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(*b*. Halle, Germany, 24 February 1878; *d*. Zurich, Switzerland, 3 December 1956)

mathematics.

Bernstein's father, Julius, who wrote on electrobiology, studied under DuBois Reymond, Felix studied in Halle with Georg Cantor, a friend of his father, then went to Göttingen to study with Hilbert and Klein. In 1896 he took his Abitur in Halle, then taught mathematics and studied physiology there. He received his Ph.D. at Göttingen in 1901 and his Habilitation in Halle in 1907. He returned to Götungen in 1911 as associate professor of mathematical statistics. After military service in World War I, he headed the statistical branch of the Office of Rationing and in 1921 became commissioner of finance. Also in 1921 he became full professor and founded the Institute of Mathematical Statistics, where he was director until 1934. He emigrated to the United States, where he became a citizen in 1940. He taught at Columbia, New York, and Syracuse universities. In 1948 he returned to Göttingen.

It was in 1895 or 1896 while a student at the Gymnasium that Bernstein gave the first proof of the equivalence theorem of sets. If each of two sets, A and B, is equivalent to a subset of the other, then A is equivalent to B. This theorem establishes the notion of cardinality and is thus the central theorem in set theory. It bears some similarity to the Eudoxean definition of equal irrationals.

Cantor, who had been working on the equivalence problem, had left for a holiday and Bernstein had volunteered to correct proofs of his book on transcendental numbers. In that interval, the idea for a solution came to Bernstein one morning while shaving. Cantor then worked with the approach for several years before formulating it to his satisfaction. Cantor always gave full credit to Bernstein, who meanwhile had become a student of fine arts at Pisa. He was persuaded to return to mathematics by two professors there who had heard Cantor expound the equation at a mathematical congress. Bernstein retained this interest in the arts, particularly painting and sculpture, throughout his life.

Bernstein's subsequent work in pure and applied mathematics shows great versatility, and includes some of the earliest applications of set theory outside pure mathematics, contributions to isoperimetric problems, convex functions, the Laplace transform, and number theory as well as set theory itself.

Toward the 1920's Bernstein became increasingly interested in the mathematical treatment of questions in genetics; he was to contribute decisively to the development of population genetics in the analysis of modes of inheritance. The discovery of human blood groups had made possible an entirely new approach to human genetics. In 1924 Bernstein was able to show that the A, B, and O blood groups are inherited on the basis of a set of triple alleles, and not on the basis of two pairs of genes, as had been thought. He compared a population genetic analysis of the frequencies of the four blood groups-numerous records of racially variant blood-group frequencies had been available since the discovery of this phenomenon by L. and H. Hirschfeld—with the expectations for the blood-group frequencies according to the expanded Hardy-Weinberg formula $p^2{:}2pq{:}q^2$, and found significant and consistent differences. When he applied the same technique to an expectation based on a triple-allelic system of a singlelocus, the agreement with observation was excellent.

Bernstein also applied the techniques of population genetics to such problems as linkage, to the measures of the degree of inbreeding for individuals and populations, to determination of the presence of recessive inheritance, to a method for deriving genetic ratios based on an a priori expectation, and to use of the development of presbyopia as an indicator of age. He also interpreted the direction of hair whorl and variations in singing voice, as found in different populations, in terms of allelic differences of single pairs of genes, but this interpretation has not with-stood the test of time.

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