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## Surgical Leaders *Theodor Billroth and His Musical Life*

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**A**LTHOUGH MOST WIDELY recognized for the two types of gastric reconstructions that bear his name, Christian Albert Theodor Billroth was one of the most innovative surgeons of his time. His contributions included developing techniques for procedures on the larynx, breast, and esophagus. He pioneered sterility and antisepsis in operating rooms. He also improved surgical education by advocating for longer apprenticeships, which helped create a framework for today's residency programs. However, what often goes unnoticed was Dr. Billroth's love for music, a passion that fueled him throughout his life.

Dr. Billroth (Fig. 1) was born on April 26, 1829, on Rugen, an island off the coast of north Germany. He was the oldest of five boys born to Johanna and Carl Theodor Billroth, a Lutheran pastor. With several musician and physician relatives, his family had a rich tradition in both music and medicine. After his father died of dysentery, Theodor at age 5 years moved to Greifswald, Germany, to live with his grandparents who were both professional opera singers.<sup>1</sup> It was at Greifswald where Theodor was first exposed to the great composers of the Classical period. He studied musical theory and composition at an early age and developed into a talented pianist. He frequently performed in amateur recitals with his two brothers who also shared a fondness for music. Although he excelled with music, Billroth had difficulties in the classroom. Music was his first love and his clear distraction. He was described as an average student and needed tutors to graduate from high school.<sup>1</sup>

At the request of his family, Theodor gave up the pursuit of a musical career and at 19 years of age entered medical school under the tutelage of surgeon Wilhelm Baum. He followed Dr. Baum to the University of Gottingen where for the first time he developed scholastic interests.<sup>2</sup> Theodor considered many paths in medicine; he was attracted to histology and pathology as well as to clinical care.<sup>3</sup> He was able to continue his

musical interest while at Gottingen and even performed with the famed Swedish Nightingale Jenny Lind. Theodor accompanied the 29-year-old soprano on the piano in two sell-out recitals.<sup>3</sup>

Theodor transferred to the University of Berlin for his final year and graduated from medical school in 1852. The next year, after brief attempts at ophthalmology, dermatology, and general practice, he became an assistant to Dr. Bernhard von Langenbeck, an esteemed surgeon at the time in Berlin.<sup>3</sup> Through this experience, Dr. Billroth solidified his interest in academic surgery. Dr. Billroth would spend the next 7 years in Berlin studying pathological anatomy and surgical technique. At this time in his life, music pursuits became subordinate because most of his time was spent working to publish numerous papers on pathology and histology. In 1858, Dr. Billroth met and married Christine Michaelis. She too came from a family with roots in medicine and music. Christine was a daughter



FIG. 1. Theodor Billroth. Originally published in McLaren N, Thorbeck RV. Little-known aspect of Theodor Billroth's work: his contribution to musical theory. *World J Surg* 1997;21:569-71.

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FIG. 2. From right to left: Theodor Billroth, Johannes Brahms, and music critic, Edward Hanslick. Originally published in McLaren N, Thorbeck RV. Little-known aspect of Theodor Billroth's work: his contribution to musical theory. *World J Surg* 1997;21: 569–71. Drawing by AF. Seligmann, Institut für die Geschichte de Medizine, Vienna.

of a physician and also related to Berlin's premier singing family, the Eunikes.<sup>3</sup> They had five children together.

In 1860, Dr. Billroth became Professor of Surgery at the University of Zurich where he excelled academically, publishing a surgical pathology textbook. While in Zurich, his passion for music returned. He quickly befriended intellectuals who enjoyed playing string quartets.<sup>1</sup> To join his musical colleagues, he took up the viola and became a proficient player. He also served as guest conductor for the musical organization Allgemeine Musikgesellschaft Zurich on occasion. Dr. Billroth also became the first music reporter for the newspaper *Neue Zürcher Zeitung*.<sup>3</sup> With a keen ear, he was well informed and became known for his "caustic pen."<sup>1</sup> Despite his busy schedule, Billroth also composed songs, which he would dedicate to his friends.

Dr. Billroth met one of his favorite composers, Johannes Brahms, when Brahms performed his *Serenade in D Major* in 1865 in Zurich. Brahms was so well received that Dr. Billroth organized a private concert for those that wished to hear him again. The two remarkable men formed a lifelong friendship (Fig. 2). In 1867, Dr. Billroth was appointed Chief of Surgery in Vienna where Brahms resided. The two visited one another constantly, played and discussed music, and dined and traveled together.<sup>3</sup> Some of Brahms' music was first rehearsed and played in Dr. Billroth's mansion. He often sent Dr. Billroth unfinished manuscripts for him to critique and eventually honored Dr. Billroth with dedications of his Opus 51 string quartets in C minor and in A minor in 1873.

Dr. Billroth achieved his greatest surgical feats in Vienna. He performed the first total laryngectomy in 1873 with the use of a prosthesis that he fashioned himself for tracheal and phonetic function.<sup>4</sup> The techniques for esophageal resections were developed in his laboratory, and in 1877, his greatest pupil, Dr. Vincent, Czerny performed the first human esophagectomy.<sup>4</sup> In 1881, Dr. Billroth achieved his most famous accomplishment, the first subtotal gastrectomy on a 43-year-old woman with gastric cancer of the pylorus and antrum. In an operation that lasted only 1 and a half hours, he removed a segment of distal stomach and anastomosed the remaining stomach directly to the duodenum (a Billroth I reconstruction). Three years later, he performed his second type of gastrectomy where he attached a smaller segment of the stomach to the jejunum (a Billroth II reconstruction). Despite his many innovations, Dr. Billroth believed his greatest legacy was his surgical school where he was disciplined and tenacious. He had the ability to instill these attributes into his students, many who later became leaders of European surgery.<sup>2</sup>

Despite his meticulous care to his patients, Dr. Billroth neglected his own health. He ate and drank heavily and enjoyed black cigars.<sup>1</sup> He battled heart disease and recurrent pneumonia in his later years. Even with his health failing, Dr. Billroth found time to draft a book on the physiology of music entitled *Wer ist musikalisch?* (Who Is Musical?). In it, he sought to explore the relationship of music to human physiologic and psychological nature. Dr. Billroth died at age 65 years on February 6, 1894. His book was completed and published posthumously by Edward Hanslick, a musician critic and close friend.

Although the legacy of Theodor Billroth is one of surgical innovation and advances in surgical education, he was also a gifted musician and supporter of the arts. Music was a passion that remained with him throughout his life. His life proved that music and medicine could complement one another. Perhaps Dr. Billroth described it best in a letter to his friend, Wilhelm Lubke, "It is one of the superficialities of our time to see in science and in art two opposites; imagination is the mother of both."<sup>1</sup>

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