

A Tribute to Ellis R. Ott

THIS special issue of *JQT* is dedicated to the memory and pioneering work of Dr. Ellis R. Ott, Professor Emeritus, Rutgers University. Dr. Ott's work improved the quality of life for all who came in contact with him or his teachings and it is fitting and proper to document his many contributions. In the process, we also record some of the early history of statistical quality control.

He left us many legacies, the two most important being his philosophy and technique of problem solving, as evidenced by his analysis of means (ANOM) methodology, and the many useful citizens produced by the program in applied and mathematical statistics he founded at Rutgers University. Dr. Ott was a pioneer in many senses and his contributions should be viewed in that light. He was a leader in the development of problem solving philosophy and technique, in the education of statisticians, quality professionals, scientists, and engineers, and in the introduction of statistical quality control to industry, both in the United States and abroad.

We have focused this issue of *JQT* on Dr. Ott's analysis of means technique with the objective of bringing together methodology that will enable quality professionals to use Dr. Ott's ideas in solving the problems they face in their work. ANOM was very important to Dr. Ott. This innovation and his work with August B. Mundel on narrow-limit gauging are his two most important technical contributions. The articles, computer software, and references in this issue contain the information necessary to implement ANOM and provide a starting point for those who wish to conduct further research on the properties of the procedure.

Dr. Ott developed the ANOM to fill the quality professional's need for a statistical procedure for troubleshooting industrial processes and analyzing the results of experiments. He recognized the critical importance of graphical displays in the data analysis process and used Shewhart's control chart as the basis for ANOM. He also recognized that analysis of variance (ANOVA) techniques could be applied in the situations where the ANOM was used. He observed, however, that ANOVA was difficult for nonstatisticians to understand and the effectiveness of the procedure was limited because data plotting was not an integral part of the procedure. Dr. Ott's objective was to give practitioners something they could and would use. ANOM was

easy to learn and use because it was a logical extension of the control chart which was well-known to quality control practitioners. ANOM was, of course, effective because graphical display of data is a key part of the procedure.

One of Dr. Ott's guiding principles was that the best way to do troubleshooting and solve process problems is to collect data using statistically designed experiments, typically involving two or three variables, and analyze the results using graphical procedures such as ANOM. The result is objective information that is more likely to stimulate management to take action than would subjective impressions of what variables affect the process. He liked to emphasize that improvements can be made in almost any process when there is clear evidence of assignable causes. Dr. Ott felt strongly about this philosophy, promoting it throughout his career in his courses, lectures, seminars, his book, *Process Quality Control*, and in his latest papers in *Quality* (April 1980, May 1980, March 1982), one of which appeared shortly after his death.

Dr. Ott made other important contributions through the many students who studied at Rutgers University during his tenure. He recognized the importance of an education that was based on a balance of theory and practice. The Rutgers program was so oriented and each graduate received a degree in applied *and* mathematical statistics. It was clear to Dr. Ott that industry needed many employees who were well-trained in statistics and statistical quality control at the masters level. Between 1954 and 1970, the Rutgers masters program granted degrees to 344 persons. The PhD program, instituted in 1959, granted its first degree in 1963 and produced 35 PhD degrees by Dr. Ott's retirement in January 1972. As Mason Wescott points out in the following article, Dr. Ott's students have had an impressive impact on many aspects of our society; hence, he left a legacy that will continue to contribute for many years to come.

The success of Dr. Ott's students is due in no small part to his unique talent of identifying persons who had the interest and ability to make useful contributions to quality control, statistics, and society in general. He combined with this the ability to stimulate students to make the most of their talents and opportunities. He also gave them an effective set of tools, a philosophy on how to use

those tools, and encouragement to acquire new tools as needed.

Dr. Ott had innovative approaches to education in statistics and quality control. His course "Statistics 586—Interpretation of Data" was based on his problem-solving experiences and is fondly remembered by all his students. His book, *Process Quality Control*, was developed from his Statistics 586 notes. The American Statistical Association Committee on Training of Statisticians for Industry recently noted Dr. Ott's course and recommended that universities consider offering such courses on a regular basis.

Dr. Ott also started in 1965 what I believe to be the first statistical consulting intern program in the United States. In this program, statistics graduate students at both the MS and PhD levels learned the art and science of statistical consulting by working on real problems under the guidance and supervision of experienced practicing statisticians. Universities are recognizing the importance of such programs and are including practical experiences as part of the education of statisticians.

I had the good fortune to study and work with Dr. Ott. All students in the department were "his students" and he took a personal interest in each of us. He will be remembered as an outstanding teacher, an effective problem solver, a good friend, and a great human being. Quality professionals and statisticians are indeed fortunate that he chose our field as his life's work.

In order to perpetuate Dr. Ott's ideas and ideals, a group of his associates has formed a Foundation to honor his memory by advancing the goals to which he devoted decades of tireless effort: Applying statistical quality control to maximize industrial productivity, and introducing statistical quality control to a broad spectrum of people. Contributions to the Foundation will be used to fund activities that focus on the techniques and principles that Dr. Ott so dynamically expounded, such as, technical seminars and conferences, specially directed college courses, continuing education programs, and publications in trade journals. The Board of Trustees consists of William C. Frey, Frank M. Gryna, Jr., J. Stuart Hunter, Stanley A. Marash, Louis A. Pasteelnick, Edward G. Schilling, Edwin S. Shecter, and Ronald D. Snee. Further information regarding contributions and Foundation activities can be obtained by contacting the Ellis R. Ott Foundation, 2124 Oak Tree Road, Edison, New Jersey 08820, (201) 548-0605.

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