Hermann Helmholtz

1821 - 1894

Helmholtz made major contributions to two areas of science: physiology and physics.

In physiology he invented the 'ophthalmoscope' for inspecting the interior of the eye and the 'ophthalmometer' for measuring the eye's curvature. In physics his best known discovery is the law of conservation of energy.

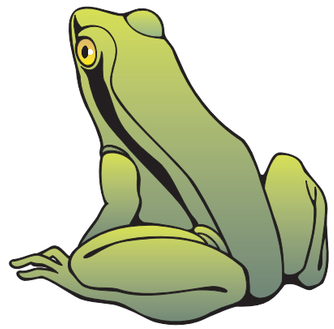
Hermann Ludwig Ferdinand von Helmholtz was born in Potsdam in 1821. His father was a teacher of philosophy and literature at the Gymnasium and his mother a descendant of the founder of the state of Pennsylvania in the United States.

As a child he was 'delicate' and often ill, but his parents did their best to amuse him. While at school he developed slowly, but eventually showed an interest in mathematics and physics. However, his father persuaded him to take up the study of medicine, and he entered the Friedrich Wilhelm Medical Institute at Berlin in 1838.

After receiving his MD, Helmholtz became an army surgeon. His ability in science as opposed to medicine was soon recognized and, in 1848, he was released from his military duties.

The following year, he took up the post of professor of physiology at Königsberg. He taught at Bonn and Heidelberg, and, in 1871, he was appointed to a chair in Berlin. Later he became the first director of the Physico-Technical Institute at Berlin Charlottenburg.

He studied muscle action and animal heat and came to the law of conservation of energy



The first works of Hermann Helmholtz were devoted to the study of the nerve fibre and the nerve cell. One of Helmholtz's interests had been muscle action and animal heat and this led him to the discovery of the law of conservation of energy (independently of Joule and Mayer).

Helmholtz measured the nerve impulse velocity by experiments with a frog and found it to be about a tenth of the speed of sound. He investigated 'accommodation', colour vision and colour blindness. His study of the sense organs was continued in work on the ear and the mechanism of hearing. He developed a theory of the nature of harmony and of musical sounds (he was a skilful musician).

Helmhotz's most celebrated paper in theoretical physics was ***On the Conservation of Force*** (1847). There he showed that the total energy of a collection of interacting particles is constant, and later applied this idea to other systems.

In 1861 Hermann married Anna von Mohl, the daughter of a Heidelberg professor. Anna, by whom he later had three children, was an attractive sophisticated woman considerably younger then her husband.

Helmholtz's health began to fail after 1885. He had always suffered from migraine, from which he sought relief in music and mountaineering in the Alps. He died in 1894 after a stroke.

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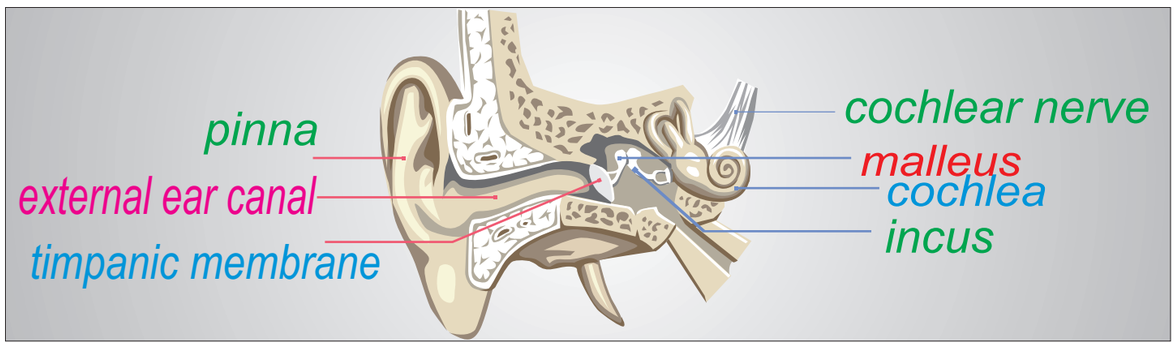

He worked on 'the Physics of the human ear'