Statistical Science
1990, Vol. 5, No. 4, 371

In This Issue

This *Statistical Science* issue features something old—Shafer's treatise on probability, tracing over three centuries of the evolution and diversity of probabilistic thought; and something new—Stein's and Chen's method of Poisson approximation. We borrowed, translated and reprinted a 1923 paper of Jerzy Neyman's from an obscure Polish agricultural journal. And Harry Roberts has provided his perspective of statistical applications and needs for statistics in the world of business.

Roberts has spent the bulk of his career thinking about statistics in business and economics. His paper identifies existing objectives in business statistics, including the need for expansion in such areas as past performance, forecasting for performance evaluation, cause and effect, and sampling for information. Such new inroads will benefit both fields, statistics and business, because systematic collection and analysis of data serve as a tool for discovery, understanding, and knowledge of business processes, and the new problems will provide new opportunities and challenges for statisticians. The comments on Roberts' paper amplify on these points, from perspectives of the United States and of other countries. The need for statistical thinking applies to other fields too, because, as W. Edwards Deming observes in his discussion, statistics is the field that accounts for variation and uncertainty in the optimization of systems. Many of these ideas are sufficiently general to be useful also to those pursuing and expanding statistical applications in fields other than business.

Richard Arratia, Larry Goldstein and Lou Gordon review extensively a new method for determining the accuracy of Poisson probability approximations. The mathematical level of this article exceeds most of those that appear in this journal, but this article makes the ideas clear via applications to the birthday problem, runs, cycles and graphs, and a problem in the authors' area of molecular biology. Results are obtained with surprising ease and simplicity. The discussions attend to extensions of the theory and additional applications. The discussants are careful to note the limitations of the Chen–Stein method, but what clearly emerges is their genuine appreciation for this simple and powerful new tool.

Glenn Shafer's inaugural lecture, upon his receiving a distinguished professorship at the University of Kansas, treated the unity and diversity of probability. That lecture, published here, traces the intellectual history of probability over the last 336 years, the ensuing outgrowth of statistics, and the recent Balkanization of probability (including the frequentist and subjective perspectives), caused by pressures to meet the widespread needs of diverse users of our statistical ideas and methods. Shafer also considers the implications for statistics departments, which today struggle in competition with many other departments for the successful application of statistical thought. Indeed, statistics appears to be at a strange time in history, when statistics and probability never have been more important or more widespread, but when some statistics departments and statistical researchers are struggling for survival. This stems from the peculiarities of statistics, its funding, and the divided responsibility for teaching statistics in universities. Shafer proposes reunification and broadening of the missions of statistics departments. His controversial views inspire vigorous comment by the articles' discussants.

Terry Speed has located a portion of Jerzy Neyman's doctoral thesis, written at the University of Warsaw in 1924. It has appeared before, in Polish, only at that time in a Polish agricultural publication. Dorota Dabrowska has translated this work into English for *Statistical Science*. It is important to make this paper available now, because Neyman's model for agricultural field experiments is a percursor to modern modeling and thinking about causal inference, randomization and repeated sampling evaluations. Don Rubin, a proponent of the modern view, has provided discussion, linking the ideas and evolution of the paper to current perspectives on causal modeling.

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