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Historical Article

Adam Politzer's influence on the development of international otology

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Justifiably hailed as the 'Father of Modern Scientific Otology', Adam Politzer (1835–1920) taught otology in Vienna to several generations of postgraduate students from all over the world. He was born in Albertirsa in Hungary in 1835 (Figure 1) and following his grandfather into medicine, graduated from the University of Vienna in 1859.

The middle of the 19th century was a turning point in otology. Until then, much of the treatment of ear disease had, with some notable exceptions, been in the hands of empiricists. In England, James Yearsley (1805–1869), founder of the Metropolitan Ear, Nose and Throat Hospital, wrote in 1841: 'It must be observed that in no department of medical science are we so much behind our continental neighbours as in the treatment of aural disease. The remedial measures are still limited to syringing, blisters, irritating ointments, purgatives, acoustic oils and stimulating eardrops applied whether the disease is external or internal to the membrane of the drum.'

FIG. 1

Plaque at the birthplace of Adam Politzer in Albertirsa, Hungary. Unveiled in 1973, it states "In this house Adam Politzer (1835–1920), the world famous founder of otology, Professor at the University of Vienna, was born. In his memory, The Hungarian Oto-Laryngological Society."

The correlation between clinical signs and pathological evidence as promoted by the eminent pathologist Carl von Rokitansky (1804–1878) enabled the Viennese and German schools to lead in the field of specialization. Hospital medicine was linked with laboratory medicine and diseases were described in terms of pathological processes.

Claude Bernard (1812–1878) in 1865 summarized this process by saying: 'I consider the hospital merely as an antechamber of medicine and the first observation field that the physician should examine; but the real sanctuary of medical science is the laboratory.' By 1859 when Adam Politzer set out to obtain his training in otology, considerable progress had been made in the gross and microscopic structure of the ear as a result of the work of Scarpa (1747–1832) and Corti (1822–1888). The anatomy of the labyrinth was known. Helmholtz's new theory of hearing was becoming generally accepted and the hearing tests of Rinne and Weber had been described. Friedrich Hoffman (1806–1886) and Anton von Tröltsch (1829–1890) had independently introduced the reflecting aural mirror with a hole in the centre and Voltolini had invented the oxyhydrogen incandescent light in 1858. Eustachian tube catheterization had long been established but was not always used for the correct indications. Drainage of mastoid abscesses had been introduced at the end of the eighteenth century but the operation had fallen into disrepute as a result of being used for the wrong indications and was thus not commonly performed.

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Despite Yearsley's earlier comments the pioneer work of Joseph Toynbee (1815–1866) in London and William Wilde (1815–1876) in Dublin was known to the University authorities in Vienna. Johann von Oppolzer (1808–1871), one of the senior physicians, recognized that if the Viennese clinicopathological approach was applied to otology, Vienna could take the lead in this field. His attention had already been drawn to Politzer who, within a year of qualifying, had demonstrated the innervation of the tensor tympani and stapedius muscles by stimulating the fifth and seventh cranial nerves in animal experiments performed in the laboratory of the physiologist Carl Ludwig (1835–1920).

Politzer (Figure 2) was thus sent first to Würzburg where he learnt histological techniques with R. A. von Kölliker (1817–1905), and with Heinrich Muller, the physiologist, he demonstrated the pressure equilibrium in the middle ear during swallowing by using manometric studies of the external auditory canal. He learnt the physiology of hearing from Hermann von Helmholtz (1821–1894) in Heidelberg and with Helmholtz's pupil Rudolf König (1832–1901), who lived in Paris, he worked on vibrations of the auditory ossicles after tonal stimulation. This work was subsequently reported on Politzer's behalf by Claude Bernard to the Académie des Sciences.

FIG. 2
Adam Politzer (1835–1920).

And so to London where Politzer was able to examine Joseph Toynbee's extensive collection of over 2,000 temporal bones gathered over 20 years mostly from the Asylum for the Deaf and Dumb and the Asylum for Idiots where Toynbee held appointments as aural surgeon. Some of the ears had been examined in life. This opportunity led Politzer to later form his own large collection of temporal bones which he was able to amass by virtue of his appointment by the City of Vienna in 1863 as otologist to the poor. After Toynbee's sudden death the collection was given to the Hunterian Museum of The Royal College of Surgeons (at which Toynbee was a founder fellow). It was sadly lost when the College was bombed in 1941.

Adam Politzer returned to Vienna in late 1861 and was appointed 'dozent' (lecturer) in otology at the University. In Oppolzer's eyes Politzer could do no wrong but there was still a deep seated prejudice against otology particularly amongst the general practitioners. Nevertheless, Oppolzer permitted Politzer to hold classes in a ward in his own department.

Politzer had as his sparring partner Josef Gruber (1827–1900) who had qualified four years before him and was largely self taught in otology (Figure 3). Gruber was appointed aural surgeon to the Imperial Royal General Hospital (Allgemeines Krankenhaus) in 1862 and was allocated a small room in the first

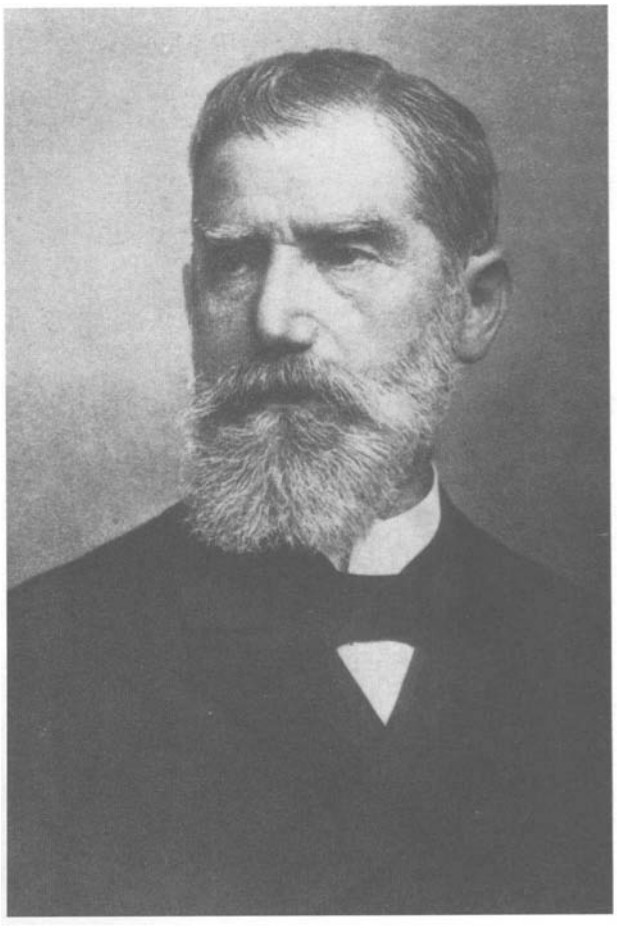

FIG. 3
Josef Gruber (1827–1900).

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courtyard. For twelve years they worked competitively and independently but in 1871 the University authorities gave them both the title of associate professor and in 1873 made them joint directors of the newly founded University Clinic of Otology, the first of its kind in the world. This clinic consisted of one large ward which was partitioned into two rooms. Josef Gruber was given charge of the men's ward with 11 beds and Adam Politzer looked after the women's ward with eight beds. This small space served as an outpatient department, operating theatre and lecture room. They had to wait until 1898 before any further space was granted and by then they had both been appointed full professors for four years.

The famous surgeon Theodore Billroth (1829–1894) aptly described the position of otology in 1874: 'It is desirable' he said, 'to give this small and yet not unimportant subject a definite place in the curriculum of the universities . . . The Vienna School (led by Gruber and Politzer) and the Berlin School (led by Lucae and Schwartze) have attained great success in otology. It calls for a certain amount of heroism in a man to sacrifice himself to this, therapeutically the most thankless and limited phase of surgery!'

Politzer was not deterred by this statement and within a few years the number of patients attending his clinic increased to between 12 and 15,000 a year.

What of the city of Vienna in which he worked? From Vienna the Hapsburgs ruled the Austro-Hungarian Empire. The city expanded rapidly from the mid-nineteenth century and the railways, planned by the Imperial Government, ensured that Vienna became the centre of the Empire. With the railways came finance and the Viennese banks flourished. The revolution of 1848 enabled Jews to move freely about Europe and many successful ones went into banking and also provided Vienna with its professional classes and intellectual life. The city walls were destroyed in 1855, following an attempt on the life of Franz Joseph as he was walking along them. They were replaced by the Ringstrasse resplendent with great buildings: Imperial Classical in the Parliament House, the Opera and the Burgtheater; Gothic revival in the Votivkirche and the Rathaus.

Music still came first but it was now for a largely middle-class audience rather than for aristocratic patrons. Musical Vienna was not content to live on its classics, however great these were. Gustav Mahler (1860–1911) and Hugo Wolf (1860–1903) both graduated from the Vienna conservatory and formed the bridge between the old school and the new as exemplified by Schönberg (1874–1951), Webern (1883–1945) and Berg (1885–1935).

Vienna was indeed an exciting and creative city. Quite apart from the new movements in art and music, Sigmund Freud (1856–1939) was working out a new approach to psychology which was to rock the foundations of established morality. Franz Brentano (1838–1917) was clearing the way for a new school of philosophy and Austrian sociologists were the first to study scientifically the particularly Austrian problem of nationality.

What old and new Vienna had in common was that they were Austrian, not German. If they had a foreign affiliation it was with Paris. Vienna was a German-speaking Paris, with even larger cafés and an even gayer life. The 'fiacres' rolled through the Prater as they did through the Bois de Boulogne. What a time to live and what a place to live in! Any wonder so many intellectual people journeyed to Vienna.

Adam Politzer during his active service of 46 years was to receive over 7000 foreign doctors from all over the world. He was fluent in Hungarian, German, English, French, Italian and Spanish. Apart from his profound knowledge, based on clear scientific assessment, he was able to communicate his enthusiasm for otology. In his own words: 'Everything is connected with everything.' He was a talented artist and frequently illustrated his lectures. He would spend his evenings with a microscope, drawing his specimens. He also collected art and was interested in history.

Politzer is best known for his contributions to the knowledge of aural anatomy, the pathology of cholesteatoma, otosclerosis, serous otitis media, labyrinthitis, congenital deafness and the intracranial

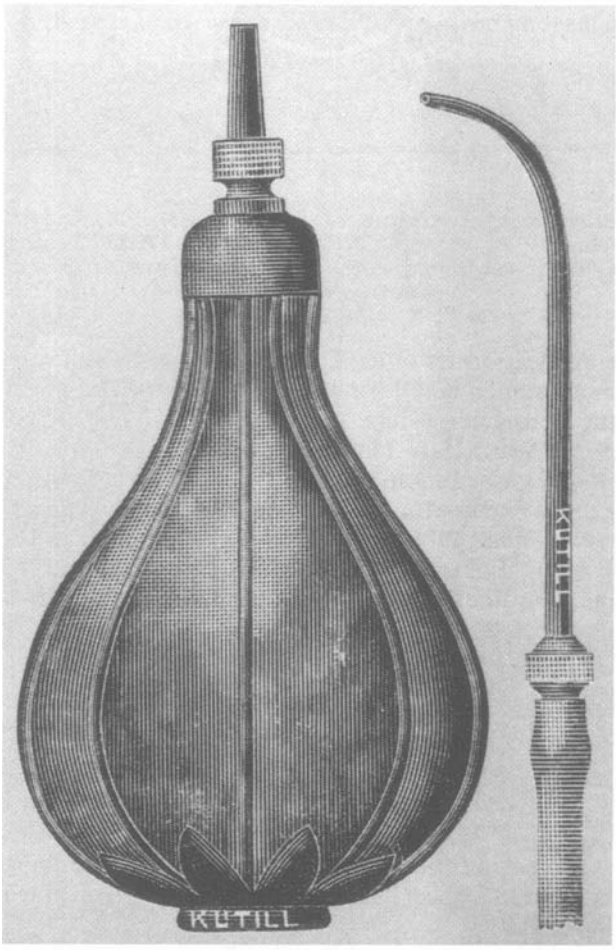

FIG. 4
Politzer's air-bag for making the Eustachian tube permeable (1863).

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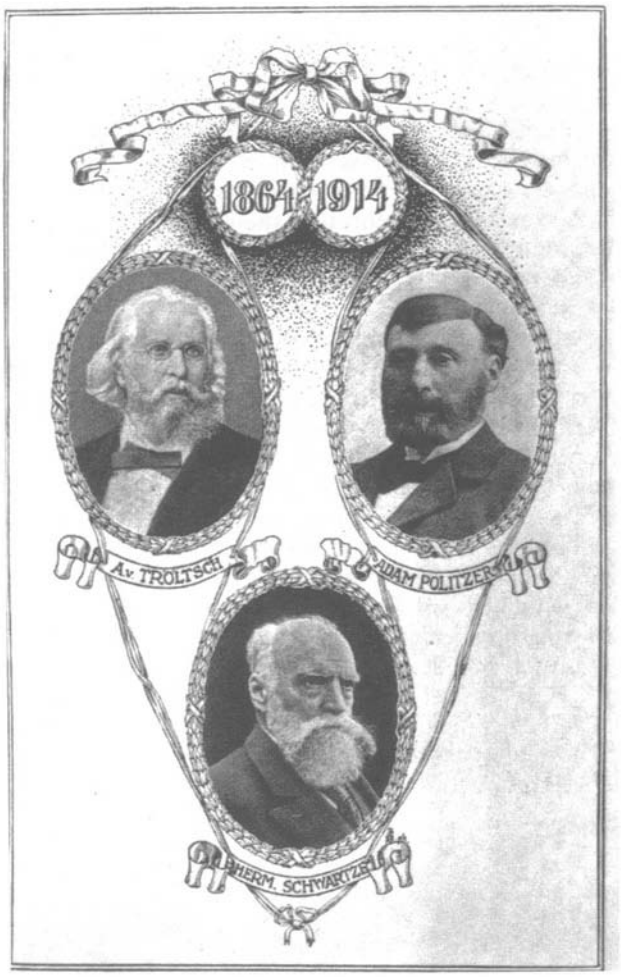

FIG. 5

Bicentenary of *Archives of Otology* (1864–1914) and its founders: Anton von Tröltsch (Würzburg), Adam Politzer (Vienna) and Hermann Schwartze (Halle). From *Archives of Otology,* vol. 96 (1914).

complications of otitis. Today though, he is still very much remembered for his technique of inflation of the Eustachian tube—Politzerization. This technique, which gave him international recognition, he first described in an article '*On a New Procedure to Cure Deafness Caused by Immobility of the Eustachian Tube*', published in 1863 in the *Vienna Medical Weekly*. Politzer maintained that 'his method of inflating the tympanic cavity is rarely less effective than the air douche with a catheter, and is frequently more so' (Figure 4). Politzer's method was rapidly picked up around the world and von Tröltsch proclaimed in 1864: 'The great masses of the unpractised—physicians as well as laymen—now have the possibility to eliminate or at least to soothe a considerable number of pathological conditions of the ear. It is therefore the humane aspect of this achievement which cannot be praised highly enough, and from which science will receive so much impetus.'

Politzer noted that his technique was particularly useful in children suffering from great dullness of hearing in the course of acute or chronic nasopharyngeal catarrh. He noted though that the catheter still had a place if the clinician was considering injection of fluids or introducing bougies into the middle ear. Gruber claimed prior invention of the technique in 1862 and also invented a version of the rather cumbersome force pump.

Politzer's teachings were conveyed to the outside world not only by his courses in Vienna but also by the wider communication of books and journals. He published over 100 original articles and monographs. His first book entitled *Pictures of the Tympanic Membrane in Health and Disease* was published in Vienna in 1865. He drew the sketches for the work from which Carl Heitzmann (1836–1896) created the chromolithographs. This work was rewritten and enlarged in 1896 with 392 illustrations of the tympanic membrane. Politzer's *Textbook of Otology* first came out in 1878 and subsequently ran to five editions and was translated into French, English and Spanish. With von Tröltsch and Herman Schwartze (1837–1900) he founded in 1864 (Figure 5), the *Archiv für Ohrenheilkunde* (*Archives of Otology*).

As a result of the influence of Toynbee, Politzer became a master of the technique of dissection of temporal bones. He described his methods in his book *The Anatomical and Histological Dissection of the Human Ear in the Normal and Diseased Condition for Anatomists, Otologists and Students* published in German in 1889 and English in 1891.

His specimens were sent to important world meetings and 44 of his temporal bones together with 15 enlarged plaster models of the tympanic membrane were included in the Austrian exhibit at the Centennial Exhibition held in Philadelphia in 1876 under the general slogan of 'the best we can do'. This exhibition which covered 24,000 square feet included many items of glass, clothing, pottery and furniture for in those times it was not uncommon for scientists to exhibit alongside general manufacturers. Not only physicians gathered around the collection. Numerous charlatans sought to capitalize on the interest in the collection by peddling secret nostrums and patent medicines to those with aural afflictions.

The collection was purchased by the College of Physicians of Philadelphia for 800 dollars and is still displayed today in the Mutter Museum. When the Viennese heard that the collection had been sold Politzer was depicted in cartoons as a common thief snatching temporal bones for sale. He was therefore obliged to obtain a letter from the College of Physicians of Philadelphia stating that the payment was for the mounting and preparation of the specimens alone. This publicity though, only served to increase the flow of students to Vienna to attend Politzer's courses.

When Politzer visited the United States in 1893 to give a lecture to the Pan-American Congress in Washington DC, he took the opportunity to view his collection in the Mutter Museum and noted that the specimens were in fine condition. It was at this lecture that he explained that the so-called dry catarrhal otitis was not a disease of the mucous membrane of the middle ear but a primary disease of the otic capsule. This was the original description of

otosclerosis which Toynbee had called stapedial ankylosis and considered was due to a post-inflammatory condition leading to rheumatic arthritis and bony fixation.

One of the factors which stimulated the growth of specialties was the increase in ease of communication and transport as a result of the Industrial Revolution. The cities of the American East, especially New York, became focal points for the introduction of European medical ideas partly due to immigration of European physicians and partly because American doctors returned there from European tours. Some of these doctors helped to spread the knowledge of otology by being instrumental in the foundation of new journals.

Hermann Knapp (1832–1911) of New York, who had studied with Politzer, joined Salomon Moos (1831–1895) of Heidelberg and together they founded in 1869 the *Archives of Ophthalmology and Otology* published in both English and German. Ten years later the journal was divided and the *Zeitschrift für Ohrenheilkunde* was produced in both languages. Max A. Goldstein (1870–1942), trained in otology by Politzer, returned to St Louis as Professor of Otology and subseqently founded the *Laryngoscope* in 1896. He also started the Central Institute for the Deaf. Goldstein's slogan was 'help the handicapped child to help himself'. Clarence J. Blake (1843–1919) of Boston, a keen follower of Politzer, was the founder of the *American Journal of Otology*. Of the European emigrés who studied with Politzer, Max Thorner established himself in Cincinnati in 1886, Adolph Barkan settled in San Francisco in 1871 and Ferdinand Hotz served as aurist to the Cook County Hospital, Chicago.

That the basic philosophy behind the Viennese and German University model transferred well to America is borne out in a letter from Clarence Blake of Boston to Politzer. He wrote: 'We have every reason to be encouraged as to the standing of otology in America in the future. The aurists here seem always ready to acknowledge each other's good work and to help each other in study and experiment . . . He can speak freely of his proposed work without fear of any claim of priority and so is able to receive many valuable hints and suggestions which are willingly given.' This exemplifies the manner in which Politzer taught otology to so many over 46 years.

A fascinating example of the students' view of Politzer was given by Alexander Randall, an American graduate from the University of Pennsylvania who, using funds from a legacy, set sail for Bremenhaven in April 1883 on the *Lloyd America*, a paddle steamer with sails. Once in Vienna he embarked on a series of courses in ophthalmology and otology. There was extensive competition to get on these courses which by then were given under the

FIG. 6
Photograph of Politzer's clinic with dedication in his own hand.

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sponsorship of the Medical Faculty of the University of Vienna and the newly formed Austro-American Medical Society. Randall succeeded in getting on to Politzer's course. He described him as being 'sharp as a steel trap' and learnt more from him in an hour than he did from six hours with Bing. With his mirror held by a handle between his teeth Politzer would spin around from one patient to another asking 'Have you zeen?' He would dash off a quick sketch of the drum head details, fasten it to the patient's shoulder so that the students could compare their observations with those of the master. The reason that Politzer preferred to have his mirror held between his teeth rather than wear a headband popularized by von Tröltsch was that the headband would have risked displacing his rather neat toupé.

Not everything was perfect in Politzer's clinic. During Randall's visit Politzer recommended performing Wilde's incision for a case of mastoid abscess. There was very little preparation and no anaesthetic. He made the incision to bone, evacuated the pus but opened a postauricular artery. To quote Randall 'Its spurt nearly washed him off his feet and utterly discombobulated him.' He could not stop the spurter and called in Wöffler from Bilroth's clinic. Wöffler sensing the chaos quietly took the patient by the ear and marched him off to his own department. It is interesting that during Randall's attachment no further mastoids appeared among the hundreds of patients seen.

Politzer and Gruber taught simultaneously in their wards. Politzer spoke rather contemptuously of a certain Josef Gruber and the latter did the same of Politzer. Randall endeared himself to Politzer because he showed a particular interest in the emerging art of photography. Politzer himself had not yet managed to produce satisfactory pictures so they spent many an enjoyable evening photographing Politzer's specimens. When Randall left, Politzer did him the singular honour of mounting and exhibiting several of his photographs on the walls of his clinic (Figure 6). Randall was delighted when on returning to America his friends would remark 'I saw your photographs framed on Politzer's wall'. Randall later became Professor of Otolaryngology in the University of Pennsylvania.

No account of the influence of Politzer on the English-speaking world would be complete without referring to those from the British Isles who benefited from his teaching. Sir William Milligan (1864–1930) was born and educated in Aberdeen, studied in Vienna and Göttingen and was later appointed aural surgeon to the Manchester Royal Infirmary. He was the first president of the Visiting Association of Throat and Ear Surgeons of Great Britain.

John Smith Fraser (1874–1936) settled in Edinburgh and was particularly interested in the fields of congenital deaf mutism, otosclerosis and otogenic intracranial infection.

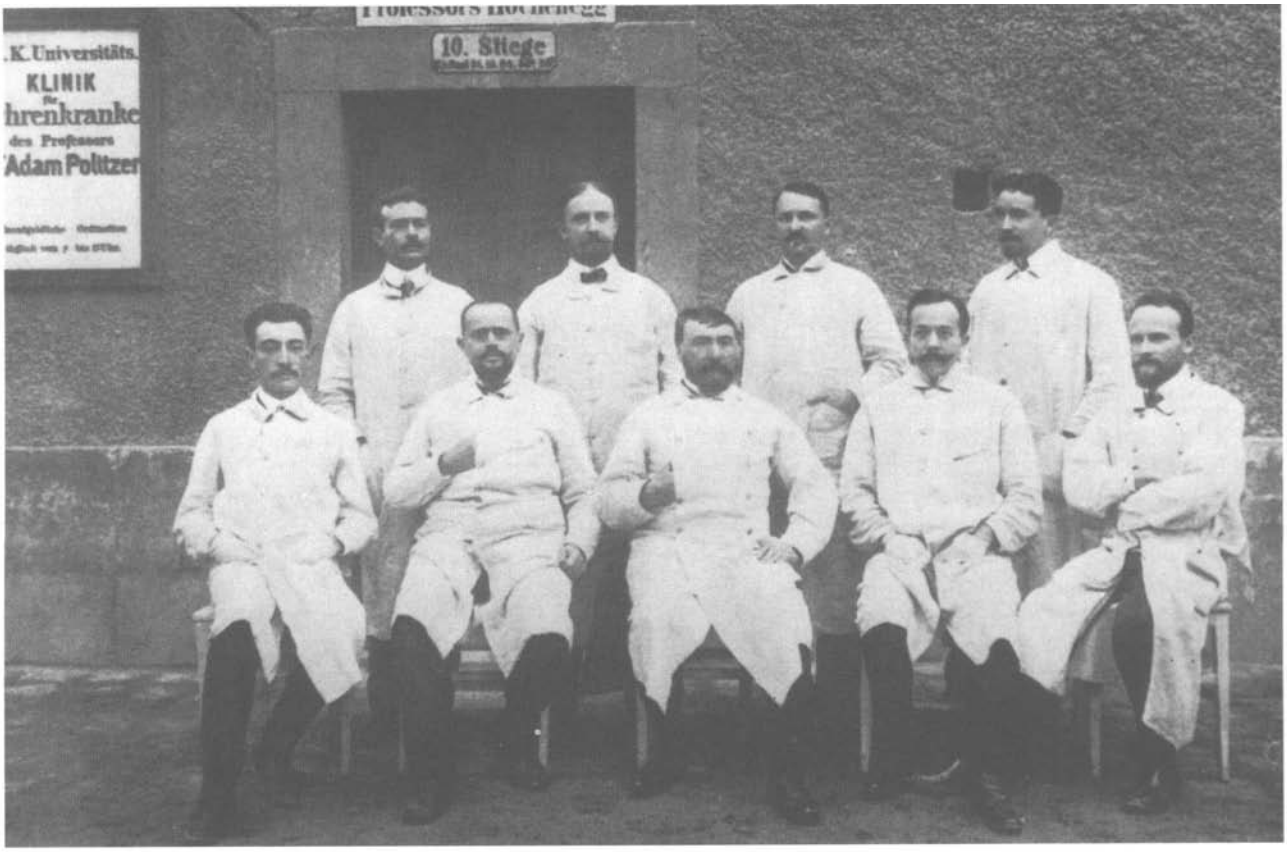

FIG. 7

Politzer and assistants in front of the Otology Clinic (circa. 1905). Front row (left to right): unknown, Alexander, Politzer, Neumann, Bárány.

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Thomas Barr (1846–1916) of Glasgow, who was an early disciple of Politzer, opened the aural department of the Glasgow Western Infirmary in 1877 and is still remembered for his work on noise-induced hearing loss. Perhaps one of the best known English otolaryngologists of this era was Sir St Clair Thompson (1859–1943). After serving as Lister's house surgeon at King's College Hospital, he later pursued his postgraduate training with Politzer and Hajek in Vienna and subsequently was appointed physician to the Throat Hospital, Golden Square, and surgeon to the Royal Ear Hospital, Dean Street. He joined the staff of King's College Hospital in 1901. Politzer's pupils were not limited to Europe and North America, as Australians and New Zealanders also made their pilgrimage to the 'Mecca' for otologists.

When in 1907 Adam Politzer retired, his valedictory address was signed by 366 otologists from 21 countries. A year earlier, at the German Congress of Otologists, he gave a report on the position of otology: 'We can only point to those otological procedures which can be considered amongst the most difficult techniques in modern surgery. I particularly have in mind the surgical therapy of otogenic brain abscesses and thrombosis of the intracranial sinuses. These operations have enabled interventions on many patients who had previously been considered hopeless.' Politzer had, in 46 years, turned otology from a 'sterile, hopeless discipline' into an academically recognized specialty.

His retirement was spent writing his famous two-volume *History of Otology* published between 1907 and 1913. Although much disturbed by the outcome of the 1914–1918 war which resulted in the collapse of the Hapsburg Empire, he still retained an interest in otology right until his death on the 20th August, 1920. On 29th March that year he addressed the 25th Anniversary meeting of the Austrian Otological Society which he, with Josef Gruber and Viktor Urbantschitsch (1847–1921) had founded in 1895. 'Regardless of the sad state into which our country has sunk due to the war, it is the duty of all who have at heart the advance of science to look undismayed into the future, and with all the forces to assume the interrupted work. Upon you, my younger colleagues, does this duty rest.'

And those 'younger colleagues' took up the task – so well were they trained by Politzer (Figure 7). Professor Heinrich Neumann (1873–1939) and Professor Gustav Alexander (1873–1932) continued to teach at the Allgemeines Krankenhaus and the numbers of otolaryngologists far outweighed those students in other fields.

Adam Politzer had laid the foundation of modern scientific otology and through his books and his pupils his work continued to diffuse throughout the world.

Bibliography

Garcia-Ballester, L., Olagues, G., Ciges, M. (1978) *Classics in Modern Otology*. University Press, Granada.

Majer, E. H., Skopec, M. (1985) *History of Oto-Rhino-Laryngology in Austria*. Verlag Christian Brandstätter, Wien-München.

Lederer, F. L. (1961) A Tribute to Adam Politzer. *Archives of Otolaryngology* **133:** 130–133.

Stool, S. E. (1983) A historical vignette: Memoirs of an otologist's European study in 1883. *American Journal of Otology* **4:** 346–349.

Weir, N. (1990) *Otolaryngology – An Illustrated History*. Butterworth Scientific, London.

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