

Frederick Mosteller, President-Elect

William Kruskal

Frederick Mosteller is the first statistician elected to presidency of the AAAS, but that statement requires elaboration. To begin with, Fred Mosteller is more than one of the world's greatest statistical scholars. He is at home and creative in many fields of science, exemplifying the title of his first paper (1) in *Science*, "The education of a scientific generalist." Thus Mosteller brings to presidency of the AAAS a fruitful, diverse, and eminent career. More than that, he brings organizational experiences, years of thought about science as it relates to society, and the highest standards of logic, clarity, and initiative.

Mosteller was born the day before Christmas of 1916, in Clarksburg, West Virginia. He earned the B.Sc. from Carnegie Institute of Technology in 1938, and the M.Sc. there a year later. His Ph.D. in mathematics—in fact, mathematical statistics—was awarded by Princeton University in 1946. The University of Chicago (1973) and Carnegie-Mellon University (1974) have presented Mosteller with honorary D.Sc.'s. He is replete with honors, professional recognition, respect, and affection. In 1941 he and Virginia Gilroy married; their son William is a systems analyst in the Computer Division of Boeing Company, and their daughter Gale is a graduate student of economics at the University of Chicago.

Fred Mosteller's first professional position, after a Princeton instructorship and a period with its Office of Public Opinion Research, was part of the World War II effort. In 1946 he went to Harvard (where he has been ever since) as a lecturer in the Department of Social Relations; in 1957 he became founding chairman of the new Department of Statistics. Its successful growth and conspicuous success are to a large extent Fred Mosteller's work. He is a member of the John F. Kennedy School of Government's faculty and has taught in Har-

vard's Law School. In 1977, he was named Roger I. Lee Professor in the Harvard School of Public Health, and chairman of its Department of Biostatistics.

Along with this academic experience, Mosteller brings to the AAAS presidency a background with scientific organizations that I can but sketch. He has served as president of the American Statistical Association (the major American statistical society), as president of the Institute of Mathematical Statistics (the major international society for theoretical statistics), and as president of the Psychometric Society. For 4 years he was chairman of the board of directors of the Social Science Research Council, and he served as chairman of Section U (Statistics) of AAAS. He was vice-chairman of the President's Commission on Federal Statistics (1970-1971) and a founding member of the commission's offspring, the National Academy of Sciences-National Research Council's Committee on National Statistics. He served on the AAAS Board of Directors during 1975-1978. I stop there for want of breath and space, not of activities.



Frederick Mosteller

To summarize Fred Mosteller's research is still more difficult because of its scope and intensity. I touch only on a few of the high spots, and begin with theoretical statistics—with the warning that in the Mosteller cosmos there are no boundaries among different kinds of statistics. For example, the analysis of surgical risks leads to new theoretical developments for cross-classified data; in turn, that leads to applications in law and elsewhere.

Mosteller was first widely known as a theorist for his work on order statistics, a body of research beginning with his doctoral thesis and still continuing actively. Order statistics are centrally important in nonparametric, or distribution-free, statistical analysis, but they are also of great utility in parametric statistics, including formulations dominated by the ubiquitous normal distribution assumption. With those formulations in mind, Mosteller affectionately called the order statistics "inefficient" statistics (his quotes) in 1946, but in a broader context he rechristened them "sturdy statistics" for his 1973 book (with Robert E. K. Rourke) of that sturdy title.

A second stream of theoretical work flows from the 1964 book by Mosteller and David L. Wallace on the Federalist papers: *Inference and Disputed Authorship: The Federalist*. The book might well be regarded by historians as an application of statistics to settling long-standing disputes about authorship of the Federalist papers, but for Mosteller, Wallace, and most of the book's statistical readers, the Federalist focus of the book provided a specific, fascinating historical context in which to compare Bayesian and frequentist modes of statistical analysis.

Indeed, an essential characteristic of Fred Mosteller's mind and work has been fascination with the role of chance—of randomness—in mathematics, in statistical inference, in many of the natural and social sciences, and in society at large. On the mathematical side of probability, there are research papers, his widely applauded introductory texts with Robert E. K. Rourke and George B. Thomas, Jr., his 1965 collation of 50 challenging problems, and his mixed empirical-theoretical approach to number theory. Other aspects of Fred's lifelong attachment to random variability run throughout this appreciation.

Statistical and probabilistic studies in psychology, especially in learning theory, have been a long-standing Mosteller interest. Included here is a trio of now-classic papers clarifying the ideas of paired comparisons in psychology, a

The author is Ernest DeWitt Burgon Distinguished Professor of Statistics and Dean of the Division of the Social Sciences, University of Chicago, Chicago, Illinois 60637.

book (with the late Robert R. Bush) on models for learning theory, and a flow of later papers.

Mosteller's medical activities have become richer and stronger with the years. They began with papers in the 1950's on the measurement of pain, expanded in the late 1960's to a grand treatment (with others) of the safety of surgical anesthetics, and more recently have turned to cost-benefit analyses for surgery and attempts to quantify ideas of the quality of life. This medical research has exhibited and sharpened Fred's role as a master data analyst. There, as elsewhere, he frames a model that the rest of us can admire appreciatively (because it is so clear) but can seldom hope to match.

Teaching has always been a passion for Fred Mosteller, as his many former students will testify. That passion has found concrete expression in his superb textbooks and manuals of practical advice for teachers, in his television "Continental Classroom" course, and in his concern for teaching at secondary school levels. He led a joint committee of the American Statistical Association and the National Council of Teachers of Mathematics that published two wholly new kinds of statistical books. One, *Statistics by Example*, put together a sequence of examples that could be used at all levels of instruction to teach real statistics via analyses of football scores, calibration of auto speedometers, user ratings of typewriters, and Thomas Paine's early ideas

about old age pensions. The other, *Statistics: A Guide to the Unknown*, now in its second edition, contains nontechnical essays describing the importance of statistics applied in testing vaccines, counting whale populations, deciding on police manpower, predicting election results, and many other important activities. For both these books, Mosteller was organizer, major editor, and participating author.

A related activity has been Mosteller's collaboration in the National Assessment of Education Progress. This systematic study of achievement levels in the secondary schools has faced numerous issues of statistical design, analysis, and exposition.

Mosteller has for years devoted much thought to societal problems, and to the roles of science in society; that thoughtfulness has expressed itself in print more and more frequently. His book, edited with Daniel P. Moynihan, *On Equality of Educational Opportunity*, begins with the editors' superb, constructive opening chapter on the fundamental methodological problems of the famous report by James Coleman and others. A later book, *Statistics and Public Policy*, edited with William Fairley, includes masterful chapters by Mosteller (himself or with coauthors) on assessment of social innovations, the infamous Collins case in California, and order of magnitude estimation. Evaluation of public policy is, I confidently guess, a process in which

Fred Mosteller and the AAAS find natural synergy.

Perforce, I omit any but this paralectical mention of other problems and areas to which Fred Mosteller has brought his vigor and special talents: the Kinsey report (and its relevance to other surveys), the evaluation of weather modification experiments (with wise suggestions for their future improvement), a magisterial statement (2) about nonsampling errors in statistics, his text—with John W. Tukey—on data analysis and regression, and so on.

It will be plain by now that Fred Mosteller is a scientific collaborator par excellence. His style often is to raise seductively interesting questions with colleagues, students, friends, or a chance visitor—obviously overlapping categories, to see intellectual sparks catch fire, and to feed them as they grow to new illumination. He is a warm, demanding, interactive friend and colleague, and he will be a warm, demanding, interactive President of the AAAS. In that process he will demand more of himself than of others, and he will meet those demands for our common benefit.

References

1. H. Bode, F. Mosteller, J. Tukey, C. Winsor, *Science* **109**, 553 (1949).
2. In David L. Sills, Ed., *The International Encyclopedia of the Social Sciences* (Macmillan and Free Press, New York, 1967). Also, with a substantial postscript, in W. H. Kruskal and J. M. Tanur, Eds., *The International Encyclopedia of Statistics* (Macmillan and Free Press, New York, 1978).

1978 Report of the Executive Officer

William D. Carey

1978 was a strong year for the AAAS, where strength signifies growing membership, more joint activity with affiliated societies, continued financial soundness, increased circulation of *Science*, higher visibility earned through timely reports and meetings on federal R & D policy, and new program initiatives in areas of scientific freedom, human rights, public understanding of science,

and international cooperation. It was also a year that featured its full share of external challenges to the shaping and the priorities of science and technology in the larger sense, ranging from growing governmental friction with university research to constraints imposed by domestic inflation, and, on the international front, the confrontation with authoritarian states over scientific freedom fol-

lowed by the spectacular entry of the People's Republic of China into the common market of scientific inquiry and cooperation. And finally, 1978 brought its measure of sadness as we lost five past presidents—James B. Conant, Chauncey Leake, Kirtley Mather, Margaret Mead, and Warren Weaver—as well as our colleague on the Council, Leo Schubert.

A period of strength in the affairs of the Association is a time for considering a sensible and affordable agenda. The Council will receive the end report of the Committee on Future Directions with its substantial menu of opportunities and priorities which can serve to define and clarify our options, as well as settle questions about the style of operations of the AAAS. On that score, one hopes there is consensus that AAAS as an organization should be conservative in its growth of staff and budget but progressive in anticipation and responding to new tests and opportunities. We can achieve that