Adrian Padfield and Peter Mohr have finally firmly resigned.
They will leave their posts at the AGM on September 6th .
We need a new Treasurer and a new Secretary.
Without officers the society cannot function!
If you feel you can help then ***please*** make yourself known to the Chairman, Adrian Thomas, at
adrian.thomas@btinternet.com

CONTENTS

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Chairperson's Chatter

Adrian Thomas

I was pleased to have been asked to become the new Chairperson of HMES, and my first task has to be to thank John Prosser as the outgoing Chairperson for all of his hard work. I also wish to thank the other members of the committee for all of their good work.

I have always enjoyed HMES meetings, both for the talks and also for the various locations that we have visited over the years. This year (2023) was no exception with excellent talks, and a great guided tour of the College of Optometrists. I am interested in Benjamin Franklin and was amused to learn that the College of Optometrists has more Benjamin Franklin material than the nearby Benjamin Franklin House. If you have not visited Benjamin Franklin House then it's worth a look, especially since it once housed an anatomy school. Benjamin Franklin House is a good example of how to have a museum when you have no original material related to your topic! The same might be said about the Freud Museum in Vienna.

I am pleased that we have re-joined the British Society for the History of Medicine (https://bshm.org.uk). As members of an affiliated organisation we are all now automatically members of the BSHM and as such we do not need to take out individual subscriptions. The BSHM's aim is to support organisations and individuals in the UK interested in all aspects of the history of medicine. We are mentioned on the BSHM website, and we need to develop our own web and digital presence.

The topic of historical medical equipment is surprisingly wide and interesting. The range of equipment varies from huge medical cyclotrons to tiny devices for implantation. The range encompassed by the word 'medical' is also broad, and includes instruments used by surgeons, patient aids and appliances, nursing equipment, and more popular items. A great mass of material has been used by the general public over the years with little or no medical or nursing involvement. Medical equipment is as old as humanity itself, and is found in all cultures. I am looking forward to hearing many more interesting talks in the future!

Editorial

Peter Mohr

18 members and speakers attended the HMES meeting at the Museum of the College of Optometrists, Craven Street, London, the first meeting since 2019. This was the second time we have held a meeting at this excellent venue, and I am grateful to the curator, Neil Handley, for his help and support.

The new chairman, Adrian Thomas, opened the meeting with a wide-ranging account of the use of electrotherapy and its use by the medical profession and for self-treatment. Faradic stimulation, massage devices, violet ray tubes, static electricity generators and other devices were discussed. The history of electricity and lighting were of special interest because Benjamin Franklin (1705-1790), who experimented with lighting, lived in a house only a few doors further down Craven Street.

Margaret Willson followed with an excellent talk on the problem of illuminating the mouth in dentistry; early practitioners relied mainly on sunlight –

reflected light from paraffin or gas lamps was never bright enough and later even battery lights presented problems of access and a reluctance to put light bulbs inside the mouth. Smaller bulbs attached to a spatula or a mouth gag, and modern fibre lights improved illumination, nevertheless many dentists and dental schools still like to face their patients towards the sun!

Our host, Neil Handley, continued with a thoughtful discourse on why medical organisations set up historical museums and collections. Medical schools have collections for teaching, however other collections are centred around a medical speciality or a personal collection; they may also be part of an archive of a society, or to conserve historic equipment. Such collections were often a focus for a society membership.

Peter Mohr finished the morning session with a report on two large rare wax anatomical models in the Manchester Medical School, made by artist, Friedrich Zeigler (1860-1936) in 1902. A large wax embryo and model of an infant brainstem, had remained hidden on shelves, forgotten and unused since 1973.

After lunch, Jonathan Goddard presented a detailed account of the cystoscope instruments used in perurethral prostatectomy (TUPR). The earlier instrument with a small wire loop which first cut then cauterised was associated with complications. The main cause was poor technique, and the emphasis now is on detailed surgical training for TURP using phantom prostates made from apples or ox heart muscle!

Adrian Padfield discussed the history of epidural block and showed an interesting film of the technique.

Evelyn Barbour-Hill's lecture on a thermometer, 'Dr Forbes' Specifications,' was an excellent Power Point presentation with a voice recording of his talk, about an early bath thermometer calibrated for domestic or nursing use. The originator, Dr John Forbes (1787-1861), is also remembered for his translation of Laënnec's book on monaural stethoscopes (1819).

A guided tour of the British Optical Association Museum by Neil Handley was the highlight of the meeting. The museum has recently been refurbished and includes a magnificent collection of spectacles of all types, optical instruments, portraits, prints, and all sorts of ephemera related to the history of optometry, including a large reference library. The Museum can be visited by arrangement (www.college-optometrists.org/the-british-optical-association-museum) and also has open days.

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The meeting welcomed the new Chairman, Adrian Thomas, and thanked John Prosser for his many years of service to the HMES. A further meeting is planned for mid-September 2024. There was a difficult discussion about the cost of the website versus its use. The present website has not been renewed and Dr Mohr will investigate other options. One problem is accessing past issues of the HMES Bulletin: Dr Mohr has a full set of issues on PDF files with an index on a USB stick which can be loaned to a member to copy. (peter.mohr@manchester.ac.uk)

The future of the HMES depends on the active participation of the younger members of the Society both for management and presentations, otherwise the Society will fade away as the older members atrophy! Some of the present older members of the committee are near the stage of having to resign; I resigned as Honorary Secretary in 2018 but agreed to continue as 'meeting organiser', so the post of Hon. Secretary, and also two general member committee positions are vacant. I plan to help organise the next meeting in 2024 but then I intend to resign at the end of 2024 when I am 80.

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Electrotherapy, Clinical and Popular

Adrian Thomas

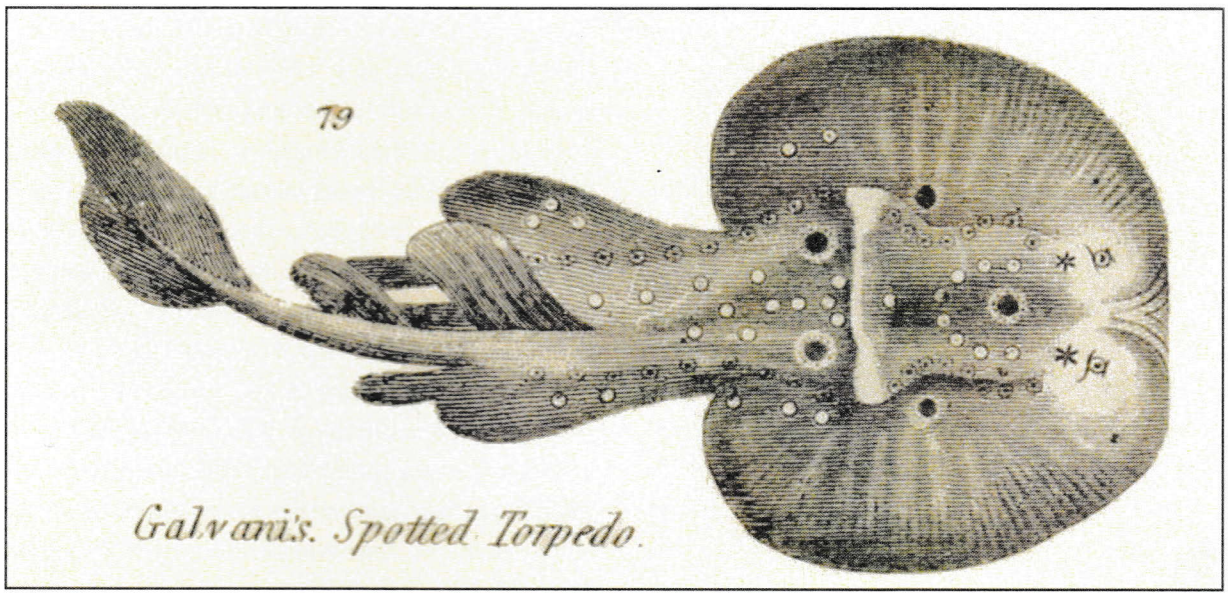

Fig. 1 Galvani's Spotted Torpedo: Kaempfer's *Amoenitatum Exoticarum* 1712

Introduction

The use of electricity in medicine is a complex and interesting topic. This paper considers selected aspects of the long history of electrotherapy. The standard text is that of Hector Colwell from King's College Hospital **1**. Colwell discusses the use of electricity in medicine up to 1922 with a full and interesting account. More recently Iwan Rhys Morus has written an excellent account of medical electricity in Victorian England **2**. The increasing knowledge and use of electricity has affected all aspects of our lives, and these developments continue today.

Origins

Knowledge of electrical phenomena developed only slowly. Early humans would have found electrical phenomena both complex and difficult to understand. They observed strange electrical phenomena in the sky, including lightning or the northern lights (the aurora borealis). There would be speculation as to their origins, and men were ever ready to attribute the mystery of flash and sound to supernatural powers, so that the earliest electrical observations were given a sacred or religious character. In reality humans do not change, and whilst we may smile at attributing thunder and lightning to the actions of the gods many contemporary writers, including Fritjof Capra **3** and Rob Bell **4** , now derive a spirituality from the universe of quantum physics. The sense of wonder persists and for many the boundaries between physics and metaphysics are thin.

Greece and Rome

Thales of Miletus (548-545 BCE) can be considered as the first known Greek philosopher, scientist and mathematician. Amber is made up of fossilised tree resin, and its colour and natural beauty has been valued since earliest times. Thales noted the interesting properties of amber, particularly that when friction is applied it will attract lightweight particles, including straw, fluff or dried leaves. This

reflected light from paraffin or gas lamps was never bright enough and later even battery lights presented problems of access and a reluctance to put light bulbs inside the mouth. Smaller bulbs attached to a spatula or a mouth gag, and modern fibre lights improved illumination, nevertheless many dentists and dental schools still like to face their patients towards the sun!

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has fascinated observers from the earliest times. This property is related to static electricity, when the amber becomes negatively charged. Pliny the Elder (23-79), and other Roman writers, found that various curative powers were bound up with electricity **5**. One of the remedies in use among the Romans was the use of the electric ray of the order Torpediniformes (Fig. 1) which could be placed in a bath of a patient with gout. Pliny the Elder (23-79CE) in his *Naturalis Historia* implies that it was well known as a therapeutic agent.

Increasing Knowledge of Electricity

During the 16th-century a systematic knowledge of natural sciences was developed, and the pre-eminent name is William Gilbert (1540-1603) **6**, who was Physician-in-Ordinary to Queen Elizabeth and President of the Royal College of Physicians. Gilbert first introduced the word electricity, and the publication of his great work *De Magnete* in 1590 established the basis of electrical science. Gilbert's major conclusion was that magnets worked because the earth itself was a magnet, and this was a source of astonishment to readers of his period, who still believed that such phenomena were derived from the spiritual world. The connection between magnetism and electricity was shown by the Danish scientist Hans Christian Ørsted (1777-1851) as late as 1820.

The German investigator, Otto von Guericke of Magdeburg (1602-1686), was conducting experiments in the hope of obtaining an empty space. He attempted to produce a vacuum by emptying a sealed water cask with the help of a piston water pump. Another of his inventions was the first machine for generating frictional electricity. This invention was a crude method for rubbing a rotating sulphur ball with the hand, and had some significance for the production of a high tension electrical current.

In 1705 Francis Hauksbee (1660-1713) **7**, Curator of Experiments to the Royal Society in London, was investigating mercury in a vacuum. He described the phosphorescence of mercury globules, and did not initially see it as resulting from an electrical phenomenon. In 1709 he developed an apparatus using a spindle to rub two substances together in an evacuated bell-jar. He substituted a glass globe for von Guericke's sulphur globe.

Hauksbee was able to rub wool and amber beads together and observed the pale light flashes. He repeated the experiment in the open air and noted "very little light did ensue in comparison to the appearance of it in vacuo." He continued his work using a variety of materials, and when he used glass and wool he saw a fine purple light when he rotated the spindle. This research carried out by Hauksbee is remarkable, and marks the earliest observation of the results associated with an electric discharge through a vacuum. The rubbing together of specific bodies is the oldest means of generating electricity. Hauksbee's purple light is a typical electric discharge, and was regularly seen by early radiologists when the gas X-ray tube had an incomplete vacuum. In 1729 Stephen Gray (d.1736), demonstrated that some materials would conduct electrical properties for a distance and that some would not. Importantly he showed that metal wires conducted electricity.

Throughout the 18th century the study of electric phenomena was popular in royal courts including the French court. Abbé Nollet (1700-1770) **8** held the Chair of Physics at the College of Navarre and was Preceptor in Natural Philosophy to the Royal Family. His apparatus was his remarkable electric egg, which at the time was more an object of curiosity or parlour trick than one of scientific value. It was in the next century its significance was appreciated. The electric egg was a strongly made oval glass vessel, similar to an electric bulb. When the egg was exhausted by an air pump and then subjected to the transmission of an electric current from a frictional machine, it produced a number of startling and colourful effects. These were again not unlike the phenomena eventually produced in an ion X-ray tube with a low vacuum. Nollet obtained his results by connecting his electrical generator to the electric egg by wires, which carried the discharges through the bulb. His observations were published in Paris in 1753.

One day, and apparently out of simple curiosity, his co-worker, Charles François du Fay (1698-1739), suspended himself by a silk cord, and Nollet gave him to a charge of electricity from his frictional machine. He then touched du Fay's hand, and a spark was seen, as bright as it was surprising, to pass between the two men. In 1734 du Fay stated that electricity was in two forms which he called resinous and vitreous, now called negative and positive.

Benjamin Franklin (1706-1790)

Benjamin Franklin was a remarkable man, contributing to many different areas. In 1745 scientists at the University of Leyden developed the Leyden jar which is essentially a device to store static electricity, a high voltage device with a high storage capability. A Leyden jar was sent to Franklin **9** and he used it in his experiments. His best known experiment is in the development of static or high tension electricity, and at that time only static electricity was known. Franklin believed that the electricity on the earth and in the air were the same essential phenomenon and this view was ridiculed. Franklin overcame this opposition in his famous experiment **10**. He made a silken kite which had an iron point. Fastened to this kite was a hempen string which, continuing as a silken cord, had an iron key attached to its lower end. The trial was made in Philadelphia on a rainy day when Franklin released his curious apparatus in the wind. When it was made wet by the rain, the hemp string became a conductor, and Franklin then touched the key. A spark was immediately created, and this technique, by bringing lightning down to the earth, demonstrated its electrical nature at the same time as it proved his theory. Franklin noted that "thereby the Sameness of the Electric Matter with that of lightning is completely demonstrated". Franklin also differentiated between positive and negative electricity, and between conductors and non-conductors of electricity, originating the terms. It is surprising that Franklin was not killed.

Benjamin Franklin was a resident in London and his house near Trafalgar Square, is currently a museum, and is his only surviving residence and well worth visiting **11**.

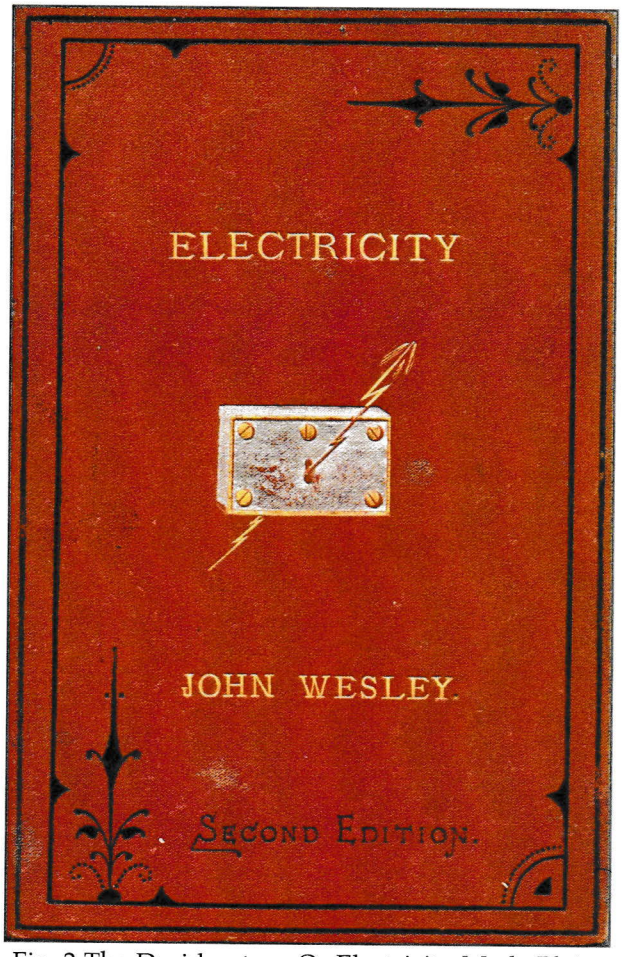

Fig. 2 The Desideratum Or Electricity Made Plain and Useful: John Wesley

John Wesley (1703-1791)

Two of the first practitioners to use electricity as a therapeutic agent were John Wesley and Richard Lovett, and these two may be seen as the real pioneers of electro-therapy in the United Kingdom **12** . Wesley was an enthusiast for electricity as a treatment, and his electrical machine may be viewed in John Wesley's House which stands next to the Museum of Methodism on the City Road, London (Fig. 2) **13**. His book *The Desideratum Or Electricity Made Plain and Useful* of 1759 gives an account of his experience and recommendations (Fig. 3)**14**. Wesley praised the new electricity for its healing properties, and wrote in his *Primitive Physic* of 1747:

"In the course of time I have likewise had occasion to collect several other remedies, tried either by myself or others, which are inserted under their proper hands. Some of these I have found to be of uncommon virtue, equal to any of those which were before published; and one I must aver from personal knowledge, grounded on a thousand

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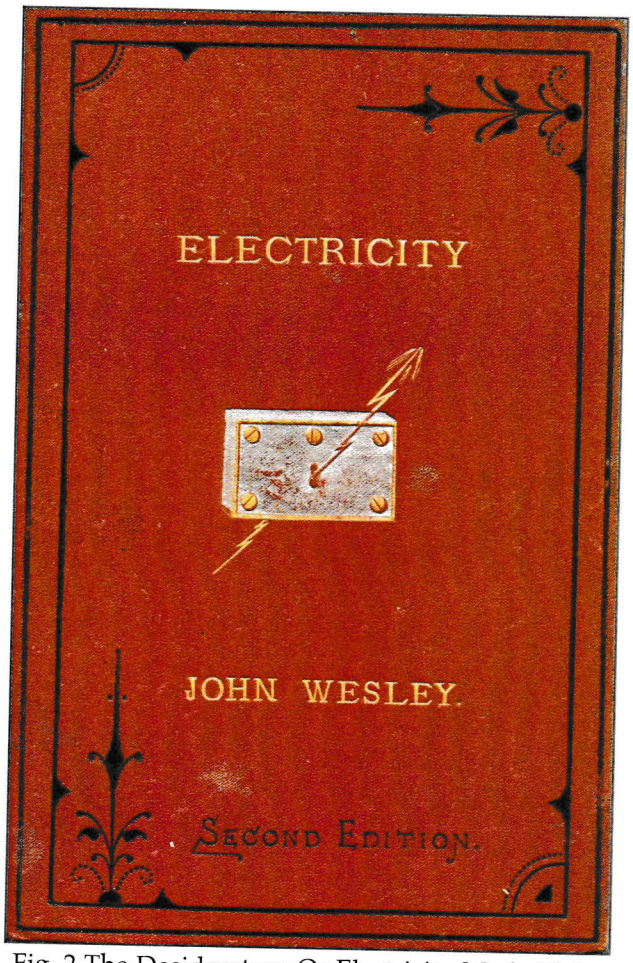

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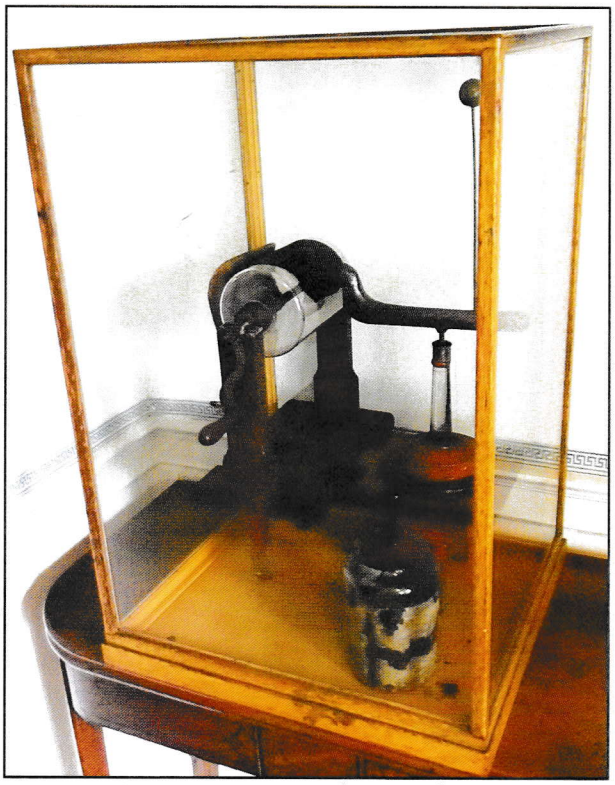


Fig 3 Wesley's electrical machine with a Leyden jar in front

experiments, to be far superior to all the other medicines I have known – I mean Electricity. I cannot but intreat those who are well-wishers to mankind to make full proof of this. Certainly it comes the nearest to a universal medicine of any yet known in the world." **15**

Wesley was strongly practical in his approach and was careful to try his various remedies. His list of conditions that would benefit from electricity included: blindness, ulcers, nervous disease, and weakness of the legs. There was some medical opposition to Wesley's views, however many physicians shared his enthusiasm. As a time when therapeutic options were limited it was not unreasonable to try the new technique.

Luigi Galvani (1737-1798)

Animal electricity, otherwise known as the electrical nature of animal bodies, is the essential reason for medical uses of electricity for both diagnosis and therapy. The English author Mary Shelley explored this theme in her 1818 novel *Frankenstein; or The Modern Prometheus* in which electricity is seen as the life-giving principle. Muscular contraction as a result of electrical stimulation was first noted by Jallabert of Geneva in 1748. In 1791 Luigi Galvani of Bologna showed the movement of a freshly killed frog's leg in response to electricity.

P G Grimelli in his classic study of electro-physiology illustrated this physiological action of electricity on the recently killed frog (Fig. 4) **16**. On the title page of his book Grimelli has a charming figure of an angel in the clouds using a static machine and in the act of making lightning, showing his knowledge of the work of Franklin.

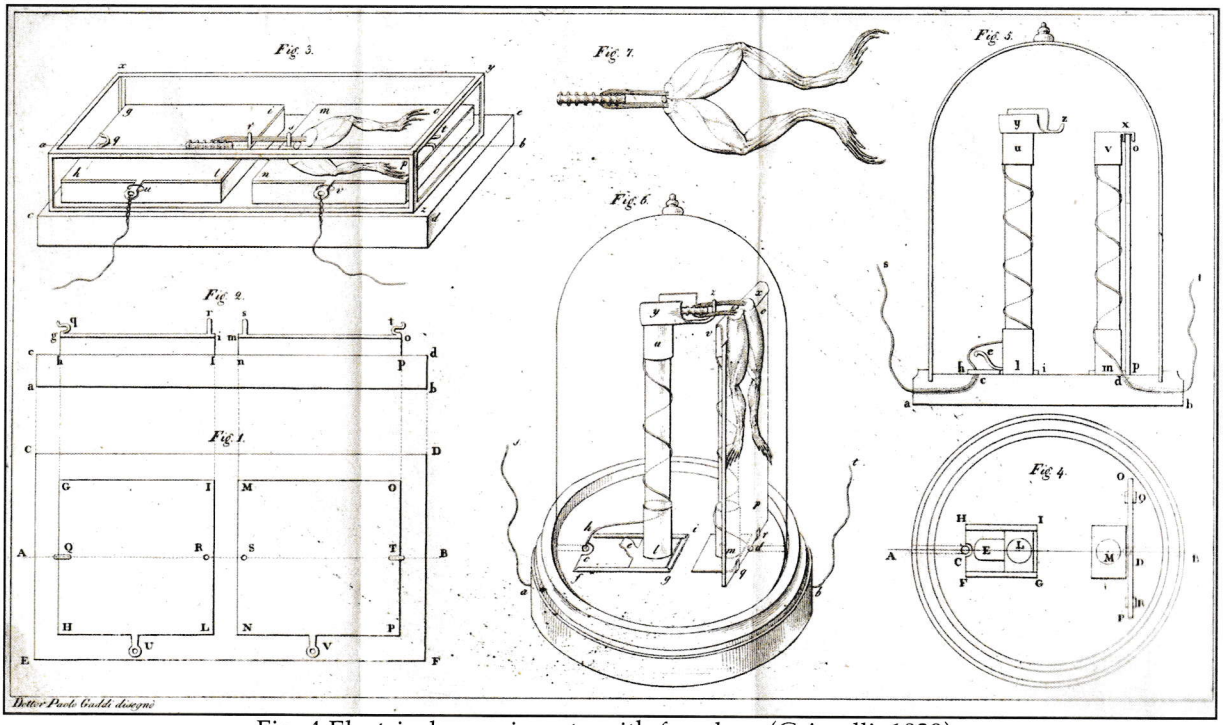


Fig. 4 Electrical experiments with frog legs (Grimelli, 1839)

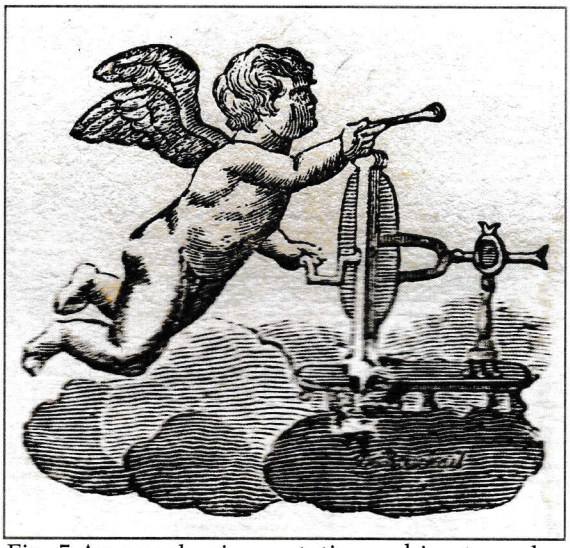


Fig. 5 An angel using a static machine to make lightning (Grimelli, 1839)

Medical and Popular Magnetism

The relationship between magnetism and medicine is complex **17**. By the end of the18th century better quality and more powerful magnets were being manufactured, and there had been reports of the treatment of stomach pains and toothache using them. The story of Franz Anton Mesmer (1734-1815) is fascinating. It is too easy to represent what transpired with Mesmer and his followers as an example of either ignorance or quackery. This would be a mistake, and Mesmer and his followers were sincere, and believed in the truth of their observations. Mesmer practiced as a doctor in Vienna and published his doctorate in 1765 on the influence of celestial bodies on disease. Mesmer believed that the universe was filled with a universal fluid, which could influence humans. Mesmer wrote

"I never gave up close observation of my patients in accordance with my theory and became so involved that I experienced the condition myself, in the rise and fall of the illness. In the end I came to the conclusion that the ebb and flow in the body of the sick person was similar to those of magnets".

It was therefore quite logical for Mesmer to use his animal magnetism for therapy. Mesmerism was popular in the 19th-century as can be seen in John Bovee Dods' book of 1886, *Mesmerism and Electrical Psychology* (Fig 6) **18**. There was opposition from the medical establishment towards Mesmerism, however many of the ideas may be found today in the discipline of medical hypnosis.

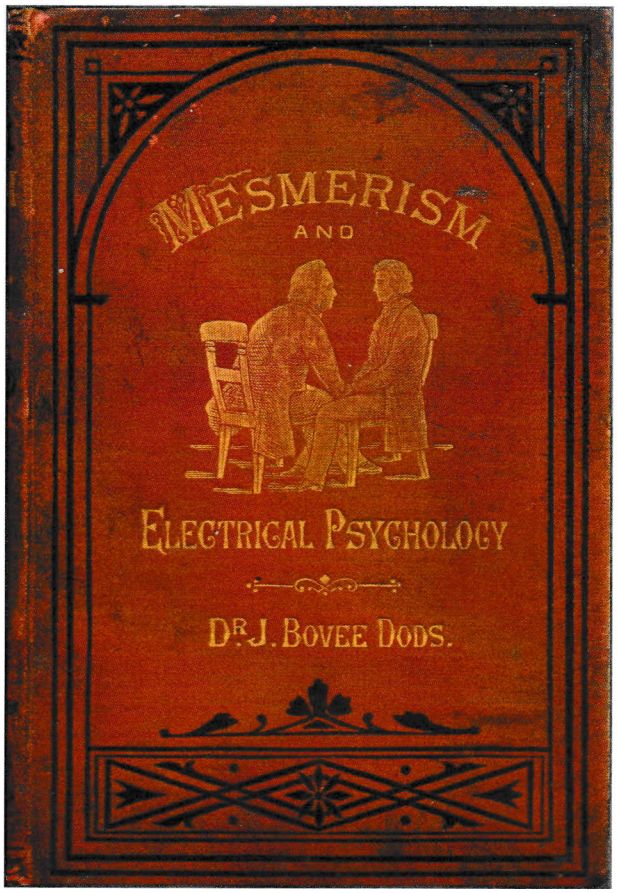


Fig. 6 John Bovee Dods' *Mesmerism and Electrical Psychology* (1886).

Magnetism has continued to fascinate with a belief in its healing power. There remain many links between magnetism and medicine both in mainstream practice and in quackery. In popular medicine magnets have been worn as bracelets and in corsets and this shows no sign of ceasing with contemporary promotion of medicinal lodestones. Finally, magnetism was to have a role in medical imaging in an unsuspected manner in magnetic resonance imaging (MRI).

Conventional Medicine and Electrotherapy

In the 19th century many hospitals developed electrical departments. These departments supported all aspects of medical electricity, from electrical therapy to the extraction of foreign bodies using electromagnets. The topic of electrotherapy is very large and complex and difficult to summarise in a short paper. There were essentially three forms of electricity as used in therapy and shown in table 1. These are essentially friction, chemical action, and induction **19**.

In 1871 J Russell Reynolds from University College Hospital in London published his well-known

lecture series on the clinical uses of electricity **20**. Reynolds notes that electricity could be used for diagnosis, and it could also be used for treatments. Reynolds explained that as a treatment, electricity may immediately cure, such as in some patients who have lost their voice.

Table 1. Forms of Electricity in Clinical Use (From Reynolds, 1871)

Franklinic Electricity
Static or Friction Electricity.
Galvanic Electricity
Constant or battery or continuous current.
Faradic Electricity
Induced, Magnetic, or Voltao-Magnetic Electricity.

1. Franklinic Electricity.
This is the classical 'electrical machine' and a cylinder or glass plate collects static electricity. It was called Franklinic in memory of Benjamin Franklin. It was used in three ways:
i. The patient can be part of the prime conductor and charged full of electricity as in the 'electric bath'. The patient is placed on a glass-legged stool and attached to the prime conductor by a brass chain. The patient's hair will 'stand on end'.
ii. A spark is applied to a particular part of the patient. A moveable brass knob is connected to the prime conductor and is applied to the area to be treated.
iii. An electrical shock is applied through the part to be treated, however Reynolds comments somewhat dryly that "short of being hanged, I do not imagine that anything could be much more unpleasant."
2. Galvanic Electricity.
This is continuous, battery or constant current. It was also called interrupted continuous current. It is of relatively low intensity regarding its action on nerves and muscles, however it will produce thermic effects with a rise in temperature.
The current might be used in a continuous or interrupted form.
3. Faradic Electricity.
This third form is 'faradisation', also known as induced electricity, magneto-electric, or voltao-dynamic electricity. Reynolds noted that this was the type of electricity of which Michael Faraday was the great exponent. Reynolds commented that the electricity was of a very high tension, but had a minimal chemical action, with no heating, and no burning sensation. It resulted in a marked action on nerves and muscles. The current is induced, and is of only a momentary duration.

As the 19th century progressed many hospitals opened electrical departments (Fig. 7).
An 'Electrical Room' had been set up at Guy's Hospital as early as October 1836. However, the first London Hospital to install electrical apparatus was the Middlesex in 1767 with St. Bartholomew's following 10 years later. Dr. W.E. Steavenson was appointed 'Hospital Electrician', and was the first of the modern electrical medical officers at St. Bartholomew's Hospital. Steavenson installed an electric bath in 1882 (Fig. 8). On the death of Steavenson a mass of notes were left, and were the basis of the book *Medical Electricity* by Steavenson and Lewis Jones which went through many editions and was popular and very influential.
H. Lewis Jones (1857-1915) was the primary developer of British Electrotherapeutics. Lewis Jones introduced Diathermy to England at St. Bartholomew's Hospital in 1909. The use of electrotherapy in November 1916 for an injury in the Great War is shown in this charming postcard from a series on physiotherapy (Fig. 9).

During the twentieth century electrotherapy gradually passed out of use. Many of the conditions formerly treated with electricity were seen as psychological in origin and having a functional component. This does not make them any less real, and somatisation remains commonplace with the physical expression of stress and emotions related to the mind-body connection. Interventions now centre on various forms of talking therapies and psychotherapy, or with pharmacological treatments. However, should the use of electrotherapy in selected conditions be reconsidered since it was certainly effective in many conditions?

The relationship between medical and popular electrotherapy is well seen in the Violet Ray Vitalator (Fig. 10). The Violet Wand electrodes are made of glass, and are evacuated and filled with a

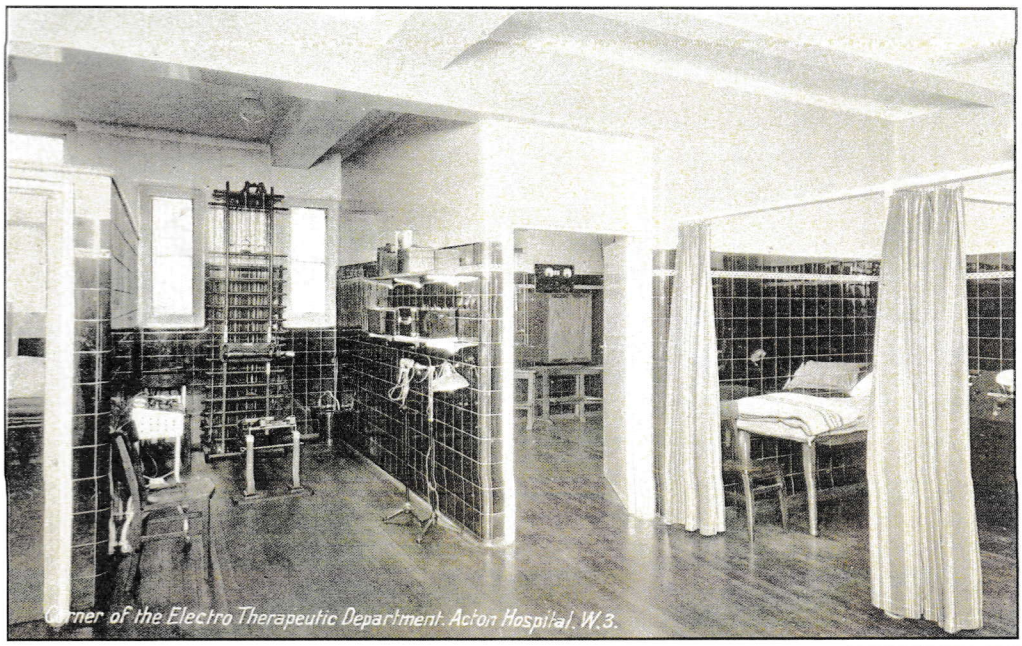


Fig. 7 Acton Hospital Electrical Department (1930s postcard).

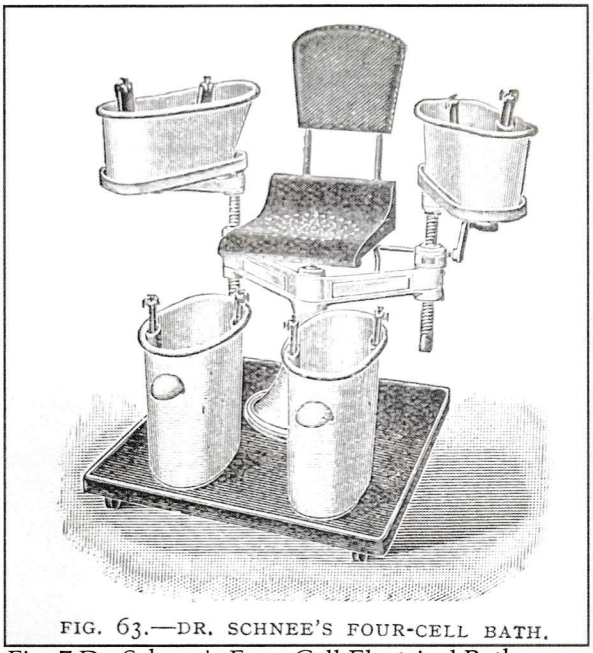


FIG. 63.—DR. SCHNEE'S FOUR-CELL BATH.

Fig. 7 Dr. Schnee's Four-Cell Electrical Bath (Magill, 1917).

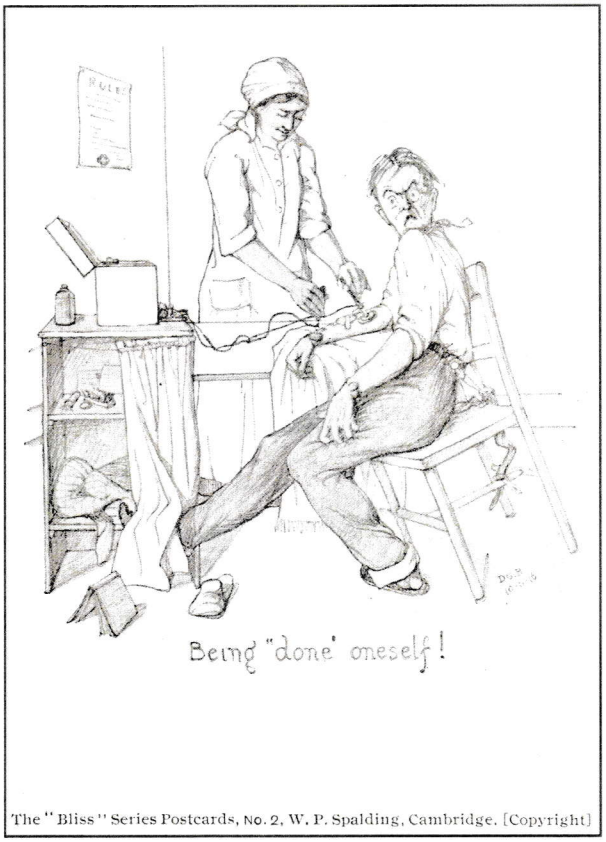


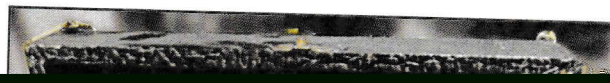
Fig. 9 Being "done" oneself! Electrotherapy. 'The " Bliss" Series Postcards, No. 2

gas which glows violet when excited. They had a selection of shapes and gave different strengths of spark. They were initially seen in catalogues for medical practitioners, and became popular with the general public for home use in the 1920s and later. They are now commonly to be found in antique shops and on E-bay. They are still available on-line from the Violet Wand Store® who proclaim that they are proud to carry award winning fetish products, violet wands, violet wand electrodes, and accessories **21** .

Conclusions

There is a complex relationship between what has been called quackery and what is called conventional medicine. It might well be asked, what is conventional anyway? What is quackery in one generation may become mainstream in another, and vice-versa. Alternative medicine is alternative to what, exactly – since all medicine was once alternative to what came before. Traditional electrotherapy and medical electrology is a huge subject and continues today in neuro-physiology, physio-

therapy, rehabilitation medicine and alternative medicine. Diagnostic radiology and radiotherapy



Ziegler's Wax Medical Models
in the Manchester Medical School and Museum of Medicine & Health (MMH)

Peter and Julie Mohr

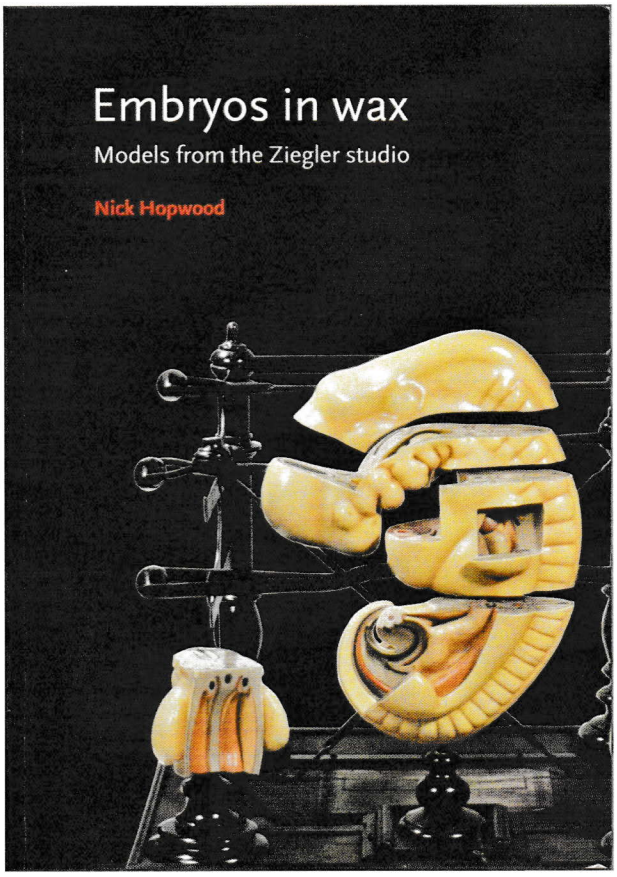


Figure 1

This paper is a report on two rare, large, wax models made in 1902 by the anatomical modeller, Friedrich Ziegler, and which have laid, almost forgotten, in the Manchester Medical School for many decades. One is a 45cm. model of a human embryo and the other is a set of three 42 cm. models of a dissected brainstem. Their 'rediscovery' was triggered in 2021 by Professor Hopwood's book, *Embryos in wax*, which displays, prominently on the front cover, a striking image of a large wax embryo, identical to the one in the Manchester MMH (Fig. 1). The book provides a full account of Ziegler's life and work, and beautiful coloured plates of wax models in museums across Europe, and a copy of Zeigler's catalogue from the 1920s **1**. This paper describes the Ziegler studio-workshop, the two wax models, and the technique of their construction.

Adolf Ziegler (1820-1889) and Friedrich Ziegler (1860-1936)

The Ziegler Studio in Freiburg was founded by Dr. Adolf Ziegler, who qualified MD from the University of Freiburg in 1850. He was interested in midwifery, and his first post was in obstetrics at the Vienna General Hospital. He had learnt wax modelling as a schoolboy, and while in Vienna he became fascinated by the anatomical models in the medical museum and the wax sculptures in La Specola in Florence; he made and sold his first wax model, a placenta, in 1852-3. In 1854 he returned to Freiburg as a demonstrator in the Physiological Institute under Professor Alexander Ecker (1816-1887). He taught embryology, took practical classes, made models and demonstrated experiments. Together, they produced a large collection of models of human and animal embryos for teaching, such as a series showing the 'Development of the Frog'.

Adolf found he could sell his models to other universities and museums, and so in 1867 he left the Institute to set up his own 'Studio for Scientific Teaching Models'. Embryology was a topic of increasing interest, and researchers would approach Adolf to make models of their work - for

example Wilhelm His (1831-1904), professor of anatomy at Basel, asked him to make a series to show the 'Development of the Chicken in the Egg' (1868). Ziegler's models became famous and won prizes at international exhibitions, and his models can be found in museums and medical schools all over the world, including a large collection in 1879 purchased by Arthur Milnes Marshall, professor of zoology, for the University's Manchester Museum **2**.

His son, Friedrich, trained as an artist and sculptor, and then taught art in Freiberg for three years. When Adolf retired in 1883, Friedrich took over the business and moved to a new studio-workshop, where a team of assistants produced 'new editions' of older embryo models. He described his work as 'plastic publishing' and regarded himself as a 'publisher' of the original work of the researcher (the 'author') and that the subsequent 'editions' (the later copies of the model) could be sold by him to museums, colleges and collectors.

The models used for research work were more complicated and designed to show internal features, reconstructed using the 'stacked wax-plate technique': first, serial sections were cut with a microtome to make microscope glass slides of the original foetus. An enlarged image of each slide was projected by a 'camera lucida' attached to an 'embryograph' onto a sheet of special paper so a detailed drawing could be made, which was then 'rolled' onto a 1mm-thin wax layer (Fig. 2) **3**. This was repeated for each microscope slide! When finished, the wax slices were then accurately stacked to reconstruct a 3D image of the enlarged embryo, which could be seen in the transilluminated wax stack (Fig. 3) **4**. The modeller then carefully dissected the layered embryo from the wax - this was called the 'plate model', from which Zeigler made a plaster cast, which was used to make production models, painted and mounted. The plate models were well within Zeigler's skills, but were also often made by the original researcher and given to Zeigler to make the display models. Friedrich would have had to work closely with these 'authors'.

Fig. 2 An embryograph. A Verick *camera lucida* (c.1860s) at the top, projects and magnifies an image of the microscope slide through two special lenses onto a flat surface for drawing.

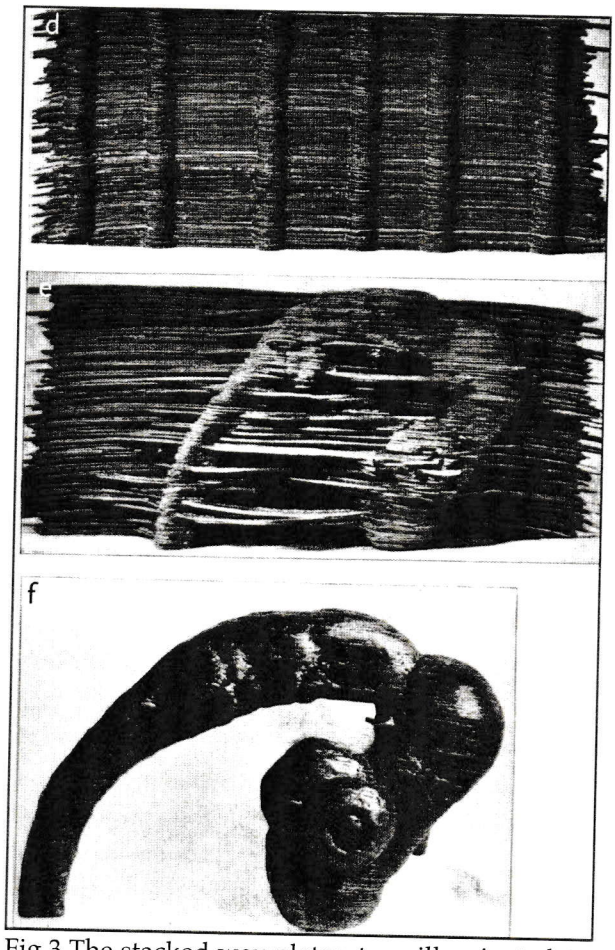


Fig.3 The stacked wax plates, transilluminated, and the final 'plate model'

Fig.4 Photograph of the Manchester Medical School histology laboratory after refurbishment in 1930. The wax embryo is prominently displayed on its stand, inside a glass case (University of Manchester archives)

The large wax embryo model 1902

The Ziegler wax embryo model in the MMH is 45.3 cm. long, enlarged x 66 from the original human embryo of 6.8 mm! The plate model was made by Prof. Hans Piper (1877-1915) in Berlin in 1902 for Franz Keibel (1861-1929), professor of physiology at Strasberg. The finished model is made of four large sections that link together, plus two more smaller, sections. The colour pictures of it in Prof. Hopwood's book show one of the models displayed in Jena University in a sturdy metal frame. A photograph from 1930 shows the Manchester wax embryo in the old Manchester histology laboratory (Fig. 4). Unfortunately, the Manchester model, now in the MMH, has lost the original frame (probably sent to salvage with other 'scrap metal' during the 1970s), and the sections remain in boxes, stored on a shelf (Fig. 5). However, the authors made a temporary wooden frame (Fig. 6). It is not clear how many of these large embryos were made; we have not found any others in the United Kingdom, but we did locate one in the Anatomy Museum in Dublin (Fig. 7).

The wax brainstem model(s) 1902

The three 42 cm. wax models (magnified x 14) show stages of partial dissection of a 3 cm. brainstem of a full-term stillborn infant. (Fig. 8) The plate model and dissection were performed by Dr Florence Sabin BSc MD (1871-1953) who graduated from the John Hopkins Medical School in 1900. She was lecturer in histology, and after completing the plate models she personally took them to Zeigler in Freiberg and stayed seven weeks to help with the modelling, and later wrote a detailed monograph about them **5**. The three models show different stages of dissection, and can be rotated to reveal all sides. The ones in the Manchester Medical School Anatomy Museum, dusty and slightly damaged, have been stored on top of the cabinets since 1973 and before that, in the old Medical School from the early twentieth century.

Teaching

Embryology was the subject of considerable research and advancement during the period 1860s-1920s. Ziegler's complex wax plate models were

Fig. 5 The three main sections of the Manchester embryo, stored on a shelf in the MMH

Fig. 6 The Manchester embryo displayed on a temporary wooden frame made by the authors

Fig. 7 The wax embryo in the Dublin School of Anatomy Museum with intact stand and case (Photograph by Siobhan Ward, Chief Technical Officer)

used to study organogenesis and follow the development of internal structures in human and animal embryos, while the simpler more basic solid models were for teaching. Embryology was a difficult subject for medical students; not just because it was three-dimensional, there was the additional problem of visualising the growth and morphogenesis over time. The Manchester Anatomy Department in the Stopford Building has had a set of the models of the brainstem in their museum since 1973, but they have never been used for teaching in living memory. The use of models had gone out of fashion by the end of the 1930s, replaced by lantern slides, wall charts and well-illustrated textbooks of embryology. Indeed, Dr Thom Astley MD (1913-1972), lecturer in embryology at Manchester, 1946-72, never used models, and was known for his skilful blackboard drawings with coloured chalks.

Comment

In 1916 Friedrich Ziegler received an honorary doctorate from Freiberg Medical School in recognition of his contribution to medical science. After World War 1 orders declined, and towards the end of his life in 1936 he sold the business to another company, 'Marcus Sommer', who after World War 2 moved to the USA and produced some of Ziegler's products in plastic. Later, the company returned to Germany and opened the Somso Museum in 2001. A recent catalogue (2018) includes a plastic version of the large embryo on a light-weight stand (Fig.9) **6.**

Ziegler's models are now historical specimens, a link to the efforts of past researchers' attempts to unravel the mysteries of embryogenesis. They are a stimulus for medical historians; a landmark in the technology of medical research; a question for medical ethics, and examples of medical art and the artistic skills of Friedrich Ziegler.

Fig. 8 The series of three wax models of an infant's brainstem in different stages of dissection, in the Manchester Anatomy Museum

Acknowledgment

This paper was inspired and informed by Prof. Hopwood's beautifully illustrated *Embryos in Wax*. I am grateful to him for his advice and help trying to locate other examples of the large embryo models. I also owe thanks to Siobhan Ward MSc, Chief Technical Officer, Dublin Anatomy Museum, for photographs and details of their wax embryo.

References

1 Hopwood N. (2002)*Embryos in Wax* Whipple Museum, Cambridge

2 Hickson S.J. (1902) Manchester Museum Owens College Catalogue of Embryological Models. Cornish Manchester (1902).

3 The Embryograph of Wilhelm His, c. 1881 www.antique-microscopes.com/photos/embryograph

4 Making visible embryos www.sites.hps.cam.ac.uk/visibleembryos/s5_3

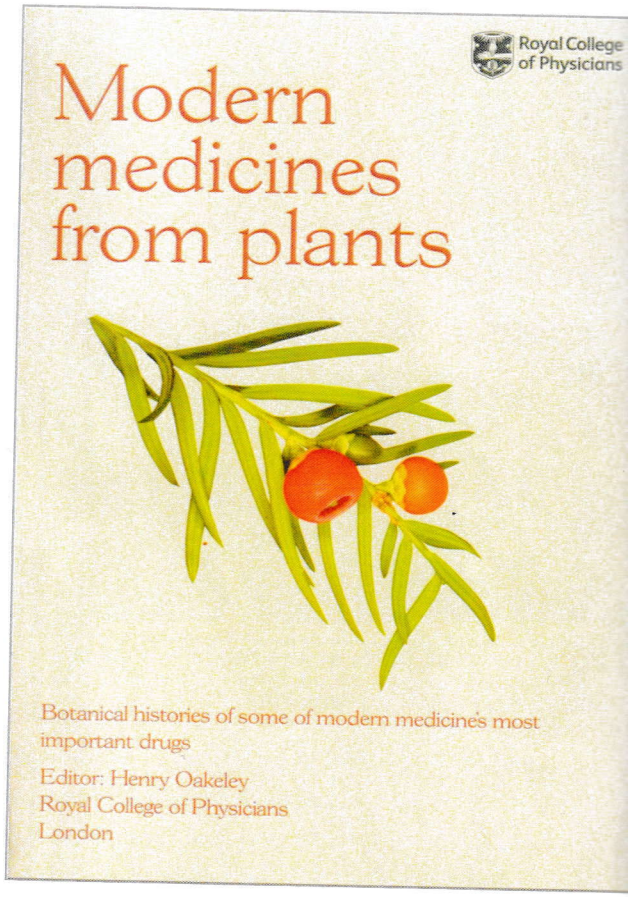
5 Sabin F.R. (1901) *An Atlas of the Medulla and Midbrain*. Baltimore Press.

6 Adam Rouilly, (2018) Catalogue A77/1, Somso Modelle since 1876 p.83.

Fig. 9 A page from the Rouilly/Somso catalogue (2018), showing a modern plastic version of the embryo on a light-weight stand

Book Review

Modern Medicines from Plants
(Royal College of Physicians, CRS Press 2024)
Authors: S. Burge, T. Cutler, A. Dayan, M. de Sweit, A. Devanesan, G. Foster, J. Knowles, J. Newton, H. Oakley, A. Tunstall and N. Snell
393 pages (25x17cm.) £17.99



This beautifully produced book provides a detailed account of the botanical history and medical use of 43 herbal plants in the Garden of Medical Plants at the Royal College of Physicians. Each plant is the subject of a chapter, which describes its natural history, structure, chemistry, folk-use, medical use, pharmacology and extraction of active ingredients.

Each author is an expert on one or more of the medicinal plants. For example, Timothy Cutter describes how *Colchicum autumnale* was known to Pliny as a poison (70 AD); it was used for gout from the early 1800s, and the active ingredient, colchicine, was discovered in 1820. It stops the painful inflammation by inhibiting the micro-tubules in neutrophils. Noel Snell explains that pilocarpine was extracted from plant *Pilocarpus microphyllus* in the 1890s and was soon recognised as an agonist for the parasympathetic system, and used for glaucoma, as an antagonist to atropine and in diagnosing an Adie pupil.

John Newton traces tobacco smoking from the 16th century. Nicotine from the plant *Nicotiana tabacum* (and *N. rustica*) is the addictive agent, and seventy other chemicals in the smoke are carcinogenic, confirmed by Doll and Hill in 1952. Interestingly, genetically engineered tobacco leaves are used to produce antibodies to Ebola!

Each chapter is illustrated with excellent coloured photographs, and is a journey from ancient history to modern medicine; a reference source for the history of botany, herbalism, pharmacy, pharmacology and therapeutics.

PDM

Notes for contributors

We are happy to accept contributions, short or long, in almost any form, although the editor is delighted when it's electronic. If you have references, please try to cite them in the form you see in this issue.

Pictures

We like lots of illustrations if they are available. Please supply each one separately, **NOT** embedded in a document. Most forms are fine and there is no need to convert them – in particular, if you have a TIFF, don't convert it. Please don't reduce quality to make the file smaller, send what you've got. We can reduce size here if necessary, but we can't put quality back.
The editor will be very happy to talk to you if you are having any problems.

Why Do Medical Bodies Set Up Historical Museums?

Neil Handley

At the last meeting, held at my own institution, the College of Optometrists, I spoke without notes on and around the topic of my recent PhD thesis, entitled 'Museums of the New Medical Professions in the Twentieth Century' (Birkbeck, University of London, 2022). The meeting venue, home to the British Optical Association Museum, had served as one of my three principal case studies, the other two being the BDA Dental Museum and the Anaesthesia Heritage Centre of the Association of Anaesthetists of Great Britain and Ireland. For this thesis I had studied the period roughly 1890-2005, across all the UK home nations, including the territory now comprising the Republic of Ireland. The three main questions surrounded historical medical museums (i.e. those covering medical and institutional history rather than museums exclusively concerned with anatomy, pathology or materia medica) as centres for collecting, architectural spaces for housing and displaying those collections and physical entities that could be visited, not merely by members of the respective profession but also by a 'general public', variously defined by the host museums. All this, a crash course in the sociology of the professions and seven years of my adult life, had allowed me to provide some answers as to what these museums were for. Many of my conclusions were hardly rocket science even if, surprisingly, they had never quite been expressed in such terms before.

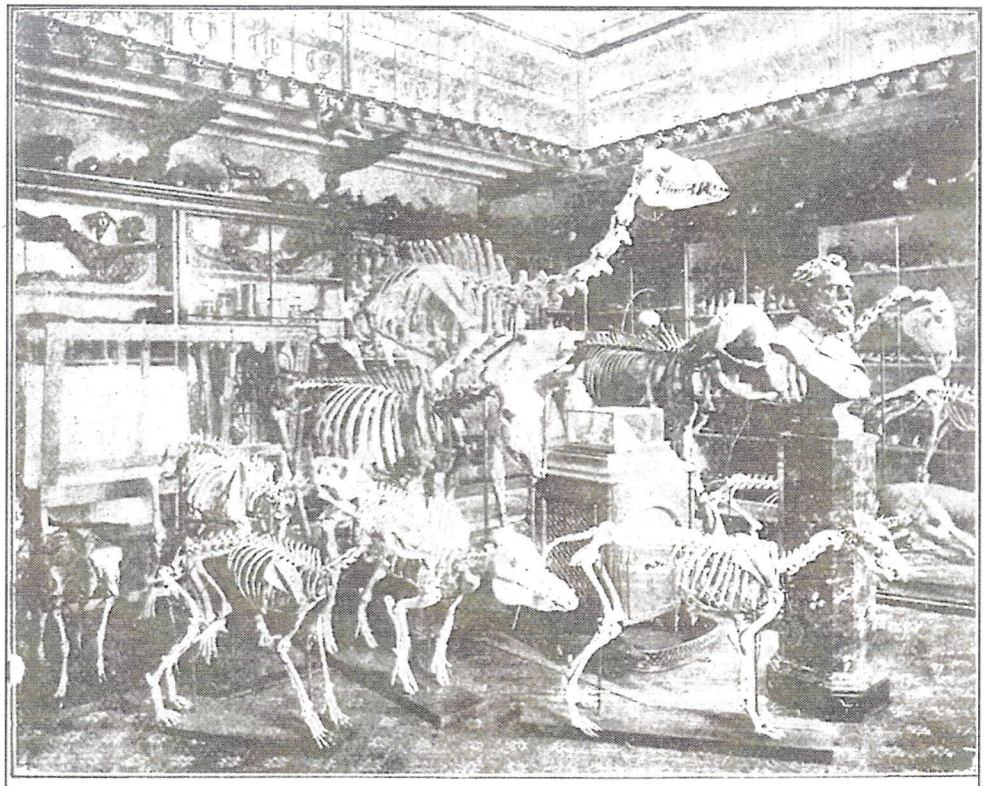
In a nutshell I found myself able to argue that:

• In the period under consideration professional bodies came newly to the idea of establishing historical museums. Many already had a tradition of amassing collegiate 'treasures' but often these were managed separately from 'museums' which largely retained their professional educational function until the later twentieth century. It was the newer professions, those with arguably the shortest histories, who emphasised their past more, in an apparent attempt to acquire status and thereby assert jurisdiction over their specialist areas of practice.

• The act of collecting, often in emulation of other medical or medical-related professions became almost an end in itself, a natural 'way of working' with sometimes quite expert involvement by members of the profession, albeit on a voluntary basis. In strictly museological terms these professional people were amateurs and qualified museum curators were practically unknown in such museums before the 1980s.

• Museums came to be seen as the ideal way to fill a professional headquarters building, especially when administrative staff numbers were low and dispersed national memberships proved reluctant to assemble in their professional 'home' quite as frequently as their leaders may have envisaged. A tendency to assert gentlemanly status by occupying Georgian townhouses seemingly influenced the nature of the material collected and the manner of display. Professional people could quite literally feel 'at home' here but outsiders might have found it intimidating.

• The satisfaction of gathering and housing a museum was sometimes sufficient, with comparatively less effort made to attract visitors, about whom the term 'unwanted' occurred more than once in the archival sources. I came up with the concept of museums that were 'theoretically open', advertised as being open to the public but with, in reality, numerous barriers to visiting, including zealous



A HAPPY FAMILY IN BONE.

gatekeepers, excessive security, remote and hidden display areas, competing institutional events leading to periods of closure and extremely discrete marketing, including tiny external signage and the restriction of information on how to access the museum, for example listing it only in professional journals. When the Internet age burst upon the medical museum scene, around 1996, it was welcomed as a means of sharing the professional heritage without having to admit the great unwashed.

Let us just consider this print in my own personal collection which shows the museum of the Royal Veterinary College (RVC) in about 1891. Traditional 'specimens' are interspersed with art treasures (such as an historical bust). One is tempted to conclude that the exhibits are a 'happy family' because unmolested by visitors. The exhibits act as symbols of a profession that is fully established, exercises specialist knowledge and skill and can afford the conspicuous consumption of dedicating significant physical space to what might be considered a non-essential activity. Within each specialty, however, (in this case, veterinary medicine), there was only room for one organisational body to carry the banner of a museum. Hence, in 1902, Professor Albert Mettam, a Council member of the Royal College of Veterinary Surgeons (RCVS), complained, "I was in the museum this morning and I think it is more a place to set potatoes in than anything else". He accused even the Museum Committee of having abandoned it. Indeed, it eventually was abandoned and its collections transferred to the RVC. Other references suggest visits to such museums were infrequent, often confined to major events and required extra work to facilitate, for example at the Royal College of Surgeons of Edinburgh in 1921, 'In anticipation of the meeting of the British Association…some cleaning of the Museum was carried out', a possible inference of prior neglect.

The concerns of those who managed such museums were a little different from mainstream museums. For example the Pharmaceutical Society discovered that young members of their own profession, instead of being proud of their collective inheritance, were wont to steal exhibits for reasons of rivalry between training institutions. In 1924 students from the London School of Pharmacy sent a raiding party to seize the bust of Jacob Bell from 'its usual place of honour' and the elderly porter was unable to stop them. That anecdote, however, only made a footnote in my eventual thesis. More common was a belief that historical museums could act as useful tools for recruitment, attracting the medical professionals of tomorrow. This required the

The British Optical Association Museum, then in a Mayfair townhouse, in the 1930s: objects, antique prints and a pioneering lampstand served as professional heirlooms and a means of promotion, but only to highly selected audiences.

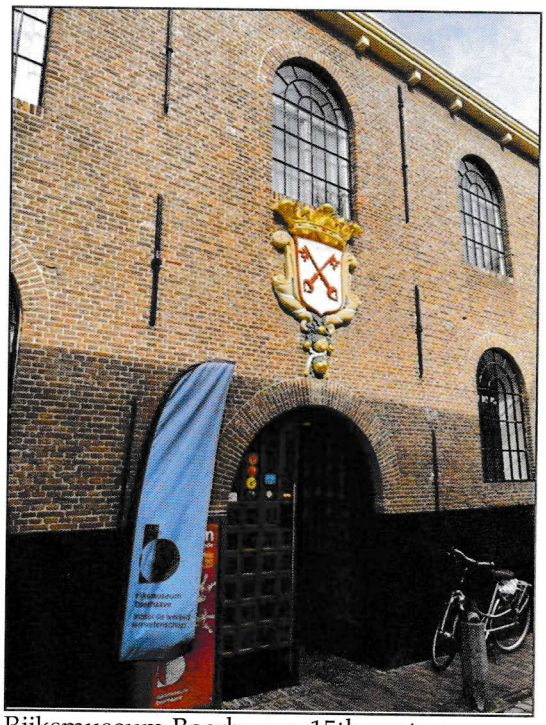
professions, often their most elderly retired members, to engage with school parties and expound their knowledge of obscure and by now obsolete instruments. Goodness knows what the poor kids must have thought?

The Honorary Curator of the British Dental Association Museum, who often disappeared without trace somewhere in the basement, wrote in the 1970s that 'there is no way in the foreseeable future in which school visits could be entertained. It is maintained and conserved in what leisure time a dental practitioner and I can find…it is visited by such folk as doctors, artists, film-makers, television producers and writers…apart from members of the dental profession from this country and overseas'. There is an incongruity between this willingness to admit those who might help promote the museum more widely and the reluctance to encourage visits by those who might consequently demand to come. Clearly, if receiving visitors was to remain a leisure activity for the hosts, the numbers would remain small. This seems borne out by a report in 1971 that, 'The museum has continued to attract a very satisfactory number of visitors' [my emphasis] and that while 'the impression was received during last year that requests for admission from persons outside the dental profession…were considerably more numerous than in previous years' (indicating that actual statistics were not kept) the real reason for satisfaction was because 'The number of dentist visitors from overseas certainly increased…it was gratifying to hear from some that they had been advised to visit the BDA museum by acquaintances who had already seen the exhibition and had spoken of it with praise when they had returned home'. Relying on word-of-mouth publicity absolved the museum volunteers from promoting the museum themselves, except indirectly by ensuring that such visitors as did come were treated hospitably.

Passages such as that just quoted therefore make me reluctant to criticise museums of the medical professions too harshly. For those with a genuine interest they could be welcome and enjoyable places to visit. They were often self-appointed guardians of specialist histories that larger but more general museums would have ignored. Ultimately more and more professional bodies felt a need to establish a museum….members of the public would write to them, or even offer them further material 'assuming' they had one. Their reputations were truly international and, as such, these museums deserve academic study beyond that which their physical size might suggest.

Microscopes and Windmills

Stephanie Seville



Rijksmuseum Boerhaave, 15th century Monastery turned teaching hospital and claimant as home to the beginning of clinical teaching.

For the University of Manchester's Museum of Medicine and Health (MMH), an opportunity came in September 2023 in the form of a conference to launch the International Association of Medical Museums (IAMM). Hosted at the Rijksmuseum Boerhaave in Leiden, Heritage Officer Stephanie Seville and Professor Carsten Timmermann, Head of the Centre of the History of Science, Technology and Medicine (CHSTM) contributed to the programme. This article gives an insight into the conference and some of the speakers. It also highlights one of the displays at the host museum - their Antoni Van Leeuwenhoek exhibition drawing some parallels with some of MMH own microscopic slides collections.

Over 90 delegates attended the New Horizons for Medical Museums and Collections conference. Representation was world-wide with members from across Europe, the UK and as far afield as New Zealand. The event included presentations covering how medical museums interpret ty, body diversity, death, terminal illness a tary crisis. In the first session Katie Dabin at the Science Museum reflected on thei Revolution exhibition, which opened Manchester, with loans from the MMH of century radiotherapy equipment fr Manchester's Christie Hospital, before m the London Science Museum.

Presentation highlights

A sensitively coordinated exhibition, co with a 'Deaf and Hard-of-Hearing' exper was explained by Ruben Verwaal from the Medical Centre, Rotterdam. The *Yo, doc, l* display aimed to uncover cultural experien medical perceptions of deafness sinc Modern Europe, by means of objects, art tions, photographs, and videos. It raised aw among medical students and healthcare pr als about the many obstacles that these gro ularly encounter.

Carsten and I spoke in the 'Meet the Muse tion of the conference; a fast paced session d to impart strengths of collections and working. In the short but punchy presentati shared the longevity and success of ten contributing to University's Art Galle Museum Studies MA module and high existing and current development of engagement resources.

Another part of the programme was a 't with medical collections' session, which w endorsing and inspiring. The MMH aims t tain a dialogue with the University of Stra academics who ran it and try out their mo object-based learning. For example, student gation of collections by asking 35 question object as a first encounter.

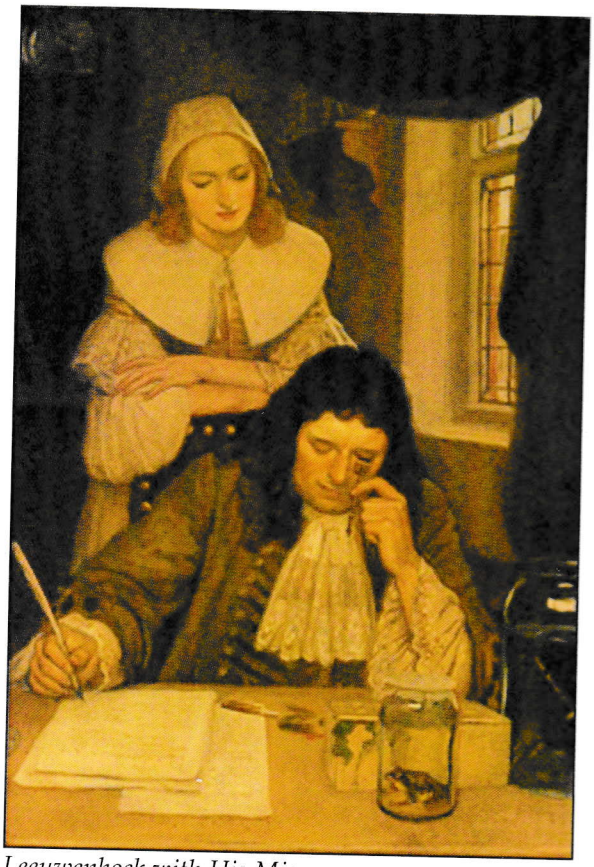
Rijkmuseum Boerhaave

The Rijksmuseum Boerhaave was a special location. It contained creative and tech led displays, which included an animated way of interpreting an Andreas Vesalius (1514-1564) book *On the fabric of the human body*. Visitors are invited to place their forearm for dissection under a clever projector that exposes the inner anatomy.

An exhibition that caught my attention was *Unimaginable - How Van Leeuwenhoek's microscope changed the world*. Antoni van Leeuwenhoek (1632-1723) was a Dutch textile merchant who made a name for himself with his self-made microscope. Only a few have been preserved worldwide. This makes it rather special that National Museum Boerhaave has no fewer than five of them in its collection. His best microscopes could show details to 0.001 millimetre - it would take another 150 years before the accuracy could be matched.

In the century that followed Van Leeuwenhoek's death, microscopy became popular in well-to-do circles. Specimens from the supplier Abraham Ypelaar are encased in ivory rings, classified as plants, animals and minerals. The display brought to mind the recent focus and research at MMH by Dr David Sigee.

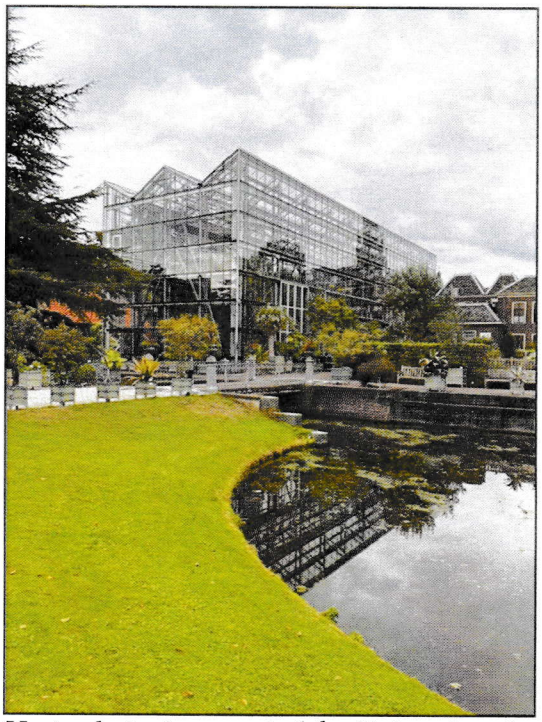
Dr Sigee, a retired University of Manchester plant scientist in biological sciences, is conducting an ongoing project to catalogue and research the forgotten and neglected collection of old microscope slides located in the Stopford Building. He is busy researching their history and producing images of the slide specimens using a Zeiss microscope or a high-resolution scanner. One such collection, donated in 1977 by Mr A R Gibson MPS, is a Victorian mahogany cabinet containing 22 trays - each with around 30 slides, is particularly rich in botanical and zoological specimens. Particularly impressive examples include a beautiful Hummingbird feather and complex diatoms. The MMH is grateful for his efforts so far.



Leeuwenhoek with His Microscope by Ernest Board, about 1912. Wellcome Collection

A variety of microscopes on display as part of the *Unimaginable* exhibition

Ivory rings with specimens from the supplier Abraham Ypelaar



Hortus botanicus, part of the University of Leiden

Windmill De Valk stands proudly as iconic cultural and old industrial heritage

In conclusion, the trip to the Netherlands was a great way to learn from those doing similar work to manage collections of different sizes within university settings, with all the challenges and opportunities this presents. An excursion to the Hortus botanicus, the oldest botanical garden in The Netherlands, was fun and passing the Windmill De Valk museum each morning on my way to the conference venue was a treat.

In addition, the event marked the end of Pro Timmermann's role as Social Responsibility lead fo the museum, with the appointment of Dr Harrie Palfreyman, Lecturer in Science Communicatio also in CHSTM.

HISTORICAL MEDICAL EQUIPMENT SOCIETY — Accounts 2022/23

Opening Balance (Barclays)

27th July 2023	£1730.14
29th July 2022	£1685.14

Income		**Expenditure**	
Subs @ £10 single or £15 joint	**£365** / £418	**Bulletin** costs	**£330** / 283.76
(One joint member paid £20)		**Website** costs	nil
Guest prepaid 4th September meeting. **£10**			
	Total: **£375** / £418	Total:	**£330** / 283.76

Closing balance on 27th July 2023 **£1730.14**

Total membership: 34 including 8 joint members. 2 new members. 4 deceased. 6 unpaid including institutions.

Adrian Padfield Honorary Treasu

Ox Heart to Apple: How To Do a TURP

Jonathan Charles Goddard

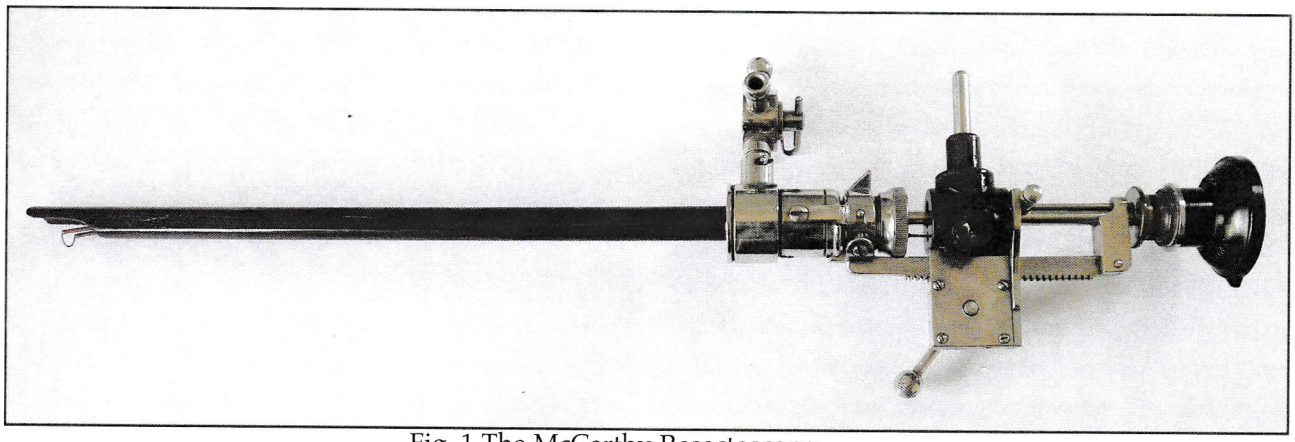


Fig. 1 The McCarthy Resectoscope

Urology has always been at the forefront of technological advances and has seen many sea changes in practice, often dependant on the introduction of new instruments. Transurethral Resection of the Prostate, TURP, is now seen as one of the operations that define Urology. Seeing its heyday in the later part of the Twentieth Century, TURP is still is one of the most well known urological operations. It was an inevitable consequence of the long history of blind transurethral surgery (that basis of minimally invasive urology) and the invention of cystoscopy. Once the lower urinary tract could be visualised, endoscopic therapeutic procedures quickly followed. Whilst the development of cystoscopy was dependant on the understanding and advancement of the physics of light, the invention of TURP was intimately linked with innovations in electrical current.

Endoscopic surgery followed close on the heels of diagnostic endoscopic examination. Early on, small bladder tumours were snared and then, following the work of Edwin Beer (1876-1938) in 1910, fulgurated **1**.

In January 1926, Maximilian Stern (1878-1946) presented his resectoscope to the Genito-Urinary Section of the New York Academy of Medicine **2**. Stern's current was a radiofrequency type of low voltage he called a 'resectotherm'. It was a continuous-flow un-damped current developed by the Western Electric Co. The resectoscope allowed him to cut spaghetti-like slivers of prostate using a tungsten wire loop moved in and out with a rack and pinion device. This was the first resectoscope and the first true TURP.

Theodore M. Davies (1889-1973) found that Stern's resectoscope didn't coagulate well, so he redesigned it. Recognising the need for an un-damped cutting current and a damped coagulating current he used a machine that delivered both, changing between the two via a foot pedal switch. He also increased the diameter and thickness of the tungsten cutting loops.

It was Joseph McCarthy (1874 - 1965) who put all these elements together: Stern's resectoscope, Davies' current, a Bakelite insulating sheath designed by Kenneth Walker (1882 - 1966) of

London and his own excellent panendoscope. (Fig. 1) The McCarthy resectoscope formed the basis of all future models and continued in use until at least the end of the 20th century **3**. A rack and pinion model resectoscope can still be purchased from Karl Storz Endoscopy today! **4**

It is notable that Stern in his 1926 paper, in the widely read Journal of the American Medical Association, emphasised his new technique as being 'minor surgery of the prostate'. He wrote that any desired number of sections of prostate could be removed at a single sitting 'without causing bleeding'; and another paper published in the same year was titled Minor Surgery of the Prostate **2**, **5**.

Theodore Davies, in 1932, also called TURP 'minor surgery', telling urologists they should seek out patients with early outflow symptoms for, 'relief by an operation in the earlier stages, wherein the risk is negligible, the convalescence is materially shortened and the end-results are equal, if not superior, to those of prostatectomy'. In fairness to Davies, he also pointed out that the new TURP required 'the greatest technical skill even in the hands of the expert.' **6** Davies had also presented a series of 246 TURPs on 10th June 1931 at the American Medical Association meeting in Philadelphia and inspired many US urologists to rush out and buy a resectoscope **7**.

The Problem

This new, seemingly minimally invasive treatment, took off apace, especially in the USA. With their improved Stern-McCarthy resectoscopes, the Americans quickly embraced the new TURP. Writing in 1939, Keyes and Ferguson stated that one dealer 'has sold more (resection) instruments . . . than there are urologists in the United States.' **8**

Unfortunately, the apparent simplicity of TURP led to a multitude of complications and deaths as surgeons failed to grasp the underlying complexity of the new operation **9**. These complications included, rectourethral fistula, urinary incontinence (temporary and permanent), sepsis, extravasation of urine, stricture of the urethra, perivesical abscess, phlebitis, rupture of the bladder, peritonitis, gangrene of the bladder, perforation of th ruptured diverticulum, ischiorectal abs ineal abscess, torn bladder neck, pe abscess, electrocution, embolism, apople septicaemia **10**.

The Bard Company stated that the estima al sales of the Cunningham incontinen averaged from 100 to 150 during the ten ceding 1928, and gradually doubled d ensuing years to 1933 (when precise figu available) and then was 384, 473, 720, 684 for the years 1933 to 1937. The estimated figure for 1938 was 1,700 **11**. (Fig. 2)

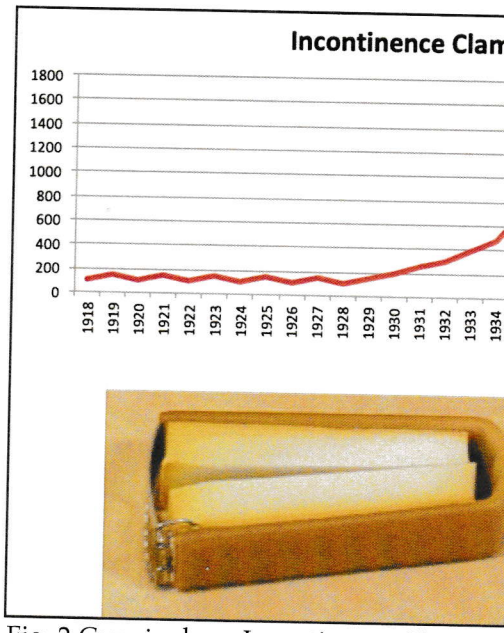


Fig. 2 Cunningham Incontinence Clamp

Over in the UK, where the surgeons were m itant to introduce new procedures, Kenneth a proponent of early endoscopic surgery 'Initially welcomed as a minor procedu McCarthy operation in the hands of the soon proved itself to be fraught with dang even when carried out by experts the earlie tions were not always satisfactory' **12**.

Gershom Thompson (1901-1975), who taugh scopic prostatectomy to many British an urologists, told William Wardill (1894-1 Newcastle, 'to put a resectoscope in the han man who is not prepared to study it, is like g submachine gun to a small boy who has bee ing Deadwood Dick' **13**.

The Ex Vivo TURP

The two major textbooks on the technique during the early era of TURP were by Roger Barnes (1897-1982) of Los Angeles and Reed Nesbit (1898-1979) of Michigan, and were both published in 1943 **14**, **15**. Both authors agreed that the would-be resectionist should train with the resectoscope away from the live patient prior to their first TURP. Barnes suggested using an ox heart model, passing the scope through the valves to practise resection of the muscular ventricular walls. Nesbit encouraged resection of meat under water. George Otto Baumrucker (1905-1991) of Indianapolis, also writing in 1943 and who subsequently wrote an excellent little book on the hazards of TURP, also suggested resecting meat in a bowl of water to allow the surgeon to familiarise themselves with the diathermy cutting and coagulating method. (Fig. 3) He further suggested that the trainee practise TURP on a homemade model constructed from the rubber ball of a large gastric syringe, cut in half, containing a 'prostate' made of children's modelling clay **16**, **17**. Barnes explained that the technical skill to manipulate this unfamiliar and complex surgical instrument meant that the number of procedures required to become competent in TURP was much greater than with open surgery. He suggested 100 TURPs were required to gain proficiency whereas after assisting in four or five open prostatectomies a surgeon could do one alone **14**. In the 1960s, Henry Habib (1927-2008) wrote that two years of training was required for a resident to become proficient(18).

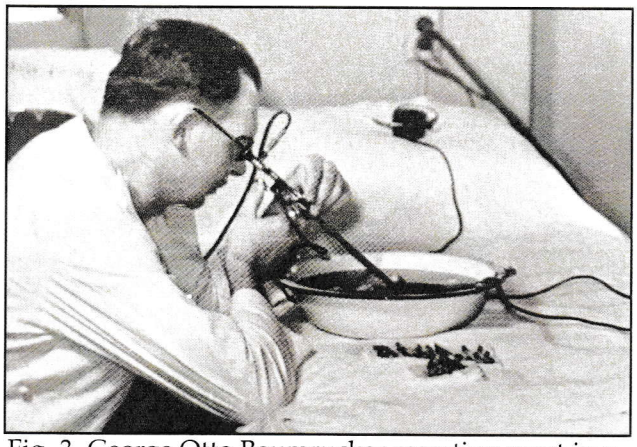


Fig 3 George Otto Baumrucker resecting meat in a bowl of water

Another technique to remove tissue from around the obstructed bladder neck was the Prostatic Punch. The first useable Punch was that designed by the Father of American Urology Hugh Hampton Young (1870-1945) in 1909, and the ultimate punch of Gersholm Thompson was still in use in the 1980's. The prostatic punch required skill to master but could be successful in the right hands, but it was even more difficult than the resectoscope. Indeed, Earl Nation (1910-2008) writing in 1977 felt that the Punch was too difficult for the average urologist(19).

Thomas Lightbody Chapman (1903-1966), who founded the urological department at the Victoria Infirmary, Glasgow, travelled to the Mayo Clinic in America to learn the new technique of punch prostatectomy and began carrying out punch prostatectomies in Glasgow from January 1938 **20**. Chapman was a great teacher who used innovative techniques to educate his students in the skills of punch prostatectomy. These included a cine-film, using both live action and animation, to demonstrate the technique, and a training model where the trainee surgeon could be observed punching out a phantom prostate. In order to train his registrars and to ensure they had grasped the necessary skills of the punch before allowing them to operate on patients, he invented this teaching aid.

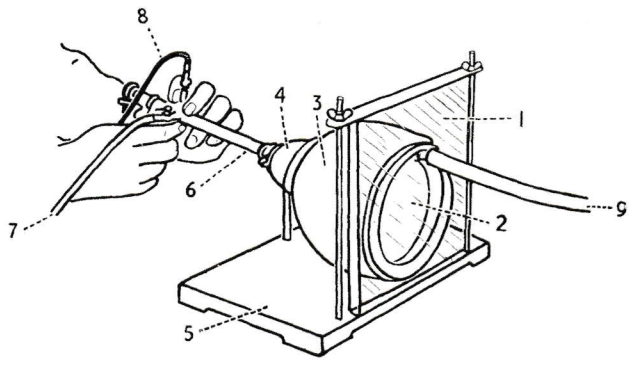


Fig. 4 Chapman's practice model for punch prostatectomy.

Reproduced by permission of John Wiley and Sons.

The phantom was made of rubber with a Perspex plate on the bladder side so Chapman could watch how a trainee punched away at a (replaceable) prostate made of a plastic like substance called Vinamould. The learning curve took several weeks **21**. Chapman subsequently published a description of his teaching model so that others could use it **22**.

Other models suggested to learn TURP included the cow udder. Henry Habib's TURP Model won first prize at the AUA annual meeting in Pittsburgh in 1964 and a cine film of it was shown at the SIU congress in London in September that year. He argued that the teat resembled a penis and urethra and the interior looked like a trabeculated bladder, which also filled and emptied in a similar way. Due to the weight of the udder, no other equipment was required, it could just be sat on a table and as there are four teats and compartments, four trainees could in theory use it simultaneously. The teats required dilatation to accept a 28Ch resectoscope and the curds needed washing out first, but it was clearly being used by the urology residents of Habib's unit in the 1960s **18**.

The Spanish surgeon Luiz Cifuentes Delatte (1907-2005) suggested using an enucleated human prostate from a transvesical or Milin's prostatectomy attached to a balloon to practice on. It is likely this was just a theory and was probably not practical **23**. However, Kishore Narwani in Montreal successfully used a cadaveric human bladder model. The whole bladder and prostate was suspended with sutures and rubber bands from medal rods fixed to a wooden board **24**.

The introduction of the Hopkins Rod lens and Storz cold light source revolutionised endos and endoscopic surgery in the 1970's. The n improved vision heralded a rise in the popular TURP. The instrument catalogues of the Karl Company around this time included a TURP tice model. An apple was used as the surr prostate. The surgeons no longer had to make own out of rubber syringes and modelling cl first appears in the Karl Storz Catalogue in 19 (Fig. 5) It was designed by Bojan Pirkmaj Yugoslavia and Leusch of Pforzheim, Germany published in the German journal Urologe A i same year **26**.

In the early years of the 21st century, computer gical training models began to appear; endos surgery, which is already viewed on a monitor itself to this modality. Rapid improvements in nology now allow trainees to practice on a realistic TURP model with visual and haptic back as well as a numerical 'score' on their effi cy and safety **4**.

Despite these advanced models, it was pleasi see a German urology unit in 2009 publishi homemade TURP trainer made of 7 cm of ga hose, a suprapubic catheter, a Tupperware three catheter spigots and some silicon gel; a th back to the early resectionists with their ox h and apples **27**.

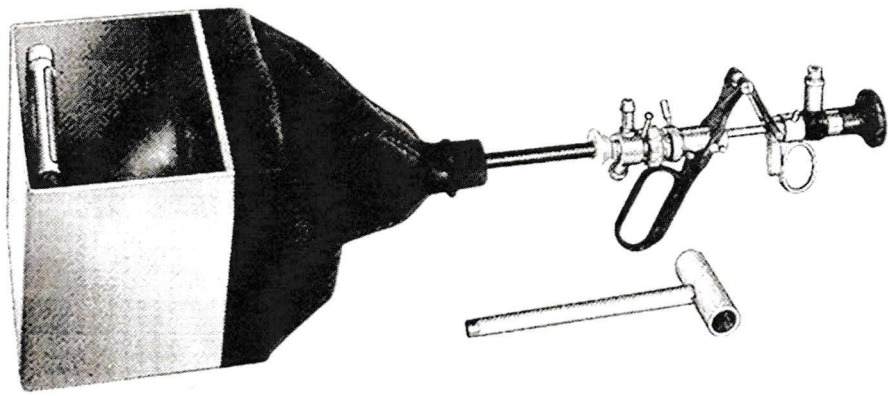


Fig. 5 Storz TURP Trainer.
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The Technique of Epidural Block

Adrian Padfield

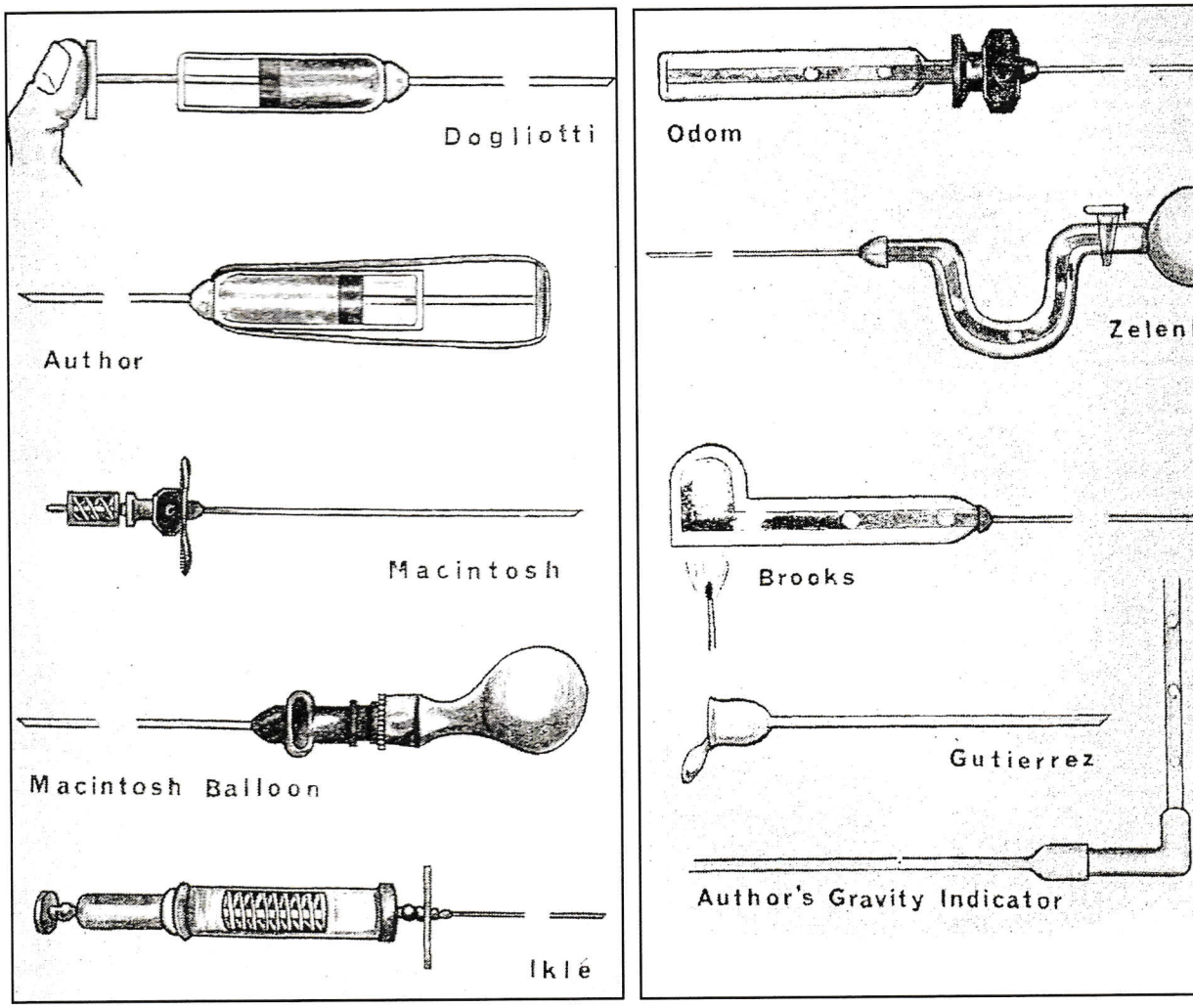
at the 2023 HMES meeting introduced a film from 195
entitled "The Technique of Epidural Block"

This film was produced in 1959 by Duncan Flockhart. It featured the use of Xylocaine, i.e. lignocaine, which is now called lidocaine.

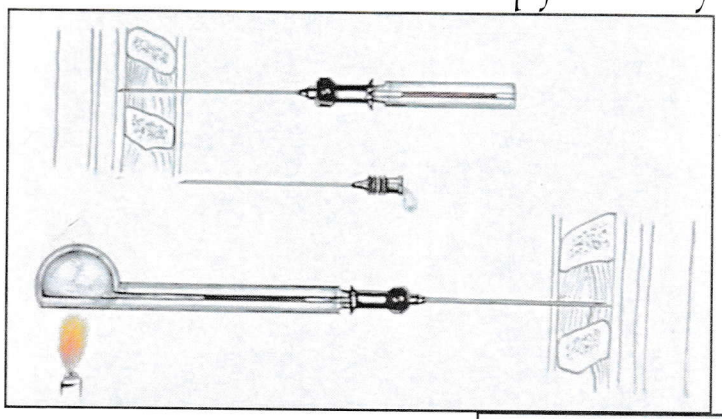
It describes the various methods of locating with certainty the epidural space, but it culminates in a Caesarean section.

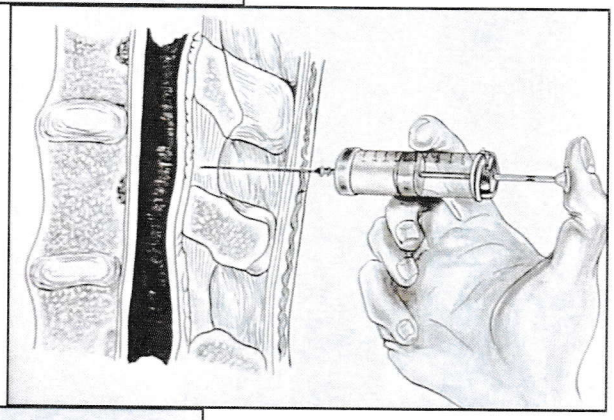
The Wellcome Institute have a copy of this film Dr. Padfield also showed slides of some of the very varied bits of apparatus used to locate the epidural space.

A reference of interest is:
(1963) Anaesthesia **18** pp66-77

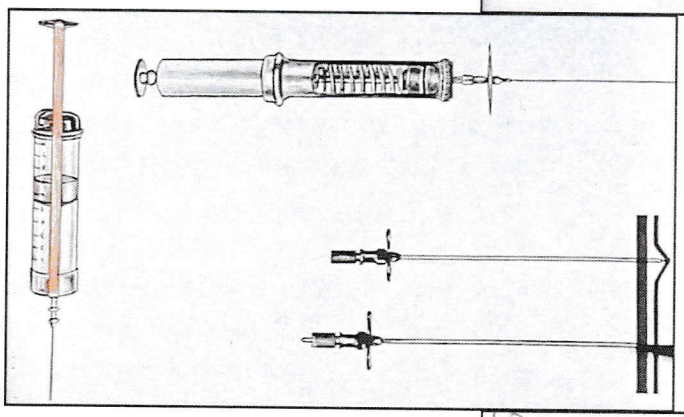


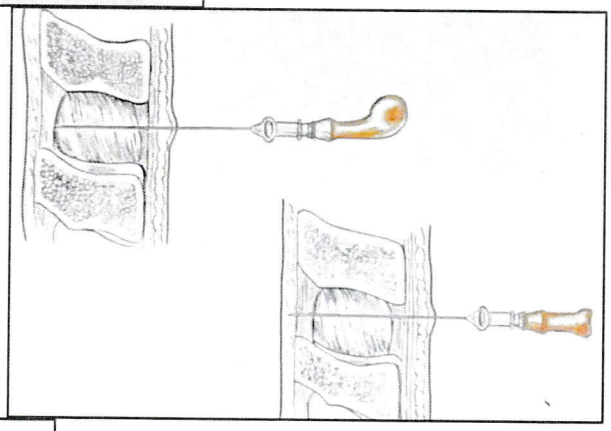
Two pages from the journal Anaesthesia showing various types of epidural indicator

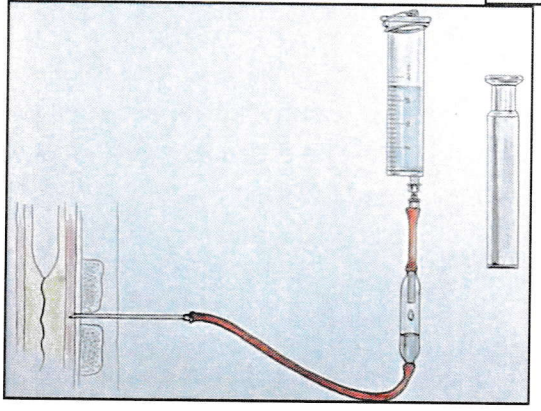




Five illustrations showng location of the epidural space and the making of the injection

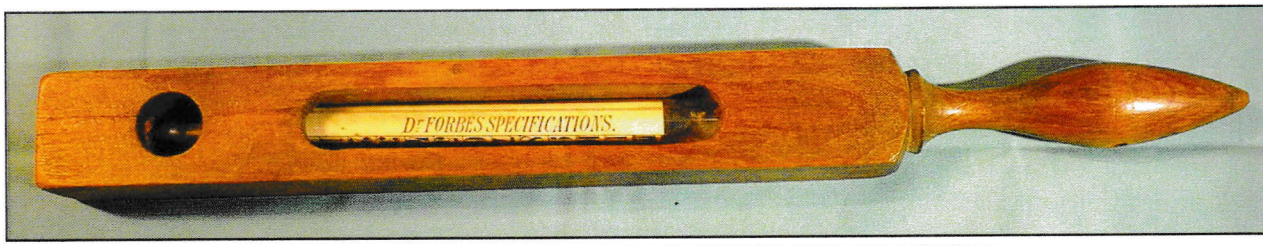


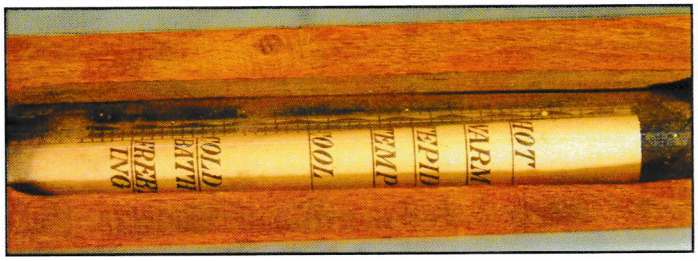




Dr. Forbes' Specifications

Evelyn Barbour-Hill





We begin with a chance find in an antiques shop. A rather plain bath thermometer, but it was the beautifully styled legend that caught my eye. There's the actual scale, and "Dr. Forbes Specifications" and marks for Freezing, Cold Bath, Cool, Temp, Tepid, Warm and Hot.

It's very much an everyday object, made of some durable straight-grained wood. The actual thermometer has been placed into the wood casing through a whole at the bottom which was then closed up tightly with cork. The mercury-filled bulb of the thermometer is naked and exposed in a round aperture. The rest of it is enclosed in a thin outer glass tube which one presumes is sealed – its ends are not visible. The legends are engraved upon a piece of paper which has been rolled and then wedged between the thermometer and the glass outer tube.

There is a hole in the handle for a cord. It may mean nothing, but the openings of the hole have been squared, so it is possible that a little bolt held something more elaborate than a piece of string.

Fig. 2 shows a thermometer which is very similar but was perhaps slightly more expensive – in this one clearly the handle unscrewed and the gla instrument was inserted downwards.

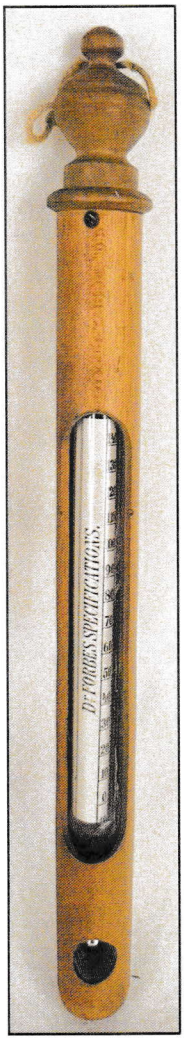


Fig. 2

Fig. 3 Dr. Forbes in his thirties
(Royal West Sussex Hospital, Chichester)

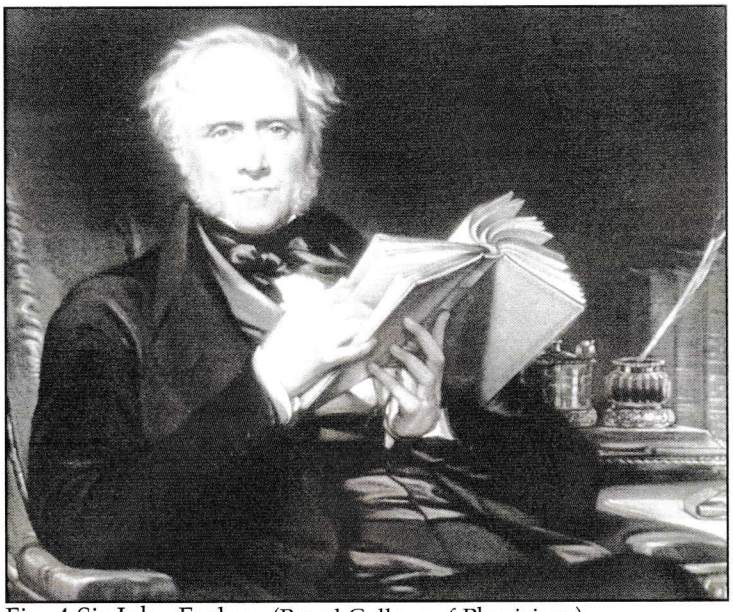


Fig. 4 Sir John Forbes (Royal College of Physicians)

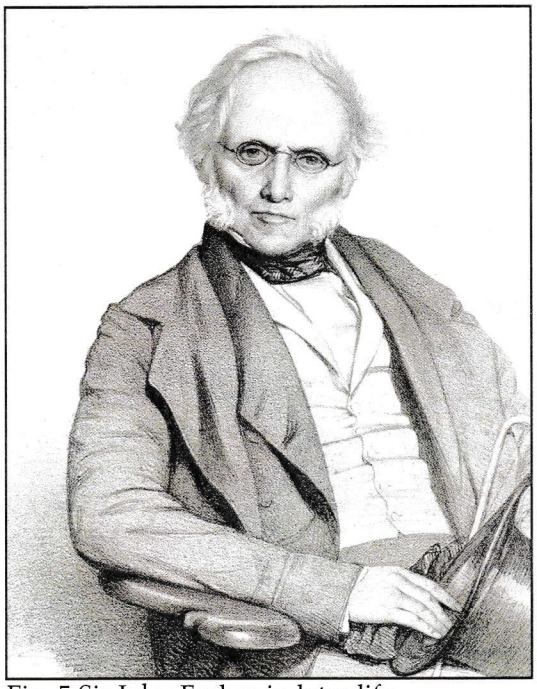


Fig. 5 Sir John Forbes in later life
(Wellcome Institute)

Who was Dr. Forbes?

Dr. Sir John Forbes is well known to medical historians. The late Robin A. L. Agnew wrote a short biography, and much of the following information comes from that work **1**. Forbes had an interesting career but is particularly well kown for having translated Laënnec's *De l'Auscultation Médiate; ou, Traité du dignostic des maladies des poumons et du coeur, fondé principalement sur ce moyen d'exploration,* and in effect introducing the British medical profession to the use of the stethoscope. He also translated Auenbrugger's work on percussion of the chest, and other authors.

Forbes was born in 1787 in Banffshire. From the age of 11 he was the friend of James Clark, later to be Dr. Sir James Clark, physician to the Queen. After a brief medical apprenticeship, and a brief period of instruction in Edinburgh, he obtained the Diploma of the Royal College of Surgeons In 1807 he joined the Royal Navy as Temporary Assistant Surgeon.

He reached the rank of Full Surgeon after a couple of years and served in a number of ships, seeing a good deal of action and having plenty of adventures. However, the Napoleonic Wars finally came to an end and Forbes left the Navy. He went back to the medical school and university in Edinburgh and qualified MD in August 1817, on the same day as James Clark. At the same time he was studying geology, one factor which gained him the post of physician to Penzance public dispensary where he also worked in general practice.

James Clark gave Forbes a stethoscope after visiting Paris and moved him to translate Laënnec's work as *A Treatise on the Diseases of the Chest, etc, etc.* The edition was a great success and further editions followed. During the same period Forbes was writing papers on the geology of Cornwall, climate and botany.

Married, Forbes moved to Chichester and built up a large practice there, while continuing to write natural history papers studies on the diseases of underground miners. But within two years he had produced the book *Original Cases with Dissections and Observations illustrating the use of the Stethoscope and Percussion in the Diagnosis of Diseases of the Chest; also commentaries on the same subjects selected and translated from AUENBRUGGER, CORVISART, LAENNEC and others.*

The book was very well received. To quote Agnew, "There was a need, at the time, for a reliable textbook on the practice of auscultation and the dissemination of Laënnec's views to a medical world still sceptical about the value of a stethoscope in clinical diagnosis – a view initially held by Forbes himself".

The Cyclopaedia of Practical Medicine

Forbes and two othe doctors, John Conolly and Alexander Tweedie combined to produce a huge work, the *Cyclopaedia of Practical Medicine.* This appeared in four volumes between 1832 and 1835. Like many works of the era, it was published in monthly numbers; when you had collected a whole volume, you sent them off to be bound. The set type had all been kept, so after that each volume could be bought as a finished book. All three doctors wrote articles for the *Cyclopaedia*, while Forbes was the main Editor.

Each of the four volumes of the *Cyclopaedia* is of around 800 closely set pages. Even allowing for the somewhat wordy style of writing of the time, there is an immense amount of information.

In 1836 Forbes and Conolly started a journal, the *British and Foreign Medical Review, or Quarterly Journal of Practical Medicine and Surgery.*
Conolly left, on good terms, in 1839. To quote Agnew again, the journal "became accepted and read all over Europe and America as the articles selected by the editors helped to promote more rational methods of treatment than the bleeding and purging still prevalent".

For reasons of convenience or ambition or both, 1840 Forbes moved from Chichester to London. and his family moved in to 12 Old Burlington St

Handily, in 1841 he was appointed a Co Physician, undoubtedly through the influence of James Clark. Later he was appointed Physician the Prince Consort, but does not seem to have be involved in any great dramas in that role. Howev he must have served well, as it was this serv which brought him his knighthood.

He continued consultant practice along with journalism and also wrote considerably Mesmerism, sleepwalking, clairvoyance, 'anir magnetism' and so on, and in Agnew's words "v interested in establishing the truth or error of su 'fringe' subjects as Phrenology and Homeopathy He was very dubious about all these things, but felt that they should be subject to scientific trial.

Now this attitude eventually got him into water. In January 1846 he published in the *Revie* a commentary referring to a review of nine artic on Homeopathy, entitled *Homeopathy, Allopathy 'Young Physic.'* (It was anonymous, but almost c tainly by Forbes.) It "sets out the case for the *medicatrix naturae* and the shunning of polypharm cy... a plea for medical students to think for the selves... substantially improving the standard teaching of all doctors"**1**.

This was poorly received by the medical establi ment. The claim was made that Forbes favou Hahnemann's system of Homeopathy. This was so. "He appears to have kept an open mind on principle of 'like cures like' and certainly had time for medical humbug" **1**.

One suspects that the real cause of violent opp tion by the establishment was really the suggest that students not be afraid of questioning dogm teaching. Whatever the truth, a chip remained some shoulders and brought an unpleasant ob ary in the *Lancet* some sixteen years later.

Possibly this row led to the decline in the circu tion of the *Review*; it might have been a cause

Forbes' resignation as Editor in 1847. Nonetheless, Forbes went out in triumph: he was present at the first operation in England under ether general anaesthesia, when Liston amputated a leg at the thigh. This was a nice scoop for the *Review.* Forbes entitled the write-up *New Means of rendering Surgical Operations painless*; this way led the future.

Medical Uses of Bathing

The entry on Bathing in the *Cyclopaedia* occupies nearly 22 of those closely-printed pages. This article by Forbes first introduces the subject in general, but then deals in great detail with the observed effects and then the uses of six different temperature of bath: the cold bath, the cool, the temperate, the tepid, the warm and the hot. Then the effects and uses of the vapour bath.

However, near the bginning, we have this:
"The simplest and most natural division of baths is into *cold* and *hot*; the former comprehending all those which communicate the sensation of cold, the latter all which occasion the feeling of heat. Although, for reasons above stated, it is impossible to fix the degree which shall form the boundary between the two classes of sensations, we shall nevertheless, on the ground of practical convenience, assume such a precise limit. Generally speaking this boundary will be found between the 84th and 88th degree of Fahrenheit; and although well aware that this range is sufficiently small , we shall still further abridge it by naming the intermediate degree of 88 as the precise limit, denominating all baths of a temperature below this *cold*, and all above it *warm*."

"... we would propose the following arrangement to the practitioner... in fixing the precise boundaries by individual degrees, we are influenced more by motives of convenience than from any belief that these are the exact and true limits of the different classes of baths:–

1. *The cold bath....*	from 33° to 60°
2. *The cool bath....*	60° to 75°
3. *The temperate bath....*	75° to 85°
4. *The tepid bath....*	85° to 92°
5. *The warm bath....*	92° to 98°
6. *The hot bath....*	98° to 112° "

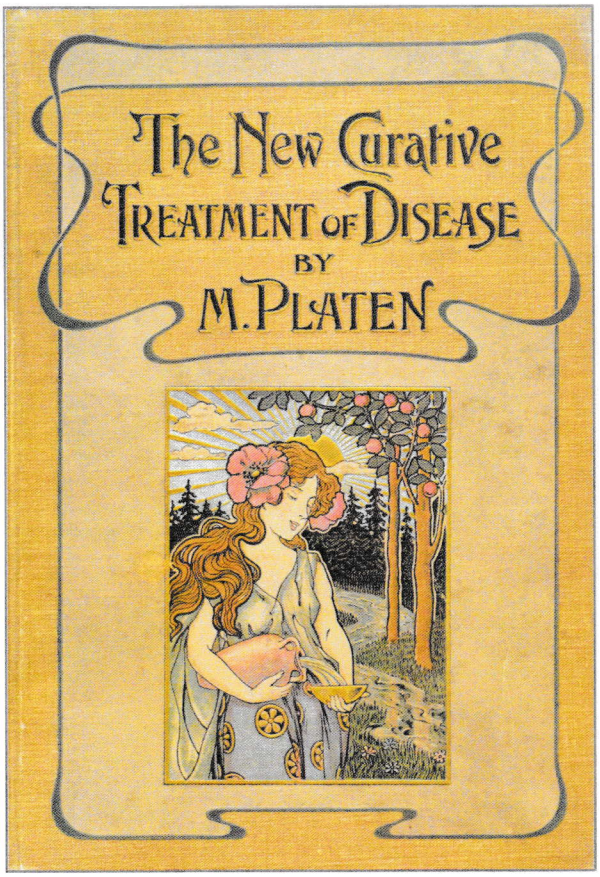


Fig.6

Thus we see that Forbes did not lay down specifications, only suggestions for the ranges of temperature for the different baths he was about to discuss in much detail.

Bathing therefore seems to have been a more or less 'mainstream' part of medical practice in this time, the mid 19th century. In more extreme form, using water in many ways, soaking, douching, bathing and so on, indeed what was popularly known as 'The Water Cure' was widespread and well developed – possibly not mainstream but well known and fairly respectable. As it represented an alternative to the occasionally brutal and extreme methods of surgery of the day, this is not surprising.

I have a copy of *The New Curative Treatment of Disease* by M. Platen, in 2 volumes, not dated but, from the typefaces, late nineteenth century **2**.
Platen is described as *Lecturer on, and Practitioner of the New Curative Treatment.* (Figs. 6 and 7)
Much of the book is an excellent and uncontentious encyclopaedia of health and disease, with much good sense and advice with which in 2024 we can hardly quibble. Only in therapeutics does it differ,

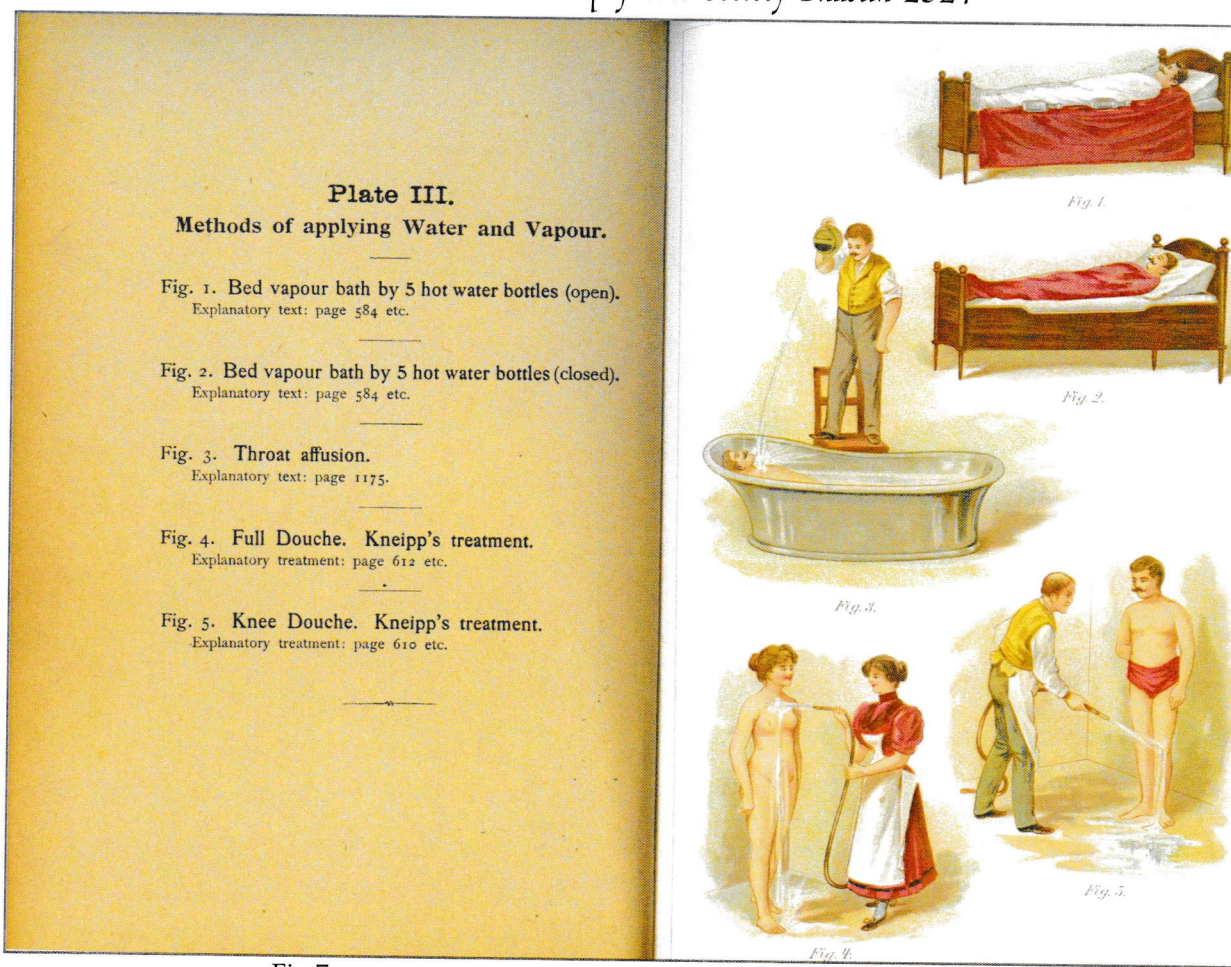


Plate III.
Methods of applying Water and Vapour.

Fig. 1. Bed vapour bath by 5 hot water bottles (open).
Explanatory text: page 584 etc.

Fig. 2. Bed vapour bath by 5 hot water bottles (closed).
Explanatory text: page 584 etc.

Fig. 3. Throat affusion.
Explanatory text: page 1175.

Fig. 4. Full Douche. Kneipp's treatment.
Explanatory treatment: page 612 etc.

Fig. 5. Knee Douche. Kneipp's treatment.
Explanatory treatment: page 610 etc.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 5.

Fig. 4.

Fig.7

very markedly, from the conventional. (It is subtitled *Handbook of Hygienic Rules of Life, Health Culture and the Cure of Ailments without the aid of Drugs*). Some herbal treatments are recommended, and the occasional odd machine, but overwhelmingly the therapy is by use of water.

Bath thermometers

There can be little doubt that works such as the *Cyclopaedia*, which was widely read, and then the popularity of the Water Cure, led to the need and desire for bath thermometers. Some enterprising manufacturer saw that labelling his bath thermometers with "Dr. Forbes Specifications" had to be good for business.

I do not believe that this was any enterprise of Sir John Forbes. The manufacturer may have asked his permission; but there is no particular reason to suppose that even this was done.

How were thermometers made?

This is not quite such an easy question to answer as might be supposed. I found no written records. It does seem that in the early nineteenth century glassblowers were already skilled enough to p duce tubing of sufficient fineness and reliable c sistency. But how did the mercury get into the bu Reliable vacuum pumps were not available.

The technique was this. Firstly, tubing was blow then stretched until it was of the desired fineness suitable length was cut, and a blown bulb attach to it.

The bulb was heated in hot water or over a spi lamp to reduce the density of air within it, and t open end of the tube was then plunged into a bo of mercury until the desired amount, judged eye, had been sucked in. Then the open end of t tube was sealed in a flame.

Air bubbles were commonly entrained in the me cury; these were removed by shaking the instr ment at arm's length, the process known as 'sha ing down'.

Each instrument had to be calibrated individuall as it was impossible to control exactly the bulb siz or the quantity of mercury contained. This wa

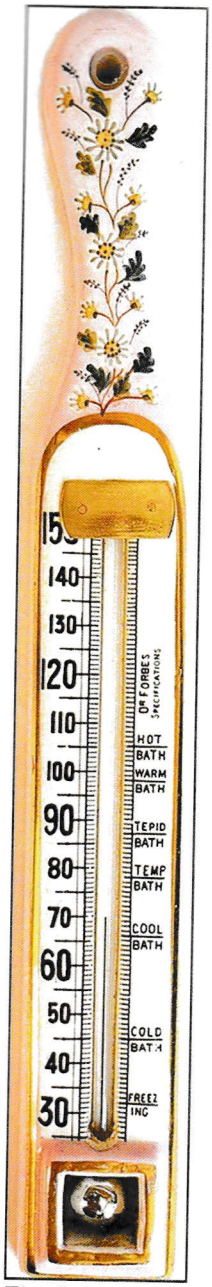


Fig. 8 A very pretty thermometer, said to be late Victorian. The tube is simply clamped to the printed metal scale.

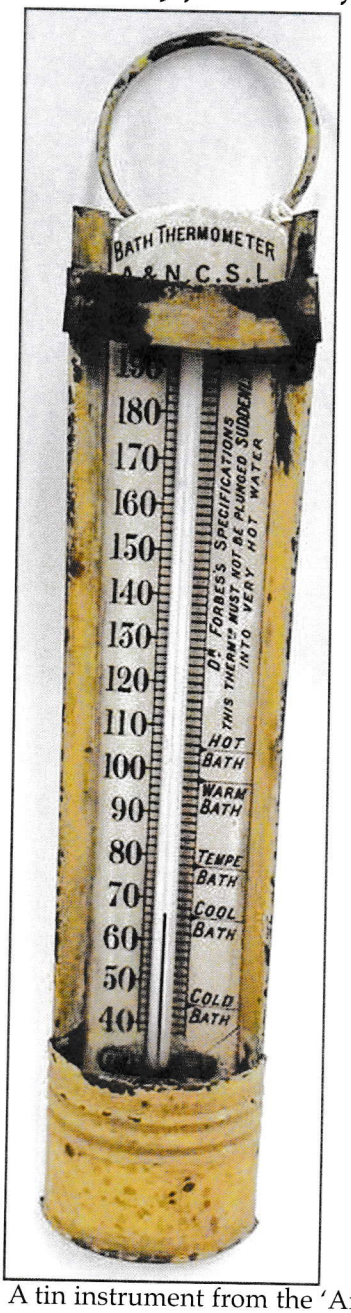


Fig 9 A tin instrument from the 'Army and Navy'. Early to mid twentieth century? Note the legend with very correct apostrophe:
Dr. Forbes's Specifications
This therm^mr must not be plunged suddenly into very hot water.

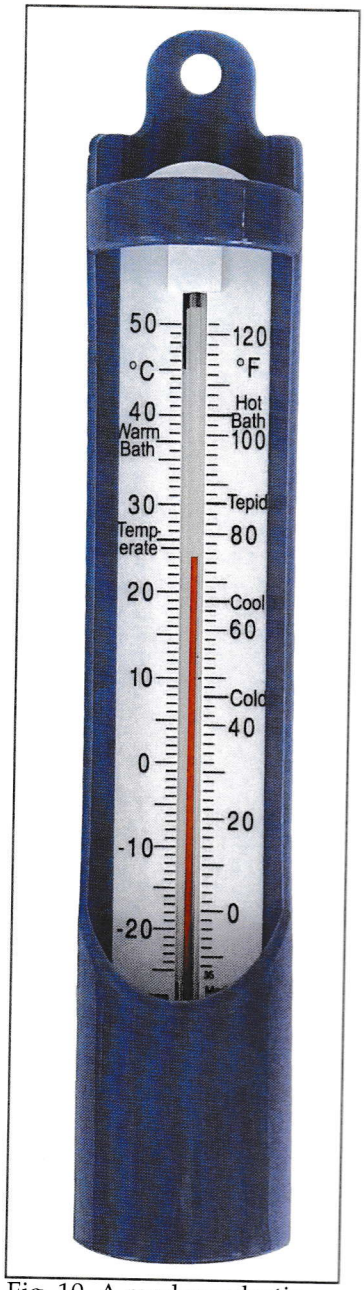


Fig. 10 A modern plastic bath thermometer.

done by immersing the bulb in water of known temperature – generally in more modern times at 32°F or 100°F shown by a reliable standard thermometer – and scratching a mark at the top of the mercury. The pre-printed paper was then applied appropriately, with the assumption that the rest of the scale would be accurate, or accurate enough.

Of course for the original design of the paper scale, at least two temperatures would have to have been carefully marked on an instrument made to be close enough limits to be standard for subsequent production. Clearly it was possible therefore in the earliest third of the nineteenth century to consistently and reliably form 'standard' thermometer tubing.

In the absence of records one cannot be sure, but I would surmise that for the cheaper thermometers only a sample for each batch were actually calibrated, the rest having the scale applied where it seemed to be right. Perhaps this is a most unjust suggestion, I cannot say.

Certainly in the instrument that is the subject of this article, I can see no adhesive on the paper, so it may have been just wedged in.

Bath thermometers continued to be made in quantity throughout the nineteenth and twentieth century, in a great variety of construction and decoration, and continued to be labelled "Dr. Forbes Specifications" although I suspect almost everybody had forgotten the origin of these specifications. They are still made today, although innocuous coloured liquid has replaced mercury. (Figs. 8, 9 and 10) The specified temperatures may still be shown, although the words "Dr. Forbes Specifications" have finally gone. What, I wonder, would Sir John Forbes think, nearly two centuries after he did **not** make those specifications?

Acknowledgments

Much of the factual material about Forbes has been taken from the biography by Robin Agnew.

I am very much obliged to Mr. Andrew Brannan (Managing Director, S. Brannan and Sons, thermometer manufacturers since 1913) for the information about manufacture;

and to Mr. Harrison Davies, Curator, Stourbridge Glass Museum, for information about production of glass tubing.

Enquiry Officers at the Science Museum were helpful, and Mark Day found the short film that is noted below as **6**.

References and Further Reading

1 Agnew, R.A.L (2018)
The Life of Sir John Forbes (1787-1861)
2nd edition
Bernard Durnford Publishing

2 Platen, M. (date uncertain)
The New Curative Treatment of Disease
Translated from the original German edition
London: Bong and Co.

3 Forbes, J. et al. (eds.) (1845) revised edition
Bathing in
The Cyclopaedia of Practical Medicine
Volume 1 (of 4) pp266 to 287

4 Forbes. J. et al.(eds.)
British and Foreign Medical Review
Founded 1836. Amalgamated in 1848 with the *Medico-Chirurgical Review,* renamed
British and Foreign Medico-Chirurgial Review
The anonymous article entitled *Homeopathy, Allopathy and "Young Physic"* appeared in the issue of January 1846.

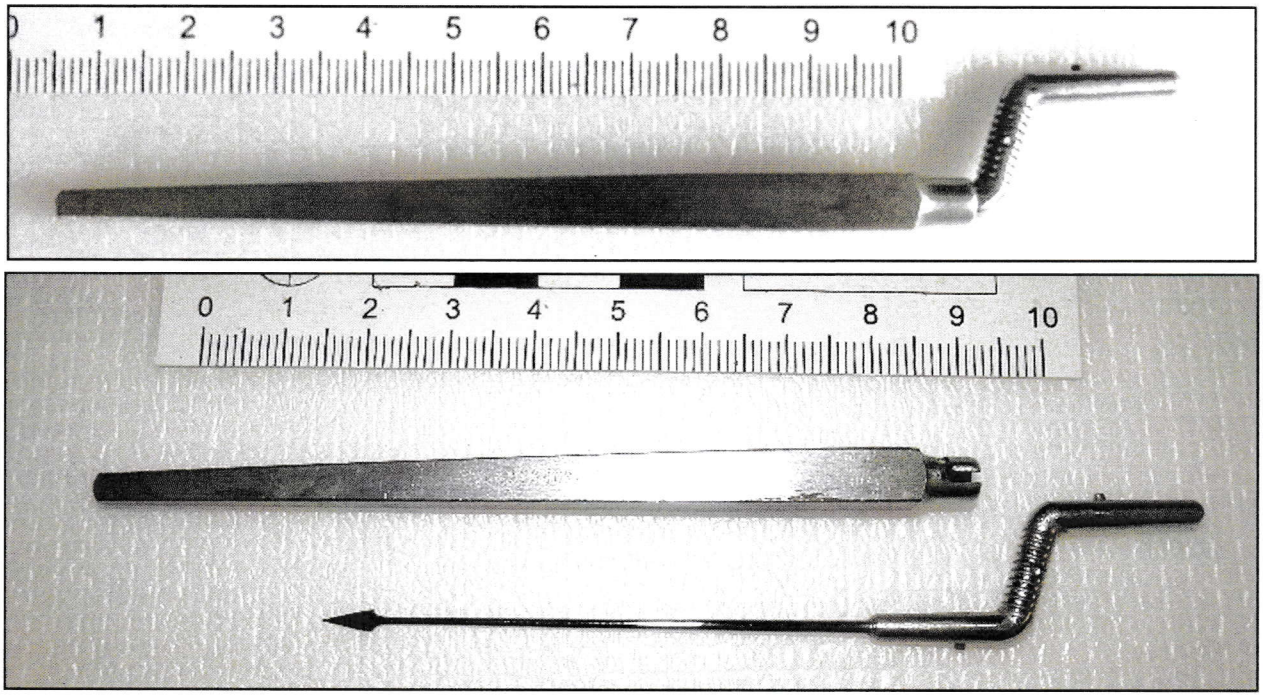
5 Obituary of Sir John Forbes
The Lancet (November 23rd 1861) **2** p.512
Obituaries in the other medical journals were complimentary, as indeed was the Lancet obituary apart from the one sour and unpleasant paragraph.

6 Making Mercury Thermometers | Lost & Found N°2 | British Pathé
www.youtube.com/watch?v=WCDDnQF0X1M
A brief film from 1953 about the making of clinical thermometers. It is interesting to see how much was still done essentially by hand. Glass tubes dunked in an open bowl of mercury.
The blown glass tubing is drawn out mechanically to fine tubing. In the film this is done by an electric machine – in the early nineteenth century it must have been done by some hand-powered method.

Have you paid your subscription for 23-24? It was due on October 1st 2023.
If you are not absolutely sure, please check; if you find it wasn't paid, please pay up NOW

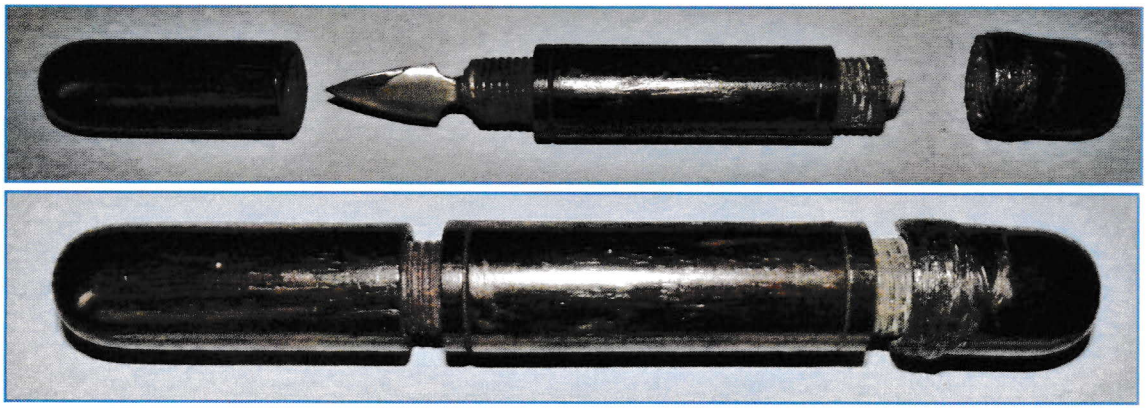
Can you identify this object?

This Allen & Hanburys all-metal surgical instrument is a handle (12.5cms.). The 'bayonet' stepped end can be turned to unclip a slim knife (12cm) with a very sharp arrowhead blade, hidden and protected inside the handle. The blade is then attached and locked onto the handle with a half-turn. What is it called? What is its specific use?
Answers in the 2025 issue!



What was it?

This handy article was our 2022 "Can you Identify This Object?"



It is a **Brunton's Snake Knife**, popular in India and Australia, still used in the later twentieth century.
It can be seen in the Down Bros. catalogue of 1935, page 322.
Theres a sharp blade at one end, and potassium permanganate soaks the 'wick' at the other.
It is named for Sir Thomas Brunton MB CM MD FRS (1844-1916)
Brunton was a pharmacologist, and a lecturer at Bart's. He was well-known for his work on digitalis.

The next meeting of the Society will be on Friday 6th September 2024
at the KARL STORZ Endoscopy Endoscopic Training Centre, 415 Perth Ave, Slough SL1 4TQ
10.00 am Arrive (tea and coffee available) for a 10.30 start
Lunch will be provided.
A guided tour of the centre is part of the programme.
Finish about 4.30
It would be extremely helpful, if you are thinking of attending, if you could let the committee know. This is not as a booking, just to give an idea of numbers.
Attendance is free for members. Guests and all non-members are very welcome. There is a charge of £10 for each non-member.

The programme, and details of how to find the centre, parking and so on, have been sent to all members by email. If you have not received these details, **or if you would like them sent again**, please contact the Editor at the address shown at the foot of the inside front cover

A video about the Centre is available online at **www.youtube.com/watch?v=tM7qCPb_85E**

Plates from *The New Curative Treatment of Disease* by M. Platen