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PIONEERS IN NEUROLOGY

Wilhelm Heinrich Erb (1840–1921)

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Wilhelm Heinrich Erb, the founding father of German neurology, was an ingenious figure who made several remarkable contributions to the science of neurology (Fig. 1) [4, 7]. Today, he is recalled by several eponyms: Erb's phenomenon (intensified electrical irritability of nerve fibers in tetany), Erb's reflex (biceps femoris reflex), Erb-Charcot paralysis (a form of spinal syphilis), Erb-Duchenne palsy or Erb's palsy (upper brachial plexus injury), Erb test (reaction of degeneration test), Erb-Westphal symptom (absence of knee jerk reflex), Erb's point (third interspace to the left of the sternum), Erb's dystrophy (scapulohumeral dystrophy), and Erb-Goldflam syndrome (myasthenia gravis) [5–7].

Erb was born on November 30, 1840 in Winnweiler municipality, the Bavarian Palatinate, Germany [4]. His father, Friedrich Erb, was a forester [5]. In 1857, at the age of 17 years, Willhelm Heinrich Erb began his medical education at the University of Heidelberg [4]. He continued his studies in Erlangen and finally moved to Munich where he earned his MD degree in 1864 [4, 7]. After receiving his doctorate, Erb became the assistant of Ludwig von Buhl (German pathologist) in Munich [1]. Shortly afterwards, he returned to Heidelberg and worked as an assistant to Nikolaus Friedrich (German pathologist and neurologist) in the Medizinizsche Klinik (Medical Clinic) [1, 6, 7]. Erb first worked in the fields of internal medicine and pathology, but later, influenced by Friedrich, he became interested in neurology [9]. He was promoted to associate professor in 1879 [4]. In 1880, Erb moved to the University

Fig. 1 Wilhelm Heinrich Erb (1840–1921)

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of Leipzig and became chief of the Medical Polyclinic. During his 3 years of residency in Leipzig, he became professor ordinaries (full professor) [1]. In 1883, Erb came back to Heidelberg and succeeded Friedrich as president of the Medical Clinic [1, 6]. In 1907, he was awarded the title of Professor Emeritus [7]. He retired in 1907 and finally died in Heidelberg in 1921 [6].

In 1891, Erb (with Friedrich Schultze) founded the present day *Journal of Neurology* under its first title, *Deutsche Zeitschrift für Nervenheilkunde* (*The German Journal for the Neurosciences*) [6, 8, 9]. He contributed to the first volume of this journal by writing a text on muscular dystrophies [5]. That same year he was appointed as the first president of the German Neurological Association [9]. In 1907, together with Herman Oppenheim, Erb founded the Gesellschaft deutscher Nervenarzte (Society of German Neurologists) and became its first president [6]. He was one of the first honorary members of the American Neurological Association [4].

Erb set up neurology as an independent branch of psychiatry [6]. This is regarded as his most significant contribution to medicine [1]. He added the field of neurology to the medical school study course at Heidelberg [1, 6, 9, 10].

About 270 publications are credited to Erb [1, 7]. His writings cover areas such as electrotherapy, peripheral nerve disorders, spinal cord disorders, and diseases of the medulla oblongata [6, 9]. Toxicology, histology, specific types of brain tumors, neurosyphilis, and poliomyelitis were some of his specific areas of interest [1, 4, 5, 7, 9]. Erb believed some etiologies other than syphilis could cause progressive spasticity [1]. He discussed the linkage of syphilis and tabes dorsalis and proved the presence of cerebrospinal fluid pleocytosis in this disorder [4, 9].

In his paper entitled *Über das Zusammenvorkommen von Neuritis optica und Myelitis subacuta* (*On the co-occurrence of optic neuritis and sub-acute myelitis*) published in 1880, Erb presents one of the first descriptions of neuromyelitis optica [3]. In 1878, he presented one of the first detailed descriptions of myasthenia gravis [7, 9]. After Jean-Martin Charcot, Erb provided one of the earliest descriptions of patients with intermittent claudication [2].

Erb was a trailblazer in the field of electrodiagnosis and electrotherapy of neurological problems [7, 10]. He was the first to describe the reaction of degeneration in muscles [10]. He published his views on this phenomenon in the book *Handbuch der Elektrotherapie and Elektrodiagnostik* (*Handbook of Electrotherapy and Electrodiagnosis*) [4].

In 1875, for the first time in medical history, Erb presented Patellarsehnenreflex (patellar tendon reflex or knee jerk) to the medical community, separately yet simultaneously with Carl Otto Friedrich Westphal. It is worthy to note that Erb pointed to the role of the spinal cord in this process and explained it as a true reflex arc [5, 8]. He was one of the first physicians to introduce tendon reflexes as part of a systematic neurological examination and utilized the reflex hammer for this purpose [1, 5, 7].

Muscular dystrophy was a specific focus of attention for Erb, such that he wrote monographs specifically on this issue. In 1884, he described juvenile forms of progressive muscular atrophy. Erb differentiated between myodystrophy and myoatrophy [1, 4].

Erb was the first to explain the pathogenesis, clinical findings, and categorization of patients with myotonia congenita (later named Thomsen's Disease). One of his remarkable contributions was a report on the typical pathological findings of muscle biopsy in this disease. His report contradicted his predecessors who believed in the presence of normal pathological findings with this disorder [1].

Erb's works had a great impact on his contemporaries and succeeding generations of neurologists, including such renowned doctors as Friedrich Schultze, Ernst Julius Remak, Emil Kraepelin, Paul Julius Mobius, Johann Hoffmann, Henry M. Thomas, Max Nonne, Carl Eisenlohr, and others. Some of these neurologists were his students [4, 5].

Today, the Erb commemorative medal is known as the most admirable prize in German neurology [4].

Conflicts of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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