

## Christian Albert Theodor Billroth: Master of surgery

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Christian Albert Theodor Billroth was the first of five sons born to Carl Theodor Billroth, a priest in the Lutheran church and his wife Johanna Christina. He was born on April 26, 1829, at Bergen, on the island of Rügen, Prussia. The family lived in Klosterstrasse, later renamed Billrothstrasse.<sup>1-5</sup> Three years after Billroth's birth, the family moved from the fishing village Bergen on the Baltic coast, to Reinberg. His father died when Theodor was five, and his mother then moved with his grandfather in Greifswald where Billroth attended the Gymnasium. He was musically inclined – a family characteristic – and probably for that reason was not an exceptional pupil, needing tutoring at home. He seemed unable to master languages and mathematics, was not quick-witted and spoke slowly.

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### Tryst with Medicine

His mother and two professors of medicine in Greifswald, Wilhelm Baum (1799-1883) and Philip Magnus Seifert (1800-1845), induced Billroth to become a doctor for financial reasons. Billroth was a nephew of the medical officer in Stettin, Wilhelm Friedrich Billroth, who distinguished

himself during the cholera period.

During his first semester as a medical student in Greifswald, Billroth studied natural sciences and began the multifaceted activity and careful use of his time that characterised his later years. He followed Baum to the University of Göttingen, where he established a lasting friendship with George Meissner (1829-1905). Like Billroth, Meissner was interested in music and was a pupil of the physiologist Rudolph Wagner (1805-1864).

Along with Wagner and Meissner, Billroth went to Trieste to study the origin and insertion of the nerves of the torpedo fish. There, Ludwig Traube taught him experimental pathology and encouraged him to write the thesis 'De natura et causa pulmonum affectionis quae nerve utroque vago dissecto exoritur'. On September 30, 1852, Billroth received his doctorate in Berlin, and that winter he passed the state medical examination, after which he worked in the ophthalmology clinic of Albrecht von Graefe (1828-1870).

### The Young Surgeon

In order to take courses in dermatology with Ferdinand von Hebra (1816-1880), in pathology with August Wilhelm Eduard Theodor Henschel (1790-1856) and in internal medicine with Johann von Oppolzer (1808-1871), Billroth went to Vienna in the spring of 1853. That fall he tried in vain to establish himself as a general practitioner in Berlin but after a few months he was appointed assistant to Bernhard von Langenbeck in the surgical clinic at the Berlin University (1853-1860).

He published on pathological histology and in 1856 became Privatdozent in surgery and pathological anatomy. Later he

lectured on surgery and gave practical demonstrations. In 1855, he produced his first monograph on polyps and concluded that benign and malignant polypoid tumours of the colon were related and suggested early treatment. He published numerous works on the pathology of cystoid tumours of the testis, blood vessels, development and comparative anatomy of the spleen.

It was in Berlin that Billroth met his wife Christine, daughter of the court physician Heinrich Sabatier Michaelis (1791-1857) and Karoline Eunike. They were married in 1858, and of their four daughters and one son, only three daughters survived.

### Professor in Zurich

Billroth next turned to teaching and writing on historical developments in surgery and was nominated Professor of surgery and director of the well-known surgical hospital and clinic in Zurich in 1860. He stayed in this position until 1867, when he became professor at the University of Vienna and head of the 2nd Surgical Clinic at the General Hospital in Vienna.<sup>2-4</sup> During his seven-year stay as director in Zurich, he added greatly to the fame and growth of the surgical clinic.

Modern surgery was in its infancy, and Billroth was especially interested in the causes of wound fever. He insisted on regular temperature-taking and believed that wound fever was caused by a chemical poison produced by some living organism.<sup>2,5</sup>

While at the University of Zurich (1860-1867) as professor and director of the surgical clinic, Billroth published his classic textbook *Die Allgemeine Chirurgische Pathologie und Therapie* (1863). In Zurich, he introduced the concept of audits, publishing all results, good and bad, which automatically

resulted in honest discussion on morbidity, mortality, and techniques – with resultant improvement in patient selection.

### The Master of Surgery

The peak of Billroth's career however, began when he joined the faculty of the University of Vienna, where he worked from 1867 until his death in 1894. Here, Billroth excelled as a surgeon, teacher and scientist.<sup>1,3,4</sup>

In 1870, he volunteered for the Franco-Prussian War, working in the field hospitals at Weissenburg and Mannheim.

In 1872, he was the first to remove a section of the oesophagus, joining the remaining parts together and in 1873, he performed the first complete excision of a larynx.<sup>3,7,6</sup> He was the first surgeon to excise a rectal cancer and by 1876, he had performed 33 such operations.

By 1881, Billroth had made intestinal surgery seem almost commonplace and was ready to attempt what appeared in his time as the most formidable abdominal operation conceivable: excision of a cancerous pylorus (the lower end of the stomach).<sup>3,6,8</sup> His successful execution of the operation caused a great sensation and initiated the modern era of surgery. His methods of resection, although modified, remained in use for many years. Plastic surgery, especially of the face, was another of his specialities.

He is regarded by many as the leading German surgeon of the late 19th century.<sup>4,6</sup> An outstanding surgical technician, he was able to bring experimental medicine to clinical practice. He had radical ideas on surgical training, advocating a prolonged surgical apprenticeship on completion of medical studies consisting of preliminary work in hospitals followed by performing operations on cadavers and experimental animals. This would be followed by a 2-3 year assistantship in a surgical department with studies of the surgical literature and the acquisition of advanced practical skills. His ideas were taken up by many who visited him.

Billroth was a member of the Academy of Sciences in Vienna.<sup>1,3</sup> Billroth founded the House of the Society of Physicians in Vienna - K. K. Haus der Gesellschaft der Ärzte - and it was due to his energetic efforts that the "Rudolfinerhaus", a teaching institution for "worldly" nurses, was established in Vienna.

### The Man

Billroth was a man of strong artistic bent, above all a great lover of music.<sup>9,10</sup> He was an artist by nature: intuitive, humane and inventive. His home in Vienna became a musical centre where he played second violin and viola and became friends with Johannes Brahms and with the musical theorist

and writer Eduard Hanslick (1825-1904). In Zürich he was invited at times to be guest conductor of the Zurich symphony Orchestra.

Towards the spring of 1887, he fell ill with a severe inflammation of the lungs. Later on, he suffered from cardiac weakness that increased during his last years. However, he lived to enjoy his sixtieth birthday as well as his 25th anniversary as professor in Vienna.

Theodor Billroth died on February 6, 1894, and was buried with "princely" honours in Vienna.<sup>2,4</sup>

A memorial to him was unveiled in the arcade square at the University of Vienna on November 7, 1897.

### Associated Eponyms

#### *Billroth's cords*

The splenic cords found in the red pulp between the sinusoids.

#### *Billroth's disease I*

Accumulation of cerebrospinal fluid under the scalp in children.

#### *Billroth's disease II*

Malignant lymphoma.

#### *Billroth's operation I*

Removal of the lower portion of the stomach (pylorus) with end-to-end anastomosis of the remaining stomach with the duodenum.

#### *Billroth's operation II*

Gastrojejunal anastomosis with duodenal closure.

#### *Billroth's venae cavernosae*

Small tributaries of the splenic vein in the pulp of the spleen.

#### *Buerger's disease* or Billroth- von Winiwarter's disease

A chronic inflammatory disease of the peripheral vessels forming blood clots that results in reduced blood flow, possible ulceration, and gangrene.

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