

Biomedical mementos. Ernst von Brücke, founder of Austrian physiology

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Abstract. This vignette commemorates the pioneer Austrian physiologist Ernst Wilhelm von Brücke in conjunction with a special plaquette commissioned at the 8th triennial International Congress of Physiologists which was held in Vienna in 1910.

Key words: experimental physiology, Second Vienna School, Berlin Physical Society, ciliary muscle, dynamic psychiatry

To the editor,

In conjunction with the 8th triennial International Congress of Physiologists, which was held in Vienna on 27–30 September 1910 under the auspices of the Imperial Ministry of Culture and Education, a plaquette was commissioned from the Austrian sculptor Peter Breithut to commemorate Ernst Wilhelm von Brücke (1819–1892), professor and chairman of physiology and microscopic anatomy at the University of Vienna from 1849 to 1890. The plaquette (Figure 1) features Brücke's portrait on the obverse and a human figure who watches an eagle surging towards the sun on the reverse. Brücke's alumnus Siegmund von Exner-Ewarten, who was instrumental in erecting his mentor's monument in the *Arkadenhof* 16 years earlier, presided over the Congress.

Brücke is considered the founder of experimental physiology in Austria (1). He is eponymously remembered by the meridional smooth fibers of the ciliary body ("Brücke's muscle") of the eye (2). His two-volume textbook of physiology (*Vorlesungen über Physiologie*, Braumüller, Vienna, 1873/1874) was for many years a standard reference, having gone through four editions. In it, Brücke introduced the principles of a physicochemical physiology prompted by cues from the theory of thermodynamics. Such traces were

already evident in his thesis (*De diffusione humorum per septa mortua et viva*, Schroeder, Berlin, 1842), where he asserted that osmosis is not related to some undetermined or inscrutable vital entity, but to quantifiable physicochemical variables.

The versatile mind of Brücke ventured upon a spectrum of diverse interests that spanned from philology, poetry, phonetics, optics, color and art theory to anatomy, physiology, biochemistry, physics and mathematics (3). At the age of 22 years, Brücke studied binocular vision and suggested that rapid eye movements, changes in convergence, and visual persistence form the basis of stereoscopic depth perception (4). The biography by his grandson, the Austrian–American physiologist Ernst Theodor von Brücke (*Ernst Brücke*, Springer, Vienna, 1928), was valued as a distinct contribution to biomedical historiography "during its most romantic period" (5).

In 1845, Brücke, Carl Ludwig, Emil du Bois-Reymond and Hermann von Helmholtz founded the *Berliner Physikalische Gesellschaft* (Berlin Physical Society). They delivered physiology from all traces of speculation and mysterious forces by defending the physicochemical basis of biological phenomena and by opposing *Naturphilosophie*, Friedrich Schelling's pantheistic monism, and vitalism, the fundamental tenet of Johannes Müller, Brücke's own mentor in Berlin.



Figure 1. Bronze plaquette honoring Ernst Wilhelm von Brücke. Actual size 64.6 mm (width) × 64.8 mm (height) × 6.7 mm (maximum thickness); weight 162 g. Crafted by Peter Breithut (1869–1930), a native of Krems an der Donau, Lower Austria [Author’s private collection].

The irruption of Newtonian concepts and causality to the exclusion of all others in physiology undeniably stood as a model for Sigmund Freud’s dynamic psychiatry. Freud had joined Brücke’s Physiological Institute in 1876 as a research student (*Famulus*), conducting experiments in comparative neurohistology over 6 years. He afterwards took Brücke’s theory a step forward and applied the principles of thermodynamics and dynamic physiology to the mental apparatus. Brücke’s strong influence, along with the inclusion of Darwinian evolution and materialistic reductionism into psychoanalytic theory, in the attempt to understand the human mind on neurophysiological grounds is apparent throughout the Freudian opus, foremost, in the 1895 manuscript posthumously published as the *Project for a Scientific Psychology* (6).

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References

- Schmidt G. Ernst Wilhelm von Brücke (1819–1892) als Wegbereiter der experimentellen Physiologie in Wien. *Wien Klin Wochenschr* 1992; 104:144.
- Brücke E. Über den musculus Cramptonianus und den Spannmuskel der Choroidea (Vorgetragen in der Berliner physikalischen Gesellschaft am 29. Mai 1846). *Arch Anat Physiol Wiss Med (Berl)* 1846; 13:370–8.
- Kniefacz K. Geschichte der Universität Wien: Ernst Wilhelm Ritter von Brücke. <https://geschichte.univie.ac.at/de/personen/ernst-wilhelm-ritter-von-bruecke> (2021, accessed 15 August 2023).
- Wade NJ. Ernst Wilhelm Brücke on stereoscopic vision. *Strabismus* 2022; 30:159–64.
- Anonymous. Book Notices. Ernst Brücke, von E. Th. Brücke. *J Am Med Assoc* 1928; 91:1828.
- Yilmaz YA. Ernst Brücke and Sigmund Freud: Physiological roots of psychoanalysis. *J Hist Neurosci* 2022; 31:568–91.

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