A Short History of Otolaryngology

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IT is customary to refer to the speaker at the annual address at the opening of the winter session as the orator. I was relieved to find, on looking up the Oxford Dictionary, that orator was defined as "the maker of a speech" as well as "an eloquent public speaker." I may, therefore, claim the title for to-day.

On behalf of the medical staff, I have the honour of extending a hearty welcome to the students of all years, but more especially to those who walk the wards of this hospital for the first time. This is one of the most important milestones in your life, probably your first experience of mass sickness and suffering. The suffering may not be noticed by some of you at first, as the majority of those who suffer succeed in hiding it from the superficial observer. Those whose heart is really in medicine will soon learn to see through the barrier and will thus have acquired something which is essential to a good doctor. You must not only learn all about the diseases which afflict the human frame, but also the individual reactions which vary so much from one patient to another. This you can only acquire by careful observation and close contact with patients during your time in the wards. No amount of reading can do this. The advantage which you take of the opportunities presented during your undergraduate years in hospital will, more than anything else, pave the way for success or failure in your profession.

It is our sad duty to record the great loss which this hospital and the whole community have sustained during the past year by the passing of three distinguished members of the visiting staff.

Professor Sir William Thomson was a member of the staff of this hospital for thirty-one years, and occupied the Chair of Medicine at Queen's University for twenty-seven years. He was elected to many important positions, including membership of the General Medical Council.

Known to all as "W. D.," he was a man of outstanding personality. His humility, gentleness and charm endeared him to all. He was one of the greatest of our clinical teachers and was beloved by students and patients alike. He was strong and brave in time of adversity, of which he had more than his share. He fought and conquered a long and tedious illness, and bore the loss of his only son with courage and dignity. Many here to-day will never forget his help and encouragement during their early professional days. None sought his help in vain. He was a great scholar and an outstanding orator. No man has done more for the advancement of our Medical School. His countless friends rejoiced when the King conferred a Knighthood upon him in January, 1950. Unfortunately, he

was not to live long to enjoy this well-merited honour. Death struck suddenly on 26th November, 1950.

Dr. Samuel Ireland Turkington died on 1st August, 1951.

He was a member of the visiting staff of this Hospital for twenty-five years. A recognised authority on diseases of the chest, his opinion was widely sought. Few practitioners in the Province have not, at some time, called him out in consultation. He, also, was an outstanding clinical teacher. He was renowned far beyond our own school for his teaching of the clinical examination of the chest. "Turkie," to all who knew him, was a man of wide culture. He made the classics a hobby, and took a keen interest in the Ulster dialect. He had a fund of witty stories, many of them true personal experiences. He was a very popular after-dinner speaker. A sombre and pessimistic mask covered a most kind, generous and sympathetic heart.

On 9th September, 1951, Professor Charles Gibson Lowry passed away. Affectionately known as "C. G.," he was a member of the staff of this Hospital for twenty-six years.

Emeritus Professor of Midwifery and Gynæcology and Pro-Chancellor of Queen's University, he earned a world-wide reputation. As a result of his efforts, the Royal Maternity Hospital was built, and remains as a fitting memorial to his work for the mothers and babies of his and succeeding generations. He played a large part in the foundation of the Royal College of Obstetricians and Gynæcologists and became a Vice-President of the College. Like Professor Sir William Thomson, he was the crown nominee for Northern Ireland on the General Medical Council. Many honours were bestowed upon him, the last being an Honorary Degree by Queen's University. As a teacher, he was unique. His students honoured him by never missing one of his lectures, unless it was absolutely impossible to attend. All listened with rapt attention to the wisdom which flowed frim his lips. His teaching was always practical. A common question to a student at one of his clinical lectures was "What would you do?" He made a point of knowing all his students, and followed their progress with the greatest interest. He was always kind and sympathetic, quiet of speech, and his presence provoked a feeling of confidence in time of trouble.

His friends and colleagues presented him with his portrait, painted by James Gunn, when he retired from the Chair in 1945.

Rarely has the hand of death been laid so heavily upon our senior colleagues as during the past year. To the bereaved relatives, we offer our very sincere sympathy.

On behalf of my colleagues, I have great pleasure in welcoming to the staff the following new members :—

Dr. J. F. Bereen, Dr. W. H. T. Shepherd, Dr. D. A. D. Montgomery,
Dr. J. S. Logan, Dr. J. F. Pantridge, and Mr. T. B. Smiley.

"It is good to look back to the olden days and gratefully to recall the men whose labours in the past have made the present possible." "By the historical method alone can many problems in medicine be approached profitably." Many

of you will recognize these words of William Osler. I propose this morning to take his advice and give you a short history of Oto-Laryngology. In doing this, we must not forget what Susruta said in the fifth century A.D.: "He who knows only one branch of his art is like a bird with one wing."

We might say that the first known Rhinologist was an Egyptian called Sekhet'enanch, who lived about 3,500 years before Christ. Evidence of this was a drawing on a slab found in a royal sepulchre. It depicts the physician and his wife. The inscription says that King Sahura had ordered it to be engraved as a testimony to his doctor Sekhet'enanch, because he had "made his nostrils well, and he, therefore, wished him long life and happiness."

Folk-lore has passed down the ages by word of mouth and folk medicine is probably the oldest form of medical practice. Strange and interesting superstitions are connected with the ear, nose and throat; for example, that the conception of the Virgin Mary arose from the breath of the Holy Ghost in her ear. The shape and size of the ear is supposed to indicate the individual's character, small ears being the sign of mental power, large ears show a dull wit, and pointed ears a bad character. The wearing of ear-rings to cure weak eyes is still believed in by some uneducated people. The preference for lamb's wool over cotton wool is probably a relic of the folk-lore remedy for deafness. The belief that tingling of the ears is a sign that others are speaking of you, dates back to the time of Pliney. If the left ear tingles, someone is speaking well of you, if the right ear tingles, the reverse.

It was generally believed in Shakespeare's time that poisons dropped into the ear were as lethal as if they were swallowed. You will remember the case of Hamlet's father.

The popular belief in the close relation between the size of the nose and the sexual organs dates back to ancient times.

In the Middle Ages St. Blaise was a well-known saint, and has been called the "defender of the throat."

Ætius of Amida, who lived in the fourth century, advised that after other methods had been unsuccessful in the removal of a foreign body from the throat, the physician should say to the foreign body—"Piece of bone or thorn, whatever thou art, just as Jesus Christ caused Lazarus to come forth from the tomb and Jonah from the belly of the whale (here the patient should be seized by the throat) in the name of St. Blaise, martyr and servant of Christ, I order thee to come up or go down." In Roman Catholic churches on the 3rd of February, the ceremony of the "Benediction of the Throat" is still carried out in memory of St. Blaise.

The earliest of all books on medicine are the Egyptian Papyri. The Papyrus Ebers, probably completed about 1550 B.C., contains prescriptions for diseases of the ear; for example, "for an ear that is suppurating, olive oil, frankincense and sea salt syringed into the ear;" and "for an ear that hears badly, red lead and resin, grind to a powder, rub in fresh olive oil and apply to the ear." It is possible that the existence of the eustachian tubes were known, as it is stated

in the Papyrus, "the breath of life passes by the right ear, the breath of death by the left ear."

In the Edwin Smith Papyrus, which is even earlier than that of Ebers, there are many references to injuries of the nose, and the frequency of bleeding from the ear in head injuries is mentioned and regarded as an unfavourable sign.

There is little mention of diseases of the ear, nose and throat in ancient Hebrew medical literature, but the Hindus were probably the first to practice rhinoplasty. New noses were made from flaps from the cheek and forehead. This operation was probably in great demand, as cutting off the nose was the usual punishment for adultery. Ma Huang, or Ephedrine, was known in China for centuries before it was introduced to the Western World.

There is little more to record until the coming of the Father of Medicine—Hippocrates, who lived twenty-five centuries ago. That was the golden age of Aristotle, Plato and Socrates. Hippocrates rescued medicine from the sphere of magic. He was the first to describe the tympanic membrane—"a dry thin spun web," and he connected it with the organ of hearing. His writings contain case reports of cases of otitis, and one of his aphorisms reads : "Children suffer from ear discharge, adults from deafness." He also noted the association of headache, otorrhœa and high palate. Hippocrates' sponge method of removing nasal polypi was used until near the end of the nineteenth century. Three or four strings were tied to a small sponge. The ends were knotted together and fixed to the end of a probe, and was then passed through the nose into the pharynx and brought out of the mouth. A forked probe was held in the pharynx, and over this the strings were passed and traction exerted. The sponge was thus pulled through the nostril into the naso-pharynx bringing with it the polypi. It was only successful when the polypi were large and soft.

About four hundred years after Hippocrates, Cicero wrote about nasal physiology. He mentioned the value of the moisture in the nose in arresting dust.

Cornelius Celsus described an incision through the palate for the evacuation of a quinsy. His description of the removal of an insect from the ear is interesting. "An insect must first be killed with vinegar, and then removed with a probe, the patient should be encouraged to sneeze, or better still, he should be bound to a table with the affected ear downwards, and the table should then be forcibly struck with a hammer so that the foreign body may be shaken out of the ear." Celsus even described tonsillectomy with the finger nail. His description of the treatment of injuries of the external ear is quite modern. He advised careful suturing of the skin, if broken, but if intact and a swelling occurs below it, the ear is to be opened from behind and a window cut in the cartilage.

Claudius Galen was born in Asia Minor in A.D. 131. Some of his writings were centuries in advance of their time. He advised that carious bone should be removed after making an incision behind the ear. This is probably the first reference to mastoid operative surgery, but centuries were to pass before his advice was put into practice.

The basis of surgical and medical knowledge is human anatomy, so the birth of the Science of Surgery dates from the foundation of the Schools of Alexandria by Ptolemy Soter, King of Egypt in 255 B.C. Here human anatomy was first systematically studied and taught. Unfortunately all the knowledge gained was lost, when the Alexandrian Libraries were burnt. For over a thousand years anatomy was forgotten and Medicine slipped back into the darkness.

After the fall of Constantinople in 1453, valuable manuscripts were scattered through the Mediterranean countries, and in particular Italy.

One of the Byzantine compilers, Ætius of Amida who lived between A.D. 500 and 550, gives an excellent description of diseases of the ear, nose and throat, including the operation of tonsillotomy. Forceps are recommended for the removal of foreign bodies in the throat, but if the foreign body cannot be seen, the patient is given a piece of raw meat on a string, which is pulled up after he has swallowed it.

Paul of Ægina was another Byzantine compiler. He described a throat condition, which was probably diphtheria. For ear discharge, he advised many kinds of drops. His advice on the treatment of nasal disease is good. "Before treating affections of the nose, the whole body must be treated."

Towards the end of the thirteenth century, human dissection again began to be practised in Italy. The first textbook on anatomy was written in 1316. At that time, the whole dissection of the body had to be completed in four days.

With the Renaissance, artists wanted anatomical knowledge, and some artists performed their own dissections. Leonardo da Vinci recorded a great many of his thoughts, plans and anatomical drawings in notebooks. After passing through many hands, they found their way into Windsor Castle Library. It is interesting to note that Leonardo was left-handed, and that he wrote from right to left. With a mirror, his writings are easily read. He described the maxillary and frontal sinuses, also the facial muscles and their functions. He distinguished seven movements of the tongue. He also described the tonsils, trachea and bronchi as far as their third subdivision. It is strange that he made no mention of the vocal cords. Unfortunately, his drawings were not published until 1898, otherwise they would have advanced the study of anatomy and physiology, and so of medicine and surgery by many years.

The first use of the ear speculum is attributed to Fabrice de Hilden, but it was probably used by Guy de Challiac in the fourteenth century. However, as reflected light from a mirror was not used at that time, it cannot have been of very much use.

With the coming of the sixteenth century, anatomy made great strides. Andreas Vesalius, Professor of Anatomy at Padua, revolutionized anatomy by describing what he had seen at personal dissection. He gave a detailed description of the malleus and incus, two of the small bones in the middle ear;; the third one, the stapes, was not described until some years later. A contemporary of Vesalius was Bartolomeus Eustachius, a name well known in otology. He wrote what was probably the first textbook devoted to the ear, but his renown is associated with

the tube which bears his name. He gave an accurate description of its structure and position, but made no mention of its function.

Another well-known name in otology is Gabriel Fallopius. He succeeded Vesalius. He described all, and named some of the following structures: the inner and middle ears, the chorda tympani, trigeminal, auditory and glossopharyngeal nerves. He described the bony canal for the facial nerve which bears his name. His knowledge was mainly anatomical, as he regarded purulent discharge from the ear as "excrement of the brain."

Let us leave the ear for the moment and look at the history of Tracheotomy.

Galen, Aretæus and Paul of Ægina mentioned cutting the trachea, but the first good description is by Fabricius. It reads as follows: "Of all the surgical operations which are performed on man for the preservation of his life by the physician, I have always judged to be the foremost that by which man is recalled from a quick death to a sudden repossession of life, a feat which raises the surgeon nearest to the level of Æscalapius; the operation is the opening of the aspera arteria, by which patients, from a condition of almost suffocating obstruction to respiration, suddenly regain consciousness, and draw again into their heart and lungs that vital ether, the air, so necessary to life, and again resume an existence which had been all but annihilated." Although he gave advice on the technique of the operation, he never performed it himself. It was probably first performed by Antonio Muser Brasavola in 1564.

Other nose and throat operations performed in the Middle Ages were uvulotomy, tonsillotomy and removal of nasal polypi. The actual cautery was used extensively.

Many famous names grace the seventeenth century, of these the most eminent was William Harvey, who discovered the circulation of the blood, and so opened a new concept in Medicine.

Thomas Willis' famous work, "Cerebri Anatome," was illustrated by Sir Christopher Wren, the latter drew the first circle of Willis. In otology, Willis is remembered by the symptom which bears his name—Paracusis Willisi. He described it as follows: "We meet with a certain kind of deafness in which those affected seem wholly to want the sense of hearing, yet, as soon as a great noise as of great guns, bells or drums is made near the ears, they distinctly understand the speeches of bystanders, but the noise continuing, they presently grow deaf again. I heard from a credible person that he once knew a woman, though she were deaf, yet so long as a drum was beaten within her chamber, she heard every word perfectly, wherefore her husband kept a drummer on purpose for his servant, that by that means he might have some converse with his wife."

Duverney of Paris in 1683, corrected an age-long error by proving that the eustachian tube was not an avenue of breathing, but existed simply as a means of renewing the air within the tympanum. His theory of hearing was very like that of Helmholtz. He compared the cochlea to a musical instrument suggesting that the lower tones were perceived by the basal coil of the cochlea and the higher tones by the apical portion. Helmholtz showed that the high tones were perceived

in the basal coil, and the low tones by the apical portion. Duverney also made important observations an aural pathology; that at post-mortem, pus was often found in the tympanum even when the brain was normal, so the pus could not have come from the brain as was the accepted theory at that time.

Another well-known name in otology is Antonio Valsalva. He wrote a book called Tractatus de Aure Humana, published in 1704. He was the first to demonstrate ankylosis of the stapes at post-mortem. The significance of this observation was not appreciated for over a century. His name is associated with the test of inflating the middle ear by closing the mouth and nose and forcing air up the eustachian tubes. The eustachian catheter was invented by Edine-Gilles Guyot, a postmaster at Versailles. He succeeded in relieving his own deafness by the use of a curved tube passed into the mouth and behind the palate. Nearly twenty years later, Archibald Cleland, a Scottish military surgeon, recommended passing a silver tube via the nose and syringing with water. It did not occur to him that air might be blown in.

Following the advances in anatomy, further attempts at surgical treatment were made, these included opening of the mastoid and incision of the tympanic membrane.

In 1760, Petit successfully opened the mastoid in a case of suppuration, but the pathology not being understood, the operation was tried for cases of deafness without suppuration, and so it soon fell into disrepute.

Astley Cooper observed cases of perforation of the tympanic membrane with relatively little deafness, so he thought that the deafness due to eustachian obstruction might be relieved by puncturing the tympanic membrane. However, he gave up the operation as he was unable to keep the opening patent, and after its closure, the hearing became worse than before. Twenty years later, Itard gave the true indications for the operation, namely, the presence of exudate in the middle ear which was unable to escape.

Following these abortive attempts at surgical treatment, the surgery of the ear remained practically at a standstill until the middle of the nineteenth century. The treatment of ear disease was almost wholly emperical, mainly useless to a large extent in the hands of quacks. Ballance quotes the case of the great statesman, Peel, who placed himself under the care of a then notorious ear quack, called Curtis. The latter was summoned to Whitehall Gardens to attend Mr. Peel, then Secretary of State for the Home Department, who was suffering from a temporary deafness. One of Curtis's modes of practice, which he adopted in almost every case, was to clear out the affected organ by means of injecting warm water through an enormous syringe, not unlike a garden syringe. He brought this instrument with him to the residence of his illustrious patient. On his arrival, he found Mr. Peel in the drawing-room with the Duke of Wellington, Sir Astley Cooper and Sir Henry Halford. He immediately commenced to syringe the ear. During the operation, Mr. Peel became rather too inquisitive as to the nature of his complaint, its situation and the modus operandi of the remedy. Curtis was in a very difficult position, but his natural shrewdness and his imperturbable coolness, made

him equal to the occasion. I saw, he said, that I must stop this inconvenient questioning, so putting the point of the syringe by the side of the ear passage, I gave him a dig and said, "Mr. Peel, if you don't hold your tongue, I shall certainly do you a mischief." "He was as dumb as an oyster afterwards."

The speciality of laryngology really began with the discovery of effective means of demonstrating the interior of the larynx, but prior to this, several diseases of the throat had been described and some attempt had been made at treatment.

Horace Green, known as the Father of American Laryngology, was the first to introduce medicaments into the larynx. He also removed a laryngeal polyp from a child of 11 years old. He did this by direct vision, depressing the tongue until the growth was visible.

Another American, Gordon Buck, in 1848, published an important paper on "Edematous Laryngitis and its treatment by scarification." He was one of the first to remove an intra-laryngeal growth by laryngo-fissure .

Like the eustachian catheter, the laryngoscope was discovered by a layman. Manoel Garcia, a Spanish singing teacher, who lived and worked in London, was on holiday in Paris. Here is his own description of his inspiration: "One September day in 1854, I was strolling in the Palais Royal, preoccupied with the ever-recurring wish, so often repressed as unrealizable, when suddenly I saw the two mirrors of the laryngoscope in their respective positions, as if actually present before my eyes. I went straight to Charriere, the surgical instrument maker, and asking if he happened to possess a small mirror with a big handle, was informed that he had a little dentist's mirror which had been one of the failures of the London Exhibition in 1851. I bought it for six francs. Having obtained also a hand mirror, I returned home at once, very impatient to begin my experiments. I placed against the uvula the little mirror (which I had heated in warm water and carefully dried); then flashing upon its surface with the hand mirror a ray of sunshine, I saw at once, to my great joy, the glottis wide open before me, and so fully exposed that I could perceive a portion of the trachea. When my excitement had somewhat subsided, I began to examine what was passing before my eyes. The manner in which the glottis silently opened and shut and moved in the act of phonation, filled me with wonder."

Garcia wrote a paper entitled, "Observations on the Human Voice." This paper was communicated by the physiologist, William Sharpey, to the Royal Society of Medicine, which had been founded in 1660. Thereafter, followed a controversy between Professor Turck of Vienna and Professor Czermak of Budapest. Both claimed priority as the first to use the laryngoscope in the diagnosis of laryngeal disease. After a bitter fight, this was settled by a Commission of the Academie des Sciences of the Institute of France by according each an honourable mention and suggested that an equal amount of money, 1,200 francs, should be awarded to each.

In England, the great possibilities of the instrument were seen by Sir Morell Mackenzie, one of the most famous names in British Laryngology. Born in 1837, he was a brilliant student, and was admitted a Member of the Royal

College of Surgeons at the age of 21. He studied in many European countries and soon became well known as a laryngologist. In 1863, he was awarded the Jackonian Prize for his essay on "The Pathology and Treatment of Diseases of the Larynx." He founded the Hospital which is now known as the Throat Hospital, Golden Square. His most outstanding work was his textbook, "Diseases of the Throat and Nose." When at the height of his fame, he became involved in a most unfortunate affair, which was given world-wide publicity. In 1887, he was summoned to Berlin to see the Emperor Frederick III, who was suffering from cancer of the larynx. I will quote from College's paper on the subject in the Journal of Laryngology and Otology, 1936. "Sir Morell Mackenzie arrived in Berlin on 20th May, 1887. He found the Crown Prince Frederick, who was under the care of Professor Gerhardt, had been suffering from an affection of the larynx since the autumn of 1886, and that a diagnosis of cancer had been made, and that the operation of thyrotomy was to be undertaken on the following day by Professor Von Bergmann, who had made all the necessary preparations. Mackenzie was asked to give a final opinion before operation. He examined the patient with a mirror, and saw a growth on the posterior part of the left cord which was partly subglottic. There was some limitation of movement. He expressed the opinion that the diagnosis of cancer had been made on insufficient evidence, and that a portion of the tumour should be removed for examination under the microscope. He did this the following day, and Professor Virchow reported the growth to be benign. On 8th June, a further piece was removed and Virchow pronounced the growth to be pachydernia verrucosa. On the strength of this report, it was decided to treat the case by endo-laryngeal extirpation with forceps. On June 14th, the Crown Prince arrived in England to take part in the Jubilee Procession on June 21st. On June 28th, another piece, thought to be the entire growth, was removed in London and sent to Virchow, who again found no evidence of malignant change. In September, a swelling was seen below the left cord, which increased in size and began to ulcerate and soon a swelling appeared below the right cord. He was seen in November by Professor Schrotter of Vienna, who made a diagnosis of cancer, and advised removal of the entire larynx or as an alternative, that a palliative tracheotomy be performed. The patient declined excision of the larynx, but agreed to tracheotomy, when necessary. An external swelling appeared, and increasing dysphœa had to be relieved by tracheotomy, which was performed by Dr. Bramann on 9th February. A month later, particles of cancerous tissue were found in the sputum by Professor Waldeyer. The patient, now Emperor, steadily declined and died on 15th June, 1888 A post-mortem was performed by Virchow and Waldeyer, and an extensive glottic and sub-glottic cancer was found with secondary glands. Mackenzie, faced with dignity the bitter attacks by his German colleagues upon his personal character and his professional skill. He had relied too much on the three negative biopsy reports.

Some years after the death of the Emperor, the London Laryngological Society, realizing the deep injustice that had been done to Mackenzie, decorated

his grave, a very belated honour, and the marble cross bears the following inscription :—

"Sir Morell Mackenzie, M.D.
Lives of great men all remind us
We can make our lives sublime,
And departing leave behind us
Footprints on the sands of time."

The Laryngoscope was introduced into the United States in 1858 by Ernest Krakowiczer of Vienna. He first demonstrated the vocal cords with a mirror in New York. One of the first Laryngologists in the United States was Dr. Jacob da Silva Solis Cohen, who was born in New York about 107 years ago. It is said that the famous American surgeon, Dr. Gross, criticized Solis Cohen for leaving the ranks of what he called legitimate practice to become engaged in a narrow speciality. "Why does he devote most of his time to a cubic inch of the human anatomy? Some day, I suppose, we shall have specialists confining themselves to diseases of the navel!"

Solis Cohen was the first American to perform laryngectomy. Local anæsthesia of the larynx was introduced by Koller. The drug was of course cocaine. This was about 1880. In the same year, Joseph O'Dwyer of New York demonstrated intubation of the larynx. This was a great advance in the treatment of laryngeal diphtheria and is used at the present time. No one has been able to improve upon his intubation tube.

The next step was an attempt to introduce tubes into the œsophagus and stomach. The pioneers were Stoerk and Kussmaul, the latter used a sword swallower as his subject. He was successful, but the light was very poor. This darkness was lit up by Edison's discovery. Killian of Freiburg was the first to introduce a tube into the bronchi. Haslinger of Vienna and the Jacksons of America have brought the technique up to its present high standard. The bronchoscope may be described as the midwifery forceps which delivered the speciality of thoracic surgery.

In the nineteenth century, otology made great strides. Joseph Toynbee gave otology a scientific basis by his beautiful dissections of over two thousand ears, these formed the Toynbee Collection in the Museum of the Royal College of Surgeons, which was destroyed by enemy action in 1941. He described otosclerosis and demonstrated ankylosis of the stapes of the fenestra avolis in 160 specimens. His assistant and successor was James Hilton, a philosopher as well as a surgeon. He advised early incision of the tympanic membrane in acute otitis media. A contemporary was Sir William Wilde of Dublin, father of Oscar Wilde. He set up a dispensary for diseases of the eye and ear in a disused stable, this eventually became St. Mark's Hospital, Dublin. He was the first to teach otology in the United Kingdom, and students came from all over the world, particularly America. His name is still associated with the method of treating mastoiditis by a post-aural incision—Wilde's Incision.

Modern surgery really began with the discoveries of Morton, Simpson, Pasteur and Lister. Anæsthesia and antiseptics set surgery free from the fetters which held it.

Two famous names of the latter part of the nineteenth century and the beginning of the twentieth century are Sir Charles Ballance of London and Sir William Macewen of Glasgow. Ballance's volumes on the Surgery of the Temporal Bone are classics and should be read by all interested in otology. The results of Macewen's operations for otogenic cerebral abscess are still remarkable. Quoting from a statistical table in his famous book: "Of 25 cases, 19 were operated upon and 18 cured." This series of cases would be difficult to equal, even with all our chemotherapeutic aids.

Tonybee's description of otosclerosis, especially his findings that the organ of hearing itself was intact, led surgeons to investigate the possibility of operative measures to enable the sound waves to byepass the middle ear obstruction and reach the intact cochlea.

Kessel, in 1876, attempted removal of the stapes, but where this was possible, infection usually supervened and either the cochlea died or sometimes patient and cochlea. Later, the promentary was trephined and the opening covered with a muco-periosteal flap. No lasting improvement was obtained, and often the hearing was made worse.

In 1913, Jenkins of London, at the International Medical Congress in London, described two cases in which he had made an opening in the external semi-circular canal. Improvement was only temporary.

In 1917, Holmgren made an opening in the superior semi-circular canal, which would be covered by the dura hoping to delay or prevent bony closure.

Sordille of Nantes also became interested in the problem. He eventually covered the opening in the lateral canal by a muco-cutaneous flap continuous with the tympanic membrane. His operation was described in 1929 as an open operation done in two, three or more stages to combat infection. In 1938, Lempert of New York described a one-stage operation with approach through the meatus. In 1940 and 1941, he described further modifications, and in 1942 Shambaugh of Chicago added the use of constant irrigation, and the use of a binocular dissecting microscope when drilling the external canal. This is the type of operation which is being done to-day.

Time will not permit me to bring this short history up to date. During the first half of this century, otology and laryngology, in company with the other branches of medicine and surgery, have made great advances, thanks to the work of famous men like Albert Gray and Brown Kelly of Glasgow, Donald Patterson of Cardiff, Logan Turner of Edinburgh, Sir St. Clair Thomson, Mackenzie, College and many others. Many of the advances, of course, could not have taken place without the corresponding advances in the other branches, such as radiology, anæsthesia, bacteriology, etc. The advances in chemotherapy during the past fifteen years have completely changed our ideas on the treatment of the various infections, and we look forward to the future with hope and confidence to equally great dis-

coveries. Future scientific development may explain and solve many of our present problems. Over a century ago, a Swiss scientist discovered that when he covered a bat's eyes it could still give a perfect example of blind flying, but when he covered its ears, the bat remained obstinately grounded, or if it attempted to fly, it flew into every obstacle. The development of Radar and the supersonic wave analyser revealed the method whereby the bat can fly in the dark and avoid hitting any obstruction. The bat in flight sends out an interrupted train of high frequency sound, generally through its mouth, but sometimes through the nostrils. These vibrations are reflected from objects in their path and return to the bat as an echo. As the time interval between the transmitter squeak and its echo is proportional to its distance from the reflecting body, the bat is able to fix its position with accuracy.

The expansion of scientific methods, however, should not be allowed to obscure the value of the older methods of accurate clinical observation.

Sir St. Clair Thomson said that he who looks only forward seldom sees but one road to advance, generally a crowded one and sometimes a wrong one. While he who looks backward may see several and can appreciate that many of them lead nowhere, that some still point to promising lands and have never been thoroughly explored; and that not a few were paths converging on the broad road of progress where we walk with so much confidence, and with too much self-righteousness.

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