



## Obituaries

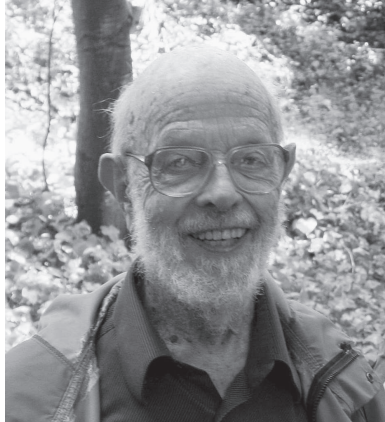
### Erich Leo Lehmann, 1917–2009

Erich L. Lehmann, Professor Emeritus at the University of California, Berkeley, passed away on September 12th, 2009, aged 91 years. Erich was one of the engines that drove much of the development of theoretical and mainstream statistics during the second half of the 20th century. At the same time he kept himself aware of developments in applied statistics and probability. He knew both the subject matter and the individuals developing our subject. He was a member of the powerful team of individuals that Jerzy Neyman built up at Berkeley in the 1950s. These included David Blackwell, Joe Hodges, Lucien Le Cam, Michel Loève, Henry Scheffé and Elizabeth Scott. Erich co-authored articles with each, except for the probabilist Loève.

Erich was born in Strasbourg, France, on November 20th, 1917. His family moved to Frankfurt where they lived until 1933. When the Nazis came into power the family fled to Switzerland where Erich went to high school. In 1938, following his father's advice, he went to study mathematics at Trinity College, Cambridge. Erich remarked that he was 'always the best student in mathematics', but he did not enjoy the accompanying astronomy and physics. Of the latter he said 'I hated it' (in 'A conversation with Erich L. Lehmann', with Morris DeGroot, in volume 1 of *Statistical Science* (1986)). In 1940, again influenced by his father, Erich went to New York and then following a suggestion by R. Courant he crossed the country to study at Berkeley.

At the University of California in Berkeley Erich received a Master's degree in mathematics in 1942, having been admitted to the graduate programme without an undergraduate degree! He was a Teaching Assistant in Neyman's Statistical Laboratory from 1942 to 1944 and from 1945 to 1946. In the gap period, 1944–1945, he was an Operations Analyst in the US Army Air Force stationed in Guam, working on interpretation of photographs. In 1946 Erich obtained his doctorate in mathematics with a thesis titled 'Optimum tests of a certain class of hypotheses specifying the value of a correlation coefficient'. The problem was suggested by P. L. Hsu, most of the supervision was by G. Pólya and Jerzy Neyman was the Berkeley thesis examiner. Optimality and the Neyman–Pearson approach were concerns of Erich's in many of the following years. His first publication was also in 1946, 'Une propriété optimale de certains ensembles critiques du type A1' (in volume 223 of the *Comptes-rendus des Sciences de l'Académie des Sciences* (1946)). (In modern terminology 'A1' refers to a uniformly most powerful unbiased test.) The paper was transmitted to the French Academy by Émile Borel. An expanded version, 'On families of admissible tests' appeared in volume 18 of the *Annals of Mathematical Statistics* (1947). These papers provided an alternative to the then traditional Neyman–Pearson approach to testing. Erich became Instructor in Mathematics at Berkeley in 1946 and thereby the first regular faculty member in statistics after Neyman. In 1947 Erich was promoted to Assistant Professor of Mathematics.

During the period 1950–1951 Erich was on the East Coast of the USA as Visiting Associate Professor at Columbia one semester and as Lecturer at Princeton for the second. There



**Professor Erich Lehmann**

he became exposed to T. Anderson, H. Levene, H. Scheffé, A. Wald, J. Wolfowitz and their work. In 1951–1952, when California's Loyalty Oath difficulties were clouding the scene, Erich chose to be Visiting Associate Professor at Stanford, following Charles Stein to that institution. Luckily for Berkeley Erich returned in 1952 as Associate Professor of Mathematics. In 1954 he was appointed Professor of Mathematics and a year later, when the Statistics Department was created, Professor of Statistics. He became Professor Emeritus in 1988 but continued to have an important professional and departmental presence until he passed away. In fact an amazing number, 41, of papers, books and revisions by Erich appeared after 1988. He spoke often of having wished to become a writer, and he surely succeeded.

In 1947 two other important papers appeared. One on optimal tests with a constraint appeared in the *Annals of Mathematical Statistics* and the second in the *Proceedings of the National Academy of Sciences*. The latter paper was written jointly with Henry Scheffé. There were two other early papers jointly with Henry. All told, Erich had 34 papers in the *Annals of Mathematical Statistics* until 1973 when the journal split into the *Annals of Probability* and the *Annals of Statistics*.

The famous and much used lecture material 'Notes on the theory of estimation', which was recorded by Colin Blyth in 1949–1950, quickly circulated widely in the theoretical statistics community. After an introduction they contain chapters on testing against a simple alternative, sufficient statistics, the principle of invariance, the principle of unbiasedness and optimum properties in the large. The writing is expository, and clear. A sad story associated with the notes is related in C. Reid, *Neyman from Life* (1982). Lehmann was teaching material related to the notes in a graduate course on statistical theory. Neyman had been given a copy of the notes by Erich and asked to see the book manuscript that Erich was preparing. Erich was bothered by this request and declined. He never got to teach that course again until Neyman resigned as Department Chair. Erich's book *Testing Statistical Hypotheses* (1959) grew out of these notes as did much of his later research.

In 1950 Erich had a publication 'Some properties in minimax point estimation' with J. L. Hodges, Jr. This was the first of 13 papers with Hodges. The 1963 *Annals of Mathematics* article with Hodges, 'Estimates of location based on rank tests', is important for showing how rank methods . . . for hypothesis testing could be transferred to point estimation. There was also the 1964 Hodges and Lehmann book *Basic Concepts of Probability and Statistics*. Other co-authors in the early years were C. Stein, H. Chernoff, R. R. Bahadur and E. Fix.

In the following years Erich steadily prepared papers on topics including non-parametrics, robustness, discrimination, estimation, decision theory, goodness of fit, selection, confidence intervals, multiple comparisons, dependence, sampling and efficiency. There were many expository articles and publications on the history of statistics and the statisticians he had known. The *Encyclopedia of Statistics* article, 'Statistics: an overview' (1988), lays out his description of statistics as '... the enterprise dealing with the collection of data sets, and extraction and presentation of the information they contain'. Lehmann wrote five books beyond those mentioned above. They are *Testing Statistical Hypotheses* (1959), *Basic Concepts of Probability and Statistics* (1964), *Nonparametrics: Statistical Methods Based on Ranks* (1975), *Theory of Point Estimation* (1983), *Ancillary Statistics* (1992) with F. Scholz, *Reminiscences of a Statistician: the Company I Kept* (2008) and *Fisher, Neyman, and the Creation of Classical Statistics* (2009).

Erich's first student Colin Blyth's thesis was titled 'Part I, Contribution to the statistical theory of the Geiger-Muller counter, part II, On minimax statistical decision procedures and their admissibility' (1950). His last student Javier Rojo's thesis was 'On Lehmann's general concept of unbiasedness and the existence of  $L$ -unbiased estimators' (1984). There were 38 in between. His student P. Bickel co-authored seven articles with Erich. His thesis title was 'Asymptotically nonparametric statistical inference in the multivariate case' (1963).

Erich impacted the whole statistics community by his editing. He was Editor and Associate Editor of the *Annals of Mathematical Statistics* in the period 1953–1968. He was the Probability and Statistics Editor for Holden-Day, Inc. He was Special Editor/Co-editor of the second and third editions of *Statistics: Guide to the Unknown* (1978, 1989). Both formally and informally Erich inspired others to write. He assisted them in finding publishers and in preparing manuscripts. Always with good humour, when asked he positively criticized presentations and drafts of manuscripts. He did express unhappiness with papers appearing in books, rather than journals; however, at the banquet for his 1983 *Festschrift* he remarked that there were two types of *Festschriften*: others and his. He was very appreciative of his.

Erich had a steady influence on the theoretical statistics community, but he also influenced applied statistics. For example the Berkeley students who became applied statisticians learned his theory.

It is amusing to read his remarks in his conversation with DeGroot:

'One of the things ... that I disliked about statistics when I wanted to get out of it, was the applied flavor. ... But the curious thing is that over the years I have gotten to like the applied aspect of statistics. ... Julie [his wife Julie Shaffer] calls me an "armchair applied statistician"... each of us reads in draft whatever the other writes ...'

Erich and Julie collaborated on four papers and one doctoral student. It may also be mentioned that Erich was Distinguished Research Scientist at the Educational Testing Service in Princeton 1995–1997.

As the years passed Erich received many important professional awards. These included three Guggenheim Fellowships (1955, 1966 and 1980), Wald Memorial Lecturer (1964), elected Member of the American Academy of Arts and Science (1975) and of the US National Academy of Science (1978), Doctorates *honoris causa* from the University of Leiden (1985) and the University of Chicago (1991). He was the Committee of Presidents of Statistical Societies Fisher Memorial Lecturer (1988), received the Wilks Memorial (1996) and the Noether (2000) Awards. He was an Elected Member of the International Statistical Institute. Lastly there have been three Erich L. Lehmann Symposia (2002, 2004 and 2007). He prepared a talk and article for each.

Erich was Department Chair from 1973 to 1976. He had always refused previously for a variety of reasons. He did it so well that I sometimes thought that he must have thought through

how a Chair should behave and put his conclusions into practice. For example, to the delight of visitors and others he was in the coffee room each day at 10 a.m. He focused on the whole department—staff, students, colleagues and visitors. Of teaching activities he once remarked that ‘. . . the one that I enjoy most is working one on one . . .’.

Erich had connections with the Royal Statistical Society. In 1954 the paper with J. L. Hodges, Jr, ‘Testing the approximate validity of statistical hypotheses’, appeared in Series B. He became a Fellow in 1981 and an Honorary Fellow in 1986. He had close contacts with and the respect of Society members throughout his career, writing about some. George Barnard was one of the many who described Lehmann’s books as classics.

Erich’s amusements included family, skiing, hiking and walking in Berkeley, Yosemite and the Alps, reading and translating German books, music (*lieder*), playing the piano, ping pong and entertaining statisticians. He has left the world with a scientific legacy and those who had contact with him with dear memories.

*David R. Brillinger*

## **William Mendenhall III, 1925–2009**

William Mendenhall III passed away on December 8th, 2009, at 84 years of age. With his demise, the statistical community has lost a pioneering educator and a prolific text book author.

Mendenhall was born on April 20th, 1925, in Montoursville, Pennsylvania, where his father was a postal clerk. He earned his Bachelor’s degree in mechanical engineering (1945) and Master’s degree in mathematics (1950) from Bucknell University. His doctoral degree in statistics was completed at North Carolina State University in 1957. After receiving it, he spent a year (1957–1958) at the University of London assisting Professor M. G. Kendall in compiling a comprehensive bibliography of research articles in life testing.

Before that his professional career spanned a variety of activities comprising teaching and research, consulting and working for government and industry. Two stints in the US Navy, as an Ensign during 1943–1946, and as a Lieutenant during 1950–1952, enabled him to gain experience both in teaching and practising engineering applications of statistical methods.

His industrial experience included employment at the Armstrong Cork Company (1947–1948) and Sylvania Electronic Products (1953). Later he provided consultation and short courses on statistics to a variety of government and private organizations including the US Bureau of Mines, International Business Machines, Merck and the Technical Association of the Pulp and Paper Industry.

Among his teaching and research experience were appointments as Assistant Professor in the North Carolina State University (1958–1959) and as Associate Professor of Mathematics in Bucknell University (1959–1963). His services as Professor and founding head of the statistics department at the University of Florida during 1963–1977 will be remembered by all those who are familiar with the long history of failed efforts to form a viable statistics department in one of the major campuses in Florida. He was the primary architect responsible for developing the department from its beginnings as a small three-member unit in the College of Agriculture with no students and no academic programmes to a nationally recognized department that rivalled established statistics programmes in the USA like those in the University of North Carolina and Virginia Polytechnic Institute. This was no easy task in a campus where statistics courses were spread over more than eight departments with vested interests not willing to see the advantages of concentrating statistics education in a single department under the control of competent