David A. Sprott
(1930-2013)

David Arthur Sprott, one of the pioneers and leaders of statistics in Canada, died on December 13, 2013 in Waterloo, ON. He was 83.

Born and raised in Toronto, David Sprott completed BA, MA and PhD degrees at the University of Toronto in 1952, 1953 and 1955, respectively. His PhD thesis, written under the supervision of Professor Ralph Stanton, was on the combinatorics and geometry of balanced incomplete block designs. Following his PhD, he received an NRC postdoctoral fellowship to study as a Research Assistant in Genetics at the Galton Laboratory at the University of London under L.S. Penrose, (1955-1956). In 1956 he returned to Canada as Biogeneticist and Clinical Teacher in the Department of Psychology at the University of Toronto (1956-1958). He joined the University of Waterloo in 1958 as an Associate Professor having been recruited by Professor Stanton who had come to Waterloo a year earlier, the year the University was founded.

Two important events took place before coming to Waterloo. While at the Galton Laboratory, he met Sir Ronald A. Fisher and became more acquainted with some of his work in statistical inference. This began a train of thought that led to his view of statistics and to a decidedly Fisherian approach to inference that guided much of David's work throughout his career. The second event occurred through his association with the Department of Psychology at the University of Toronto. There he met his future wife, Muriel Vogel (later Vogel-Sprott). Muriel also moved to the University of Waterloo in 1958 and in time became a distinguished faculty member of its Department of Psychology. David and Muriel had two children, Anne and Jane, and were lifelong partners until 2009, when Muriel passed away.

David Sprott had a profound influence on the direction of statistics, actuarial science and more broadly the mathematical and computing sciences at the University of Waterloo. He became a full professor in the Department of Mathematics in 1961 and led the statistics group from the very beginning of the University. He served as Chair of the newly created Department of Statistics from 1967 to 1975. He also served as the first Dean of the newly founded Faculty of Mathematics in 1967 until 1972. As Chair of Statistics, his objective was to establish an international presence in statistical inference and its applications. In this endeavour, he placed great emphasis on the teachings and ideas of R. A. Fisher, and emphasized the central role of the likelihood function and fiducial inference in statistics. This was a different direction than what was common at the time. Particularly the ideas of likelihood-based inference have had a substantial impact on the profession and the role of statistics in science. He was quick to realize the importance of the computer in the context of statistical analysis. The Department at Waterloo developed its character during the period when David was Chair. Several graduates

of Waterloo were enticed back to the Department and hires both junior and senior gave breadth to the Department's activities. In time, Waterloo became very strong in the theory and applications of statistical inference, biostatistics, industrial statistics (experimental designs, quality control and productivity), actuarial science, and time series.

As Dean of Mathematics, David also saw the importance of computer science as a discipline and as a component of the new Faculty. Departments of Computer Science were only just beginning at that stage and the development of the Department at Waterloo was a key aspect of his tenure as Dean. There were, of course, some in the more traditional branches of mathematics who doubted the academic potential of computer science, seeing it as more of a technical resource than an important academic discipline, but the strong support of then Dean Sprott was key in promoting this crucial aspect of the Faculty's activities in the early days.

He was an outstanding teacher in the true sense of the word. His style did not appeal to all, but to many of his students, he was inspirational. He was obviously very keen on the subject matter and the ideas that he was presenting and he concentrated on the general and philosophical aspects of inference. He was not kind to the Neyman-Pearson approach with many examples at his command to illustrate its weaknesses. He worked foundational discussions to every course, and taught over a broad spectrum of the curriculum. David was never one to mince words and would say in colourful language what he thought. His interview with Mary Thompson that appeared in *Liaison* (Vol. 3, No. 2, February 1989) gives an excellent glimpse of this style.

David Sprott made many important methodological and applied contributions to statistics. The main research focus was on methods based on the likelihood function. He studied many types of likelihoods, including joint, marginal, conditional, profile and integrated likelihoods. One guiding principle was that inferences such as confidence intervals should reflect the shape of the relevant likelihood. From early days, he was an avid proponent of examining the course of the likelihood function as one aspect of statistical inference. He had particular interest in how best to deal with large numbers of parameters within likelihood inference and worked on methods of marginalization, integration and conditioning to provide valid inferences for the parameters of interest. Throughout his career, he had a very keen interest in applications of the methods to other areas, including genetics, physics, chemistry, psychology and biostatistics. He regularly collaborated with scientists in these fields. His book *Statistical Inference in Science* (Springer, 2000) gives an excellent summary of his views on statistical inference and its role in scientific investigations. It contains a large number of applications to illustrate his approaches in depth, and as in much of his work, the focus is decidedly Fisherian in flavour with an emphasis on the likelihood and significance tests and a focus on interesting aspects of inductive inference. This book illustrates the flavour of his many publications, most of which centered on the use of

likelihood and related methods in the analysis of real applied problems. His work contributed greatly to the outstanding reputation of the University of Waterloo in statistics and to the reputation of Canadian statistics more generally.

In 1985, David decided to take advantage of a phased retirement opportunity at Waterloo which allowed him to reduce his load to 50%. This was in part to spend the winters in Guanajuato, Mexico, where he and his wife purchased a handsome hacienda home in the small town of Marfil near Guanajuato. After some time, he initiated a collaboration with the Center for Research in Mathematics (known as CIMAT for its Spanish name) and became affiliated with its Statistics Department. The formal relationship began with a Chair of Excellence granted to him by the National Council of Science and Technology of Mexico in 1993. At CIMAT, he taught several courses in statistical inference (in Spanish) and supervised several PhD and master students in statistics. His presence there also led to conferences and workshops on statistics and regular visits of eminent statisticians to CIMAT. His involvement at CIMAT contributed greatly to the development of the field of statistics at CIMAT and in Mexico more generally.

David Sprott's contributions to statistics were recognized with many awards, including Fellow of the American Statistical Association, Fellow of the Institute of Mathematical Statistics and Elected Member of the International Statistical Institute. In 1975, he was elected a Fellow of the Royal Society of Canada. He received the Gold Medal, the highest award of the Statistical Society of Canada in 1988, and was subsequently awarded the distinction of Honorary Member of the SSC. In 1997, he was awarded the title Distinguished Professor Emeritus by the University of Waterloo.

David Sprott had other passions, including wine and cider making as well as cooking, with certain well-spiced specialties to his credit. He loved nature, and shared his rustic cabin in Muskoka with a multitude of mice and occasionally a colleague. Later, he purchased a wooded property near Waterloo where he could be found walking on fine summer days. He was a skilled canoeist, and could demonstrate how to right one that had capsized. But it was photography that rivaled statistics as his passion. He was an accomplished photographer, who early on had an outstanding portfolio of photographs of birds. Later his interest moved to photography of flowers and small plants with sharp impressions against the sun. His photographic contributions were recognized with Fellowship in the Royal Photographic Society. Of all his honours, he was perhaps proudest of this.

David Sprott died at his home in Waterloo on December 13, 2013. His many contributions will long be felt and remembered. A memorial tribute to his life and contributions will be held at the University of Waterloo on March 28, 2014.