

OBITUARY: David L. Wallace

1928–2017

EVEN THOUGH DAVID WALLACE was not well known across the broad landscape of statistics, among academic statisticians he was widely considered to be one of the most insightful statisticians of his generation. David was not a prolific publisher, but he was a penetrating thinker, and a fierce and inspirational oral commentator; when he did write up his work, his publications were gems.

Best known was his landmark study, with Frederick Mosteller, of disputed authorship among the Federalist Papers, the series of political tracts that laid the foundation for the U.S. Constitution. When Mosteller and Wallace published their work, in a 1963 *JASA* paper and a 1964 book, they provided a compelling solution to a 175-year-old problem: Which of these famous Federalist Papers had been written by each of the potential authors? It had been generally agreed that, of the

77 Federalist papers, John Jay had written five (and no others), Alexander Hamilton had written 43, and James Madison had written 14. That left 12 where there was a dispute (Hamilton vs. Madison) and three joint papers where the relative contributions of the two were in doubt. To solve the problem, Mosteller and Wallace provided the first large-scale computer-based analysis of text, using Bayes classifiers built on data-driven priors in hierarchical models. Their work required important technical innovations (including the application of Laplace's method to Bayesian computation), as well as labor-intensive coding procedures, and it was a model of painstaking, thorough analysis in reaching definitive conclusions. When the book was published it garnered headlines in the national press: "Computer Scans Federalist Papers," *NY Times* (Front Page); "IBM Machine Picks Federalist Papers' Author," *NY Herald Tribune*; and "A Computer Makes History, Spots Federalist Papers' Author," *Chicago Sun Times*.

In the 1960s David also helped develop modern methods for real-time forecasting of elections. John Tukey and political scientist Richard Scammon assembled a team for NBC, on which David played a key role, in a public competition to be the first network to announce results during the evening of election day, and to do so accurately. The methods developed were regarded as proprietary, and were not published, but from later descriptions we know the team used Bayesian hierarchical models based on early, incomplete counts to make projections across precincts, and to evaluate uncertainty. Both this and the authorship work anticipated methods that would much later become standard in statistics and machine learning.

David's reputation was also based, in



David Wallace in 1978

Photo by Donald Rocker, courtesy of Univ. of Chicago Special Collections

part, on a 1958 foundational paper on asymptotic expansions. To students, and others around him, David provided a strong voice supporting the importance of statistical theory when tied to problems arising in data analysis, and he imparted a sense that data analysis was a deep subject worthy of serious intellectual pursuit.

David was born in Homestead, PA, and went to Carnegie Tech (now Carnegie Mellon) for Bachelor's and Master's degrees (1948 and 1949), then to Princeton for a PhD, where his thesis supervisor was John Tukey. He received his PhD in 1953 and then held a post-doctoral position at MIT (where he shared an office with John Nash, whom he had known as a student at Princeton). In 1954 he accepted appointment as an Assistant Professor of Statistics at the University of Chicago, and remained there until he retired in 1995. There, David played a vital role in developing the curriculum and setting the intellectual and collegial tone of the Department of Statistics, and served as its chair from 1977–1980. Lacking a feasible set of statistical programs for instruction, in the 1970s he wrote the statistical package SNAP, which was used with success until it was superseded by larger and broader-based packages.

He was an inspiring teacher, and his image remains vivid, with the white lab coat he wore to protect his suit from the clouds of chalk stirred up by his sometimes-impassioned lectures. The Department offers an annual David Wallace Prize in his honor to the best statistical application by a graduate student.

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