Paul Langevin Biography

Paul Langevin

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Biography

Paul Langevin was never particularly interested in fame; he preferred teaching his theories to his students rather than publishing them for the scientific community, and he rarely engaged in the risky business of invention. Nevertheless, he is best remembered for his invention, with the help of the Russian scientist Constantin Chilowski, of the echolocation system known as sonar.

Born in Paris in 1872, Langevin demonstrated an enthusiasm for school, especially the sciences. Always at the top of his class, he enrolled at a local engineering school, where his laboratory work was supervised by French chemist Pierre Curie (1859-1906), who, along with his wife Marie Curie and Antoine-Henri Becquerel (1852-1908), was awarded the 1903 Nobel Prize for physics. This contact strengthened Langevin's interest in physics. After graduation, he moved to Cambridge, England for a year to work with English physicist Joseph J. Thomson (1856-1940), who in 1906 received a Nobel Prize for physics. Upon his return to Paris he completed his postgraduate studies at the Sorbonne, again working with the Curies, and he received his Ph.D. in 1902. Langevin concentrated his research efforts toward the study of *paramagnetism* and *diamagnetism*.

During World War I the British fleet was being systematically decimated by German submarines, whose stealthy attacks left the British defenseless. It had been theorized for years that the distance to the bottom of a body of water could be determined by using a pulse of sound and measuring its travel time. The British army hoped that this same principle would provide a means for calculating the presence and position of submarines. Numerous scientists worked to this end, and in 1912 Chilowski built a device which was sound in principle, but was unable to generate a strong enough signal. Two years later Langevin was asked to help perfect Chilowski's design. Using piezoelectricity (a phenomenon discovered by Pierre Curie and his brother Jacques Curie) he boosted the output of ultrasonic waves to the point where echolocation was possible. Although the first working sonar system was not built until after the war, it provided an important tool for future military and civilian applications.

Langevin was a member of many scientific academies and he played a key role in bringing the theories of Albert Einstein to the French public.