

Biographical Encyclopedia of Astronomers

© 2007 Springer

Thomson, William

Born Belfast, (Northern Ireland), 26 June 1824

Died Netherhall near Largs, (Strathclyde), Scotland, 17 December 1907

William Thomson calculated the age of the Earth from its cooling rate and concluded that it was too short to fit with Charles Darwin's theories of evolution. As Lord Kelvin, he is commemorated in the Kelvin temperature scale and the Kelvin-Helmholtz time scale.

Thomson's father, James Thomson, held the chair of Mathematics at Glasgow University. His mother died when William was 6 years old. William learned mathematics from his father and became adept in that field at a very young age. He was admitted to Glasgow University at age 10, and began what we would now consider university-level work at 14

Thomson won a medal from the University of Glasgow when he was 15, for an essay entitled "Essay on the Figure of the Earth." This essay contained many important ideas that he returned to repeatedly in his later career. Thomson was strongly influenced by the French mathematical approach to physical science, including the works of Joseph Fourier, Augustin Fresnel, Adrien Legendre, Pierre de Laplace, and Joseph Lagrange.

At the age of 17, in 1841, Thomson entered Cambridge University and published his first paper, on Fourier series. Papers on heat and electricity followed later in his undergraduate career. He graduated in 1845, becoming second wrangler in the mathematical tripos of 1845. Thomson was elected a fellow of Peterhouse College, Cambridge

Thomson studied in Paris in the physical laboratory of Victor Regnault and had deep discussions with Jean Biot, Augustin Cauchy, Joseph Liouville, François Sturm, and J. B. Dumas. In 1846, with the help of his father, he was elected to the chair of natural philosophy at Glasgow.

Thomson collaborated closely with George Stokes on the theory of heat and its relation to the theory of fluids. In 1848, he proposed the absolute scale of temperature. The Kelvin scale of temperature derives its name from the title that Thomson was given by the British government in 1892: Baron Kelvin of Largs.

In 1852, Thomson observed the Joule-Thomson effect, namely the decrease in the temperature of a gas when it expands in a vacuum. James Joule influenced Thomson's ideas, which were developed into a dynamical theory of heat that became the foundation for what we now know as statistical mechanics.

He was then led into the study of electricity and magnetism, and his ideas became the foundation on which James Maxwell built his remarkable new theory of electromagnetism. However, Thomson developed his own ideas differently and diverged from Maxwell's viewpoint, not accepting the existence of the displacement current.

Thomson was knighted in 1866 for work on the transatlantic cable connection; he had invented a very sensitive mirror galvanometer. He published more than 600 papers. Thomson was elected to the Royal Society in 1851 and was its president from 1890 to 1895

In applying thermodynamics to cosmogony, Thomson foresaw the heat death of the Universe. He was interested in the age of the Sun and assumed its radiant energy came from the gravitational potential of matter that had fallen into it. Thomson estimated the Sun's age at 50 million years. The ideas he put forward were closely related to those earlier expressed by Julius Meyer and John Waterston, some of whose work he had seen.

David Jefferies

Alternate names

Baron Kelvin of Largs

Lord Kelvin

Selected References

Buchwald, Jed Z. (1976). "Thomson, Sir William." In *Dictionary of Scientific Biography*, edited by Charles Coulston Gillispie. Vol. 13, pp. 374–388. New York: Charles Scribner's Sons.

Garnett, William and Hugo Munro Ross (1911). "Kelvin, William Thomson." In *Encyclopaedia Britannica*. 11th ed. Vol. 15, pp. 721-723. New York: Encyclopaedia Britannica.

Russell, Alexander (1938). *Lord Kelvin*. London: Blackie and Son.

Smith, Crosbie and M. Norton Wise (1989). *Energy and Empire: A Biographical Study of Lord Kelvin*. Cambridge: Cambridge University Press.

Young, A. P. (1944). *Lord Kelvin, Physicist, Mathematician, Engineer*. London: Longmans, Green