Leading Personalities in Statistical Sciences: From the Seventeenth Century to the Present
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Wilson, Edwin Bidwell

Born: April 25, 1879, in Hartford, Connecticut, USA.
Died: December 28, 1964, in Brookline, Massachusetts, USA.
Contributed to: mathematics, physics, statistical inference, biostatistics.

Edwin Bidwell Wilson was a scientific generalist. As a mathematician, he published two of the most influential advanced texts of the early part of this century, and he criticized David Hilbert on the foundations of geometry. As a physicist, he did path-breaking work on the mathematics of aerodynamics, and he criticized Albert Einstein on relativity. As a statistician, he anticipated Neyman* on confidence intervals, he devised one of the earliest normalizing transformations, he founded the biostatistics program at the Harvard School of Public Health, and he criticized Ronald Fisher* on inference.

Wilson's lifelong commitment to science and education was presumably instilled in him at a very early age: his father was a teacher and superintendent of schools in Middleton, Connecticut. Wilson graduated from Harvard College in 1899, majoring in mathematics, and he then went to Yale to continue his mathematical study as a student of J. Willard Gibbs. In 1901, the same year he received his Ph.D., Wilson published *Vector Analysis, Founded upon the Lectures of J. Willard Gibbs*, a text that, with Wilson's later *Advanced Calculus* (1912), provided a significant portion of the upper-level mathematics curriculum in America for the first third of the century.

From 1900 to 1907, Wilson taught at Yale, with a year off in 1902–1903 for study in Paris. In 1907 he moved from Yale to a faculty position at Massachusetts Institute of Technology (M.I.T.), where his interests evolved to mathematical physics and academic administration. From 1920 to 1922 he served as one of a committee of three, functioning collectively as interim president of M.I.T. In 1922 he moved to Harvard as professor and head of Vital Statistics in the Harvard School of Public Health, where he remained until his retirement in 1945. Wilson was managing editor of the *Proceedings of the National Academy of Sciences* for fifty years, from its first issue in January 1915 until his death in December 1964. He was active on nearly every national committee involved with social science over the last half of his life. A student of his, Paul Samuelson, has described him as "the only intelligent man I ever knew who liked committee meetings." [6]

WORK IN STATISTICS

Wilson's most important contribution to statistics was arguably as an institution builder, founding a program that still flourishes under the title of Biostatistics in Harvard's School of Public Health. He also brought his sharp critical intelligence and knowledge of quantitative social science to bear on methodological issues on many national committees and in a far-ranging national correspondence (see, e.g., ref. [7]). He had a keen sense of data analysis, as indicated in his reinvestigation

with Margaret Hilferty of C.S. Peirce's extensive data on reaction times [9], a study still cited in the literature on robustness. But he also made a number of important technical contributions. In work with Jane Worcester on quantal response [15], he advanced the study of the estimation of the median lethal dose, which they called "LD 50." Wilson's 1931 paper with Margaret Hilferty [10] introduced what has become known as the Wilson–Hilferty transformation, a device that allowed the use of the normal approximation for chi-square probabilities over a wide range of degrees of freedom.

In 1927 Wilson published a short note that anticipated (albeit for a very limited class of problems) the concept behind Neyman's confidence intervals. Wilson clearly described in that paper how the confidence-interval idea could be invoked for inference about the binomial parameter, explaining the difference between the confidence idea and the common use of standard errors as an approximate way of doing inverse probability (or Bayesian) inference [8, 12].

In 1941 Wilson published a note in *Science* that contradicted R. A. Fisher on the analysis of two-by-two tables [11]. Fisher's polite reply [2] elicited a published retreat by Wilson [13, 14], and the two enjoyed a long correspondence on statistical issues [1].

Wilson wrote several general articles on statistical inference and scientific methodology; articles that show an acute sensitivity to both similarities and differences between measurement problems in the social and physical sciences [3]. He also made important contributions to mathematical utility theory, showing that Pareto's derivation of the law of demand held under more general conditions than had been previously believed [5]. Wilson's work on statistics, whether on bioassay, contingency tables, factor analysis, population growth, or the foundations of inference, showed a keen and acutely perceptive intelligence that was unusual among writers at that time. Although he only rarely achieved originality of concept, his knowledge and critical assessment of contemporary advances was far ahead of most of his contemporaries'.

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