

## Medicine in Stamps

# Emil Theodor Kocher (1841-1917): thyroid surgeon and Nobel laureate

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The English anatomist, Thomas Wharton, first named the thyroid in 1656, believing that its purpose was to beautify the neck. Goitres, which accentuated neck fullness, conferred additional elegance, and were excised only when they caused airway obstruction. Unfortunately, surgery for massive goitres carried a 40% mortality rate. Samuel Gross, a noted American surgeon, wrote in 1866: *“But no sensible man will, on slight considerations, attempt to extirpate a goitrous thyroid gland. If a surgeon should be so adventurous, or fool-hardy, as to undertake the enterprise, I shall not envy him.... Every step he takes will be environed with difficulty, every stroke of his knife will be followed by a torrent of blood, and lucky will it be for him if his victim lives long enough to enable him to finish his horrid butchery.”*

Towards the end of the 19th century, Theodor Kocher, a meticulous and unassuming Swiss surgeon, described a technique for the safe removal of an enlarged thyroid, and along the way, unraveled the true function of this endocrine gland. In 1909, he became the first surgeon to receive the Nobel Prize *“for his work on the physiology, pathology and surgery of the thyroid gland”*.

**EARLY INFLUENCES** Kocher was born on August 5, 1841 in Bern, Switzerland, the eldest of five children. His father was a successful civil engineer, and his mother, a religious woman, who left a deep imprint on him. It is unclear who inspired him to take up medicine, but 1865 found him graduating with a medical degree from the University of Bern. He then spent a brief stint in Europe and England, learning from pioneers such as Paget, Lister, Pasteur, Virchow, von Langenbeck and Billroth.

Billroth and Lister were particularly influential in shaping Kocher's career. The quick but crude Billroth (*“less regard for tissues and less concern for hemorrhage”*) was considered one of the best thyroid surgeons in Europe and had performed 20 thyroidectomies

by 1869. However, eight of his patients died from sepsis or haemorrhage, and many developed tetany because of unintended injury or removal of the parathyroid glands. Kocher studied under Billroth, and also learnt from Lister, the great English surgeon, who introduced the concept of asepsis to the surgical world.

In 1866, Kocher returned to Switzerland and worked as assistant to Dr Lücke, a professor of surgery at the University of Bern. Seven years later, Lücke left his post and Kocher was appointed full professor of surgery at the young age of 31 years. There he stayed for the rest of his life.

**REMOVING THE THYROID** Iodine deficiency was endemic in parts of Switzerland, and many of Kocher's patients suffered from large goitres. In 1872, Kocher performed his first thyroidectomy using Billroth's

technique of a vertical incision before splitting the capsule and ligating the major arteries. Unfortunately, profuse bleeding in the vascular gland was a common outcome. Kocher subsequently abandoned the technique for one which first ligated the major arteries and veins followed by identifying and isolating the recurrent laryngeal nerve. Only then was the external capsule split and the isthmus removed. This technique avoided the haemorrhage and spared the

recurrent laryngeal nerve. The improved haemostasis allowed for careful dissection and preservation of the parathyroids. Moreover, Kocher employed the strict aseptic routines he had learnt from Lister. By 1883, he had performed 101 thyroid surgeries, and lost only 13 patients, none due to sepsis. Kocher presented his experience at the German Congress of Surgery in 1883, subsequently publishing the results in his famous work, *On the Extirpation of Goiter and Its Sequel*. By 1898, mortality rate in his hands had dropped to 0.5%.

**TRAGIC AFTERMATH** Although Thomas King, an



English anatomist, had proposed in 1836 that the thyroid may have a secretory function, most of the prevailing theories in 19th century Europe had to do with its role in regulating blood flow to the brain. However, Kocher soon recognised late physical and mental changes in his thyroidectomised patients. Others, such as Professor Reverdin, a surgical colleague, had reported similar observations. A quick retrospective review of his patients uncovered symptoms that included weakness, pallor, anaemia, puffy face, and mental deterioration. Kocher noted the similarity to spontaneous myxoedema, and termed it *cachexia thyreopriva* or *cachexia strumipriva*, (*cachexia*, Greek meaning “bad condition”, *struma* Latin for “mass” and *priva* for “set apart”). The irreversible condition caused Kocher to halt further thyroidectomies, and to lament: “*I have doomed people with goiter, otherwise healthy to a vegetative existence. Many of them I have turned to cretins, saved for a life not worthy living.*” That *cachexia strumipriva* was due to the loss of the hormone, throxine, only became obvious following the work of famed neurophysiologist Brown-Sequard, and the effective use of animal thyroid extract by George Murray in 1891.

**OTHER ACCOMPLISHMENTS** Kocher’s many other contributions included a technique to reduce a dislocated shoulder—the Kocher manoeuvre, and the design of surgical instruments like the Kocher clamp. He also conducted research on the prevention of gastric aspiration, and the use of salt solutions to treat shock. In 1892, he published the authoritative “Textbook of Operative Surgery,” which was later translated into several languages. In 1902, Kocher became the first president of the German Surgical Society, and in 1908, he became the first president of the International Surgical Congress.

**KOCHER, HALSTED AND CUSHING** Many academicians visited Kocher’s clinic in Bern, including two American legends of surgery, William Halsted and Harvey Cushing. Halsted was then chairman of surgery at Johns Hopkins, and Cushing was his surgical resident. In 1899, Halstead met Kocher for the first time, and the two became lifelong friends. Cushing visited Kocher the following year after an otherwise disappointing 14-month tour of Europe. Immediately impressed, Cushing asked to work in his laboratory. Kocher, whose interests extended to spinal cord lesions and brain physiology, agreed, and in the process helped launch the career of one of America’s most illustrious neurosurgeons.

**PERSONAL SIDE** Although reserved by nature, Kocher was very warm to his patients and they, in turn,

loved him. A grateful patient went as far as naming a volcano in Manchuria after him. Many of his patients requested his services because they believed he had “lucky hands.” His private life was one of peace and quiet comfort. He married Maria Witchi-Cournant in 1869 and had three sons, one succeeding him at the Bern surgical clinic. He did not have many interests outside of surgery, and after retiring his professorship in 1911, he continued to operate until his death from renal failure at the age of 75 years. On July 23, 1917, he performed his last operation, a gastric resection, when a colleague was called away to war.

The first International Neurological Congress held its meeting in Bern in 1931. Harvey Cushing, an esteemed attendee at the conference, took the occasion to visit Kocher’s gravesite. His words on that rainy morning accurately captured the spirit and brilliance of the humble Swiss surgeon: “*A slight, spare man of personal neatness, of quick step and alert bearing, of unfailing courtesy and dignity, precise and scrupulous in all his dealings, professional, public and personal—a man to trust.... From hard work and responsibility surgeons are prone to burn themselves out comparatively young, but Kocher had been blessed with an imperturbability of spirit which enabled him to bear his professional labours, his years, and his honours with equal composure to the very end. The current of his long and active life was as steady, cool and uninterrupted as that of the Aare [river] encircling his beloved Berne.*”

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