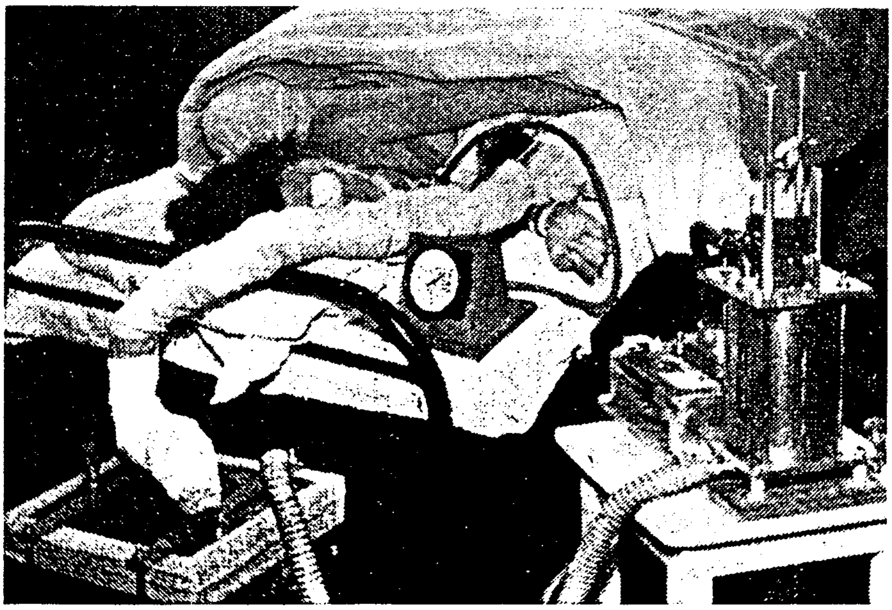


Fig. 2 One of our first patients. An early humidifier at bottom left. A prototype respirator on the right. (Smith A C., Spalding J M K & Russell W R (1953) Lancet ii, 939-945.)

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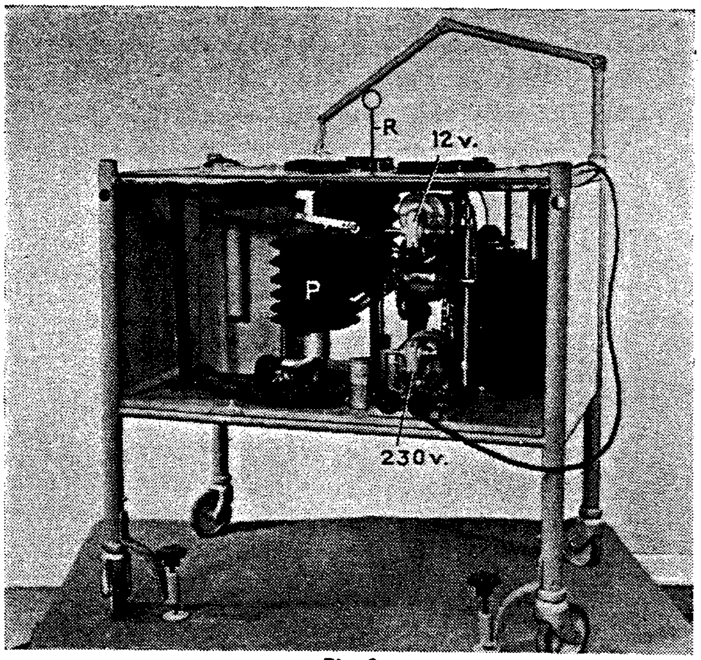


Fig. 2

Figs. 2-4—Radcliffe positive-negative respiration pump (side plates removed) showing main components: positive-pressure bellows (P), negative-pressure bellows (N), humidifier (H), cam-operated valves (V), gas-meter (M), and 12-volt D.C. and 230-volt A.C. motors.

Fig. 3 "Radcliffe positive-negative respiration pump". It was manufactured by H G East & Co and was used for decades until the introduction of electronics. Its simplicity made it easy for nurses to manage and for engineers to maintain.

"Vita Breva, Ars Ucro Longa"
(Life is short, and art is long)
HIPPOCRATES (460 – 356 B.C.) : Father of Rational Medicine
(FIRST APHORISM)

"A disease, in my opinion, how prejudicial so ever its causes may be to the body, is no more than vigorous effort of Nature to destroy (exterminare) the morbific matter, and thus recover the patient".
Introduction : "Methodus Curandi febres"
(The Method of Treating Fevers)
THOMAS SYDENHAM (1624 – 1689)
"English Hippocrates"

THE HISTORY AND EVOLUTION OF THE OPHTHALMOSCOPE

C RICHARD KEELER

[The paper based on the lecture given by the author at the Autumn meeting of HMES held at Green College, University of Oxford on Saturday 6th October 2001, has already been published in Arch Ophthalmol, Vol. 120, February 2002, P194 - 201, American Medical Association. Hence a summary of the paper is given. It was the 150th anniversary of the invention of the ophthalmoscope by Helmholtz].

SUMMARY

"In the whole history of medicine, there is no more beautiful episode than the invention of the ophthalmoscope and physiology has few greater triumphs". Thus wrote American ophthalmologist Edward G Loring in his "Textbook of Ophthalmology, Part 1" in 1982 (London, England : Henry Kinston), 2 years before the death of Hermen Ludwig Ferdinand von Helmholtz (1821 – 1894) – the great German physicist and physiologist of the 19th Century. Helmholtz first demonstrated that there were three essential elements to the working of an ophthalmoscope : a source of illumination, a reflecting surface to direct light toward the eye, and a means of correcting an out-of-focus image on the fundus. Over the last 100 years or more since his time, the essential elements have been achieved. In the process candle lamp, oil lamp and gas lamp were used for illumination – prisms and lenses for reflecting light. Method of correction needed mirrors and condensing lenses.

An ophthalmoscope is basically an apparatus for illuminating the retina using a battery and small bulb. For normal vision the ophthalmoscope consists simply of a small hole to look through and source of illumination. The light is reflected into the eye by a mirror. The observer looks directly through the hole in the centre of the mirror. The ophthalmoscope has lenses to correct for visual defects of either the observer or subject.

The invention of the ophthalmoscope 152 years ago from now by Herman Von Helmholtz was enormously exciting for the ophthalmologists of the day and fostered respect for and recognition of ophthalmology as a medical speciality. The physician and the ophthalmologist were both equally indebted to Helmholtz.

"Eight years after the discovery of the ophthalmoscope, Albrecht Von Graefe, the greatest advocate of this new tool, presented Helmholtz with a cup at the 1858 Heidelberg Ophthalmological Congress. The cup was inscribed with words that are as appropriate today as they were then : "To the creator of a new science, to the benefactor of mankind, in thankful remembrance of the invention of the ophthalmoscope".

- Editor

xXx

"Light as the radiant energy of creation, started the ring dance of atoms in a diminutive sky, and also the dance of the stars in the vast, lonely theatre of time and space. The planets came out of their bath of fire and basked in the sun for ages".

Rabindranath Tagore (1861 – 1941), Nobel Laureate in Literature, 1913 : Opening sentences (first two) of the Hibbert Lectures – "The Religion of Man", delivered at Manchester College, University of Oxford in May, 1930.

THE RISE AND DECLINE OF NEEDLE-HOLDERS

JOHN R KIRKUP

Closure of fresh wounds by needle suture is not recorded by Hippocrates who taught wound approximation by careful bandaging. Four hundred years later, in the first century AD, Celsus provided details of abdominal wound closure in two layers for which cutting triangular pointed needles were required (1); such needles have been recovered occasionally in Roman archaeological material. We can be sure these needles were grasped between thumb and index finger as no description of a specific needle-holding instrument is evident before the 18th century. Earlier, Parẽ described a handled needle, that is a needle fixed in continuity to a handle, with the eye adjacent to the penetrating point, in order to ligature aneurysms and repair herniae (2); no evidence of their employment for skin closure is known. Eventually, Garangeot's description of 1727 suggests that mechanical difficulty in handling small needles for infants' harelip surgery stimulated the introduction of the "porte-aguille" or needle holder. He wrote: "When needles… have to be extremely fine and become so small that the surgeon cannot hold them firmly; or when the skin to be pierced is so thick that small needles penetrate with difficulty, one cannot consider needle holders useless instruments; the security and precision they obtain are esteemed by sensible practitioners." (3).

Analysis identifies four structural forms of needle-holder, based on: (i) the spring forceps, initially a simple split rod controlled by a sliding collar and, later, the true dissecting forceps locked by a variety of catches (fig. 1), and fundamentally bimanual instruments, unlike the following; (ii) the pivoting forceps with plain handles gripped by the palm and controlled by thumb or little finger catches (fig. 2); (iii) the pivoting forceps with bow handles controlled entirely by thumb and ring finger (fig. 3 (a-c); and (iv) combination of spring and pivot forceps, closed automatically by the spring and opened by the palm (fig. 3 (d)).

Spring Forceps Structures

Both Heister in 1718 and Garangeot inserted needles by a pushing action using a split rod construction (mini-spring forceps) controlled by a sliding collar, known in the 19th century as Roux's needle-holder (fig. 1 (a)); thus the needle was held in-line with the handle and the power of the wrist, elbow and shoulder brought to bear simultaneously. In the early 19th century, the standard spring forceps was modified to hold needles both in-line and transversely, employing a variety of catches (fig. 1 (b)). This type of holder was abandoned rapidly when the pivoting forceps was adapted for holding needs in the later 19th century, except by eye surgeons with whom spring forceps holders remained popular. Nevertheless, in the early 20th century the principle of spring forceps action was incorporated into Lane's needle-holder (fig. 1 (c)) for cleft palate surgery although needles were manipulated transversely. Compared to in-line insertion, transverse insertion was much more controlled with the forearm rotating gently, by smooth pronation and supination, whilst the wrist was held in dorsiflexion; the coarser movements of elbow and shoulder were not required.

Pivoting Forceps Structures

(i) Plain Handles

The introduction of pivoting forceps, especially with ratchet control (figs. 2 (b-d), 3 (b)) ensured security in deep tissues especially for the demands of vesico-vaginal surgery when wound repair necessitated transverse movements of needles carrying silver wire, as devised by Sims about 1858 (4). However, an earlier exception must be recognised for Dieffenbach's pivoting needle holder, circa 1840, for cleft-palate repair. This beautifully designed instrument held in the palm and controlled by a thumb release ratchet (fig. 2 (a)) was years ahead of its time yet, for reasons unexplained, remained in obscurity until the concept was re-introduced by Durham, circa 1889, by Roubaix, circa 1895 and continued recently by Potts-Smith's modifications for cardiac surgery. In 1893, Hagedorn introduced a needle holder closed by the palm with a ratchet offering four positions, released by gentle flexion of the ratchet lever by the little finger tip (fig. 2 (b)), a concept developed by the later holders of Halsted and Cushing (5). By contrast, the Mayo or Rochester holder with a ratchet between the handles was released by a sophisticated thumb button (fig. 2 (d)). Another variant of plain handled holders is associated with Mathieu and Macphail, the terminations of the handles meeting in a ratchet which, closed by palmar compression, was automatically released when maximum compression disengaged the catch at the end of the ratchet, no manipulation by either finger or thumb being required (fig. 2 (c)).

(ii) Bow Handles

By means of bow handles, control of closure and opening is transferred to the tips of opposing fingers and thumb which, being at the termination of the handles, transfers maximum leverage to pivot and jaws. The resulting very secure grip exerted on needles explains the dominance of this type of needle-holder in 20th century surgery. Usually these holders have a series of ratchet catches between the handles (fig. 3 (b)) providing a choice of gripping pressure on needles; release requires dexterous and sometimes awkward manipulation between thumb and fingers although this diminishes with practice. This ratchet catch was absent from Spencer Wells first needle holder (fig. 3 (a)), despite its contribution to his well-known artery forceps; however, note the very short jaws and resultant strong leverage of the handles. This absence of a ratchet catch also applies to Gillies famous combined needle-holder-scissors for plastic surgery (fig. 3 (c)), characterised by asymmetrical handles which enhance ergonomic control by thumb and ring finger.

Spring Combined with Pivoting Forceps

These are generally small instruments designed for ophalmic surgery, for example Saunders' and Castroveijo's needle-holders (6) but larger versions were in use at the end of the 19th century, known simply as spring-pattern needle holders (fig. 3 (d)). The handle is a widened version of a spring forceps which is adjusted to act on two pivoting joints, one near the jaws; automatic closure by the powerful spring is cancelled by palmar compression of the handle to open the jaws. This particular form was adapted for a number of needle holders in the early 20th century but, for unknown reasons, never prospered.

Recent Developments

With the introduction of Michel's metal clips for skin suture in 1900 (7), a gradual change evolved towards closure without needle holders, including the reintroduction of adhesive but sterile wound strips; this has accelerated in the last 25 years with the appearance of staple guns, both for skin, bowel and other viscera. Attempts to utilise wound glue may also displace needle suture, especially if the key to wound healing is uncovered. In effect the needle holder is in decline.

Finally, it is emphasised that needle holders do not function as true surgical instruments, that is they do not act directly on tissues unlike scalpels, dissecting forceps, clamps and needles themselves. Needle holders are 'go-betweens' linking hand to needle and although very important, simply control and manipulate minute instruments known as surgical needles; these alone penetrate the tissues.

REFERENCES:

1. Spencer, W.G., *Celsus: De Medecina* (London: Heinemann, 1935-38), vol. III, 387.

2. Parẽ, A., *The Workes* (London: Cotes & Young, 1634), 209.

3. Garangeot, R., *Nouveaux Traitẽe des Instrumens les Plus Utiles* (Paris: Huart, 1727), vol. I, 208-9.

4. Sims, J.M., *Silver Sutures in Surgery* (New York: Wood, 1858).

5. Down Bros., *A Catalogue of Surgical Instruments* (London: author, 1906), 194.

6. Allen & Hanburys, *A Catalogue of Surgical Instruments* (London: author, c. 1910), 166; and Holborn, *General Catalogue of Surgical Instruments* (Broadstairs, author, 1978), E10.

7. Michel, P., "Nouveaux procẽdẽ de suture et instruments pour l'agrafage de la peau". *Rev. Illustr. de Polytechnique Mẽdicale et Chirurgicale* 13 (1900) : 561-565.

CAPTIONS

Fig. 1. Needle holders based on spring forceps ; (a) Roux's, (b) Charriẽre's, also a haemostat, (c) Lane's.

Fig. 2 Needle holders based on pivot forceps, with plain handles; (a) Dieffenbach's, (b) Hagedorn's, (c) Mathieu/Macphail's, (d) Mayo/Rochester's.

Fig. 3 (a-c) Needle holders based on pivot forceps with bow handles; (a) Spencer Wells' (b) Clarke's (c) Gillies, also with scissors blades: (d) Needle holder based on spring and pivot forceps.

x X x

"Man brings all that he has or can have into the world with him. Man is born like a garden ready planted and sown"
William Blake
(1757 – 1827)

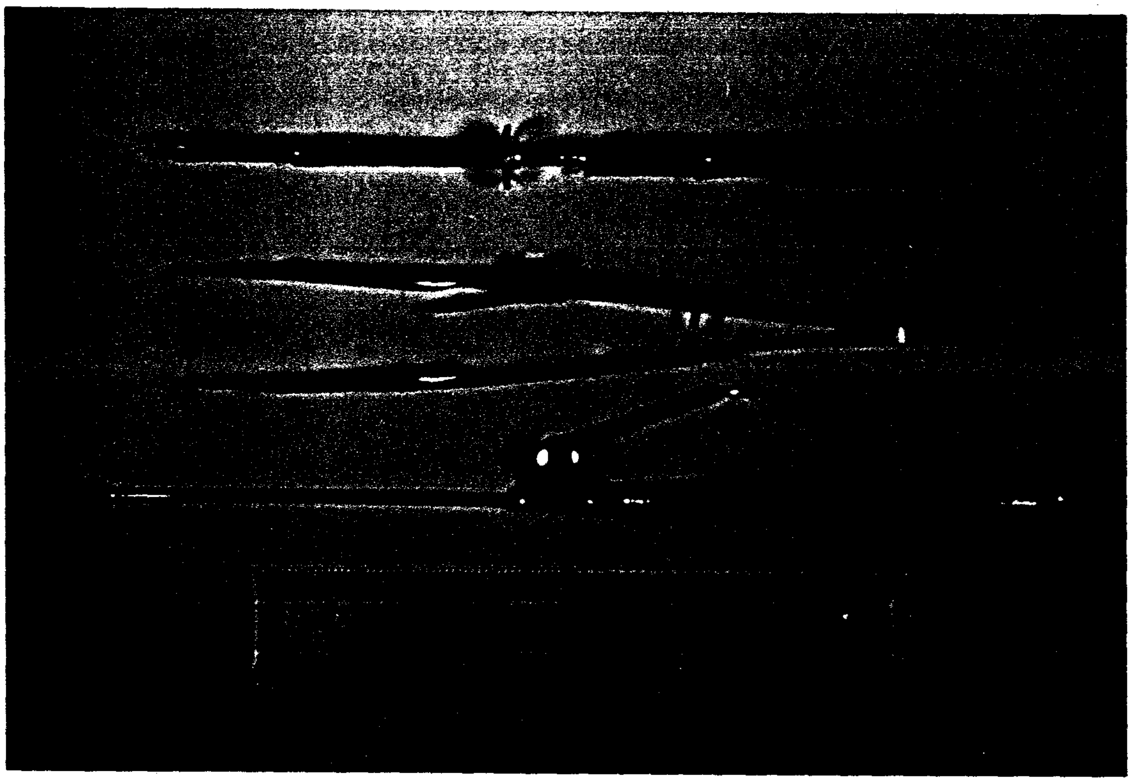


Fig. 1 – Top to bottom, (a), (b) and (c)

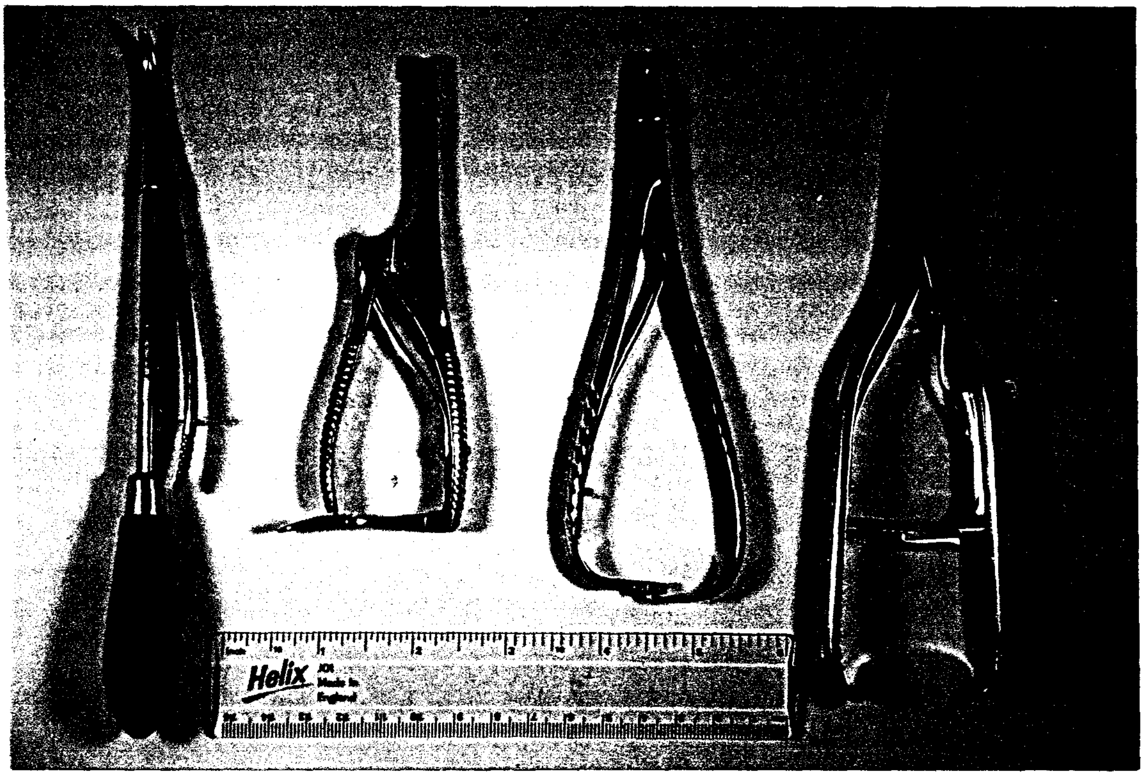


Fig. 3 – Left to Right, (a), (b), (c) and (d)

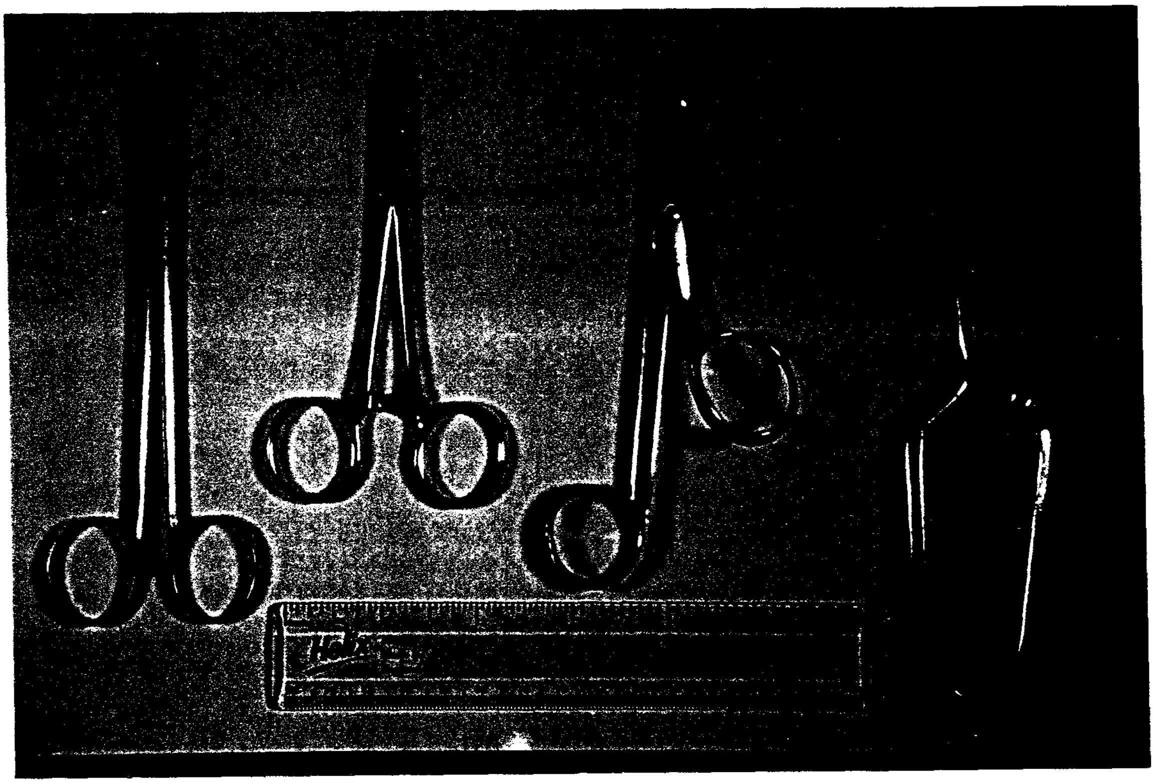


Fig. 2 – Left to Right, (a), (b), (c) and (d)

A HISTORY OF GASTROSCOPY

PROFESSOR M S LOSOWSKY
Executive Chairman, Thackray Museum,
Leeds

Early attempts to see the interior surfaces of body cavities were made in the late eighteenth century in Germany, France and Italy. Compared with the stomach, organs such as the urethra, the bladder and the vocal chords were relatively easily approached. Difficulties in relation to the stomach included the long distance from the surface meaning that adequate light would be difficult to achieve, the considerable angulation of the route from the mouth and the irregular shape of the organ.

In retrospect, the history of gastroscopy can be divided into three phases, firstly the era of rigid endoscopy, secondly the era of "flexible" (in reality semi-flexible) gastroscopy and the fully flexible or fibreoptic era.

Rigid Gastroscopy

This commenced in 1868 when Adolph Kussmaul persuaded a sword-swallower to allow a tube, 13mm in diameter, into his stomach. This proved of no practical value in visualising the interior of the stomach, but nevertheless represented a great breakthrough.

Thereafter, Kussmaul designed a rigid gastroscope and he was followed by others, notably von Mikulicz. A wide variety of innovations was introduced without overcoming the innate problems.

A notable name at this stage was Rudolf Schindler who went on to pioneer the next stage.

The "flexible" (semi-flexible) era

Although radiology of the stomach followed rapidly on the discovery of x-rays by Roentgen in 1895, the need for a three dimensional view of the stomach and its contents remained.

In 1932 Schindler, in co-operation with the instrument maker Wolf in Germany, produced the Wolf-Schindler gastroscope which was to dominate the field for some thirty years.

This gastroscope was semi-flexible in that the flexibility was restricted to the lower portion of its length and to a bed of some 34^0 (Fig. 1). The instrument was based on a complex series of many lenses within the tube allowing the image to be transmitted whether the tube was bent or straight. Schindler describes how this was the culmination of a long collaboration between the physician, himself, and the instrument maker, Wolf, before final success (Gastroscopy, the Endoscopic Study of Gastric Pathology, by Rudolf Schindler, published by The University of Chicago Press, 1937).

Schindler became the dominant figure in undertaking, advancing and teaching gastroscopy, initially in his native Germany and then, when he was forced out of that country, in the USA.

Gastroscopy was not, however, without its critics. Trenchant critics included the German surgeon Ferdinand Sauerbruch who was a man of considerable power and influence, and the eminent British physician Lord Horder who pronounced that gastroscopy was repugnant to the British character! Nevertheless, Schindler's dedication and incredible attention to detail achieved international recognition.

Gastroscopy, however, still had considerable limitations. The method could be undertaken only in selected subjects in view of the limited flexibility of the instrument, there were areas of the stomach which could not be visualised, and there were not considerable risks to the procedure.
The popularity of the procedure and the magnitude of the risk can be judged form an article (F. Avery Jones et al, "The Lancet" vol. 1, 1951, page 647) describing the result of 49,000 examinations by 40

gastroscopists with 75 complications and 32 deaths.

It was at this stage, in the nineteen-fifties, that I started being taught gastroscopy.

The Fibreoptic Era

The basic idea of fibreoptics, that a fine thread of glass while being flexible will still transmit light, can be attributed to John Logie Baird (Calder et al., "Journal of the Royal Society of Medicine" 2000 vol.93, page 438), famous in relation to his work in the development of television, who applied for a patent in 1926. This concept remained unremarked until two publications in the journal "Nature" in 1954 (Vol. 173, both on page 39) by van Heel of Delft, and Hopkins and Kapany of London, suggested the relevance of fibreoptics to endoscopy.

Problems which needed to be overcome included obtaining consistent orientation of individual fibres within a bundle so that they maintained their positions relative to each other from top to bottom (forming a "coherent" bundle), insulation of light from one fibre to another (avoidance of "cross-talk") and polishing the ends of the bundle to obtain "flat" optical entry and exit.

I attended The International Congress of Gastroenterology at Leiden in 1960 and a talk on the programme was entitled "New Information on the Application of Fibre Optics in Endoscopy". I recall a questioner asking when he might have a fibre-optic gastroscope for his own use and the speaker suggesting that if might be in about 12 or 18 months and this provide exactly right!

The first practical fibreoptic gastroscope derived from the extensive work of Basil Hirschowitz who has described the history of its production ("Gastroenterology" 1979, vol. 76, page 864). Hirschowitz described a clinically useful model in "The Lancet" 1961, vol. 1, page 1074 including the use of both still and movie colour photography and the examination of the duodenal cap. Thereafter, fibreoptic gastroduodenoscopy developed apace. A range of therapeutic manoeuvres, demonstration of pancreatic pathology by retrograde dye injection, and the development of percutaneous endoscopic gastrostomy for tube feeding are examples of subsequent use. Current gastroscopes are extremely flexible (Fig. 2) allowing inspection of all parts of the lining of the stomach and duodenal cap.

Since 1983 the application of charge-coupled devices allows the image to be projected directly on a television screen with the potential for computer linkage to allow instant printing of photographs, preparation of an instant report and the potential for registration and classification of data as information is obtained.

The Future

There will, no doubt, be many ingenious developments and applications of the technology. Examples currently at the point of availability include wireless capsule endoscopy for examination of the small bowel, high magnification endoscopy for detection of minute lesions and confocal microscopy to obtain histological information at endoscopy.

Legends to Figures

Fig. 1. Wolf-Schindler gastroscope, from the collection of The Thrackray Museum, Leeds. The maximum flexibility of 34^0 is indicated.

Fig. 2. The tip of a modern gastroscope showing its great flexibility.

x X x

"He who knows only one branch of his art is like a bird with one wing….."

(Susruta Samhita (600 B.C. – 1000 A.D.)
:
SUSRUTA : FATHER OF SURGERY)

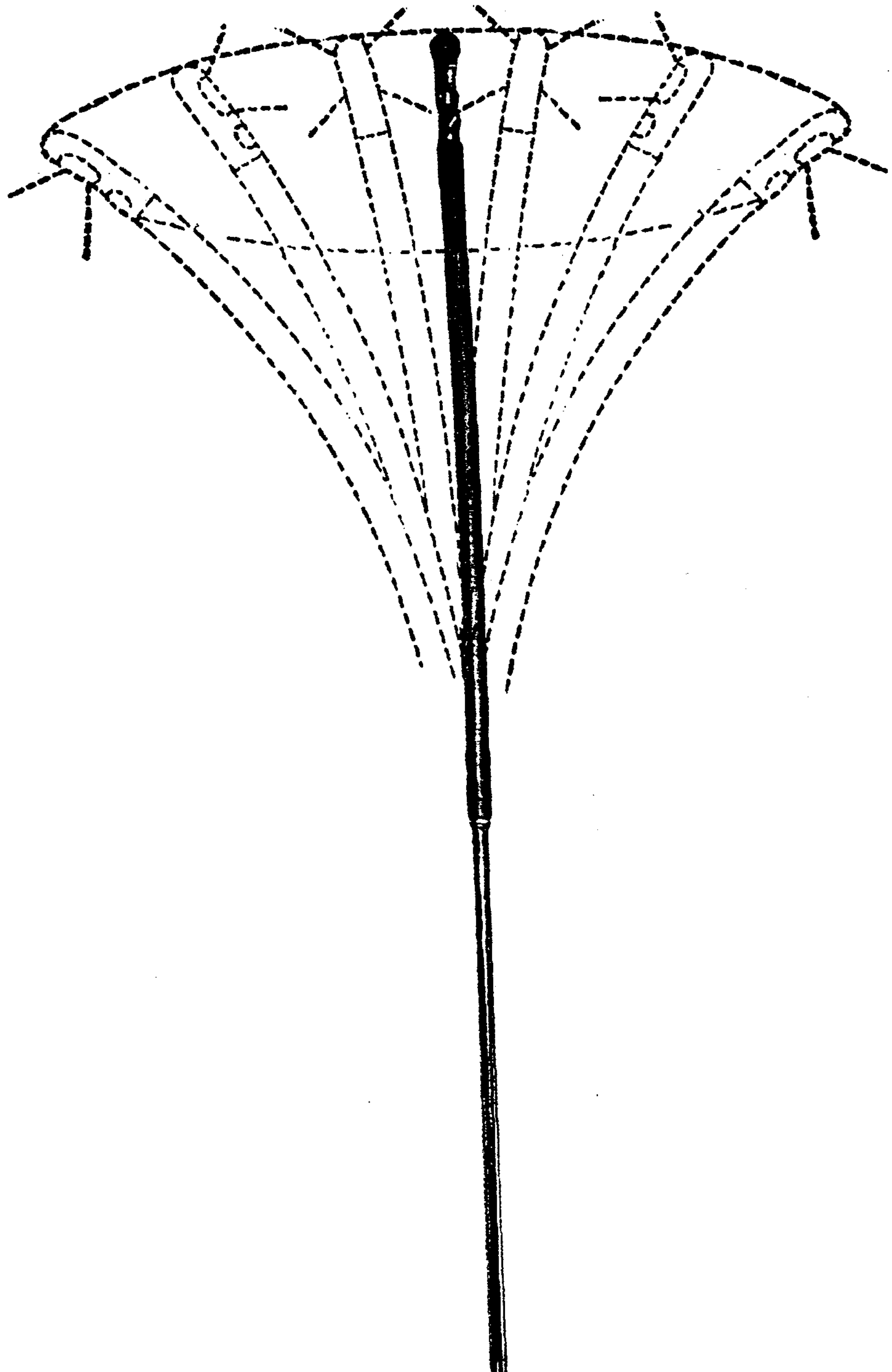


FIG. 1

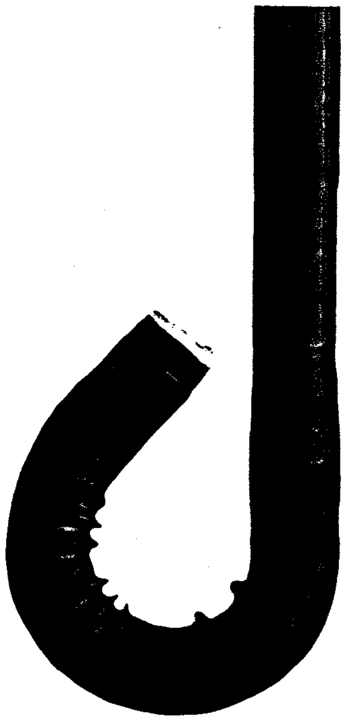


FIG. 2

SPA TREATMENTS AND EQUIPMENT

JOHN HARCUP

[Soon after settling in Malvern in 1963 the author was amazed to find that some of the residents of Malvern Wells firmly believed in the healing properties of the local Holy Well. This prompted the speaker to research the history of the forgotten spa town.]

There was a Malvern song, circa 1600, mentioning that a thousand bottles weekly were sent as far away as London, Kent and Berwick. Holy Well water had been bottled since 1622, making it the oldest bottled water in the country. Now, only Schweppes bottled water from the hills which was made famous for its purity by Dr John Wall, a founder of Worcester Infirmary and co-founder of the Worcester Porcelain Company in the 18th century. Dr Wall used the water to irrigate varicose ulcers and analysed the water and his results are remembered to this day in a couplet –

"The Malvern Water says Dr John Wall
Is famous for containing just nothing at all".

This was because surface water percolated through billions of fissures in the Pre-Cambrian rock comprising the hills and because it was so hard did not pick up any minerals by the time it issued as springs at lower levels.

W J Burrows bottled the water in the 19th century and produced a sparkling water as well as still water. Thus, bottled still and sparkling waters are not new products. Examples of various water bottles were shown, including a range of Schweppes bottles spanning 100 years.

Drinking spas were discussed and examples of Vichy (coloured and clear glass) were shown, together with those from Marianbad and Grafenberg, the latter was flattened as if it had been squashed when soft! Several drinking glasses were shown with their pouches. Karlovary flasks with hollow handles and a spout through which you drink the iron-laden spa water from behind the teeth so as not to stain them.

Examples of brass water cans were shown as this piece of Victorian domestic equipment was the "trademark" of the bath attendant. Cartoons, circa 1850, of the various treatments including the footbath, descending and ascending douches were shown and discussed with much amusement.

x X x

"Not everything that can be counted always counts, and not everything that counts can be counted."

(Albert Einstein (1879 – 1955), Nobel Laureate in Physics, 1921)

CLUB FOOT IN THE 19TH CENTURY AND ITS TREATMENT

K.M.N KUNZRU

INTRODUCTION

Clubfoot has been known for centuries and its supposed aetiology and treatment recorded from the time of Socrates. Famous individuals with this deformity include the Roman Emperor, Claudius, the French Diplomat, Talleyrand, the poet, Lord Byron, and William Little, the London Hospital doctor, who described Little's Diplegia and who set up the hospital for treatment of Club Foot in London.

I shall discuss only talipes equino-varus, the more common variety.

I have chosen to discuss Club Foot and its treatment in this period, the 19th Century, because of the significant advances that occurred in that century. The advent of anaesthesia and anti-sepsis resulted in the increasing use of surgical operations in treatment. Starting with tenotomy, it culminated in more extensive operative procedures to correct the deformity .

(An Illustration (I) of a baby with talipes equino-varus was shown to demonstrate the various features of the deformity).

This paper is in two parts. Part One describes the nature of the deformity as it was known before and during the 19th century. Part Two deals with the treatment in these two eras.

NATURE OF DEFORMITY

A. BEFORE THE 19TH CENTURY

1. Hippocrates (460-370 BCE)

In his *PERI ARTHRON* (1) he described the cause being external pressure applied to the baby in the womb; either excessive compression by clothes or by trauma. He considered these to be correctable unless the deformity was very severe. He recognised more than one variety of clubfoot.

2. Aquapendente (1533-1619)

Hieronymus Fabricius ab Aquapendente (the Professor of Anatomy and Surgery in Padova), who founded the famous Anatomy Theatre, and was William Harvey's mentor, considered the cause of Club Foot to be bony deformity. He based this on post mortem dissection and thought that Club Foot was due to persistent foetal position of the foot (2). He was convinced that most of these deformities could be corrected by careful repeated manipulation by nurses aided by bandages etc.

3. Camper (1722-1789)

Pieter Camper, Professor of Medicine in Amsterdam, in his dissertation on shoe induced deformities (3), found deformity of both the talus and os calcis in patients with clubfeet. He considered this bony deformity to be the primary cause, with contracture of muscles occurring secondarily.

4. Others

Timothy Sheldrake, an instrument maker to the Westminster Hospital in London, reported at the end of the 18th Century that the problem was caused by the legs of the baby being "too straight -causing the ankles to be curved" (4). This had and has not been observed by other doctors .He was probably misled by the leg muscle wasting in talipes equino-varus masking the physiological bowing of the tibia normally present in infants.

Popular superstition, dating from the Middle Ages, persisted in the belief in the influence of "maternal shock" in a pregnant woman who sees a cripple, or from the impression on the unborn child of the mother seeing such sights over a period of time, as a cause of Club Foot. This belief was so prevalent in certain Germanic countries that patients with deformities were cleared off the streets and isolated in institutions! Even some doctors accepted this as a possibility, e.g. Bruckner (5)!

B. 19th CENTURY

In the 19th century dissection and observation of post-mortem specimens resulted in expansion of new theories, and repudiation of the old, sometimes based on observations on one or two specimens only.

1. Scarpa (1752- 1832)

Antonio Scarpa, who had carried out extensive dissections in Pavia, recognised the dislocation of the talo-navicular joint but with normal shaped talus in Club Foot (6). Despite this the famous Abraham Colles (1773-1843) in 1817 in Dublin concluded that the talar neck was " too long and bent medially" on the basis of one or two dissections! (7)

2. Delpech (1777- 1832)

Jacques-Mathieu Delpech in 1823 (8) considered muscle imbalance to be responsible for production of the deformity rather than actual deformity of the bone itself. He based his treatment, tenotomy, on this theory of causation.

3. Little (1810-1894)

William John Little published the English version of his original Berlin Thesis in Latin in 1839 (9). He reported on his dissections in the Anatomical Institute in Berlin, where he had gone to have treatment of his own club foot by Dieffenbach, who, in turn, referred him to Stromeyer (vide infra). Little, too, considered muscle imbalance to be responsible for the deformity of Club Foot.

4. Adams (1810- 1900).

William Adams also concurred with Little's theory of "spasm", leading to muscle imbalance, in 1864 (10). He also recognised another type of condition, later named Arthrogryposis in 1923, in which there is poor distinctive definition and development of muscles and connective tissues, like ligaments, resulting in joint contractures and deformities. Adams also reported on the dissection of a postmortem specimen in which he had found atrophy of muscles on gross inspection and microscopy (the first microscopic study of muscle in Club Foot). The muscle abnormality is not surprising because the specimen was from a baby who had been born with spina bifida and myelomeningocoele. Adams was also able to distinguish clearly between true talipes equinovarus (with deformity of the whole foot) and metatarsus varus, simple forefoot varus.

TREATMENT

I will consider treatment in three sections:

A. Manipulation of the deformity and application of **"bandages"**(and plaster of Paris)
B. Manipulation of the deformity and application of **appliances**
C. **Surgical operation** and application of appliances.

A. BANDAGES

Pre 19th Century:

1. HIPPOCRATES:

Hippocrates (5) described the application of a bandage hardened with Cerate (a mixture of wax and resins, which sets hard) after manipulating the foot to correct the deformity. Following repeated manipulation and bandaging over a period of time the patient, when allowed to walk, wore special shoes. These were either like buskins (thick rigid soled shoes used when walking in the mud) or Chian sandals (from the island of Chios). No true description of the latter is available in extant literature (Retsas 11).

2. CHESELDEN (1688-1752)

William Cheselden (12), the English surgeon , used a technique he had learned from Mr Cowper, a bonesetter in Leicester who had treated Cheselden's elbow dislocation when the latter was a school boy. Cheselden used rags dipped in egg white and wheat flour, which set hard when dried out. These were applied wet, after the foot had been manipulated in to the correct position, and held till set. He also used this bandage for the treatment of fractures (Cheselden's technique illustrated in le Dran (13)).

19th Century

1. Dieffenbach (1792-1847):

Johann Friedrich Dieffenbach used a plaster of Paris mould to hold the foot in correction after manipulation (14). This type of management was promoted by Jules Guerin (1801-1866) in Paris (15) following Dieffenbach's principle .

2. Blumenkamp:

Blumenkamp, a Dutch surgeon, used his countryman, Mathysen's more modern plaster of Paris bandages after serial manipulation and correction (14).

B. APPLIANCES

1. ARCAEUS (1493 – 1573)

Franciscus Arcaeus described a corrective appliance consisting of a boot and flat medial and lateral irons (17). Arcaeus did not publish his work in life, but it was published posthumously in 1574. The manipulation was carried out after preliminary baths and poultices had been used to "soften" the parts and the foot was corrected forcibly. A wooden sole was applied to the foot with a bandage, and then the apparatus applied on top of the bandage.

2. FALLOPIO (1523 - 1562)

Gabriele Fallopio from Padova used gradual day-by-day correction of the foot deformity instead of using rapid brute force. An attempt was made to produce over-correction and then a kind of rigid shoe "for walking on clay" was applied (18). Like Arcaeus', Fallopio's publication was posthumous.

3. AQUAPENDENTE

Aquapendente (1592) developed his own appliance , which was an improvement and modification of that of Arcaeus, making the splint reach above the knee to get better purchase on the limb(2).

4. VENEL

Jean-Andre Venel (1789), in Orbe, Switzerland, was developed his own technique but never published it. His particular kind of appliance 'the sabot du Venel' was in use more or less to the middle of the 20th century in Switzerland. The design was based on an outside iron with corrective strap and boot. This principle was used in many other appliances made subsequently in Europe (19). It was introduced to Paris by d'Ivernois (20) with much success.

5. SHELDRAKE

Timothy Sheldrake (4 b) in 1798 used spring-loaded appliances, which he covered so that the spring did not show. He did not divulge the secret of the spring to others (it was Timothy Sheldrake's younger brother, William, who, without much success, treated Byron's club feet at Dulwich school and was accused of having bungled the treatment).

6. TYPHESNE

The Frenchman, Typhesne (a bandagiste in France) also used a leaf spring in his appliances and he too was quite secretive about these. Scarpa obtained the secret by visiting Typhesne's rooms in his absence by bribing the housekeeper (21).

7. SCARPA

Antonio Scarpa (1803) (6) devised two appliances (illustrations were shown). Both of these used a leaf spring (Typhesne's original idea) to control the correction of the deformity. Scarpa was convinced that gradual correction by wearing the first appliance (which was like a sandal) followed by walking in the second appliance (the so-called Scarpa boot) corrected most deformities.

C. SURGICAL OPERATION

1. SOFT- TISSUE OPERATIONS:

Before the 19th century

Before the 19th Century, open operation had been carried out with poor results. Lorenz, on the instruction of the physician Thilenius in 1789 (22) performed an open operation to divide the Achilles tendon on a seventeen year old girl with a paralytic club foot (due to a polio-like disease).
Antony Petit (23) was also reported to have carried out similar tenotomy but no details are available.
The results of open tenotomy were poor and the procedure was abandoned.

19th Century

1. DELPECH

Jean –Mathieu Delpech (8) was the first to perform percutaneous tenotomy of the tendo-Achilles followed by correction of the deformity by his own apparatus (illustration was shown). He, however, abandoned the operation because the patient's wound had delayed healing and ex-foliation of the tendon, and because of condemnation of his operation by many surgeons including his colleagues. Bouvier (1799-1877), however, reviewed this patient 20 years later and found a good result(24).

2. STROMEYER

Stromeyer (in Hanover), however, methodically carried out the same procedure as Delpech's Tenotomy, having modified the approach, and using gradual correction by an apparatus of his own devising [Illustration (II)] correcting the equinus deformity (25). On publication of Stromeyer's work, William Little (from the London Hospital) was directed to Stromeyer by Dieffenbach. Little had got a congenital club foot and had sought help everywhere to no avail. Stromeyer's correction of Little's foot deformity so impressed Little that he decided to stay on and learn the technique from Stromeyer.

3. LITTLE

William Little published a thesis on his work on club foot in 1834 in Berlin (under Dieffenbach who became an enthusiastic tenotomist) and re-published this work, revised and in English, on his return to London in 1839 (26). Little was a physician and had described Little's Diplegia. He, however, devoted himself to correcting foot deformities using Stromeyer's method. After correction Little used Scarpa's boot to hold the correction. Little also used tin splints to correct babies' feet undertaking tenotomy later, if required.

Little also devised a set of tenotomy knives and used these to divide other tendons, in addition to the tendo-Achilles, if the deformity was not fully corrected.

4. DUVAL

Vincent Duval (27) in the meanwhile in Paris, had devised a wooden box like apparatus, le Boite du Duval, and used this with some success in obtaining foot correction after tenotomy. The description of the treatment of the coachman's club foot, with disastrous results, in the famous French novel Madame Bovary, by Gustave Flaubert, describes use of Duval's apparatus. Gustave had seen the apparatus used by his famous surgeon father, Achille-Cleophas, at the Hotel Dieu in Rouen.

5. ADAMS

William Adams, a student, and later colleague of William Little, in addition to describing the aetiology of club foot after dissection (vide supra), performed tenotomy of the tendons around the ankle and foot with great zeal. He had his own set of knives manufactured to use safely in the percutaneous technique. These included a blunt- pointed, two edged knife to divide the Tibialis Posterior tendon. Adams considered Scarpa's boot unsatisfactory because it allowed the heel to ride up. He modified it with an extra heel holding strap. So that the deformity of the middle of the foot could also be corrected, he modified the foot piece into two pieces which could be angled (illustration shown). Adams also dissected, post-mortem, a patient whom he had treated and who had died of unrelated causes. He demonstrated that the tenotomised tendons had healed in this patient (10).

6. THOMAS (1834-1891)

Hugh Owen Thomas (28), the famous Liverpool surgeon and proponent of splintage and non-operative correction, always did percutaneous tenotomy of the Achilles tendon before manipulating the foot into correction, though he abhorred other operations on the foot! He had devised a wrench to forcibly manipulate the foot into correction.
His son-in-law, Robert Jones, was a keen proponent of this technique and also opposed other surgical operations for club feet (29).

7. PHELPS (1851-1902)

Abel Mix Phelps (1883) in New York continued to perform open operation to divide the posterior and medial tendons and ligaments in the foot and ankle. He also used apparatus that forcibly corrected the foot. On publication of his results, Edward Hickling Bradford in Boston(1848-1926)was sceptical but eventually came round to accepting the technique and its "good" results.

2. BONE OPERATIONS

A. Astragalectomy

With the advent of anaesthesia and antisepsis bolder surgeons undertook bony correction. William Lund (1872), from Manchester, published the results of the removal of the talus (astragalus) from both the ankles (23). This was carried out fairly frequently by the parisien Just Lucas Championniere (1843-1913) who also undertook even wider excision of bones, including the tarsus (24); the results of the latter were not good.

B. Wedge Tarsectomy

Thomas Bryant in London in 1878 published the results of excising wedges of the tarsus in the incompletely corrected club foot with, some success (32).

CONCLUSIONS

There is however, nothing to suggest that the optimistic pronouncements of the results of treatment of Club Foot were actually borne out by the results. Bradford in 1889 (33) was quite scathing in his comment about the results of treatment of Club Foot. "The list of treatments of Club Foot is, as a rule, that of *unvarying* success! It is often as brilliant as an advertising sheet - - - - - yet - - - - - no lack of half cured or relapsed cases - - - -".

It is obvious that at the end of the 19th Century the aetiology of club foot, talipes equino-varus , was far from clear and the results of the treatment were quite variable.

Bibliography:

Several authors are quoted from and attributed to the following publications :

1. LeVay, David (1990) : The History of Orthopaedics (Parthenon Publishing Group, Carnforth). **As LeVay.**
2. Brockman, E.P.(1930): Congenital Club-Foot (Talipes Equinovarus). **Quoted as Brockman.**

References:

1. Hippocrates (1849) : PERI ARTHRON (61,62) The Genuine Works of Hippocrates (Translated

by Francis Adams; New Sydenham Society, London).

2. ab Aquapendente, Hieronymus Fabricius (1592) : Opera Cirurgica (Frankfort) Levay p.489.

3. Camper, Pieter (1782): Ober den besten shoen (Amsterdam) LeVay p.310.

4. a). Sheldrake,Timothy (1806): Brockman p.3.
b). Sheldrake,Timothy (1806) : LeVay p.496.

5. Bruckner, K.A.F. (1795) : J.Erfindungen Theoricen und Widerspruche in d. Natur- und Arzner Wissenschaft 3 (sect 12), 35. LeVay p.490.

6. Scarpa, A. (1805): Memorie chirurgica sui piedi congeniti dei fanciulli (Translated by Wishart,JH, Memoir On Congenital Club Foot Edinburgh).

7. Colles, A.(1817):Dublin Hospital Reports 1:175. On the Distortion termed Varus or Club Foot.

8. Delpech, J-M(1823): Chirurgie Clinique de Montpellier (Tome II) (Paris) pp177 &231.

9. Little,WJ (1839) A Teatise on the Nature of Club Foot.

10. Adams. W(1871): Club Foot: Its Causes Pathology and Treatment.

11. Retsas, Spyros(2003): Oncologist and Greek Medical Historian (Personal Communication)

12. Cheselden, W. (1740): Anatomy of the Human Body. LeVay p.493.

13. Le Dran,H-F(1768) (Translated by Gataker) The Operations in Surgery 4th Edition (London). LeVay p.494.

14. Dieffenbach, J.F. (1841): Uber die Durchschneidung der Sehnen und Muskeln (Berlin). LeVay p.495.

15. Guerin,J (1838) : Memoires sur l'etiologiegenerale des pieds bots congenitaux (Paris).

16. Blukamp,C. (1883): Geneesk. Courant, 18 Eenigewarnemingen met het gipsverbend. LeVay p.495

17. Arcaeus,F.(1674) : Chirurgische Bucher(Nuremberg) LeVay p. 492

18. Fallopius,G.(1606): OpereGenuineOmnia(Venezia) LeVay492.

19. Venel, J-A (Posthumous) in Bruckner, A (1796): Uber die Natur, Ursachen und Behandlungder einwartsgekrummeFusse (Gotha) LeVay p.496.

20. d'Ivernois,L(1817) Essai sur la torsiondes pieds (pieds-bots) et sur le meilleur moyen de les guerir (Paris).

21. LeVay, D : p.496.

22. Thilenius, M.G. (1789): MedizinischeundChirugischeBemerkungen (Frankfort). Quoted by Bouvier (24).

23. Petit, A. (1799) : LeVay p. 497.

24. Bouvier,S-H-V (1836): Memoir sur la Section du tendon d'Achille dans le traitement des pieds bots(Paris) pp.427-428.

25. Stromeyer, L (1833): Mag. Ges. Hielk.(Rust) 39 (NF15) 198.

26. Duval, V (1839) : Traite Pratique du pied-bot..Le Vay p504.

27. Thomas, H.O. (1890): LeVay p.499.

28. Jones, R. (1909): Modern Treatment of Club-Foot (Lecture to the BRITISH MEDICAL ASSOCIATION, ANNUAL MEETING, Belfast (Reprint).

29. Phelps, A.M.(1881); NE Monthly 11;195. A case of Double Talipes equinovarus treated by open incision and fixed extension.

30. Lund .E (1872) Brit. M J 2:438. Removal of both astragali in a case of severe club foot .

31. Lucas-Championniere, JM (1890) : J.Med.Chir.Prat. Traitement des pieds bots par l'ablation d'astragale.

32. Bryant,T(1878) : Trans. Clin. Soc. Lond. 12:36,

33. Bradford,E.H.(1892) : Trans. Amer. Orth. Ass. V. 89.

Discussion:

Mr John Kirkup pointed out that tenotomy gained its popularity and rightful place mostly because of the work of Stromeyer and his meticulous reporting. He also stated that the apparatus used by Phelps in New York was capable of exerting tremendous forces of up to one ton!

Mrs. Belinda Heathcote reminded the audience of the effect of his club foot deformity on the psyche of Goebbel, the Nazi propaganda chief .

x X x

"For the love of god, a Surgeon!"
William Shakespeare (1564 – 1616) :
(Twelfth Night V.1.171)

CLUB FOOT

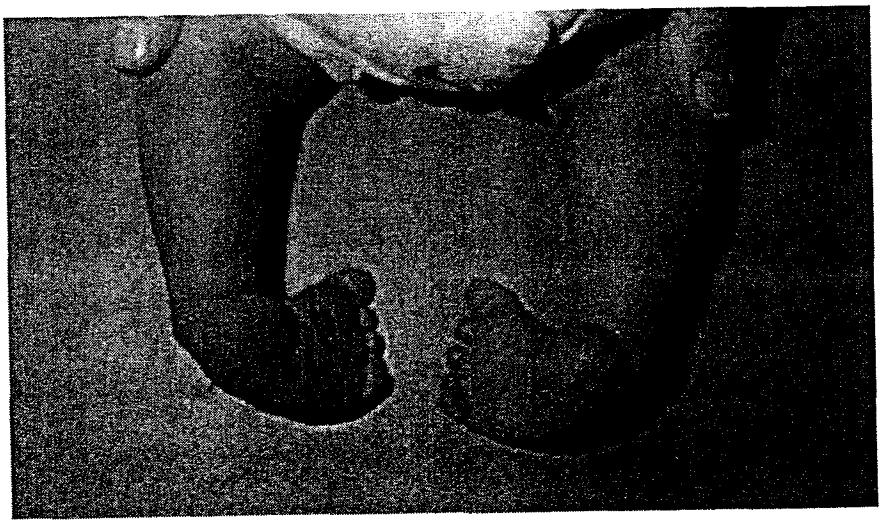
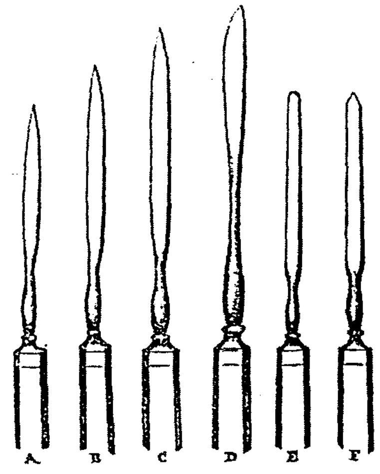


ILLUSTRATION - I



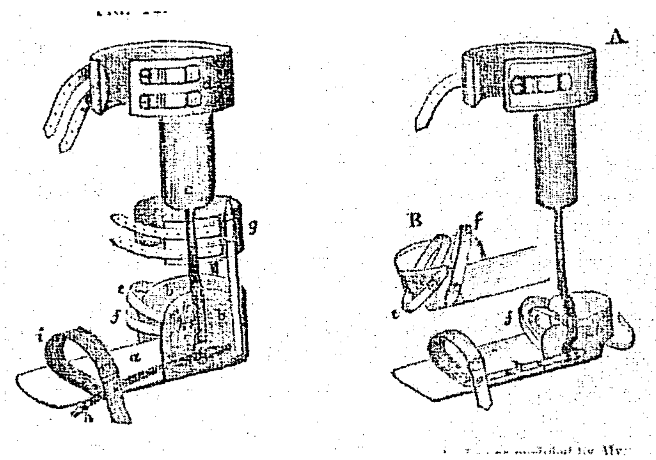


ILLUSTRATION - II

THIRTEENTH CENTURY SURGICAL INSTRUMENTS IN TURKEY

IBRAHIM SHAIKH

[Historical surgical Instruments of Albucasis and Turkish surgeon Serefeddin Sabuncuogulo of Amasia in Anatolia Turkey were compared from the Manuscripts in various libraries in London, Oxford, and Istanbul and Poster Display of Turkish Surgeon in Medical museum of Kayseri, Amasia Darrushifa now both a medical museum has nearly posters numbering over two dozen illustrations including position of surgeon and patients showing the instruments used in detail. The speaker had visited Anatolia and seen these historical hospitals which are now restored to excellent modern Medical History Museum. This is a summary of this visit presented as a Slide Illustrated talk to members of Historical Medical Equipment Society meeting held in Emmanuel College in Cambridge on 26th April 2003.]

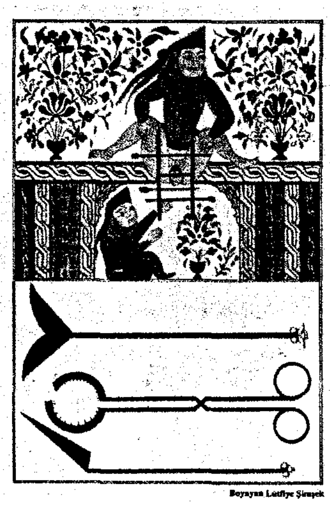
Albucasis (936 - 1013) was born in Medinat Al-Zahra and lived in Cordoba in Spain, wrote a book – 'al-Tasrif' - a 30 part compendium on practice of Surgery which became widely acclaimed text book in Europe for centuries.

'Tasrif' was the first book in Islamic medical literature to show illustrations of surgical instruments. Four centuries later another surgeon named Serefeddin Sabuncuogulo (1385 – 1468) lived in Amasia in central Anatolia after serving as a chief surgeon in Amasia Hospital (Darrushifa) for 15 years. In 1465 when he was 80 years old, he wrote 'Cerrahiye-Tul-Haniyye' consisting of three chapters, first illustrating cauterisation treatment in various diseases, the second on various general surgical procedures and third chapter on treatment of fractures and dislocations. In 1466 his text of 'Cerrahiye-Tul-Hanniye' was presented to Sultan Muhammad, the conqueror but manuscript disappeared afterwards till its re-emergence in 1920's. The book has three known copies in the world. The first copy is in Paris National Library Supp. Turcs 693 and consists of 410 pages, each measuring 18 x 26.5 cm and containing 17 lines. The other two copies are in Istanbul. One of the original copies is in Istanbul Fatih Millet Library as part of Ali Amari collection - the book consists of 398 pages each measuring 16.4 x 25.5cm and containing 17 lines. The third copy, which is in the private collection of Prof. Besim Omer Akalin, consists of 376 pages of 15 lines. Each book is made up of three sections, and contains original drawings demonstrating different surgical techniques, tools and incisions as reported by Ihsan Numanoglu in Journal of Paediatric Surgery vol. 8, no. 4 (August) 1973. It included 6 black and white illustrations.

The book is roughly a translation of Tasrif of Albucasis (Arabic : Abul-Qasim Zahrawi) but in the translation he added his own experiences and brought interesting comments on previous applications.

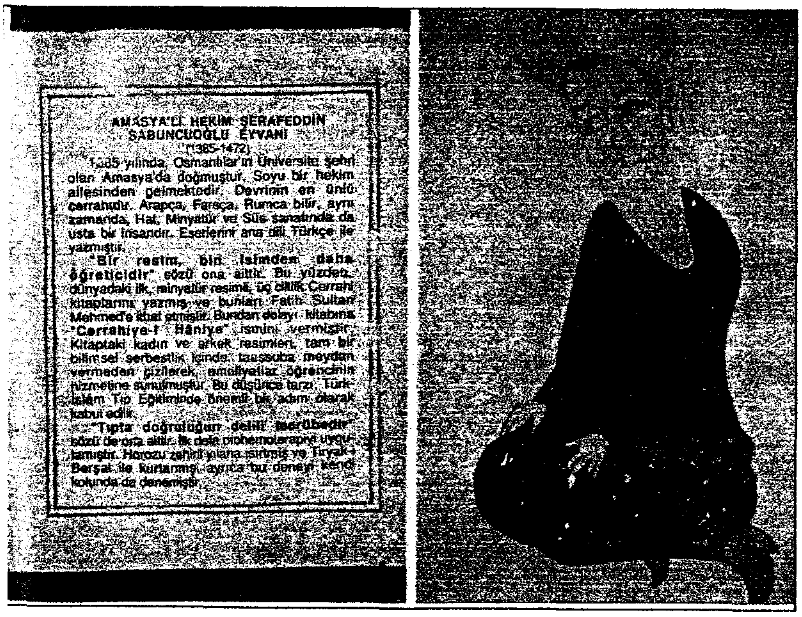
Cerrahiyetü'l Haniye

Feredeki basurlar, siğiller (vulva kondilomu) ve çıbanların tedavisi (Bab 2, Fasıl 73 vr. 112b/P)
The treatment of haemorrhoids and venereal warts and red pustules arising in the female pudenda (Part 2, Chapter 73, f. 112b/P)

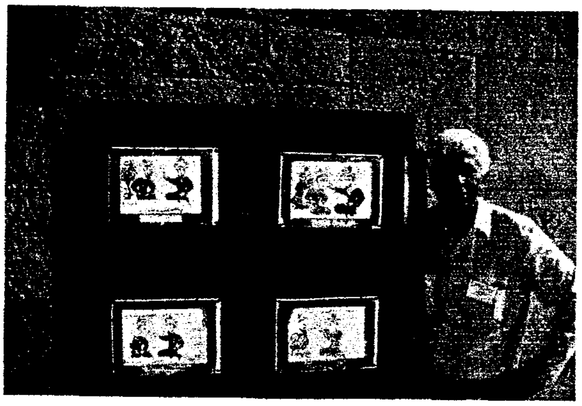


Ana rahminden çocuğu çıkarmada kullanılan aletlerin şekilleri (Bab 2, Fasıl 77, vr. 113a/M)
The forms of intruments necessary for extracting the foetus (Part 2, Chapter 77, f. 113a/M)

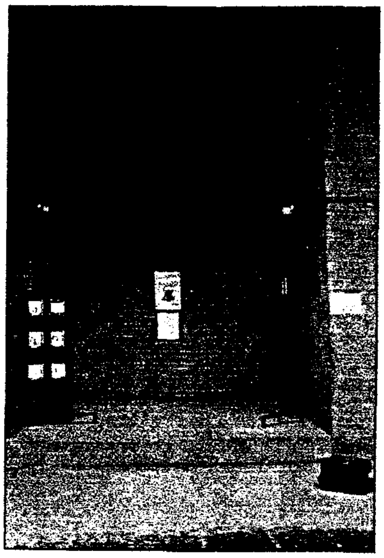
Serefeddin Sabuncuogulo was an innovative, intelligent and experienced surgeon. He was humble, his book and character are great example for today's Islamic medicine. Every surgical procedure is illustrated in his book without any moral or religious restrictions. He also has his personal innovations.



My chosen Anatolian surgeon of Amasia, who had translated al-Tasrif of Abul-Qasim into Turkish language, about whom I presented a paper in Istanbul ISHM 2002 Conference, held from September 1st-6th in Hotel Swisstol in Istanbul, is Evyan Serefeddin.

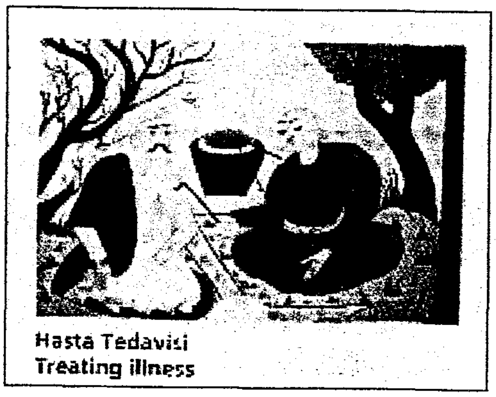


Portrait and biographic texts in Evyan Serefeddin

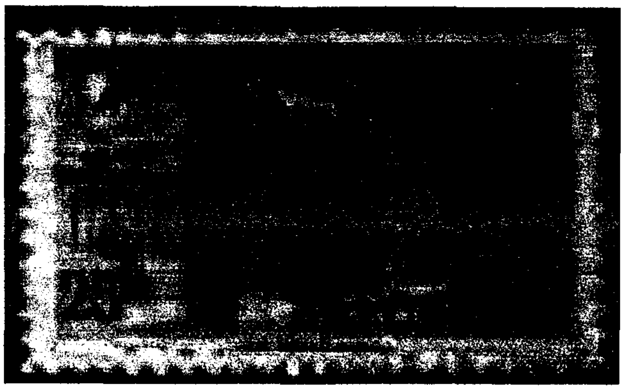


SEREFEDDIN SABUNCUOGLU EYVANI

In this huge Ivan, a framed colour portrait of the famous surgeon was on display upon the stony wall. Immediately below in another frame was written information about the surgeon in Turkish language. The two side wall there were on stands displaying posters in all 6 illustrations each showing surgical instruments and surgeons in operation of various operations like cauterisation, gynaecological procedures showing female Obstetrician called by him as "Tabibe", while the Midwife called "QABILA"



Stamp showing Darrusshifa Amasia where Serefeddin worked for 14 years and wrote his Jerrahiye alhaniye were also displayed.



ANOTHER FIRST IN TURKISH ILLUSTRATED TEXT BOOK OF SURGERY (CERRAHIYE-TUL-HANNIYE) IN ISLAMIC WORLD

'Cerrahiye-tul-Hanniye' has been claimed as The Earliest known book containing Paediatric Surgical Procedures. Six illustrations were published in the journal of Paediatric surgery in 1973 showing procedures on anal malformation, Inguinal hernias, circumcision, perineal fistula, and vaginal atresia. Recently, Nil Sari and Cenk Buyukunal in 1991 published in Journal of Paediatric Surgery "Earliest Paediatric Surgical Atlas" as title covering in details from the three original hand written manuscripts of Sabuncuogulo kept in the Istanbul National Library of Fatih, Capa Medical History Department of Istanbul University and Paris International Library. They compared with Zahrawi's text book and other ancient surgical textbooks investigating Sabuncougulo's special contribution and remarks on developments of European surgery and its influence on Arabic and Turkish Paediatric Surgery in Journal of Paediatric Surgery, Vol 26, No. 10 (October) 1991 : pp 1148-1151 (with 10 illustrations).

The historical Hospitals of Anatolia have recently been conserved and turned into Medical Museum. It is an excellent example. Built in 1204 – 1206 upon the will of Princess Gevher Nesibeh (1165 – 1206) it is claimed to be the first purpose-built complex in two distinctly separate hospitals and teaching institutions not only in Anatolia but also in Europe. Here in one Evan (Quadrangle) devoted to Surgeon Serefeddin, his portrait and life and work are on display including surgical instruments.

In Amasia, Serefeddin's home town, his life and work with surgical illustration are theme of display on Posters. A great impressive entrance of granite carved intricate floral design portal of Darussifa greets visitor inside vault above the entrance. Sereffidin portrait greets visitor, all along inside walls opening towards courtyard. Two dozen posters are on display (operating surgeon with patient and all surgical instruments). These are a great work of art – an unique historical treasure.

Some Poster illustrating Serefeddin's surgical procedures and accompanying surgical instruments are shown, from actual original manuscript, including position of patients and operating surgeon as exhibited in Amasia Durushiffa (now a restored Medical Museum).

Professor Dr. Nil Sari, President of the Turkish Medical History Society and of the 38th International Congress on History of Medicine (ISHN 2002 Istanbul) presented the attending delegates a surprise gift - a publication "Turkish Medical History Through Miniature Pictures Exhibition" edited by Nil Sari herself. Surgical Instruments of Serefeddin Sabuncuogulo of 62 colour illustrations plates on pages 51-84 were so good that some are with kind courtesy of Prof. Nil Sari are in this article reproduced with grateful acknowledgement.

ATLAS OF PEDIATRIC SURGERY (FIG) PROCEDURES ON MEATAL URINARY STENOSIS AND HYPOSPAIDIUS ALSO CIRCUMCISION

Boyayan Nalan Şahin

Çocuklarda penis ucu kapalı veya deliği dar ya da deliği başka yerde ise tedavisi (Bab 2, Fasıl 55, vr. 95b/P)

The treatment of boys born with imperforate urinary meatus, or with the meatus stricture or not in the proper place (hypospadias, epispadias) (Part 2, Chapter 55, f. 95b/P)

Sünnet etme (Bab 2, Fasıl 57, vr. 98a/P)
Circumcision of boys (Part 2, Chapter 57, f. 98a/P)

There were posters on surgery nasal polyp, eye lid swelling and cysts, hernia operation Cauterisation instruments. It was indeed a great contribution on historical surgical Instruments display.

DISCUSSION:

Mr John Kirkup:
Were the instruments of Albucasis objectively evaluated because they do not exist despite textual records?

Author's reply:
The evidence of the existence of the actual instruments used by Albucasis can only be brought to light through excavation from the ruins of the destroyed city of Albucasis with the help of archaeologists.

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"The longer you can look back the further you can look forward".
Sir Winston Leonard Spencer Churchill (1874 – 1965),
Nobel Laureate in Literature, 1953
Address to the Royal College of Physicians, London, March 1944)

JOHN F HALL-EDWARDS — RAYS, SNOW AND PAINTING

JEAN M GUY

He was born in Sparkbrook in the suburbs of Birmingham on 19th December 1858 into a well-established medical family. His father and grandfather were in general practice. He was educated at King Edward's School but seemed not to have had an outstanding academic career there. Following the family tradition he enrolled as a medical student at Queen's College, Birmingham, the forerunner of the medical school. His medical studies were completed in Edinburgh, where he qualified in 1885, and he became a general practitioner after a four year spell as histology demonstrator at Queen's College. He maintained a hospital connection as honorary anaesthetist in the dental hospital.

John had developed an interest in photography before going to the medical school, and pursued this interest with great distinction throughout his life, microphotography being his particular field. In the space of four years he received 24 medals in gold, silver and bronze for his photography and in 1894 was awarded the fellowship of the Royal Photographic Society.

While John was practising medicine in Birmingham, on the other side of the North Sea a German scientist thirteen years older was investigating the phenomena which occurred when an electric current was passed through an evacuated glass tube, as many other scientists of several nationalities had been doing for about a century. The discovery of X-rays was made by this man, Professor Wilhelm Conrad Röntgen, another amateur photographer, in November 1895. He interposed his hand between the tube and a card covered with crystals of barium platino-cyanide. He was amazed to see an image of the bones of his hand thrown onto the fluorescing card, which stimulated his investigation of the penetrating radiation emanating from the tube. He sent offprints of his research paper in the New Year of 1896 to an international circle of physicists. He also posted a selection of the first radiographs, including prints of the skeleton of his wife's hand. The impact of this image was felt not only by the physicists, but by the medical profession and the general public.

Publicity was wide and immediate, in scientific journals and the lay press. For certain groups of people, not just university physicists but scientific amateurs, teachers and doctors, their response was to attempt to reproduce Röntgen's findings. News of Röntgen's discovery of X-rays reached England in January 1896: Hall-Edwards immediately set about finding the necessary apparatus. He borrowed a fifteen inch coil from a friend in Solihull "the largest induction coil in the Midlands" and ordered an X-ray tube from Germany. This was of unusual design but served him well in the experiments which he began in early February, 1896. He was so pleased with his results that he sent a report of them to *The Photographic Journal* five days later. His first successful radiograph was of two keys, a half crown, sixpence, a picture ring and a microscope cover-glass. The first radiograph which he took of a human being was of a hand, probably that of his friend Dr J R Ratcliffe. The exposure was one hour. The comment was 'over-exposed'.[1]

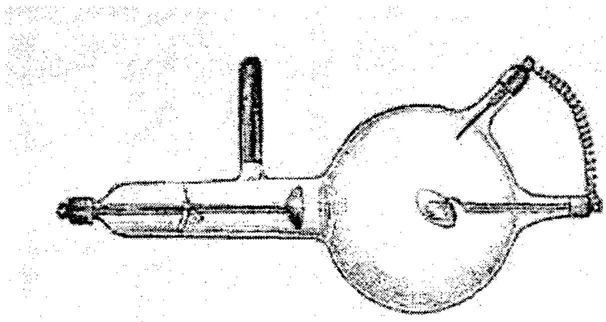
Hall-Edwards and Ratcliffe were eager to try out the new rays on a clinical case, and they had their opportunity on 13th February when a Mrs E Berry came to see them. She had run a needle into her hand so completely that it was invisible from the exterior, and having ignored it for a couple of weeks the hand had become swollen and painful. She read in the paper of a similar case in Berlin, for which X-rays had been useful and so presented herself to Hall-Edwards, whose reputation must have spread very rapidly. An excellent negative of the hand was obtained (all X-ray images were obtained at that time on the normal photographic glass negative plates). The next day she attended the Queen's

Hospital and with the aid of the radiograph the needle was successfully extracted. Soon Hall-Edwards was receiving so many requests for radiography that, before the end of the year, he sold his general practice and set up as a specialist in the city centre.

From that time on, he devoted himself wholly to radiodiagnosis, radium and X-ray therapy, and electrotherapy. He was a particularly early advocate of X-ray treatment.[2] His principal hospital appointment was that of Senior Medical Officer to the X-ray Department of the Birmingham General Hospital, which he held for twenty years, but he had honorary appointments at various times to many of the Birmingham hospitals and the Guest Hospital, Dudley. By experimentation in his own premises, he developed several technical improvements to the radiographic apparatus, including a device for the localization of foreign bodies.

Being convinced from the start that X-rays were the best way of showing foreign bodies and fractures, it seemed obvious to him that the technique would be a vital addition to the armamentarium of the military surgeon. He set about convincing the War Office of this. Letters had no effect but he set up a mock military exercise with volunteer "casualties" having bullets under their bandages which he proceeded to radiograph. This seemed to do the trick and he volunteered as a medical officer in the Boer War, working in one of the charity hospitals. He sent reports back to the BMJ and the Lancet on his radiological activities, for which he received just credit.

The apparatus was simple: accumulators which needed frequent recharging, three coils to transform the current to a high voltage, fluorescent screens, devices to localize foreign bodies, and fifteen X-ray tubes, similar to this.



3

Three electrode, cold-cathode X-ray tube 1901

A static bicycle was supposed to recharge the batteries and found to be impractical, so Hall-Edwards bought a second-hand engine to power a dynamo and incidentally light the hospital. There was at the time no appreciation of the radiation risk from the X-ray tube nor any means of shielding it. The X-ray tube was suspended on a rail over the couch, the generating apparatus behind it.

The professional life of John Francis Hall-Edwards exemplifies the pioneer who realised too late the dangers of radiation, but tried very hard to prevent similar damage to other radiation workers. During the first year of his experimentation with X-rays Hall-Edwards inflicted dermatitis upon himself and unknowingly sowed the seeds of many years of pain, disease and disability. As early as March 1896 when he described his initial radiographic experiments he said that his first tube worked continuously for eight hours a day and for ten days.[4] Later in the same year he gave a series of demonstrations lasting four evenings. On each occasion he exposed his hands to the rays for several hours. In January 1897, he told readers of the *Photographic Journal* that he had been experimenting daily for eleven months. The resulting redness around the nail beds he attributed at the time to the use of developer. 'I took no precautions to protect myself from the rays and ... I still continued to use [my hands] when testing the penetrating power of my tubes.' At the end of 1896 he denied that X-rays had the power of killing hair, stating that 'I have (for experimental purposes) radiographed my own hands dozens of times, and I fail to see any difference in the growth of hair'.[5] In January 1897 he was still saying:

"We have heard so much about the effect of the X-rays upon the skin; this I think must be due to some idiosyncrasy of the operators, for although I have myself been experimenting daily for the last eleven months I have failed to notice anything of the kind".[6]

This gainsaid the warning uttered by Joseph Lister, who had already indicated his concerns about radiation dermatitis in September 1896.[7] By 1899 Hall-Edwards' opinion had changed slightly:

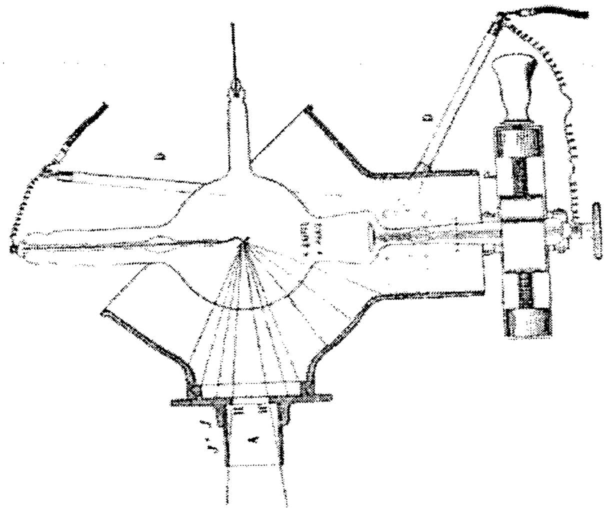
"Continued and protracted exposure to the rays at varying distances from the tubes has an effect upon the hands which although unpleasant is not dangerous. It interferes with the growth and nutrition of the nails. The skin round the roots of these becomes red, irritable and cracked, and the nails themselves thin and brittle. Most constant workers suffer in this way" ...[8]

By 1902 he must have realised that something more sinister was happening, for he was developing painful sores and warts.[9] In 1903 he became editor of *Archives of the Roentgen Ray* and under his editorship the journal published many cases, articles and radiographs of his own. One issue includes a photograph of 'chronic dermatitis of both hands', almost certainly his own, showing abnormal nail growth, warts and wrinkling of the skin.[10] At the annual meeting of the BMA held in Oxford in 1904 Hall-Edwards read a paper subsequently published in the *British Medical Journal*.[11] It was an illustrated article about his own condition, describing the signs and symptoms and the attempts at treatment in some detail. Quoting John Pitkin, an American author, he said:

"For a description of the pain and suffering, hyperaesthesia, paraesthesia, no language, sacred or profane, is adequate".[12]

His expressed motive in reading the paper was to appeal for suggestions for treatment, and the article concluded: 'I cannot too strongly urge young workers to take every possible precaution before it becomes too late.'

Four years later, he published another *BMJ* paper.[13] That year he had suffered amputation of the left forearm four inches below the elbow for 'epitheliomata' and, a few weeks later, an amputation of the right hand excluding the palm and thumb. His left arm had been useless and carried in a sling for the previous two years. This paper included suggestions for the prevention of occupational X-ray damage. He pointed out that Nikola Tesla, an associate of Edison and inventor of electrical equipment, had suggested as early as 1897 that it was advisable to place an earthed aluminium sheet between the patient and operator, and the tube. Hall-Edwards advocated shielding of the tube so that the rays emanated from only a small opening opposite the patient, and protecting the operator and the controls behind a panel of wood, sheet lead and lead glass.[14] When using the fluorescent screen, he advised the wearing of an opaque apron and lead glass spectacles. He emphasised that the effect of X-ray exposure was cumulative.



Gaiffe glass shield and tube sectional drawing
Designed by Hall-Edwards.[15]

In spite of two amputations he returned to work in three weeks, able to use only his right thumb against a leather prosthesis over the palm. Financial necessity drove him on. During the first World War he was appointed Major in charge of X-ray services in two Birmingham war hospitals, and was painted in his uniform as if in the process of examining a patient.

J. Hall-Edwards,

L.R.C.P., F.R.S. (Edin.), Hon. F.R.P.S.

Senior Officer in charge of the X-Ray Department at the General Hospital, Birmingham; Consulting Radiographer to the Guest Hospital, Dudley; Radiographer to the Eye, Dental and Royal Orthopædic Hospitals, Birmingham; Honorary Life Member of the American and German Röntgen Ray Societies; Late Surgeon Radiographer to the Imperial Yeomanry Hospitals at Deelfontein and Pretoria, South Africa, 1900 and 1901; Late President of the British Electro-Therapeutic Society and late Editor of "The Archives of the Roentgen Ray."

[16]Title page of *Carbon Dioxide Snow* showing his curriculum vitae

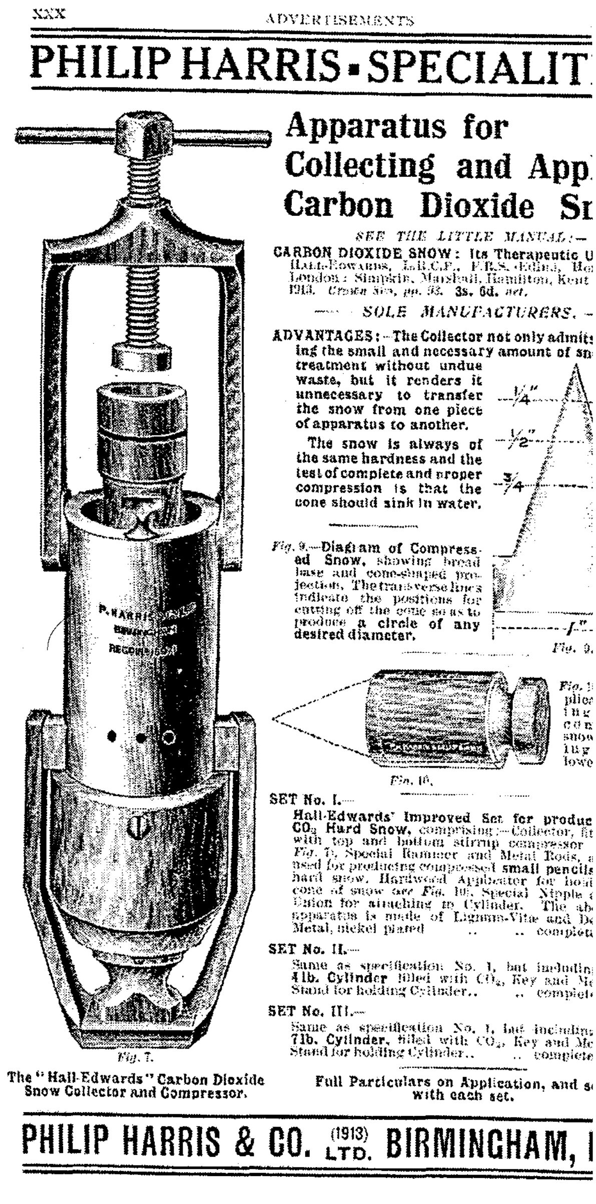
X-rays were not his only treatment option. Possibly stimulated to search for alternatives to damaging rays, he developed a method of applying carbon dioxide snow, invented the apparatus and persuaded Philip Harris, the laboratory equipment manufacturers in Birmingham, to manufacture it. His book on the subject was published in 1913 and advertised in the *Medical Annual* of 1915. It provided details of clinical applications and of correct usage of the apparatus.

Applications of CO_2

- Warts
- Moles
- Naevi
- Rodent ulcer
- Angiomata
- Lupus vulgaris
- Lupus erythematosa
- Psoriasis
- Lymphangiomata
- Chronic eczema

Undaunted by his disabilities, he took up local politics after his retirement, involving himself in the running of the city's libraries, museum and art gallery. He also took up painting, holding the brush between his remaining right thumb and the leather prosthesis over his palm. Some of these pictures survive.

To the end of his life Hall-Edwards campaigned for better radiation protection. His own sufferings were rewarded by the grant of a civil pension of £120 from the government in recognition of his contribution to radiological research, an income from a public appeal in 1908 and a Carnegie Heroes Fund medal and annuity four years before he died, on August 15th 1926. Few of his fellow-sufferers received as much.[17]



Advertisement in *Medical Annual* 1915

[1]Hall-Edwards JF. Professor Röntgen's Experiments. *The Photographic Journal* 29 Feb 1896; 174-5; *idem.* Radiography popularly described. *The Photographic Review.* March 1896; 91-97.

[2]Anon. *Edgbastonia* Apr 1908; 28: 76; a manuscript copy of Clayton's operative notes is preserved at the University of Birmingham Medical School. I am grateful to the late Dr Ben Davis for sending me a photocopy of this document. Later accounts of the event differ somewhat from Hall-Edwards', see Thomson AP. Early X-rays [letter] *BMJ* 5 Dec 1970; ii: 617-8.

[3]Allen & Hanbury. *Surgical catalogue.* London: The company 1901; 831.

[4]Hall-Edwards JF. Radiography popularly described. *The Photographic Review* Mar 1896: 91-97.

[5]Hall-Edwards JF. Radiography as an aid to diagnosis. *Birmingham Medical Review* July-Dec 1896; 40: 6-21 (p20).

[6]Hall-Edwards JF. Photography by the Röntgen Rays up to date. *The Photographic Journal* 30 Jan 1897: 112-123 (119-20).

[7]Lister J. Presidential Address. *Report* of the annual meeting of the British Association, Liverpool 1896: 3-5.

[8]Hall-Edwards JF. The hurtful effect of the rays. *Amateur Photographer.* 14 Apr 1899; 29: 284.

[9]*Daily Mail* Mar 24 1908, HE cuttings.

[10]Hall-Edwards JF. description of Plate CLXXVII (a and b) *Archives of the Roentgen Ray* 1903-4; 8: 92; the editorial of the same issue includes an article by Hall-Edwards on X-ray dermatitis: 80-82.

[11]Hall-Edwards JF. On chronic X-ray dermatitis. *BMJ* 15 Oct 1904; ii: 993-995.

[12]Pitkin J. The dangers of the X-ray operation. *Transactions of the American Roentgen Ray Society 1903*: 1904; 232-59 (240).

[13]Hall-Edwards JF. Further notes on X-ray dermatitis and its prevention. *BMJ* 12 Sept 1908; ii: 726-730; *idem.* X-ray dermatitis, its prevention and treatment. *Practitioner* Extra number on X-rays in diagnosis 1906; 113-126.

[14]A E Dean was the first to introduce lead glass, installing it into the London Hospital. Cuthbert Andrews collaborated with Pilkington to produce protective glass. Tunnicliffe EJ. The British X-ray Industry: a brief historical survey. *BJR* 1973; 46: 861-871.

[15]Hall-Edwards J. X-ray dermatitis. *Medical Electrology and Radiology.* 1905; 6: 235.

[16]Hall-Edwards JF. *Carbon Dioxide Snow, its therapeutic* uses. London: Simpkin, Marshal, Hamilton, Kent & Co. 1913. Biographical entry, title page.

[17]*Daily Mail,* 28 Mar 1908; *Birmingham Daily Post,* 6 Mar 1908, *Daily Post,* 2 July 1908; *Birmingham Post,* 16 Aug 1926)obit); Hall-Edwards cuttings in Birmingham Central Library.

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"Thousand natural shocks that flesh is heir to"
William Shakespeare (1564 – 1616) :
Hamlet Act III, Scene 1
– on 'GENETICS'

EAR TRUMPETS

JOHN M. T. FORD

Mankind has always been troubled by deafness and has tried ingenious ways of overcoming it. The most obvious is to get the speaker closer to the auditor and to speak directly into his ear. However, it is not always possible or necessarily pleasant for social or hygienic reasons for the speaker to talk directly into the ear. Many devices have been produced to facilitate this. The simplest is for a flexible tube with a speaking voice piece at one end and a small attachment like a stethoscope earpiece at the other. The tube could be of any length, but the most commonest seems to have been about three feet. This could be adapted so that two or more speaking tubes could be attached for one hearer. It could also be adapted so that the speaking and hearing pieces were transposed – this could mean that one speaker could address up to a dozen deaf hearers.

This is the principle that Laennec described with his rigid stethoscope in 1818, although with hearing aids it is more convenient for the tube to be flexible, rather than rigid. Another means of amplification is to collect more sound and channel it down into a small earpiece. The principle used is that of a megaphone in reverse. If you make a noise at the small end it is increased and sounds can be carried over a long distance. Similarly, if you collect sound at a large diameter opening, it will be magnified at the small ear end. For those who were not shy, one trumpet was produced with a large conch shell as the sound collector. The simplest instrument is a straight horn, which has a large diameter bell. Many hearing trumpets are of this type. They range from very crude instruments made by the local blacksmith to elegantly engraved silver artefacts. They are eminently collectible and some are currently obtainable for several thousand pounds. To make the straight shaft more manageable, it can be made to retract. As the straight musical horn developed into a curved instrument so the straight ear trumpet similarly became curved. This gave the advantage that the same sound amplification could be obtained with a less cumbersome apparatus that could be more readily carried in a bag or pocket.

Deafness has always carried a social stigma, so hearing aids have be adapted to try and conceal them. Some have been hidden in gentlemen's walking sticks and top hats and some in ladies' fans and head dresses. One Victorian coiffure had its large piles of hair held by a large fan shaped pin that collected sound and passed it to each ear by a small tube. Bonnets, which were worn indoors and out, could conceal small sound catching auricles in each ear. When held in place by an Alice band over the vertex, no-one was any the wiser.

The simplest hearing accessory is to cup the ear. There is a self portrait of Sir Joshua Reynolds doing just that. He is said to have become deaf after an upper respiratory infection he caught while studying at Rome. This only increases the hearing by 5-10 decibels. Ear trumpets magnify sound 10-20 decibels with most in the range of 500-1000Hz. The range of human speech is roughly 300-3000Hz so that trumpets would not help anyone with the usual high tone hearing loss of age.

These trumpets acted on increasing the sound of air conduction. Before the advent of electrical apparatus others were produced which magnified sound through the bones of the skull.

The last word must be with the Victorian aural surgeon Sir William Wilde. "There are two kinds of deafness. One is due to wax and is curable; the other is not due to wax and is not curable". For sufferers with the second type, ear trumpets have a little relief.

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**"Dust in the air suspended
Marks the place where a story ended".**

(Thomas Stearns Eliot (1888 – 1965), Noblel Laureate in Literature, 1948 – Little Gidding (1942)

REPORT : AUTUMN MEETING (Worcester, October 12th 2002)

JOHN PROSSER

Dr John Harcup gave an excellent lecture on the history of and equipment used for the Malvern Water Cure.

The Malvern waters emerging from various springs on the Malvern Hills were analysed by Dr John Wall in the 18th Century and found to contain no dissolved chemicals; thus the water was pure, unlike most natural springs which contain substances from the earth's crust thus giving healing properties. In the 19th Century Malvern became very popular as a centre for the Water Cure. Treatments were based on the teachings of Preissonitz from Grafenburg in Germany. Drs Wilson and Gully developed a programme of treatments with the pure Malvern water by drinking it and by having it applied to the body in a number of alarming ways.

Dr Harcup showed a splendid collection of slides of old bottles used to distribute the water throughout Britain and some of the souvenir cups and plates featuring the various wells about the hills; also some of the large establishments used to accommodate the patients during their stay for treatment in Malvern.

We saw also a series of cartoons, some of which are in the George Marshall Medical Museum in Worcester. These showed some of the Water Cure treatments and the equipment used, such as the downwards douche and the upward douche.

Little remains today in the way of equipment for what was a major industry in Malvern. The various Water Cure Institutes are now housing schools and hotels.

He also showed slides of equipment of other Spas in the UK. Some of these survive and have been restored. Leamington Spa and Harrogate being only two of the many spas which have retained much of their original 'spa' equipment.

This author himself spoke on 'Medical Treen' (for interest and collection).

The author explained that 'Treen' was simply a name for small articles made of wood.

He showed slides of artefacts in the George Marshall medical museum and from his own collection demonstrating that wood was used for part or all of many medical and medically related items until replaced by glass, ceramics, metal and plastics for reasons of economy and hygiene.

Surgical items shown were a lancet and a nice small boxwood container holding three small aural specula all dating from the 19th Century.

In the world of Medicine a slide of a replica of the first stethescope designed by Laennec early in the 19th Century and also a collection of wooden stethoscopes from later in the 19th Century.

A carved wooden 'Pap' boat from the 19th Century was used to feed infants and invalids. (Pap being a mixture of bread, milk and water thought suitable nutrition for these subjects).

Two bowls possibly used for bleeding in the 18th or 19th Century were shown.

Wood made good material for containers of many kinds, a slide of three medicine bottle containers was shown. One of the bottles inside had the label 'Chloroform'.

Drug and medicine jars were made of wood in the 17th and 18th Centuries. Four good examples were shown.

A slide of a glass and ivory syringe in a boxwood container showed how useful and beautiful wood can be.

In the apothecaries shop wood was frequently used during the 17th and 18th Centuries.

A very rare 17th Century Lignum Vitae lidded mortar and pestle for grinding seeds and herbs in a liquid for the preparation of a Posset was shown.

From the pharmacy a slide demonstrated a collection of items from the 19th Century, pill sliverers, a searce for fining powders, and a pill rounder.

Writing item of importance to doctors and pharmacists were shown, including a pen holder, a wooden ruler, a pounce pot, and a collection of string boxes all from the 19th Century.

Finally, the author showed slides of wooden artefacts related to good health and happiness. These included a large olivewood soap container, a good lemon squeezer from the 18th Century, a pomander for containing sweet smelling herbs to ward off evil smells, a nutmeg grater to flavour coffee and chocolate in the 18th Century, and to complete the talk two wassail bowls from the 17th Century used for alcoholic medicaments for curing body and spirit.

H.M.E.S. – Worcester October 12th 2002

Our guest lecturer was Mrs Wendy Cook, the curator of the Museum of Worcester Porcelain. She gave a most interesting talk on the history and products of the Worcester Porcelain Manufactory.

The original factory was founded in 1751 by Mr William Davis and Dr John Wall, who was also one of the founders of the Worcester Royal Infirmary, established in 1746.
The Company produced a large range of blue and white ware, copying the oriental hard paste porcelain, also some polychrome ware.

Mrs Cook showed a number of slides of the highest quality porcelain produced by the Worcester Company in the 18th and 19th Century. The company was purchased by Thomas flight in 1783 and received Royal patronage in 1788, thus becoming the Royal Worcester Porcelain Works.

The company produced a number of medical items. The only item in the George Marshall Medical Museum is a medicine spoon by Grainger, later part of the Worcester Porcelain Company.

However, the following medical items were produced by the company between 1756 and 1780 : spoons, bleeding bowls, spittoons eye baths, bourdaloues, pap boats. There are very few examples remaining of most of these articles. There is only one known pap boat, dated 1775, initialled J W. This was possibly made for Dr John Wall himself, who moved in retirement and failing health to Bath to take the Waters.

There is also a range of tableware, named Blind Earl patter, designed for an earl who was blind. The pattern is raised to make it easy for blind people to feel.

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"Science is concerned with that which is not confined to individuals; it is the impersonal human world of truths".

Rabindranath Tagore (1861 – 1941)
Nobel Laureate in Literature, 1913 :
From the conversation between himself and Prof. Albert Einstein (1879 – 1955),
Nobel Laureate in Physics, 1921, in Berlin on July 14 1930

SUMMARY OF RECENT MEETINGS

12th May 2001 Royal Berkshire Hospital, Reading organised by Dr Tim Smith.

1. The History of the Royal Berkshire Hospital - Dr Marshal Barr

2. The Development of the Anaesthetic Vaporiser - Dr Tim Smith

3. Surgical Instruments in the Taxila Museum - Dr Nasim Naqvi

Tour of the Hospital Museum and 'Nigerian' Collection

6th October 2001 Green College, Oxford organised by Mr Alf Gunning

1. Artificial Respiration in the 1950's - Dr John Spalding

2. The History & Evolution of the Ophthalmoscope - Mr Richard Keeler

3. The Rise and Decline of Needle Holders - Mr John Kirkup

Tour of the Science Museum, Oxford

27th April 2002 - Thackray Museum, Leeds organised by Alan Humphries

1. The History of Gastroscopy - Professor Monty Losowsky

2. Orthopaedic Orthoses, Prostheses and Implants - Mr John Kirkup

Tour of the Thackray Museum including its vast catalogue collection

12th October 2002 Charles Hastings Education Centre, Worcestershire Royal Hospital organised by Dr John Prosser

1. Medical Treen for Interest and Collection - Dr John Prosser

2. Spa Treatments and Equipment - Dr John Harcup

3. Worcester Porcelain and Medicine - Mrs Wendy Cooke

Tour of the Worcester Medical Museum

26th April 2003 Emmanuel College, Cambridge organised by Jean Guy

1. The Treatment of Club Foot in the 19th Century - Mr Ravi Kunzru

2. Thirteenth Century Surgical Instruments in Turkey - Dr Ibrahim Shaikh

3. John Hall-Edwards: Rays, Snow and Painting - Dr Jean Guy

4. Ear Trumpets - Dr John Ford

Tour of Whipple Museum of Science

HISTORICAL MEDICAL EQUIPMENT SOCIETY, LONDON (HMES, LONDON)

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OUR MEDICAL HERITAGE

"We may indeed be justly proud of our apostolic succession. Schools and systems have flourished and gone..... the philosophies of one age have become the absurdities of the next, and the foolishness of yesterday has become the wisdom of tomorrow; through long ages which were slowly learning that we are hurrying to forget, amid all the changes and chances of twenty-five centuries, the profession has never lacked men who have lived up to the Greek ideals. They were those of Galen and Aretaeus, of men of the Alexandrian and Byzantine schools, of the best of the Arabians, of the men of the Renaissance, and they are ours today"

WILLIUM OSLER (1849 - 1919)
Equanimities and Other Addresses, 1904, p281

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