Ernst Mach Biography

Ernst Mach

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Biography

Through the efforts of such eminent scientific theorists of the mid-1800s, there seemed to be nothing in the universe that could not be explained through scientific hypotheses. However, there existed a small group of European scientists who would not accept these theoretical explanations. Calling themselves scientific positivists, they strove to understand nature through experimentation, rather than assumption and intuition. Mach, an Austrian physicist and philosopher, was a leading figure of the scientific positivists.

Mach's name is a familiar one to most people, who usually associate it with the velocities of supersonic aircraft. The bulk of Mach's experimental work was in the field of aerodynamics; he was the first to note the changes in the movement of air around an object as it approached the speed of sound. Consequently, the speed of sound through air of a given temperature is often called Mach 1, with twice that speed being Mach 2, and so on. This system is known as the Mach number.

Mach's aerodynamic findings came only after extensive research and repetition of experimentation, as was the creed of the positivist. Generally, he believed that the laws of nature were convenient fabrications that were used to tie together many different observations that contained no inherent truth. The only scientific studies that could be trusted were those with experiments founded in empirical evidence--that which can be shown and repeated. For this reason, most of the emerging theories of the time were dubious to Mach and his colleagues. Particularly infuriating to Mach was the near-universal acceptance of the atomic theory; since nobody had ever been able to actually see an atom, Mach claimed that it was ludicrous to believe in its existence.

The commitment to scientific positivism displayed by Mach and others helped to bring about a new trend in science, one in which experimentation and verification held as much importance as hypothesis. One of the scientists to benefit from this was Albert Einstein, whose theory of relativity was based highly upon the flaws Mach had found in Newtonian physics. Despite the aid he had given Einstein, Mach himself never accepted the theory of relativity and was in the process of writing a book illuminating its flaws when he died.