

International Statistical Education Newsletter

A Publication of
the International Statistical Institute

Dr. M.H. Regier, Editor
Editorial Address: ISEN
Dept. of Mathematics & Statistics
Case Western Reserve University
Cleveland
Ohio 44106, USA

Volume 8, No. 3, October 1988

EDITORIAL

Whenever possible, this Newsletter carries articles that deal at some length with a particular topic as seen by an expert. In this issue, Professor C.B. Read throws new light on the Encyclopedia of Statistical Sciences from his vantage point behind its editorial desk, and discusses its value as a tool in statistical education.

The News section carries brief reports on some of the recent meetings on the teaching of statistics that have come to the attention of the editor to date. Readers are invited to supplement this coverage with further news of such activities for publication in the next issue.

NEWS AND ANNOUNCEMENTS

I.S.I. Round Table Conference

Over 30 delegates from 15 different countries participated in the ISI Round Table Conference on the Training of Teachers to Teach Statistics, which preceded the ICME-6 meetings in Budapest, Hungary, in late July. By all accounts, the conference was a great success, and the ISI Task Force for International Conferences will continue to plan for such meetings in the future. The Task Force is chaired by Kerstin Vännman, with James Adichie, James Landwehr, Maria Ramalhoto and Dan Lunn as members. More about the conference and follow-up activities by this Task Force will appear in future issues of ISEN.

Special Sessions on Statistical Education at ICME-6

Four sessions at the sixth International Congress on Mathematics Education (ICME-6), which was held in Budapest, Hungary, from 27 July to 3 August, dealt with the teaching of probability and statistics in schools. The sessions were organized by Kenneth Travers and Lennart Råde and covered presentations on the statistics curriculum and data analysis at the various grade levels. The Education Committee was represented by Gottfried Noether, who chairs the Task Force on Teaching Statistics at School Level (TOTSAS), with R. Biehler, A.M. Farrag and J.J. Groot as members.

Third International Conference on Teaching Statistics (ICOTS 3) August 19-24, 1990, in Dunedin, New Zealand

Conference theme: Statistics for All

As previously announced, the third International Conference on Teaching Statistics (ICOTS 3) will be held in August 1990 at the University of Otago in Dunedin, New Zealand. The Local Organizing Committee recently decided to put back the proposed dates of the meeting by one week, the new dates being August 19 (Sunday) to August 24 (Friday). This was in response to requests from teachers in the Northern hemisphere for whom the end of August tangles with the beginning of the school year. The earlier week still falls in the Otago University August vacation, so that full accommodation and conference facilities will still be available. The Committee asks you to make a note of the new dates and apologizes for any inconvenience the change may have caused.

The Committee also reports that the program for ICOTS 3 is well under way. The program will run in three broad streams: statistics in schools, statistics in the universities, and statistics outside the regular teaching institutions. Plenary speakers will include Peter Holmes, Jim Landwehr and Denis Lindley. Workshops on computers and calculators in the classroom, sessions on statistical computing and statistical graphics and their impact on teaching, on social and psychological factors affecting statistics teaching and development, on the transition from teaching institutions to the workplace, and on statistical literacy, are among many planned sessions. A draft program and full list of sessions will be included in the first circular, which is due to go out in November. In the meanwhile, further information can be obtained from: The Secretary, ICOTS 3, Department of Mathematics and Statistics, University of Otago, POB 56, Dunedin, New Zealand, or from David Vere-Jones, Institute of Statistics and Operations Research, Victoria University of Wellington, Private Bag, Wellington, New Zealand. In particular, anyone with ideas about the program, including suggestions for speakers, is invited to write to David Vere-Jones.

A potential problem facing ICOTS 3 is likely to be funding for travel to New Zealand. There is limited support from international organizations for participation in conferences. The best line of attack would seem to be for local groups acting on a national basis to pool resources for negotiating reduced fares and seeking grants to participate in the associated workshop program as well as the Conference itself.

Second Conference of the International Federation of Classification Societies

June 27-30, 1989,
in Charlottesville, Virginia, USA

The International Federation of Classification Societies (IFCS) is organizing its Second Conference, to be held at the University of Virginia in Charlottesville, VA, from June 27 to June 30, 1989. This Conference is devoted to the presentation of theoretical, methodological, and applied papers on classification, pattern recognition, and related methods of statistics and data analysis in the broad sense. It includes mathematical, statistical, and practical investigations in special fields of knowledge, and the interface between classification and the Information Sciences.

If you plan to attend the conference or have general inquiries about the conference, write to: IFCS-89, Dept. of Mathematics, U. of Virginia, Charlottesville, VA 22903; (804) 924-4919; Bitnet: SJT @ VIRGINIA. If you plan to present a paper, send an English abstract of at most one page to: Robert F. Ling, Chairman, IFCS-89 Program Committee, Dept. of Math. Sciences, Clemson Univ., Clemson, SC 29634-1907, USA, or (Bitnet: RFLING@CLEMSON). Submission of an abstract must be accompanied by a title, keywords, name(s) and institutional affiliation(s) of author(s), and the name of the contacting author for papers with multiple authors. Deadline for submitting papers is January 15, 1989.

The sixth International Conference on the New Quality Philosophy in Statistical Research and Statistical Education will be held in Washington, DC, USA, from August 6 to 10 in conjunction with the 1989 Joint Statistical Meetings of the American Statistical Association and Biometric Society. This satellite conference is sponsored by the International Society of Statistical Science in Economics (IS-SSE). For information, contact Prof. V. Shvyrykov at the IS-SSE address (see below).

The Proceedings of the fourth International Conference on the New Quality Philosophy in Statistical Research and Statistical Education [*Quantity and Quality in Economics Research* (vol III)], which was held in San Francisco, California, USA, from August 18-20, 1987, can be ordered from the IS-SSE address. Price per soft cover volume of 318 pages is \$28.65.

The International Society of Statistical Science in Economics, after six years of scientific activity, during which time it published three volumes of *Quantity and Quality in Statistical Research*, has decided to publish a new journal: *International Statistics Forum*. It is a journal which will remain neutral to controversial ideas and will print all papers that can be printed. For information, contact M. Chramko at the IS-SSE address.

Address: IS-SSE, 536 Oasis Drive, Santa Rosa, CA. 95407, USA.

VIEWPOINTS

AN ENCYCLOPEDIA FOR THE CLASSROOM

The final volume of John Wiley's nine-volume *Encyclopedia of Statistical Sciences* (ESS) has recently been published, and although a supplementary volume of entries missed earlier for one reason or another is due in 1989, this is a good time to stand back and look at the whole. During eight years as Associate and then Executive Editor I worked with the Editors-in-Chief Norman Johnson and Sam Kotz to guide the project to its conclusion.

Contributors and others in academic fields already use ESS entries in their teaching. This is not surprising; in the Preface to Volume 1 the Editors-in-Chief wrote: "The purpose...is to provide information about an extensive selection of topics concerned with statistical theory and the applications of statistical methods in various more or less scientific fields of activity. ...This information is intended primarily to be of value to readers who do not have detailed information about the topics but have encountered references...that they wish to understand." The entries were to be "pleasant and interesting to read" and were to "include historical background and perspective when these seem important..." With an enormous number of contributors from all across the world, we achieved a diverse range of styles and levels of sophistication.

In editing, insofar as we conformed to these aims we made the ESS a better educational tool. The 'typical' reader of an entry was seen as someone with some basic knowledge of statistics but who was not an expert in the subject matter of the entry. The editing process involved anticipating questions in the reader's mind, particularly those that could be circumvented by amending the entry. Hence when a term like "asymptotically second-order correct" cropped up, as it did in an entry with extensive current interest in applications, we would ask the contributor to explain and define it. We did not hesitate to raise apparently simple questions, and for the most part the result was an improved entry. With controversial issues such as likelihood, Bayesian inference, and randomization we invited various protagonists to air their views and let readers draw their own conclusions. We helped foreign contributors to rephrase quaint terminology; one entry described the development of basic ideas in statistical research as objects of "mathematical exasperations in a capillary way" by more and more scholars who add little to the real stream of these ideas. It took a double exchange of letters to substitute "detailed mathematical exercises" for this phrase and to this day we are unsure if this really reflects the intended meaning.

ESS entries are largely expository and hence many could be useful in education. The largest group covers probability theory, mathematical statistics, statistical methods and data analysis. The contributions range from comprehensive (Erich Lehmann's STATISTICS: AN OVERVIEW, David Hoaglin's EXPLORATORY DATA ANALYSIS, or D.V. Lindley's BAYESIAN INFERENCE) to specific subjects (P.A.P. Moran's GEOMETRIC PROBABILITY THEORY, Jean Gibbons' NORMAL SCORES TESTS or J.N.K. Rao's RATIO ESTIMATORS). This group includes ideal educational material, such as Ronald Snee and Charles Pfeifer's GRAPHICAL REPRESENTATION OF DATA in Volume 3, Gary Koch and V.P. Bhapkar's CHI-SQUARE TESTS in Volume 1, or D. Ruppert's contribution *M*-ESTIMATORS in Volume 5. The latter describes the estimation problem that led Huber to introduce *M*-estimators, defines them, states their properties (as in other entries, without proof), and

outlines their applications to estimation of location parameters, multivariate location and scale parameters, and to linear models. Along the way readers are alerted to related ESS entries on influence functions and robust estimation, and to the 38 references listed at the end of the entry, which is thus a very useful one for instructors and students alike.

A few pages further on is Joe Gani's contribution METEOROLOGY, STATISTICS IN, which discusses the reduction of meteorological data, the construction of meteorological models along with their use in weather prediction, and artificial weather modification. The last-named also appears as an entry in Volume 9. Entries like these, on applications of statistics to other disciplines, are pedagogical tools for the teaching of statistical methods, whether to statistics students or to students in other fields. Such diverse fields as finance, agriculture, computer science, hydrology, anthropology, psychology, economics, medicine, and even music and religious studies are covered. There are entries on techniques and theories developed for specific fields of application, including RISK THEORY (for insurance), KRIGING (for spatial processes in geology), CONTROL CHARTS (in quality assurance), LINE TRANSECT SAMPLING (in ecology), PERCOLATION THEORY (in fluid dynamics), and DENDROCHRONOLOGY (in forestry). All of these provide expository reviews invaluable for the classroom or for background material in seminar preparation.

When I began teaching statistics in the United States in the late sixties there was little coverage in most textbooks and consequently in most classrooms of the roots of the discipline. Students need to learn how statistics and probability theory developed and where statistical problems came from, so that they can obtain a sense of identity and of our place in the scientific community. Textbooks have improved marginally since then, but have some way to go; one mid-seventies statistics-in-sociology text, for instance, asserted that χ^2 in the *F*-test was named after a researcher known as "Teacher". The ESS, however, is unique in providing a wealth of historical material, which the Editors actively solicited. There are biographies of leading scientists such as the Bernoullis, Boltzmann, Chebyshev, Fisher, Galton, Gosset, Laplace, Neyman, Poisson, Karl and Egon Pearson, Abraham Wald, and others. Many entries incorporate historical background discussion; for example, in ARITHMETIC MEAN; CORRELATION; LEAST SQUARES; MILITARY STATISTICS; PUBLIC OPINION POLLS; and RUNS. Other entries address historical topics directly. These include PROBABILITY, HISTORY OF; STATISTICS, HISTORY OF; MORAL PROBABILITY; ST. PETERSBURG PARADOX; and Churchill Eisenhart's serial study LAWS OF ERROR, I; II; and III.

The Editors have already encouraged readers to browse through the volumes. The diversity of subjects, writing styles, and level of sophistication will provide teachers with endless opportunities to use the ESS in the classroom. In the end, as always, it will be the ingenuity of the instructor and imagination of the student that will determine the extent to which the Encyclopedia will be used in education.

Campbell B. Read
Department of Statistical Science
Southern Methodist University, Dallas, Texas, USA.