Anton von Tröltsch (1829‒1890) and his Otologic and Ophthalmic Education

Anton von Tröltsch (1829.–1890.) i njegovo otološko i oftalmološko obrazovanje

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Abstract. Anton von Tröltsch was well known German otologist and one of the pioneers of modern otology. The aim of this paper is to present his educational experiences in Continental Europe and the British Isles. This paper is based on an analysis of the data concerning this topic, from medico-historical books, scientific articles, and internet sources. Anton von Tröltsch was trained as an ophthalmologist and otologist, but later devoted himself to otology only. His most famous teachers were the ophthalmologists Albrecht von Gräfe, in Berlin, and Ferdinand von Arlt, in Prague, the ophthalmologist and otologist William Wilde from Dublin and the otologist Joseph Toynbee from London. He popularized the ‘reflecting aural mirror’ and the speculum for usage in otoscopy. He was one of the founders of the first otological journal. In 1857 he opened an ear clinic in Würzburg. This paper describes his training and work in otology. Professor A. v. Tröltsch made a great contribution to the development of modern otology thanks to his dedicated work and excellent training with eminent doctors of the time. He was especially impressed by British ear medicine, which led to his devotion to otology.

Keywords: education; history; ophthalmology; otolaryngology


Ključne riječi: obrazovanje; oftalmologija; otorinolaringologija; povijest

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INTRODUCTION

Anton Friedrich Freiherr von Tröltsch (Schwabach, 1829‒Würzburg, 1890) was one of the pioneers of modern otology and one of the founders of German otology (Figure 1). He came from an aristocratic family based in Franconia. He was the tenth child of the state judge Christian (1780‒1851) and his wife Susanne born Haller von Hallerstein († 1840). In 1857, Tröltsch married Auguste Julie Bauer (1833‒1908). With her he had three daughters.

After school years in Bamberg and Augsburg, Tröltsch attended high school in Nuremberg in 1847 and initially studied law in Erlangen. After completing two semesters of natural sciences in Munich in 1848, Tröltsch studied human medicine at the University of Würzburg from 1849, where he received his doctorate in 1853.1,2

He reinvented and popularized the handheld ‘reflecting aural mirror’ for usage in otoscopy and presented it in Paris, in December 1855 (Figure 2). The concave mirror was described earlier, in 1841 by Dr. Friedrich Hofmann (1806‒1886), but did not receive much attention. Von Tröltsch mostly used daylight for otoscopy. He also used and popularized the funnel-shaped ear speculum for the examination of the external auditory canal and eardrum.3,4

In 1862 he wrote a textbook “Die Krankheiten des Ohres‒ihre Erkenntniss und Behandlung” (The diseases of the ear‒their diagnosis and treatment).

He founded the first journal of otology – Archiv für Ohrenheilkunde (Archive of Otology), together with Adam Politzer from Vienna and Hermann Schwartze from Halle/Saale, in 1864.5 This journal represented the establishment of the discipline of otology as a medical speciality, reflecting a higher level of otological knowledge and the need for a specialised journal (Figure 3).

Among medical professions, otology is perceived as a less important branch of surgery. During the 1850s and 1860s, an awakening of interest in ear diseases arose among a group of European physicians who became interested in medicine and surgery of the ear. Among them there was A. v. Tröltsch. He is considered to be one of the most important otologists of the 19th century and one of the founders of modern otology in Germany.

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Figure 1. Anton von Tröltsch (1829‒1890), c. 1864 (Photo by J. G. Gattineau and Sons, Würzburg)

Figure 2. Examination of the ear with handheld reflecting mirror and speculum using daylight for illumination (From A. von Tröltsch’s Treatise on the diseases of the ear; translated and edited by D. B. St. John Roosa, 1869)
He created the foundations for the research of ear diseases using scientific methods and enabled ear medicine to be recognized as an independent specialty. Some of the physicians in Germany who showed interest in otology before Tröltsch’s educational travels, were Wilhelm Kramer from Berlin, Eduard Schmalz from Dresden and Carl Gustav Lincke from Leipzig. They wrote many papers, books about ear diseases, measured hearing ability and studied vertigo and tinnitus and gave several devices in otology for diagnosis and therapy of eye diseases.

This paper describes Tröltsch’s education in ophthalmology and especially in otology, to which he dedicated his entire working life in Würzburg. At that time, it was common practice for physicians to specialize both ophthalmology and otology. Some of the more famous physicians include Ignaz Gulz in Vienna, Thomas Wharton Jones in London and Daniel Bennett St. John Roosa in New York.

For his work as a doctor during the cholera epidemic in Munich in 1854, von Tröltsch received a grant from the Bavarian state government, which allowed him ophthalmic and otologic education abroad from 1854 to 1855. A short biography of von Tröltsch and his contributions to the otologic profession are given.

**RECEIVING AN EDUCATION IN CONTINENTAL EUROPE**

**Berlin**

Von Tröltsch studied medicine at the University of Würzburg from 1849 to 1853. In 1854 von Tröltsch received a scholarship from the Bavarian state government, which enabled him to broaden his education. He first wanted to be an ophthalmologist, so he visited the famous ophthalmologist Albrecht von Gräfe (1828–1870) in Berlin. He spent five months in his private eye clinic at 46 Karlstrasse from November 1854 to the end of March 1855. In 1854, about 500 eye patients were hospitalized at the Gräfe clinic and 365 operations (cataracts, strabismus, iridectomies) were performed. 2700 patients were treated, and 350 were operated, on, on an outpatient basis. In Berlin he also attended physics lectures with Heinrich Wilhelm Dove and Heinrich Gustav Magnus.

**Prague**

In April 1855 von Tröltsch went to Prague, to the University eye clinic of Ferdinand von Arlt (1812–1887) at 499 Linden Gasse (today U Nemocnice 2) and remained there for three months. F. v. Arlt was an ophthalmologist, who also studied ear diseases, and was the first lecturer of otology in the Monarchy. Von Tröltsch received his first lesson in otology from von Arlt, after meeting him during his lectures in ophthalmology. Arlt favored him greatly and gave him the opportunity to perform cataract surgery several times. Arlt also foresaw the development of possibilities for ear medicine and encouraged von Tröltsch to pursue this field. Von Tröltsch remained in a close and friendly relationship with him. Arlt gave him numerous tips for his later scientific work.
Dublin
Von Tröltsch became interested in otology during his studies due to some cases of hearing impairment in his family, and because, at that time, both in Germany and in the rest of the world, there was much more interest in other medical specialties than in otology. In the British Isles, scientific ear medicine began before the middle of the 19th century through the work of Toynbee and Wilde. In Germany, this development of otology was initiated by von Tröltsch around 1860. He met William Wilde in Dublin and Joseph Toynbee in London, considered to be, the greatest scientific representatives of otology, and resided in Great Britain and Ireland for nearly four months. Von Tröltsch stayed with ophthalmologist and otologist William Wilde (1815–1876), father of the writer Oscar Wilde, in Dublin from July to the end of August 1855 in his St. Mark’s Hospital for Diseases of the Eye and Ear, at 32 Lincoln Place. Wilde’s hospital was founded in 1844, and was the first of its kind in Ireland. Wilde was the first to teach otology in the British Isles and his students came from Dublin and all over the world. He was a great clinician. The hospital had two wards with about 16 beds, an operating room, a room for lectures and an outpatient clinic. In the academic year 1853/54, 211 operations were performed and 2815 eye and 609 ear patients were treated in the outpatient clinic. There were 73 cataract operations. The most common ear diseases treated in the outpatient clinic were cerumen collections (158), inflammation of the external meatus (133), inflammation and thickening of the tympanic membrane (212).

In 1853, Wilde created a technique called Wilde’s incision, which consisted of a retroauricular incision to drain purulent secretions in the treatment of mastoiditis. Von Tröltsch had the opportunity to watch that operation twice, which ended with great success. Several times he watched surgery for ear polyp removal with an instrument called the Wilde snare. The snare was easy to attach to the root of the polyp, and then quickly cut the polyp with a steel wire, which proved a much better technique than pulling out or twisting the polyp.

Glasgow
In Glasgow, Tröltsch visited the ophthalmologist William Mackenzie. He stayed at his villa in Oakfield terrace No. 1 at Hillhead. Mackenzie’s Glasgow Eye Infirmary was located at 72 Charlotte Street. It had an operating room, two rooms with 12 beds, an infirmary, and a pharmacy. In 1854, 118 patients were hospitalized and 1692 patients were examined on an outpatient basis. Of the 96 surgeries, 42 were for cataracts. There were also 180 eye injuries. At that time Mackenzie had two junior assistants, Dr. Andrew Anderson and Dr. William Brown.

At Mackenzie’s suggestion, Tröltsch was eager to see the only otologist in Glasgow, Dr. David Patrick, but unfortunately Dr. Patrick was preparing for a long trip and wasn’t able to receive him. Dr. Patrick worked as a surgeon and aurist in Glasgow from 1833 to 1869.

Edinburgh
After Glasgow, von Tröltsch turned to Edinburgh, where he did not stay long. He visited the large hospital—Royal Infirmary of Edinburgh, used by the old Scottish University for teaching purposes, where James Syme ran the surgical and John Hughes Bennett the medical clinic. At that time
two suitable rooms with about 20 beds were converted into an ophthalmic ward given to Dr. William Walker, an eye surgeon, who also took care of another eye institute—the Eye dispensary. He met William Walker, an eye surgeon at the Eye Dispensary on High Street. He also went to a small eye clinic—the Edinburgh Eye Infirmary at 140 George Street, but with a large outpatient facility, where he worked with Dr. Robert Hamilton and Dr. Benjamin Bell20.

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London
Tröltsch moved to London at the end of September 1855. In London, he visited 10 hospitals, 6 of which dealt with eye diseases and 4 with ear problems. It was quite tiring for him in London not only because of the large number of hospitals he visited, but also because of their locations in various parts of the city. He visited eye hospitals in London because he primarily wanted to be an ophthalmologist. At the Royal London Ophthalmic Hospital (Moorfields), located in Blomfield Street on the corner of Eldon Street, he contacted William Bowman, George Critchett, Alfred Poland, Gilbert Mackmudro and James Dixon. This hospital had a number of rooms with about thirty beds for surgical cases, numerous dispensaries with rooms for ophthalmoscopy, an operating room and a pharmacy. In 1852 10,595 outpatients, and 344 hospitalized patients had been treated. 171 cataracts, 18 pupilloplasties, 40 entropions, and 57 patients with strabismus were operated on21. Tröltsch was taught by Haynes Walton, Robert Taylor and Alfred Smee from the Central London Ophthalmic Hospital.

At the Royal Westminster Ophthalmic Hospital (Guthrie Hospital) at 19 King William Street, Charing Cross, Tröltsch worked with the hospital founder George James Guthrie and his son Charles Gardiner and Henry Hancock. Tröltsch had many objections to the way the hospital worked, and he particularly disliked Dr. Hancock’s surgical techniques.

He also visited the Royal Infirmary for eye diseases in Cork Street and spent time with Henry Alexander and his son Charles Reeves. Tröltsch also visited the North London Infirmary for diseases of the eye, and spent time with eye surgeon William White Cooper, who also treated eye diseases at St. Mary’s Hospital.

Professor of ophthalmology, Thomas Wharton Jones, received him at University College Hospital in Gower Street. Von Tröltsch praised his work, especially his thorough anatomical concept of disease entities and his superb capacity of determining differential diagnoses. He was less satisfied with his cumbersome and radical treatments22.

In London, he finally visited the otologist Joseph Toynbee (1815‒1866) at St. Mary’s Hospital in Paddington, a very famous and important person in the English scientific world. This was attested to by his title “Fellow of the Royal Society” (F. R. S.), which in Continental Europe is equivalent to a “Member of the Academy”. He dealt with anatomical abnormalities of the ear and dissected about 2000 preparations of the temporal bone (ear), giving otology scientific significance. By the time von Tröltsch arrived, he had prepared over 1000 of them. They were nicely arranged so that they could be studied with great ease, and Toynbee himself allowed everyone to see them, with great enthusiasm. He was the first to describe otosclerosis and demonstrated ankylosis of the stapes of the fenestra ovalis in 160 temporal bones and he recommended an early incision of the tympanic membrane in acute otitis media23.

He made and introduced an artificial eardrum in 1853 in the cases of loss or perforation of the natural eardrum. Von Tröltsch witnessed several times the introduction of such a rubber plate, attached to a silver wire, with more or less immediate hearing improvement. To examine the external auditory canal and eardrum, Toynbee used a speculum in four different sizes, oval cylinder, with an outer funnel-shaped opening. In addition to
daylight, Toynbee also used concentrated artificial lighting. He used a concave mirror with gas lighting (Segalas’s lamp) or with a wax candle (Miller’s lamp). He rarely used a catheter to examine the condition of the Eustachian tube. He would rather put an ‘otoscope’ or auscultation tube into the patient’s and his own ear, and the patient would close his nose and mouth and swallow or make a forcible attempt at expiration. During this procedure he would listen to the resulting tones and diagnose if air reached the middle ear.

His overall work was briefly described by W. Wilde: “The labor and investigations of Mr. Toynbee have affected more for aural pathology than those of all his predecessors either in England or on the continent.” Toynbee and Wilde were the two greatest otologists in the English-speaking world at the time. Von Tröltsch was impressed so much by British ear medicine that he turned to otology as a profession13, 24, 25.

He also visited the English ear surgeon George Pilcher (1801‒1855), who taught at St. George’s School of Medicine, and was a consulting surgeon at the Surrey Dispensary and worked privately at his home at 2 Harley Street. Pilcher was awarded for his work in anatomy, physiology and pathology of the ear. As a professional, he fought charlatanry in his profession, as much as Toynbee and Yearsley.

In London, Tröltsch visited two more ear surgeons James Yearsley and William Harvey. James Yearsley (1805‒1869), was an ear surgeon who founded and worked at the Metropolitan Ear Nose & Throat Hospital – the first hospital of its kind in the world. He was the first doctor to recognize the connection between the ear, nose and throat. Yearsley deserves recognition as the one who assisted in bringing aural surgery out of the degraded position it held at the beginning of the 19th century. William Harvey (1806‒1876), was an ear surgeon who worked at the Royal Dispensary for Diseases of the Ear26.

Von Tröltsch remained in London for one month, i.e., until the end of November, 1855, and then he went to Paris. There he demonstrated the usage of the concave mirror to examine the external ear canal and eardrum at a meeting of the Society of German Physicians27.

WORK IN WÜRZBURG

In February 1856 he settled in Würzburg, and in 1857 he opened a private eye and ear clinic. Initially, he practiced ophthalmology, but due to his competition with ophthalmologist Robert von Welz (1814‒1878) and the growing number of patients with ear problems, he devoted himself only to otology. Robert von Welz was a student of the famous ophthalmologist Albrecht von Gräfe (1828‒1870), who occasionally assisted Welz in counseling and in complicated eye surgeries. Tröltsch’s private clinic was in the 3rd district 46 Domer Pfaffengasse (now Bibrastrasse) (Figure 4).

After 1870 he had a private clinic in the 4th district at the address vor dem Göbelslehen No. 2/1 (later Friedenstrasse)28.

At first, he spent nearly a year studying the anatomy of the ear under Albert Kölliker (1817‒1905), Heinrich Müller (1820‒1864) and Rudolf Virchow (1821‒1902). Tröltsch treated a lot of patients with otitis media and claimed that it was responsible for numerous hearing impairments. He proved that middle ear infections in children were far more common than previously thought. He made a detailed study of the Eustachian tube, which was one of the first reports on this kind.

Figure 4. Von Tröltsch private clinic in Würzburg in the 3rd district at 46 Domer Pfaffengasse (arrow) (The map of the district capital Würzburg, 1856)
He also described the anatomical differences between a child and an adult Eustachian tube. Von Tröltsch performed deep incisions and dissected the bone for mastoiditis in 1861. He is credited with arousing interest in mastoidectomy among German ear surgeons. The 1860s was a particularly active period for von Tröltsch. He taught many physicians who later became university lecturers and founders of university ear clinics. He was habilitated in 1861 and became a lecturer at the Julius-Maximilians University as a private assistant professor. The mentors for his habilitation thesis were Albert Kölliker and Heinrich Müller. He became associate professor of otology in Würzburg in 1864. In 1867 he was elected a member of the Leopoldina-German National Academy of Sciences. During the Franco-Prussian war in 1870, Tröltsch volunteered as a medical companion for the transport of the wounded.

In 1879, although already handicapped by illness, he founded the University Ear Polyclinic. Thus, together with his assistants, he was able to treat patients in hospital rooms and use them regularly for teaching students. Tröltsch's work and publication activity had a great influence on the development of otology, in particular his textbook of ear diseases. Between 1853 and 1883 he wrote 36 scientific works.

Von Tröltsch was aware of his qualities and the importance of his work in otology but he was not boastful. He was really loved and respected by his colleagues.

END OF A CAREER

From 1877 Tröltsch suffered from multiple sclerosis or Parkinson's disease. Since 1883, his ear polyclinic had been run by his assistant Wilhelm Kirchner (1849–1937). Tröltsch closed his private practice in 1886. He died of influenza in 1890, and was buried in the honorary grave of the University of Würzburg, on the north side of the main cemetery.

CONCLUSION

Professor A. v. Tröltsch made a significant contribution to the development of modern otology thanks to his dedicated work and intense collaboration with eminent doctors of the time. The use of a perforated concave mirror with a speculum and illumination helped diagnostics and ear surgery and led to the enormous development of otology in the second half of the 19th century. The reflecting mirror has been used as a symbol of the otorhinolaryngology profession for over a hundred years. Tröltsch's otological practice was and remains an example to all otologists. In his honour, the German Society of Otorhinolaryngology, Head and Neck Surgery has been awarding an annual “Anton v. Tröltsch prize” for outstanding scientific achievements in the field of ear, nose and throat medicine, since 1962.

Conflicts of interest: Authors declare no conflicts of interest.

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