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# In This Issue

This issue features four review articles on topics in modern statistics and an interview with the 1989 Wald Lecturer, Ildar Ibragimov of the Soviet Union.

Norman Breslow was invited by the ASA Biometrics Section at the 1989 Sesquicentennial American Statistical Association meeting to present a paper on historical perspectives and new directions in biometry. We have added five discussants and a rejoinder here to his opening article, "Biostatistics and Bayes." Bayesian statistics has found a small niche in the biostatistics literature, cited in Breslow's article. As a leader in biostatistical science, and not being one identified with the Bayesian movement, Breslow has identified a series of biostatistical problems and examples suited to attack and to better understanding by Bayesian and empirical Bayesian methods. Some senior statisticians have said they find this philosophical controversy tiresome, particularly when the discussion is only theoretical. But there are practical differences, which Breslow addresses through applications, where the issues must be decided.

Breslow finds strong support for both philosophical perspectives, enforcing the thought that we need to include in our curricula both frequency and Bayesian viewpoints as mutually supportive, each having its relative advantages.

Our second paper also deals with medical applications, namely, the need to monitor statistical experiments sequentially for treatment differences in medical science. Christopher Jennison and Bruce Turnbull, working together from opposite sides of the Atlantic, review the sequential literature and provide a substantial bibliography for the reader who wishes to go further. There is a controversy concerning the vantage point from which one should consider sequential trials, with rather different answers arising from the frequentist and Bayesian perspectives. The essential distinction is whether one needs to account for the stopping rule or whether one may analyze the final body of data by ignoring the fact that the sample size was random. The Bayesian, likelihood and conditionality perspectives argue against accounting for the stopping rule, while the frequentist consideration of $p$-values and other criteria argue for it. After a review of both sides, the authors advocate frequentist solutions by methods of stochastic curtailment, repeated confidence intervals and repeated $p$-values. Their discussion then addresses not only arguments for their proposals, but also reviews the arguments against them.

Jennison and Turnbull argue that repeated confidence intervals provide interval estimates at each interim analysis, adjusted for multiple looks, and therefore work for any stopping rule, from the frequentist perspective. Thus, they have wide validity, even if the stopping rule is undefined. The authors conclude by noting, "We anticipate increased use of Bayesian methods for in-house studies, particularly in drug-development programs. However, we expect frequentist requirements to remain the fundamental basis for confirmatory studies intended to demonstrate efficacy and safety to an external audience."

Graphical methods always have been a very important and convenient way of understanding and communicating quantitative ideas. They promise to be more so in the future because we now have the technology to produce graphs easily. Patricia Costigan-Eaves and Michael Macdonald-Ross bring to us information about one of the early thinkers about quantitative graphics, William Playfair, a Scotsman who worked 200 years ago. With the help of British libraries they have tracked down a bibliography of Playfair's and of other early graphics articles. Playfair spelled out a theory of graphics and its importance that continues to hold today. In accompanying articles, John Tukey writes about data-based graphics, listing 19 ideas behind today's developing research in graphics. Then Howard Wainer concludes by discussing the changes in views of graphics over the 200 years from Playfair to Tukey today, what is common and what is distinct. Not much, Wainer finds. The main distinction is that Playfair did not appreciate the difficulty of comparing differences visually from curves.

Ildar Ibragimov, 58, is a probabilist and statistician from Leningrad. The Institute of Mathematical Statistics made him the 1989 Wald Lecturer and he chose to talk on "Some Problems of Nonparametric Estimation Theory." Ibragimov is the first Soviet to be so honored by the IMS, and of course this comes at a propitious time in the development of international relations. While visiting the University of California at Berkeley in August 1989, Ibragimov held a conversation with Peter Bickel and Lucien Le Cam about his life and events and about people in probability and statistics in the Soviet Union, including his work with Linnik and Prokhorov and his experiences with Kolmogorov. This makes for interesting reading and indicates the need for more international communication in sharing perspectives concerning probability, statistics and their future developments.

Charles Stein's celebrated result shows that one can make uniform improvements in the expected sum of squared errors when estimating the mean vector of a spherically symmetric multivariate normal distribution. Ann Cohen Brandwein and William Strawderman review this literature and its extensions by a number of authors, including themselves, that generalize Stein's result to spherically symmetric distributions. They use Stein's unbiased estimation of risk technique to develop the theory for the normal distribution. Then they branch out into less well-known areas, including scale mixtures of normal distributions and more general cases, each time offering the use of estimators similar to Stein's and demonstrating minimax properties. Their paper reviews not only the advantages, but also the limitations, of the method. While applications of such techniques are not discussed here, the authors do provide references to applications in this useful review article.

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