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British Society for the History of ENT

Abstracts from meeting 10 October 1997, City Hospital, Birmingham, UK

Alfred Gardiner Brown, M.R.C.S.(Eng), F.R.C.S.(Ed.) (1838–1882)

J. B. Booth, F.R.C.S.

Alfred Gardiner Brown entered Guy's as a medical student and took the First or Anatomical and Physiological Examination in January 1861. He 'qualified' as a member of the Royal College of Surgeons of England by examination in January a year later. He was elected a Fellow of the Royal College of Surgeons of Edinburgh in February 1875 and appointed Consultant Aural Surgeon to The London Hospital in September 1876 but sadly was to die a little over five years later. He is contemporary with Morrell Mckenzie who was a Lecturer in Diseases of the Throat at that time. He is best known for his modification of the tuning fork by placing a flat end or coin between its end and the surface, in this case, bone of the skull. He was also the first person to insert the rounded area near the base by which the tuning fork could be held between finger and thumb. He was also the inventor of the Spiroscope and the Bi-Angular Reflector for rifles! He died after a five-day illness at the age of 44. He was the first designated Aural Surgeon to be appointed to The London Hospital.

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Christie Hospital and its beginnings

W. T. Farrington, F.R.C.S.

The treatment of cancer did not effectively get under way until the latter part of the last century. Most cancer sufferers were nursed and died at home due to the lack of hospital facilities for incurables. Richard Copley Christie founded the Christie Hospital in Manchester 1892 for the sole purpose of looking after cancer sufferers.

At the turn of the century radium promised much and many clinicians turned to it with enthusiasm as an alternative to mutilating surgery. In Manchester Sir William Milligan became one of the pioneers of radium treatment and was one of the founding fathers of the Manchester Radium Institute later known as the Holt Radium Institute. Thus the Christie Hospital and the Holt Radium Institute grew up independently but were eventually united under the one roof in the early thirties. Ralston Patterson was appointed the first director of the new Institute and made it quite clear that he saw his role as promoting radium and X-rays in the treatment of cancer. Thus the Christie Hospital and Holt Radium Institute developed into a Radiotherapy Centre rather than a Free Cancer Institute which has been envisaged by many of its supporters.

It is unfortunate that the Cancer Act of 1939 was never implemented due to the advent of the Second World War. Had this taken place then the treatment of cancer in the North West of England may have taken on quite a different direction.

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Coloured imaging of nose and ears through the history of medicine

Jacques Willemot

The author presented a pictorial presentation of the history of the nose and ears throughout the ages.

He began with the Summarion period, and then passed on to the references in the Bible and the Talmud about the nose and the ears.

The Far East was represented by the History of Medicine as related to our speciality in Ancient India and in the Chinese civilization.

South America represented by descriptions of the Pre-Columbian Age.

A trip through the Middle East and Europe started with the Greco-Roman Period. This was followed by an illustration from the Judaic and Arabic literature. The author continued with the history of the nose and ears throughout the Middle Ages and Renaissance Period.

The presentation concluded with the history of nose and ears during the last two centuries with illustrations taken from the Arts.

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Facial palsy in art

Wolfgang Pirsig

Depictions of facial palsy are presented in statuettes, sculptures, ceramics, masks and in painting from 2,700 years. Most objects of art allow a difference between a central and peripheral facial palsy. Therefore, in many examples suggestions as to the underlying cause of the facial palsy are possible. We start with an example of facial palsy due to stroke depicted in a votive-statuette from Crete (seventh century BC). Several examples could be found in the Hellenistic and Roman periods, and from the Mochica-culture. One part dealt with facial palsy in the art of the Gothic period, another on depictions of facial palsy in caricatures and in masks. A special part was dedicated to the many self-portraits made by Lovis Corinth (1858–1925) who suffered from stroke in 1911. A fascinating palette shows how artists over almost 3,000 years document a facial symptom due to various diseases in their works.

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Computed tomography (CT) evaluation of cranial and paranasal sinuses' volumes in skulls of Minoan era

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Purpose: To measure the cranial and paranasal sinuses' (PS) volumes by means of CT of Minoan's era dried skulls (MS), (800–1200 BC) and to compare the results with corresponding measurements of volumes in modern people (ms). Anatomical variations of sinonasal cavity were also assessed in MS.

Materials and methods: The cranial and PS volumes of 14 MS were calculated using CT measurements. Cranial, maxillary, frontal and sphenoid sinuses' volumes were calculated in 55, 55, 88 and 89 ms, respectively. The measurements obtained from the two groups were compared.

Results: The mean cranial volume of the MS and ms was 1355 ± 86 mm^3 and 1402 ± 129 mm^3 respectively. The mean value of the right and left maxillary volumes of MS and ms was 13,177 mm^3, 12,737 mm^3, 16,572 mm^3 and 16,633 mm^3 respectively. The mean value of sphenoid sinuses' volumes in MS and ms was 5393 mm^3 and 8818 mm^3 respectively. The mean value of frontal sinuses' volume in MS and ms was 2705 mm^3 and 8944 mm^3, respectively. No significant differences were observed between MS and ms regarding the measurements of cranial and maxillary sinuses. Significant differences were found between MS and ms regarding the measurements of sphenoid and frontal sinus volumes, $p<0.05$, and $p<0.001$ respectively. Frequent variants were concha bullosa (2 MS), intraantral septa (3 MS), nasal septum deviation (5 MS).

Conclusion: Our results are indicative of no significant difference of cranial volume between MS and ms, suggesting a discrepancy with other anthropological studies. Besides, the volumes of the frontal and sphenoid sinuses seem to present a significant increase in modern population compared to the minoan people.

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Mummification of the head in Ancient Egypt – an imaging study

M. Motamed, G. Alusi, C. East

This study of a mummified head from the British museum by high resolution computer tomography and 3D reconstruction illustrates, without mutilation of the specimen, some aspects of mummification of the head; namely the extraction of the brain through the nose and filling the cranium with linen like material, packing of the oral cavity, and the presence of false eyes. These findings alone allow one to date the mummy to no sooner than the 20th dynasty, a time when this custom was at its peak. Aspects of mummification of the head were discussed.

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Drug development – from the molecule to the market

Roger Rolph

This presentation outlines the many pre-clinical, clinical and regulatory hurdles which a compound must overcome, before a marketing authorization is granted. This is a process spanning 10 to 12 years, and consuming over half of a product's period of patent protection. With its roots in the thalidomide tragedy, the rigorous regulatory framework of drug development is described, unravelling a compound's toxic, metabolic and kinetic profile. Choice of species, routes of administration, specialized techniques and GLP-driven automated data capture are discussed, along with attempts to harmonize safety testing worldwide.

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In addition to an historical perspective, charting the transition of pharmaceutical R&D from serendipitous events to targeted molecular design, an economic consideration of escalating costs, attrition rates and break-even figures is also given. The testing requirements of synthetic new chemical entities, generics, and biopharmaceuticals are all described, along with more recent demands for environmental impact assessments.

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Bleeding from the nose: an historical perspective

Vijay Pothula, David Alderson

Many of the contemporary methods used for the treatment of nose bleeds were known and practised in Greek and Roman times. In the fifth century BC Hippocrates described the application of wool packing to the nasal cavity and the use of techniques to cool the facial region. He even described the use of postnasal packs although these were used to avulse polyps rather than to stop bleeding. In the first century BC Heraclides combined an anterior pack with digital pressure on the soft palate to obstruct the nasopharynx, while a century later Scribonus Largus used a goose feather quill as an airway around which he packed the nose. Later Oreibasios advised patients to blow out any clots and then apply compression to the tip of the nose with a finger and thumb.

With the fall of the Roman Empire many of these ideas were lost to Western medicine; practitioners resorted to more curious remedies. A popular treatment during the middle ages was to use the patient's blood to write words of the Liturgy in Greek or Latin across the forehead. The tip of a nettle could be placed in the nostril while the patient's genitals were rubbed with an extract of nettles. Two standard remedies were the topical application of 'muscus ex cranio humano' and 'mummia'; the former is the name of a mould which was found to grow on the skulls of executed criminals left to hang for long periods; the latter consisted of embalming materials extracted from Egyptian mummies.

It was long held that bleeding from the nose could be beneficial. Hippocrates described the death of a woman with amenorrhoea caused by stopping the flow of blood from her nose. Even in the 18th century it was described as a cure for 'the vertigo, a headache, a phrenzy and even an epilepfy'. The difficulty for the medical practitioner was not so much what treatment to give but whether to treat it at all. These ideas were in keeping with the practice of blood-letting and it was found that a spontaneous nose bleed was more efficacious than the letting of an equivalent volume of blood with a lancet. It was not until the late 19th century that Mahomed explained these apparent benefits in terms of reducing arterial hypertension.

Anterior nasal packing advanced with the use of pig intestine as a water filled balloon by Johann Frank. This was refined with the use of the serosal covering of a chicken appendix and later a rubber condom. Postnasal packing also progressed and by the early 19th century a standard instrument was in widespread use to facilitate the passage of retaining ties through the nose: Belloc's tube, a hollow tube containing a flexible metal probe, was later condemned as 'very bulky, unrefined and largely unusable' and being more likely to cause rather than improve bleeding. Soft, flexible catheters were more likely to be used for this purpose later in the century.

More serious bleeding could still be a problem and ligation of the common carotid artery was first attempted by Pilz in 1868. Arterial ligation was made more selective by Seiffert (1928, internal maxillary artery) and Goodyear (1935, anterior ethmoidal artery). More recently the Hopkins' rod has allowed treatment to be targeted precisely to the actual origin of the bleeding. However folklore remedies still predominate amongst many of our patients.

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Medicine in the American West

Ray Clarke

The history of medicine in Europe, in particular in the 19th century, was well documented. What is less well studied is how physicians established their presence in the new frontier towns in the American West throughout the 19th century. Settling the American West was an accomplishment of great proportion, carried out with courage and vision. Many physicians participated in this accomplishment and laid the foundations for the establishment of many modern medical schools. A short account is presented of this period in American medical history, with relevance to otolaryngology.

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Evolution of the pulse oximeter

Y. L. Pole

If at all there is one monitor that has revolutionized the concept of monitoring, it is indeed the pulse oximeter. How did it originate? and how did we monitor patient oxygenation?

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In 1943 Leland Clark invented the O_2-electrode to monitor the PaO_2 but what is the normal PaO_2 in Denver, Colorado, USA? Which is more important – the SaO_2 or the PaO_2?

In 1666, Sir Isaac Newton 'discovered the rainbow from white light'. Almost a century later, Johann Heinrich Lambert introduced Lambert's Law of Light-Absorption. Yet another century later August Beer, Bouger and von Bunsen introduced the factors of solute concentration, path-length and absorption-coefficient respectively, which became known as Beer-Lambert-Bouger-Bunsen Law.

In 1864, Gabriel Stokes and Felix Hoppe-Seyler described Haemoglobin and Price-Jones described the Hb-O_2-dissociation-curve and introduced the concept of P50.

In 1911, Wilhelm Berg, invented the photo-electric cell, based on Becquerel's theory stated in 1839.

In 1932, Ludwig Nicolai constructed the first instrument to measure oxygenation which was named 'oximeter', coined by Glen Millikan, the American Physiologist who also published the first paper on oximeter.

In 1935, Professor Karl Mathes of Vienna constructed the first device to continuously measure the SaO_2 and also stated its principle – 'Red light passes through OxyHb but reduced Hb absorbs it'.

In 1940, J. R. Squire modified the instrument by introducing a capsule to set the blood-less zero. The Americans lost two planes in World War II due to the unconscious state of pilots due to hypoxia and Glen Millikan introduced the ear-oximeter with a servo-control.

In 1948, McClure, Behrmann and Hartmann reported the first use of an oximeter to control 'Anoxemia during Anesthesia'. Earlwood and Geraci introduced the bloodless-zero in Millikan's Ear Oximeter.

In 1949, William Zilstra and Robert Brinkman introduced the concept of reflection oximetry and constructed the Cyclops Oximeter.

In 1950, Earlwood and Geraci explained the extinction coefficient curves and improved the accuracy of the oximeter by dividing the red signal by the infra-red signal. They also described the isobestic points and plotted the calibration curves.

In 1951, Stephen and colleagues published a paper 'The Oximeter – a technical aid for the Anaesthesiologist'.

In 1959, there was an International colloquium on pulse oximetry in Bremen, West Germany.

In 1960, the cardiac surgeon Michael Polanyi invented the fibre-optic catheter-oximeter, and Robert Shaw introduced a self-calibrating 8-wavelength ear oximeter.

In 1974, Takuo Aoyagi and Nakajima introduced LEDs in the probe and miniaturized the instrument and also introduced simultaneous plethysmography.

In 1980, Minolta came up with a compact 3-section oximeter but no one paid any heed to it.

In 1982, William New and Mark Yelderman, two New York anaesthesiologists introduced the pulse oximeter in the operating theatre and it became a common place, and later a standard, in the operating theatres and in the intensive care units.

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Harold Hopkins – father of modern endoscopy

C. R. Jennings, M. S. Quraishi, G. M. O'Donoghue

One of the major advances in surgical practice in recent years and across all specialities is the use of endoscopes. ENT practice is no exception. Laryngology and rhinology are the major users, however the endoscope is now finding a role in otological practice including neurotology.

In this presentation the technological development of the endoscope up to the 1960s is briefly outlined. The story of endoscope technology is then almost exclusively taken over by the British optical physicist Harold Hopkins. The life of Harold Hopkins is described and his two great contributions to the design of the modern endoscope are described in detail. These are the invention of the rod lens system which led to an 80-fold improvement in the optical efficiency over the existing systems, and the large part Hopkins played in the development of fibre optics which facilitated flexible endoscopy and also allowed transfer of light from a remote and powerful light source to the area being illuminated. The first patent for the flexible light cable was interestingly issued by John Logie Baird.

This presentation is concluded by reflecting on the missed opportunity for the British manufacturing industry caused by lack of foresight that allowed the products of Hopkin's genius to go abroad.

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The early history of electricity in ENT and cochlear implants

M. S. Quraishi, C. Jennings, G. M. O'Donoghue

From prehistoric times the magical powers of electricity have attracted the curiosity of countless scientists and charlatans. The magnetic power of the lodestone was recognized by Greek philosophers in the sixth century BC. Nearly 2000 years later Paracelsus, a German physician, alchemist and astrologer applied electricity and magnetism to healing. In the 18th century, the medical uses of electricity was being introduced in Europe. In 1781, Luigi Galvani, an Italian anatomist and physicist, accidentally invoked a nerve-muscle preparation to contract with electrical charges. His works caused a sensation when they were published in 1791.

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The application of electricity in otolaryngology during the last century has varied from the treatment of the paralysed larynx with external electrodes made of sculptor's clay to the management of goitre with direct electrical stimulation of the thyroid gland. Electrical stimulation of the ear was performed by Volta in 1800 when he applied a charge of approximately 50 volts, into his ears. He described his experience to Sir Joseph Banks, the president of the Royal Society in 1800. Along with the severe shock to his brain he described a sound of a boiling paste or tenacious matter.

'Electro-otiatrics' had been promoted in the 19th century and included Galvanic stimulation with one electrode in the external ear canal and the other distally. Faradism had also been used in the treatment of diseases of the middle ear and had been advocated by Duchenne. Some workers had supposed that the beneficial effects are due to the shaking or loosening of the rigid ossicular chain. Static electricity was claimed to have a limited role in treating the diseases of the ear. Henry C. Houghton used it to restore muscular tonicity and to modify the nutrition of the middle ear. Electrolysis had been used to cure stenosis of the ear canal due to soft tissue hypertrophy by Ostmann. Electroquackery was big business during the last century and dozens of gadgets were being peddled for hundreds of ailments. This notoriety finally led to restrictions and controls in North America in 1915.

In the 20th century the greatest application of electricity in the ear has been the development of the cochlear implant. The first stimulation of the auditory nerve was performed by the Russians, Andreef, Gersuni and Volokhov in 1934. The first cochlear implant was performed by A. Djourno and C. Eyries in France in 1957.

In 1960, William House with Dr John Doyle, a neurosurgeon and his brother Jim Doyle an electronics engineer designed an electronic nerve stimulus generator which could provide a pulse train that could be varied in frequency, duration and amplitude. In 1961, they placed an implant in the scala tympani, anterior to the round window. It was on this day, 1 February, 1961 that June House, William's wife who was in the operating room but not visible to the patient spoke into the microphone 'How are you?' The patient repeated her words to everyone's joy. *History was born.*

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The next meeting of the British Society for the History of ENT will be held on Friday, 25 September 1998 at the Postgraduate Centre, City Hospital, Dudley Road, Birmingham. Junior doctors are encouraged to present papers to the meeting and a prize is offered for the best junior doctor's presentation. For further information please contact: Mr Ahmes Pahor, Department of Otolaryngology, City Hospital, Dudley Road, PO Box 291, B18 7QH.

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