Professor Richard von Mises (1883 – 1953)

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Richard Edler von Mises (19 April 1883, Lwów – 14 July 1953, Boston, Massachusetts) was a scientist and mathematician who worked on solid mechanics, fluid mechanics, aerodynamics, aeronautics, statistics and probability theory. He held the position of Gordon-McKay Professor of Aerodynamics and Applied Mathematics at Harvard University. He described his work in his own words shortly before his death as being on "... practical analysis, integral and differential equations, mechanics, hydrodynamics and aerodynamics, constructive geometry, probability calculus, statistics and philosophy."

Although best known for his mathematical work, he also contributed to the philosophy of science as a neo-positivist, following the line of Ernst Mach. Historians of the Vienna Circle of logical empiricism recognize a

"first phase" from 1907 through 1914 with Philipp Frank, Hans Hahn, and Otto Neurath. His older brother, Ludwig von Mises, held an opposite point of view with respect to positivism and epistemology.

During his time in Istanbul, von Mises maintained close contact with Philipp Frank, a logical positivist and Professor of Physics in Prague until 1938. His literary interests included the Austrian novelist Robert Musil and the poet Rainer Maria Rilke, on whom he became a recognized expert.

Von Mises' Life:

Eighteen months after his brother, the Austrian School economist Ludwig von Mises, Richard von Mises was born in Lemberg, then part of Austria-Hungary, into a Jewish family. His parents were Arthur Edler von Mises, a doctor of technical sciences who worked as an expert for the Austrian State Railways, and Adele Landau. Richard and Ludwig also had a younger brother, who died as an infant. Richard attended the Akademisches Gymnasium in Vienna, from which he graduated with honors in Latin and mathematics in Autumn 1901. After graduating in mathematics, physics and engineering from the Vienna University of Technology, he was appointed as Georg Hamel's assistant in Brünn (now Brno). In 1905, still a student, he published an article on "Zur konstruktiven Infinitesimalgeometrie der ebenen Kurven," in the prestigious Zeitschrift für Mathematik und Physik.

In 1908 Mises was awarded a doctorate from Vienna (his dissertation was on "the determination of flywheel masses in crank drives") and he received his habilitation from Brünn (now Brno) (on "Theory of the Waterwheels") to lecture on engineering. In 1909, at 26, he was appointed professor of applied mathematics in Straßburg, then part of the German Empire (now Strasbourg, Alsace, France) and received Prussian citizenship. While applying for teaching positions at the Brno University of Technology, this was interrupted by World War I.

A pilot who had lectured on the design of aircraft and given in Straßburg the first university course on powered flight in 1913, he then joined the Austro-Hungarian army and flew as a test pilot and an instructor. In 1915, he supervised the construction of a 600-horsepower (450 kW) aircraft — the "Mises-Flugzeug" (Mises aircraft) for the Austrian army. It was completed in 1916, but never saw action.

After the war Mises held the new chair of hydrodynamics and aerodynamics at the Dresden Technische Hochschule. In 1919 he was appointed director (with full professorship) of the new Institute of Applied Mathematics created at the behest of Erhard Schmidt at the University of Berlin. In 1921 he founded the journal Zeitschrift für Angewandte Mathematik und Mechanik and became its editor.

With the rise of the National Socialist (Nazi) party to power in 1933, von Mises, felt his position threatened despite his World War I military service. He moved to Turkey, where he held the newly created chair of Pure and Applied Mathematics at the University of Istanbul. In 1939 he accepted a position in the United States, where he was appointed 1944 Gordon-McKay Professor of Aerodynamics and Applied Mathematics at Harvard University. He married Hilda Geiringer in 1943, who had been his assistant at the Institute and followed him to Turkey and then to the U.S. after losing her position in December 1933.

In 1950 Mises declined an offer of honorary membership from the Communist-dominated East German Academy of Science.

Contributions:

In aerodynamics, Richard von Mises made notable advances in boundary-layer-flow theory and airfoil design. He developed the Distortion energy theory of stress, which is one of the most important concepts used by engineers in material strength calculations.

His ideas were not unanimously well received, although Alexander Ostrowski had said of him:

"Only with the appointment of Richard von Mises to the University of Berlin did the first serious German school of applied mathematics with a broad sphere of influence come into existence. Von Mises was an incredibly dynamic person and at the same time amazingly versatile like Runge. He was especially well versed in the realm of technology."

and also wrote:

"Because of his dynamic personality his occasional major blunders were somehow tolerated. One has even forgiven him his theory of probability."

Yet Kolmogorov, whose rival axiomatisation was better received, was less severe:

"The basis for the applicability of the results of the mathematical theory of probability to real 'random phenomena' must depend on some form of the frequency concept of probability, the unavoidable nature of which has been established by von Mises in a spirited manner."

In solid mechanics, Richard von Mises made an important contribution to the theory of plasticity by formulating what has become known as the Von Mises yield criterion, independently of Tytus Maksymilian Huber.

He is also often credited for the Principle of Maximum Plastic Dissipation.

The Gesellschaft für Angewandte Mathematik und Mechanik (International Association of Applied Mathematics and Mechanics) has awarded a Richard von Mises-Preis (Prize) since 1989.

In probability theory, he was the person who originally proposed the now famous "birthday problem". He also defined the impossibility of a gambling system.

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