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History of ophthalmology

Hermann von Helmholtz

Hermann von Helmholtz contributed to ophthalmology by inventing the ophthalmoscope in 1850, on similar principles to those of Galileo's telescope, 250 years previously (pity Galileo wasn't an ophthalmologist).

But remembering Helmholtz only for this achievement is as unjust as remembering Einstein solely for $E=mc^2$, as his range of interest was vast.

Helmholtz trained as a Prussian army surgeon, which must have involved many less subtle techniques than those employed in eye surgery. While living in Potsdam barracks he wrote his first dissertation, on the physiology of nerve fibres in crab ganglia, which by itself implies a certain eclecticism.

Essays followed on the first law of thermodynamics – that is, that energy can change its form but cannot disappear or be created, and the second – that is, that energy goes from concentration to dissipation but never the other way round.

His physiological research included measurement of the speed of nerve impulses, demonstration that muscle energy is a major source of animal heat, and work on the mechanism of accommodation.

A talented musician, he was fascinated by acoustics, and did much work on the ossicles and tympanum of the ear. When singing in front of his piano one day he noted that the noise made the strings vibrate, and this led him to consider how sound waves travel through the 'ether.' He also formulated the theory that different regions of the basilar membrane resonate to different frequencies. At different times he held chairs of physics, physiology, pathology, and anatomy, but always asserted that his first love was medicine.

Helmholtz first visited Britain in 1856, but was only moderately impressed by the scientific meeting he attended, noting that 'some papers were important contributions, and some the tomfoolery of the crack-brained.' Probably a fair comment.

At the banquet for his seventieth birthday, he was asked how he got his ideas. He replied that 'after investigating a problem, happy thoughts come unexpectedly, without effort. Never when at my desk, but during the slow ascent of wooded hills on sunny days.' Darwin would have agreed – his inspiration on the origin of species came to him during a carriage drive. Budding researchers could use this as a novel justification for not being at their desks.

Helmholtz's original ophthalmoscope was subsequently modified by others. Zehender showed that it was possible to visualise one's own fundus, and in 1863 Heymann invented the ingenious 'auto-ophthalmoscope', which allowed the left eye to visualise the retina of the right. One would think that this could be used to advantage by medical students. In 1870, De Wecker went one step further, he introduced a 'demonstration ophthalmoscope,' which allowed the fundus to be viewed by two observers simultaneously. Maybe this could also be resurrected for teaching purposes?

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