



IN MEMORIAM

David A. Freedman
Professor of Statistics and Mathematics
UC Berkeley
1938 – 2008

A faculty member for 47 years at the University of California, Berkeley, David Freedman made profound contributions to the theory and practice of statistics and reshaped the modern teaching of statistics.

Professor Freedman was born in Montreal, Canada, on 5 March 1938 and retained his Canadian citizenship throughout his life. He graduated from McGill University in 1958 and received an M.A. in 1959 and a Ph.D. in 1960 from Princeton University. After a year at Imperial College, London, in 1961 he entered the six-year-old Department of Statistics at Berkeley, which was chaired by Jerzy Neyman, initiating the arrival of a young generation who would maintain Berkeley's position of eminence established by the founders. He served one year as lecturer and one year as assistant professor before receiving tenure. He was promoted to professor four years later in 1967.

Professor Freedman first became known for mathematical results in probability theory, including an elegant connection that he proved between symmetry, statistical independence, and the normal probability distribution. He tackled and solved a series of difficult problems in the theory of Markov chains, martingale inequalities, and exchangeable random variables, and consolidated knowledge in a trilogy of crisp books on Markov chains, Brownian motion, and diffusion.

With respect to the divide between “Bayesians” and “frequentists” in the statistical community, Professor Freedman began with inclinations toward the Bayesian position and gradually became a “circumspect frequentist.” DeFinetti's Theorem, a cornerstone of Bayesian statistics, gained a new lease on life at the research front thanks partly to Freedman's discoveries, some joint with Persi Diaconis. The theory of Bayesian non-parametric statistics came into a new form at Professor Freedman's hands. Collaborating with Peter Bickel, he gave the first rigorous treatment of the resampling tool, the “bootstrap,” invented by Bradley Efron, and of the use of the bootstrap in statistical regression.

In the 1960s and 1970s, statistical theory was in the ascendancy, across the discipline and especially at Berkeley. Starting as a theorist, Professor Freedman moved more and more to work on applied problems, leading the way in a sea change that gradually transformed the Berkeley department and the field as a whole. He served as department chair from 1981 to 1986, acquired the department's first computer, hired faculty with practical experience like Leo Breiman, Jack Kiefer, and Charles Stone, taught statistical consulting, and supervised a departmental statistical consulting service. He insisted that applied work be mathematically informed and drew a sharp distinction between conclusions demanded by the data and conclusions driven by convenient or arbitrary choices of models. He proved to be one of the earliest to recognize that significant statistical theory would increasingly be driven by applications and data structures from emerging scientific fields.

Encouraged by his friend Hans Zeisel, Professor Freedman became an expert witness in litigation across a huge range of important cases involving statistical issues. A guide to statistics for lawyers and judges that he wrote with David Kaye was published by the Federal Judicial Center. Often in conjunction with Michael Finkelstein, he made sustained efforts to raise the level of understanding of scientific evidence in legal proceedings. He testified on subjects as diverse as election redistricting, employment discrimination, automobile sales, the flight of golf balls, and proposed statistical adjustments of the 1980 and 1990 U.S. Census counts. On census issues, he worked as an expert especially for Michael Sitcov at the U.S. Department of Justice. The 1990 census case, on which he collaborated with his colleague Kenneth Wachter, became a landmark in judicial history. Their analyses indicated that adjustment would not improve census accuracy. Referring to their testimony, the district court judge ruled not to compel adjustment. The ruling was upheld 9-0 by the U.S. Supreme Court in 1996.

In teaching undergraduate statistics, Professor Freedman became impatient with artificial examples and formulas disconnected from real-world settings. In 1978, his textbook *Statistics*, with Robert Pisani and Roger Purves, represented a leap into a new mode. Its full-fledged examples were drawn from medicine, epidemiology, demography, economics, political science, and history, continually updated as the book moved on to its fourth edition and was translated into Spanish and Chinese. Statistical thinking, questions to ask, mistakes to avoid, and purposes to keep in mind, replaced formulas as the centerpiece of the textbook. Its influence has been enormous.

Professor Freedman was elected a fellow of the American Academy of Arts and Sciences in 1991. He was an Alfred P. Sloan Fellow in 1964-1966 and a Miller Institute Fellow at Berkeley in 1990. At various times he was a visiting professor in Jerusalem, Mexico, Venezuela, Kuwait, and Athens. He testified many times before Congress. He developed close collaborations around scientific and policy issues, especially with his colleague Philip Stark. Along with service as an expert witness, he devoted himself to many issues important in public policy, including assessment of cancer risks, forecasting of energy demand, salt intake and hypertension, hormone replacement therapy, and mammography.

With David Collier, Professor Freedman stimulated ongoing debate about the role of statistical models in political science and other social sciences, subjecting ecological arguments and correlation based claims about causal influences to critical assessment. He held the view that what scientists in the public sphere put forward as “evidence based conclusions” are all too often unsupported model based conclusions, not so free from prejudice as we should wish them to be. Informed by his experience with applications, he also wrote widely on the philosophy and foundations of statistical inference, on the principles of design for observational studies, and on fundamental questions about causal inference.

Acting on a nomination by Andrew Noymer, the International Astronomical Union named one of the minor planets in our solar system, number 19969, for Professor Freedman.

In 2003, Professor Freedman received the John J. Carty Award for the Advancement of Science from the U.S. National Academy of Sciences. Reviewing his accomplishments, the award citation concluded: “These contributions are marked with an honesty and depth that have earned him a unique role as a voice of conscience for statistical practice.”

Professor Freedman was married to Janet Macher, who has had a distinguished career in environmental health in the California Department of Health Services. Their home high over Claremont Canyon was a haven of quiet and nature to which they welcomed their devoted friends. After it burned to the ground in the great fire of 1991, they set about rebuilding it with focus and resolve. Professor Freedman had a son, Joshua Freedman, and a daughter, Deborah Freedman Lustig, from an earlier marriage, and four grandchildren. He and his wife delighted in traveling together, especially to Italy and to the south of France. After he was diagnosed with a rare form of bone cancer, Professor Freedman continued to teach and serve the department, even filling in for a temporarily disabled colleague. He met with friends and completed revisions for a new scientific collection on the morning before his death on 17 October 2008. Tributes from his friends and family, presented at a gathering on 2 December 2008, are collected at

www.stat.berkeley.edu/~census/David_Freedman_Memorial.pdf.

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