In This Issue

NEURAL NETWORKS

A very active research area, devoted to constructing algorithms for classification, discrimination and prediction based on analogy with systems of neurons, has become well established without much input from statisticians. In their article, Bing Cheng and D.M. Titterington explain what neural networks are, how they may be understood in more familiar statistical terms and why more statisticians should be cognizant of this work. The discussants include several of the statisticians who have been involved in neural network research. They offer a range of views on the positive achievements of this blossoming field, the possibility of accurately modeling cognitive processes, the sometimes exaggerated descriptions of neural network success and the extent to which well-known alternative statistical methods may perform as well as or better than neural networks, and the future of collaborative effort in attacking the underlying problems neural networks are constructed to solve.

SMALL AREA ESTIMATION

When data summaries are needed for many related geographical regions, yet for some there is little direct information, the statistical problem is called "small area estimation." M. Ghosh and J.N.K. Rao review recent work on this topic, discussing the use of demographic methods of adjustment, synthetic estimation based on auxiliary variables, and model-based methods including empirical Bayes, hierarchical Bayes and empirical best linear unbiased prediction procedures. They emphasize evaluation of uncertainty of estimators, and touch on the assessment of model validity, constrained estimation, spatial-temporal modeling and other problems that should generate further research. The discussants raise a number of practical concerns including the possibility of overshrinking, the availability of model diagnostics, and the extension of the basic models to more general situations; several relate the perspective of Ghosh and Rao to their own experiences in analyzing data from sample surveys.

CITATIONS AMONG STATISTICS JOURNALS

In an effort to trace the flow of intellectual influence among probability and statistics journals, Stephen Stigler analyzed citation data. In his article, he poses the problem then examines it by viewing the citation as a "product" that is "imported" and "exported." This leads him to a discussion of "balance of trade" and diversity of "the market." Stigler then focuses on bilateral trade and introduces what he calls "the export scores model," which greatly simplifies the relationships underlying a two-way table of citation patterns. With this he is able to succinctly characterize the bilateral trade in citations among leading journals. Several findings emerge; in particular, Stigler concludes that intellectual influence in statistics tends to flow more readily from theory to applications than in the reverse direction.

ALPHA-STABLE PROCESSES

There is an increasing recognition of the role α-stable processes can play in modeling stochastic phenomena. In their article, Aleksander Janicki and Aleksander Weron show how simulation and numerical methods may be used to approximate stochastic integrals and solve stochastic differential equations, and thereby visualize the processes themselves.

MARGARET MARTIN

Margaret Martin worked at the U.S. Bureau of the Budget for 30 years after receiving her Ph.D. in economics from Columbia University in 1942. In a conversation with Miron Straf, assisted by Ingram Olkin, she talks about being in school during the depression and then reviews her varied experiences as a government statistician and, ultimately, assistant chief of the Statistical Policy Division at the Bureau of the Budget. She went on to become the Executive Director of the Committee on National Statistics and President of the American Statistical Association, and discusses her work there. As a final note, she emphasizes the ongoing need for greater interdisciplinary collaboration on statistical issues facing governmental bodies.

Robert E. Kass