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(*b*. Melle, Deux-sèvres, France, 19 December 1854; *d*. Paris, France, 16 June 1948)

mathematics, physics.

Brillouin came from a middle-class family. His father was a painter, and the family lived in Paris, where Marcel studied at the Lycée Condorcet. They moved back to Melle during the Franco-Prussian War, and he spent the years 1870 and 1871 reading all the books on philosophy he could find in his grandfather's big library. Back in Paris in 1872, he brilliantly passed his baccalaureate the following year and became a student at the École Normale Supérieure (1874–1878). He then was an assistant, at the College de France, to the well-known physicist Mascart, whose daughter he later married. In 1881 Brillouin obtained doctorates in both mathematics and physics. He spent the next several years, as assistant professor of physics, at the universities of Nancy, Dijon, and Toulouse. Brillouin returned to the École Normale Supérieure in 1888, when he married Charlotte Mascart. From 1900 on, he was professor of mathematical physics at the Collège de France until his retirement in 1931. He became a member of the Académie des Sciences de Paris in 1921.

Brillouin was a prominent theoretical physicist, but he was also a very skillful experimenter. He always had a laboratory and a large library nearby. In his teaching he always outlined the history of the subject and organized a seminar on the history and philosophy of physics for all his students. He had a great influence on the formation and careers of such students as Perrin, Langevin, Villat, Pérès, A. Foch, his son Léon, and J. Coulomb. He also maintained friendly personal relations with many foreign scientists, including Kelvin, Lorentz, Planck, and Sommerfeld.

In his long career Brillouin published more than 200 papers and books. He was a great admirer of Kelvin's lectures and wrote a preface and notes for their translation (1893); he also provided notes for a book of translations of original papers on meteorology (1900), a subject in which he was always highly interested. His interest in the kinetic theory of gases, liquids, and solids is reflected in his contribution of a preface and many notes to the French translation of Boltzmann's book (1902). This was followed by a book on viscosity (1906–1907) and a number of papers on kinetic theory and thermodynamics of liquids (isotropic or anisotropic) and solids, plasticity, and melting conditions. A book on the propagation of electricity (1904) included a complete calculation of proper vibrations for a metallic ellipsoid, a problem that became later of great importance for ultrashort wavelengths.

About 1900 Brillouin spent considerable time building a new model of the Eötvös balance and testing it in the Simplon Tunnel, which was opened in 1906. This is described in a long paper published by the Académie des Sciences in 1908. The Brillouin balance was later used for oil prospecting.

There followed a series of important papers on Helmholtz' flow and surfaces of discontinuity, with applications to hydrodynamics and hydraulic problems, and a long paper on the stability of airplanes.

From 1918 to 1922, and later, Brillouin tried to find an explanation of Bohr's condition of stable atom trajectories and their *n, l, m* quantum numbers. He attempted to use retarded actions of unknown nature (rather similar to de Broglie waves) and obtained stability conditions containing some sort of quantum numbers. Similar conditions were used later by de Broglie and modified by Schrödinger.

A few papers on the problem of an electromagnetic source in uniaxial or biaxial crystals are of interest for crystal optics. From 1925 on, most of Brillouin's research centered on physics of the earth, especially tides, and was published in the Academy's *Comptes rendus*. He also lectured on these subjects at the Collège de France and the Institut Poincaré (1930). His lectures on tides were edited by J. Coulomb, but most of them remained unpublished. Brillouin discussed a variety of mathematical problems in connection with tides, especially problems of varying boundary conditions, and transformations of spherical harmonics from one polar axis to another, the idea being to use, for tides, an axis of coordinates running through continental regions.

The interests of this wide-ranging, open-minded scientist extended from the history of science to the physics of the earth and the atom.

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