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NEUROLOGICAL STAMP

Hermann von Helmholtz (1821–94)

The physician Hermann von Helmholtz, born in Potsdam, was, on his mother's side, a descendent of William Penn, founder of Pennsylvania. His contributions to science—which included physiology, optics, electrodynamics, and meteorology—were numerous.

His doctoral thesis, begun in 1842, was on the connection between nerve fibres and nerve cells and he graduated from the Medical School in 1843. His demonstration in isolated preparations that muscles are the main source of animal heat, led him to his best known discovery, the law of conservation of energy and his paper in 1847 *Über die Erhaltung der Kraft* (on the Conservation of Force). In 1850 he became the first to measure the velocity of nerve impulses in the sciatic nerves of frogs using a pendulum myograph of his own invention. He invented the ophthalmoscope (1851) and was the first person to see the living human retina. This was followed by his phakoscope and ophthalmometer (1852). With the latter he was able to explain the mechanism of accommodation (1854), particularly the part played by the lens. His research on the eye and the result of his extensive research was his multivolume *Handbuch der physiologischen Optik* (Handbook of physiological optics) published in 1867, was one of the great contributions to medicine in the 19th century. The handbook was regarded as a classic and described by Von Graefe as “the Bible of the ophthalmologist. It remained for many decades the definitive study of the physiology and physics of vision. With Thomas Young (1773–1829) of London he developed a theory of colour vision and in studies of the ear Helmholtz showed how the cochlea resonates for different frequencies and analyses complex sounds into harmonic components. In 1863 he published *Die Lehre von den Tönenpfundungen als Physiologische Grundlage für die Theorie der Musik* (The sensation of tone as a physiological basis for the theory of music). In this work he demonstrated that the aesthetics of music was a function of the ears' mechanical ability to pick up wave motions of musical sounds. It became the handbook of not only audiologists, physiologists, and physicists, but musicians as well. Steinway, already famous for the quality of his grand pianos, tried out the improvements suggested by Helmholtz on the Helmholtz family grand piano.

With his close friend Sir William Thompson, afterwards Lord Kelvin, he estimated the age of the sun and calculated the energy radiated from its surface. Earlier, about 1840 with James Prescott Joule, he had demonstrated that

electric circuits obey the laws of conservation of energy and that electricity is a form of energy.

He had been at various times Professor of Physiology at Königsberg University (appointed in 1849), Professor of Anatomy (1856–66) primarily at the University of Heidelberg, and in 1871 he was appointed Professor of Physics in Berlin where he spent the rest of his life. He then turned his attention to electrodynamics, and was assisted by Heinrich Hertz, whose discovery of “Hertzian waves” made modern wireless transmission possible. Had he done nothing else in his life but invent the ophthalmoscope, his name would not be forgotten. He became one of the greatest of scientists who did not forget that he was a physician. “Medicine”, he said “was once the intellectual home in which I grew up; and even the emigrant best understands and is best understood by his native land.”

He was honoured philatelically by Germany (West Berlin) in 1971 on the 150th anniversary of his birth (Stanley Gibbons B394, Scott GN314).

L F HAAS