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A newsletter published three times a year by the American Statistical Association-National Council of Teachers of Mathematics Joint Committee on the Curriculum in Statistics and Probability.

COMAP BEGINS HIGH SCHOOL PROJECT

COMAP (Consortium for Mathematics and Its Applications) has received NSF money for a High School Mathematics and Its Applications Project (HiMAP). The project will research, develop, and test materials in print, microcomputer, and video form for training secondary teachers to teach the applications of mathematics.

COMAP is asking teachers to suggest specific topic areas for the project. Please write them and tell them how much we would all like to see some materials for statistics. Describe the specific statistical topics, such as hypothesis testing or probability, that you would like to see developed and field-tested. You can also ask to receive the project newsletter (no charge). The address is COMAP, 271 Lincoln St., Suite 4, Lexington, MA 02173.

GAIL BURRILL HONORED

Gail F. Burrill, a member of the ASA-NCTM Joint Committee from Whitnall High School in Greenfield, Wisconsin, was one of 104 mathematics teachers honored by the 1984 Presidential Awards program. Two mathematics teachers are selected from each state, the District of Columbia, and Puerto Rico.

Gail will be one of the speakers at the Quantitative Literacy Project's conferences to be held in Rockford, Illinois on March 25-26, 1985 and in San Jose, California on April 29-30, 1985. For more information about this conference, see the Calendar section of this newsletter.

THE NIGHTINGALE NETWORK

One of the many frustrations facing a teacher of statistics is the knowledge that, "out there, somewhere", are fascinating sets of data of great interest to a high school statistics class. These data are mentioned in articles, textbooks and the

like, but very rarely does the high school teacher have the opportunity of exploring the data at first hand. What is needed is a simple way of allowing statistics teachers to exchange data, using equipment that is readily available.

During the summer of 1984, the Woodrow Wilson National Fellowship Foundation organized a Summer Institute for 50 High School Statistics teachers. Several of the teachers at that Institute worked to develop a means of exchanging interesting data sets using a remote bulletin board system (RBBS). The outcome of their work is the NIGHTINGALE NETWORK and the associated protocol for formatting the data.

There are many hundreds of remote bulletin board systems in operation in North America. To run such a system on a microcomputer requires appropriated software and an "intelligent" modem that is capable of "answering" an incoming call. The Nightingale Network runs on an IBM XT using software developed by the Capital PC Users Group in Washington DC. After dialing the number of the Network, 604-753-3718, the caller will hear a single ringing tone, followed by a high pitched continuous tone, indicating that the system is in operation. The caller is then connected to the bulletin board and proceeds to sign on, answering the prompts that are given.

The RBBS software is menu driven, and help screens are provided. There are basically two main components of the system, the message system and the file system. Messages can be read, or left for other users, and files can be uploaded and downloaded. At the moment, all files are public. The largest file is data on 25 variables from 712 high school students in Nanaimo, Vancouver and Chicago. This is the collection of data referred to in the 1984 Yearbook of the National Council of Teachers of Mathematics. Other datafiles are being added to the collection each month.

The trial period of the Network will continue until the spring of 1985, at which time the system

will be online 24 hours a day. This will become possible with software that will be released at that time permitting the computer to run several tasks at the same time. Currently the system is in operation from 2000 (Pacific Standard Time) Friday to 0800 (PST) Sunday. The operation of the Network is made possible by the support of the Woodrow Wilson National Fellowship Foundation.

To make full use of the opportunities provided by the Network, software will be needed that takes data in the form of the Nightingale Datafile and allows exploration by graphical and other means. Such software is available for an IBMPC. But this requires 384K of memory and runs under STSC APL. Similar packages are currently being developed for other microcomputers. The Nightingale Protocol has, however, been designed in as simple a format as possible, in the hope that students can develop software that uses this format.

The Network will continue to operate as long as there is a demand. If there is sufficient demand, it may become possible to investigate the possibility of linking the network to one of the larger Networks such as Source, or Compuserve. But that depends on you.

To get the procedure for using the Network, write to me,

— Jim Swift
R. R. #3, Site E
Nanaimo, B.C. V9R 5K3
Canada

THE IMPACT OF CALCULATORS AND COMPUTERS ON TEACHING STATISTICS

The International Statistical Institute has in the past sponsored a number of round table conferences on teaching statistics. These conferences have been organized with a small number of invited participants and observers and each time dealing with a specific topic.

The round table conference in Canberra, Australia took place in August, 1985, just before the Fifth International Conference on Mathematics Education in Adelaide. The theme of the conference was The Impact of Calculators and Computers on Teaching Statistics, and it was organized by Lennart Rade, Chalmers University of Technology, Gothenburg, Sweden and Terry P. Speed, CSIRO Division of Mathematics and Statistics, Canberra, Australia.

Participants from the United States and Canada were Joe Gani of the University of

Kentucky, James M. Landwehr of AT&T Bell Labs, and Jim Swift of Nanaimo Senior Secondary School in Nanaimo, British Columbia.

The round table conference made a number of recommendations, some of which are summarized below.

1. Calculators and computers must be recognized as tools of basic importance in the teaching of statistics, as well as its practice. They should, wherever possible, be made accessible to all teachers and students of statistics; teaching methods and syllabuses in statistics courses must take full account of their availability.

2. To respond constructively to the impact of calculators and computers on statistics, the training of new teachers and the retraining of existing teachers is essential. A start could be made by including statistics in courses for potential teachers; these should be practically oriented, with an emphasis on the use of calculators and computers. At a more general level, projects like the ASA-NCTM's Quantitative Literacy Project in the USA, the Indian Statistical Institute's ISEC in Calcutta, and the Sheffield Centre for Statistical Education should be strongly supported.

3. Continuing research is needed to determine at what age and through what methods statistical concepts can be effectively learned by children; at what stage calculators and computers can best be introduced in the teaching of statistics; and for what statistical purposes calculators and computers are best suited.

4. The development of new texts making use of calculators and computers for statistics courses should be strongly encouraged; these should include good statistical data, examples, and suggestions for projects. Publishers should be made aware of the importance of providing software to accompany their statistical texts.

The proceedings of the conference will be published under the title *Teaching Statistics in the Computer Age* by Chartwell-Bratt Ltd, England and will appear in 1985. The proceedings will contain the recommendations of the conference, a list of participants and observers, a bibliography, and the papers presented with discussions. Write to Chartwell-Bratt Ltd at Old Orchard, Brickley Road, Bromley, Kent BR1 2NE, England.

— Lennart Rade
Chalmers University of Technology
Gothenburg, Sweden

REPORT ON ICME5

The Teaching of Statistics was one of ten topic area study groups at the International Congress on Mathematical Education held in Adelaide, Australia last August. During the four sessions, four major national projects were described. We reported, with Jim Swift, in the first session on the efforts of the ASA-NCTM Joint Committee to promote the teaching of statistics in the K-12 curriculum. The Quantitative Literacy Project has been funded by the National Science Foundation and four booklets will be field-tested this year: Exploring Data, Probability, Simulation, and Information from Samples.

In the second session, Peter Holmes described the work of the Statistical Education Project in Great Britain. Materials are being developed for teaching the statistics involved in non-mathematics courses.

In the third session, New Zealand high school teachers discussed how they incorporate project work in their statistics courses. The New Zealand Statistical Association's booklet *Statistics at Work* contains many useful case studies.

In the final session, Daniel Lunn of Great Britain's Open University showed videotapes from the University's television course in introductory statistics. These programs include several interesting computer simulations and displays. For example, three-dimensional perspective plots of bivariate normal densities are shown as the correlation coefficient changes from zero to one.

A general impression we formed at ICME5 was that many classroom teachers are interested in teaching more statistics and probability, both at the high school and middle school levels. Some forces motivating this are the desire to have more real-world content in mathematics classes, and the opportunities for data analysis and simulation provided by the increasing availability of computers.

— Jim Landwehr
AT&T Bell Laboratories
and
Ann Watkins
Los Angeles Pierce College

SUMMER POSITION AVAILABLE

The Johns Hopkins University Center for the Advancement of Academically Talented Youth (CTY) has teaching positions open for its residential programs, late June through early August, 1985, in three and/or six week sessions. CTY offers course work in Quantitative Economics and Probability and Statistics to academically talented students whose ages range from 12 to 16. Both courses are taught at the

college level, but neither require knowledge of calculus

Teaching experience at the advanced high school and/or college level in these specific subject areas is required. The program will be housed at the campus of Franklin and Marshall College in Lancaster, Pennsylvania.

Interested persons should call 301-338-8427 or send a letter of interest, curriculum vitae and three references to:

— Dr. Sharon Higham
Head, Science and Mathematics Programs
CTY, The Johns Hopkins University
Charles and 34th Streets
Baltimore, Maryland 21218

LETTERS

Having just read the September issue of the *Statistics Teacher Network*, I note that the lead article distinguishes statistics education from mathematics education. This may be a long term strategic error, as the renewed emphasis on curriculum is, at least in K-12 circles, strongly connected to traditional high school departmental organization (This is true for elementary as well as secondary schools.) This makes it difficult to get attention even for development of thinking skills (higher order, if you will), more so for non-traditional "subjects" such as statistics.

The probably necessary approach for K-12 is to proclaim the importance of statistics *within* mathematics. The draft of the mathematics framework for California takes that approach. As you might expect, we have been criticized by various professors of mathematics who say that algebra and geometry are far more important than statistics, while the framework implies parity.

— Walter F. Denham
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California State Department
of Education
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NEW PUBLICATIONS AND PRODUCTS

Teaching Statistics.

Teaching Statistics is a journal published three times a year at the University of Sheffield. The articles are primarily directed at teachers of introductory statistics courses, such as are offered in high schools and colleges in the United States.

As an example of the types of articles published, the September 1984 issue contains an article by Allan J. Macleod and G. Robin Henderson on "Bounds for the Sample Standard Deviation." They prove several inequalities that

can serve as "reasonability checks" on estimates and student computations. Two of these inequalities are:

$$MAD \leq \sigma \leq \frac{R}{2}$$

$$\frac{R}{\sqrt{2n}} \leq \sigma \leq \frac{R}{2}$$

where R is the range, n is the sample size, σ is the standard deviation, and MAD is the mean absolute deviation.

Another article, "Lotteries and Probability: Three Case Reports" by James A. Hanley quotes newspaper articles about lotteries and discusses the implications for teaching probability. One of the newspaper articles is from the 1978 *Boston Evening Globe*:

"During the Game's (Massachusetts Daily Lottery) 22 month existence, the illegal numbers pool has switched its payoff from the race-track parimutuel pool to the legal number. In that period, no winning number has ever been repeated, although the same four digits have won a second time in different sequence. Hughes, the expert, doesn't expect to see duplicate winners until about half of the 10,000 possibilities have been exhausted."

Probability teachers will recognize this as equivalent to the "birthday problem" in which there are 10,000 possible birthdays and 660 daily drawings. In fact, the probability of no repeat after about 660 plays is only 22 billionths of a percent. Hanley says that after this article appeared, apologetic Lottery officials announced that there had indeed been repeated numbers: seven separate numbers had repeated in the 22 months.

To subscribe to *Teaching Statistics*, send a check for \$11.50, made payable to *Teaching Statistics*, to Peter Holmes, Editor, *Teaching Statistics*, Department of Probability and Statistics, University of Sheffield, Sheffield, S10 2TN, England.

Minitab

In 1972, Brain Joiner, Thomas Ryan, and Barbara Ryan, who were teachers at The Pennsylvania State University, developed a statistical computing system that would serve as an aid to students in introductory statistics classes. Minitab has proved to be extremely popular, not only for use in college statistics courses, but with researchers and other professionals. Last August, Minitab finally became available for use on microcomputers. Versions for the IBM PC and other computers running the MS/DOS operating system can now

be ordered. You will need 256K RAM and MS/DOS version 1 or 2.

The Fundamental Module provides the most commonly used statistics and data manipulations such as plots, histograms, descriptive statistics, simple and multiple regression, analysis of variance, non-parametrics, cross-tabulation, and random data generation.

When licensing one or two modules for the IBM PC, the price per module is \$500 (\$250 academic). A customer Trial Version of Minitab is available for a deposit of \$75. For more information, write Minitab, Inc., 215 Pond Laboratory, University Park, PA 16802.

CALENDAR

The Quantitative Literacy Project of the American Statistical Association will hold four regional conferences to explore instructional strategies and specially designed educational units for teaching statistics and probability in middle and secondary schools. Participants will be shown how to conduct training sessions on statistical techniques for teachers. The workshops will be held:

March 18-19, 1985 in East Hartford Connecticut

March 25-26, 1985 in Rockford, Illinois

April 21-22, 1985 in Dallas, Texas

April 29-30, 1985 in San Jose, California.

To request further information write to Dorothy Perreca, Project Coordinator, Quantitative Literacy Project, American Statistical Association, 806 15th Street, NW, Suite 640, Washington, DC 20005 by January 15 or phone (202) 393-3253.

The Annual Meeting of the Mathematical Association of America will be held in Anaheim, California on January 11-13. On Saturday morning, there will be a contributed paper session titled "Teaching introductory statistics: topics, trends, and techniques." Papers will be presented on computer simulation, computer graphics, student projects, acceptance sampling, and other statistical topics.

WHERE TO WRITE

Send all letters, announcements, questions, and requests to get on the mailing list for this newsletter to the editor,

— Ann Watkins
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