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In This Issue

Our lead article by James Ware introduces a crucial statistical issue in the context of medical trials. The age-old controversy involving individual and collective welfare arises in the context of approval of a new treatment, in this case extracorporeal membrane oxygenation (ECMO) treatment for newborns. In nonrandomized trials, the invasive ECMO procedure improved survival rates dramatically, but scant supporting randomized evidence was available, and evidence from nonrandomized trials can be misleading. Ware describes how he and his colleagues designed a special randomized procedure to confirm the benefits of ECMO with minimal exposure of infants to the standard treatment, if ECMO's extraordinary advantage persisted in the randomized trial. This was the case.

David Pollard reviews and expands recent work in his paper on empirical processes. These provide a powerful technique for finding limiting distributions. Here Pollard illustrates recent developments in this method of working with the empirical measure, by considering in detail the techniques needed for two particular problems. Statisticians know the importance of empirical process applications to the asymptotic distribution of Kolmogorov–Smirnov and Cramér–von Mises statistics, to density estimation, the bootstrap, M-estimation, and to a variety of other topics.

Richard Smith analyzes ozone data from Houston, Texas, the extreme values of which are used to test for compliance with federal air pollution standards. Viewing this as a point process allows Smith to review much old work (e.g., by Fisher and Tippett, Gnedenko, and Gumbel), and much recent development of extreme value analysis. Because of a limit theorem, it is often reasonable to assume the maximum (or minimum) of iid variates follows approximately a Generalized Extreme Value distribution, and that the related Generalized Pareto distribution applies to the exceedences. Parameter estimation in these models is done by maximzing the (high-dimensional) likelihood function, and introduces problems common to all of us. (Also, see del Pino's paper later in the issue.)

Guido del Pino surveys and unifies the literature of iterative generalized least squares (IGLS) methodology for parameter estimation. He shows how many nonlinear minimization problems may be handled by iteratively solving a sequence of linear generalized least squares (GLS) problems, each with its own quadratic norm and manifold, and simultaneously he emphasizes the relation between the statistical properties of the model and the algorithmic structure. Thus the methodologies of maximum likelihood estimation, regression, generalized linear models, quasilikelihood estimation, robust regression, minimum chi square and other topics are included in the framework presented here.

The issue ends with a review article by Sacks, Welch, Mitchell and Wynn on large expensive-to-run computer experiments, say for weather modification, or an econometric model, etc. Their goal is to model relationships between the response y and the inputs x. This is much like the familiar statistical analyses of physical experiments, except in this case there is no random error: identical inputs produce identical results. Despite the lack of randomness, the authors argue persuasively that statistics and statistical design and analysis play an important role here in dealing with uncertainties, and in the selection of design input sites. This introduces stochastic ideas to approximation theory.

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MORRIS H. DEGROOT 1931–1989

Following a year-long battle with cancer, Morris H. DeGroot, founding Editor of *Statistical Science*, died at home on November 2, attended by his wife Marilyn. He was one of the best known and best loved members of the Statistics profession.

Morrie was a student of L. J. Savage at the University of Chicago, where he earned his Ph.D. in 1958. He joined the Carnegie Mellon University faculty in 1957, becoming the founding Head of the Department of Statistics in 1966.

In 1984 Morrie became the first Executive Editor of *Statistical Science*. His vision, talent and industry led to the concept and identity of this refreshing new journal. For that, for his remarkable sense of humor, and for his many wonderful qualities and pioneering contributions, Morrie's untimely passing is a great personal and professional loss for us all.

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