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newsletter

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## SYDNEY INTERNATIONAL STATISTICAL CONGRESS (SISC-96)

SISC-96, or to give it its full title The Sydney International Statistical Congress 1996, took place at the Wentworth and Intercontinental Hotels in Sydney from July 12 - 18. The Congress was an integration of three conferences

- the 13<sup>th</sup> Australian Statistical Conference, which ran throughout the week and took as its principal themes "Quality" and "Environmetrics";
- the 28<sup>th</sup> Interface Conference, which ran for the first two and a half days of the week with a theme of "Graph - Image - Vision"; and
- the IMS Special Topics meeting on "Contemporary Nonparametrics", which ran for the last two and a half days of the week.

The Congress was attended by 873 delegates and 30 registered accompanying persons. There were about 130 one-day registrants, and about 100 delegates registered as students. The delegates were drawn from some 45 countries; about 550 were from Australia. It was very gratifying to see a strong contingent (55) from New Zealand, testimony to the active support SISC-96 received from the New Zealand Statistical Association.

The scientific program contained 5 plenary addresses, about 170 invited papers and 320 contributed papers (including poster presentations). Three streams of invited papers and three (or more) of contributed papers were scheduled at the Wentworth. In addition, four specialist one-day workshops were held at the Intercontinental Hotel, about ten minutes walk from the Wentworth.

Associated with the Congress were nine satellite workshops; reports on some of these will appear in this Newsletter. The satellite workshops were

- Nonparametric Statistical Methods: The Road Ahead
- Workshop on Recent Developments in Time Series and Chaos
- Third International S Conference
- Statistical Education Workshop
- Dynamic Statistical Graphics Workshop
- Stochastic Networks Workshop
- Workshop on Introductory and Advanced Mathematical Morphology
- Ecological Risk Assessment and Indices of Aquatic Pollution
- Second Australia-Japan Workshop on Stochastic Models in Engineering, Technology and Management

The organisers of these very successful workshops are to be congratulated for their contribution to the Australian statistical community.

SISC-96 was the biggest statistical congress held in Australia, and was a great success scientifically and socially. The many people who contributed to the Congress as members of the organising committees, session organisers, session chairpersons, etc. can be well pleased with the results of their efforts.

Doug Shaw

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## PRESIDENT'S REPORT

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SICS 96 was not only an outstanding conference accompanied by its many- hued satellites, but also marked a week of significance in many ways. Each Australian Statistical Conference is special, each having its own particular memories

The 13th ASC was very special in being part of SISC-96 which brought to Australia for the first time Interface and a special topics meeting of the Institute for Mathematical Statistics. Yet the feeling was very much that of one conference; multi-faceted, yes, but one conference of many delegates with varied interests but unified in their involvement and commitment as statisticians.

Because a number of the week's happenings from such as Annual General Meetings, special meetings and talks, are, or will be, reported elsewhere, such as in this Newsletter, our Journal and our World Wide Web site, I would like to take the opportunity here to report on aspects of the closing session, both formal and informal.

Delegates at the presentation on the Wednesday afternoon of the 1996 Pitman medal to Professor Warren Ewens, heard Pat Moran's description of Professor Pitman's contribution to statistics, especially to Australian statistics. (The citation for Warren will appear in an issue of AJS). They also heard Pat's words of praise for the work of young statisticians in Australia, and quoted remarks from Warren's colleagues on his encouragement and support for undergraduates and young colleagues. It was thus very appropriate that the inaugural EJG Pitman prize was presented at the closing session of SISC-96. The finance for the prize comes from a bequest from Professor Pitman, and the rules were established by Central Council earlier this year after consultation. The prize is for the most outstanding talk presented by a "young statistician" at an Australian Statistical Conference. The rules, including a definition of "young statistician", were published in March's Newsletter and included in the Society's Regulations at the Annual General Meeting of Council. I would like to again thank the panel of Drs Ann Eyland, Michael Adena and Ian Saunders, for the quietly thorough and committed way of going about their task of attending and assessing about fifteen nominated talks scattered throughout the week and rooms! I would like to repeat their report here.

"The panel wish to commend the students on the generally high quality of their talks, both in terms of context and presentation. The panel looked at: motivation and setting; organisation and structure; presentation and rapport with the audience; and originality. Deciding among the talks was a difficult job." The panel identified five students who they felt deserved recognition; only one, however, could be awarded the Prize. The four students who were particularly commended are, in alphabetical order: Ingrid Baade, Neil Crellin, Yvette Mallett, Violetta Misiorek, and the 1996 EJG Pitman Prize was awarded to Steve Davies.

Congratulations to all the young statisticians who contribute so much to our conferences and meetings, and best wishes for all your future work.

It was both interesting and pleasing that a number of speakers during the week referred either directly or indirectly to some of the themes in my address on Wednesday. (It has been requested that this address be put on the Society's Web site.) These included the evolution of statistics as a science in its own right and in interaction with other scientific/quantitative areas; our increasing awareness in practice and teaching, that statistical science involves a holistic approach to problems; and that diversity of statistical applications and work may disperse us but also unify us. These themes were again present in some fine overview and specific talks on the last day, including Professor Bernard Silverman's plenary address which provided a fitting finale to a fascinating and varied program. It was a measure of the success of the conference for our international visitors, that Professor Silverman took the opportunity of being the final speaker, to pay a tribute and thanks to the conference and its organisers.

Australian Statistical Conferences are not only good scientific conferences, but play an essential role in our professional interaction and development. A highlight of the closing session at SISC-96 was a short video made up of clips from throughout the week presented in montage format over a typical "tourist" background of Australian scenery. The result captured in just a few minutes of film, the enormous vibrancy of the conference participants in conversation, in talks, in the whole interactive process so important to professional health and vitality. In my many interactions with school students and teachers, and undergraduates, the interest in the people power of professions is always apparent, and that short video could be used as a wonderful ambassador for the people of our profession. In my closing remarks I made use of an article lent to me by our ACT Branch president, on the occasion of the presentation of the Hannan medal to Professors Peter Hall and Chris Heyde in 1995. The article referred to the "improbable event" of "excited mathematicians", and "the excitement potential of this rare and normally level-headed mammal", namely, professors of statistics. The amusement generated in the conference audience by these quotes put alongside the vibrancy just seen in the video clip, clearly indicated that the audience did not feel that level-headedness about our work was incompatible with excitement about our science and our profession.

We always thank our conference-organising members, but we must ensure we thank them as publically and often as possible. The delegates' appreciation of the work and dedication of all the SISC-96 organisers including those of Interface and IMS, collectively and as individuals, was loudly and clearly demonstrated in the closing session. It

is not inappropriate to thank the whole team again, particularly in helping them in coping with the aftermath of a conference. We presented a number of key players with something portable and warming, that would assist with the conference aftermath by helping the warm glow and that could be shared, along with memories, with the team. We hope that Nick Fisher and his teams enjoy their memories of a vision that came to fruition as much as we enjoyed the result of their work. Conferences need a combination of organisation and vision, of individual efforts and teamwork, with program teams having input from the whole Australian statistical community. It is these combinations that produce the combinations of exciting and relevant scientific programs with the environment that maximises the benefits of collegiate gatherings. It was, and is, a privilege to say thank you on behalf of the Society.

Helen MacGillivray

### **PAPERS ON SURVEY SAMPLING INFERENCE**

During the Workshop on Survey Design and Analysis held in Sydney on Wednesday 10 July as part of SISC-96, I offered all those present the opportunity to receive copies of two papers I had written on procedures for combining design-based and model-based inference. A list was circulated to enable people to indicate their interest in this offer; but due to a hitch in communication, for which I accept full responsibility, I failed to pick up this list at the time and place that I was expected to.

Would anyone who would still like to receive copies of these two papers please contact me at the following address: Department of Statistics, Faculty of Economics & Commerce, Australian National University ACT 0200; or by email on [brekstat@beatbox.anu.edu.au](mailto:brekstat@beatbox.anu.edu.au) and I will see that the matter is attended to immediately. The SSA Newsletter is the only convenient means I have of spreading this message, so if readers know of any others who went to that workshop but are unlikely to see this issue, would they please draw their attention to this item.

I offer my sincere apologies to all those who have been inconvenienced by this misunderstanding.

Ken Brewer

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## CENTRAL COUNCIL

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Notes from Annual General Meetings of Central Council of the Statistical Society of Australia Inc (SSAI) and Australian Statistical Publishing Association Inc. (ASPAI) held in July 1996 at Wentworth Hotel, Sydney.

### **The Australian Journal of Statistics**

As mentioned in earlier Newsletter reports SSAI has been moving towards closer cooperation with NZSA. One aspect of our discussions with NZSA has been the proposal to have a common journal. On July 7 the Central Council of SSAI voted unanimously to merge 'The Australian Journal of Statistics' with 'The New Zealand Statistician' to form 'The Australia and New Zealand Journal of Statistics'. We were grateful that the editor of 'The New Zealand Statistician', Murray Jorgensen, and the President of NZSA, Jeff Hunter, were able to attend the Central Council meeting to participate in the discussion of the many issues involved in merging the journals. Slight changes to the Rules of SSAI and the Rules of ASPAI relating to the journal name and editorial structure will have to be put to a Special Meeting of the Society to allow the merger to go ahead. It is hoped that the merger can take effect from the first issue in 1997.

The Central Council also voted unanimously to pursue the possibility of publishing the merged journal with a commercial publisher. Moving to a commercial publisher was seen as necessary if we are to lift the international profile of the journal and be in a position to take advantage of the developments in electronic publishing that are starting to have an impact on the journal market.

There was an extensive discussion of editorial policy both at the Central Council meetings and at the AGM of the Society on 10 July.

### **Strategic Review of the Mathematical Sciences**

The final report entitled 'Mathematical Sciences: Adding to Australia' had a public launch at a one day symposium at the University of New South Wales on 23 February 1996. The Council looked at the Recommendations made in the report and drafted a response to the four Recommendations that were specifically directed to professional societies.

### **Sections**

Geoff Riley and John Hopper retired as Section Chairs at this meeting after having been very active in organising and directing various Section activities for many years. The Society is indebted to people like Geoff and John who contribute so much to the Society.

A vote of thanks to all Section Chairs for their work over the past year was moved by the President. The new Section Chairs are John Carlin (Statistics in the Medical Sciences), Teresa Dickinson and Geoff Robinson as joint Chairs of the Industrial Statistics Section and Susan Hoffmann as Chair of the Young Statisticians Section.

### **Pitman Medal**

The 1996 Pitman Medal was awarded to Professor Warren Ewens, FAA. A full citation will appear in the next issue of the Journal.

### **Conferences**

The next Australian Statistical Conference (ASC) will be held on the Gold Coast in Queensland in July, 1998. The South Australian Branch have been invited to host ASC 15 in 2000 and the Canberra Branch have agreed to host ASC 16 in Canberra in 2002. The Executive investigated the possibility of holding a joint conference with NZSA in 2000 in New Zealand but NZSA is planning a major conference in 1999 to celebrate the Association's 50th Anniversary and so another major conference in New Zealand so close to the 1999 meeting was not feasible.

### **Budget**

The Treasurer presented a draft budget for 1996-7. The capitation fees for 1997 will be held at their current level of \$45 for ordinary members.

### **Accreditation**

The Rule changes to allow optional accreditation to proceed were passed at the AGM of the Society on 10 July 1996. The Accreditation Model was included in the Regulations of the Society on 11 July 1996. The Central Council now has to appoint an Accreditation Committee whose first task will be to produce guidelines for the accreditation process which Council will consider at its February meeting in 1997. The first call for applications for Chartered Statistician status should be made early next year. A request for expressions of interest in being a member of the initial Accreditation Committee appears in this Newsletter.

### **Careers Posters**

The Society will investigate the production of posters providing profiles of various statisticians as a means of promoting the profession.

### **Election of Office Bearers**

Professor Des Nicholls was elected as Vice President at the July meeting and so is President-elect. He will take office as President after the AGM in July 1997.

Michael Adena was appointed as Circulation Manager taking over from Jeff Wood who has done a splendid job as Circulation Manager for many years. The Circulation Manager is one of the key people behind the scenes who ensures the smooth operation of the Society's publication activities.

The President paid special thanks to retiring Vice President, Ron Sandland for his leadership and outstanding contributions to the Society over the past four years.

Helen MacGillivray

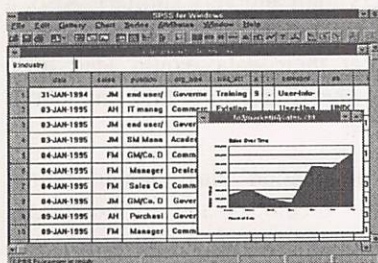
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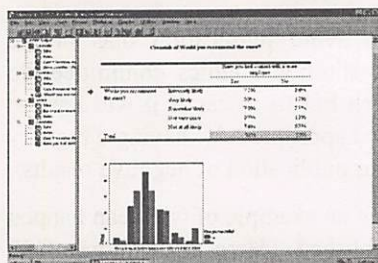
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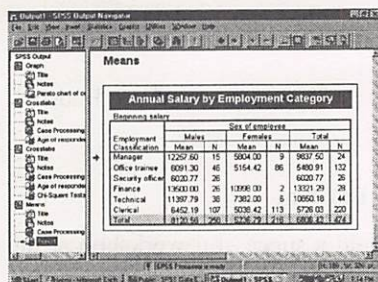
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## BRANCH REPORTS

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### New South Wales

#### Industrial Statistics - Isn't that all "Old Hat"?

At the May meeting Doug Shaw from the Quality Improvement Group, Division of Mathematics and Statistics, CSIRO spoke on 'Industrial statistics - Isn't that all "Old Hat"?'.

Doug started by telling us that there is a common view amongst many statisticians that "industrial statistics", the application of statistical ideas and methods in industry, consists of routine application of well-known statistical tools. For example, acceptance sampling, Shewart control charts, reliability analysis, factorial designs and maybe some response surface methodology.

Apparently, what the CSIRO group has seen in the past 6 to 7 years contradicts this common view. There has been a shift in industry's attitude to an increasing appreciation of statistics and, in some cases, an understanding of the value of being able to obtain and apply innovative statistical techniques - commercial advantage.

There are three aspects to statistics in industry:

- implementation of established techniques;
- development and implementation of innovative techniques;
- addressing more fundamental questions of measurement and the use of measurements.

The implementation of established techniques is being pushed by the need for ISO 9000 certification and the general impetus for 'quality and continuous improvement'. But the standard techniques are only good when used in the right context. Most processes really have multivariate measures and/or correlated data. More and more data is coming from images and we need to integrate statistical process control (SPC) with the automatic process control (APC) of control engineers. These issues lead us to the innovative side of statistics. Finally, statisticians can play a major role in addressing questions of measurement by suggesting appropriate displays and helping organisations collect the right data in the first place.

Doug summarised his talk by saying that there still is a fair bit of 'old hat' in industry but that there were opportunities to turn the hat over and pull out rabbits!

#### Publication Bias

Debbie Street, School of Mathematical Sciences, University of Technology, Sydney spoke on publication bias at the June meeting. She considered some definitions of publication bias and ways of detecting it and suggested ways of reducing it in future.

Firstly, in general, publication bias relates to the fact that studies with significant results are more likely to be published. There is a bias against negative results. Debbie identified three stages of publication bias:

- pre-publication bias that influences type of research;

- publication bias where decisions to publish are not made solely on quality issues;
- post publication bias influencing interpretation.

Anecdotal evidence shows that we are excited by affirmatives and so add to the bias problem. Debbie showed some evidence of publication bias by looking at the proportion of articles with a significance test that had a significant result for the years 1955-56 and 1986-87. The proportions were very high and very similar! Also, a survey of author generated bias found that 80% of researchers predicted that their data would lead to a rejection of the null hypothesis and so would not submit their results for publication.

Methods of detecting publication bias include funnel plots, rank correlation methods and hypothesised sampling models such as ranked sampling, truncated and weighted sampling.

The consequences of publication bias are that the results of any meta analyses may be distorted. This may lead to inappropriate treatment choices.

Debbie's suggestions to avoid publication bias in the future include getting institutional ethics committees to not only approve research but to assess if it was carried out as agreed and reported appropriately, having a registry of trials and incentives for publication of negative results.

She finished off by giving an example of what can happen even if all trials are published. Here the authors of 37 studies were contacted and 32 responded. 21 of these admitted their data was lost or destroyed, 2 gave the data with conditions, 7 gave the data but 3 had errors in their statistics and 2 said they would send the data but it never arrived!

Caro Badcock

### Victoria

#### Graphics Workshop at Ballarat

The Statistical Society held a successful workshop at the University of Ballarat on February 9. Twenty one participants had hands on experience of S-Plus Trellis graphics, under the helpful leadership of Damien Jolley and Gary Grunwald from The University of Melbourne.

Many stayed on for enjoyable evening activities at the Ballarat Fine Art Gallery and Sovereign Hill Historical Park. Thanks to Ballarat's School of Information Technology and Mathematical Sciences for hosting the event.

#### Honours Scholarships

Congratulations to Ms Tanya Smith, Ms Janine Dixon and Mr David Middleton who have each been awarded scholarships by the Society for their honours year. Tanya and Janine are students in the Department of Econometrics; David is in the Department of Mathematics. All three winners attend Monash

University. Each award consists of \$500 plus one year's membership of the Society.

### **The Effects of A Variable Proportion of Defectives on Quality Control Procedures**

At the February meeting Professor Keith Ord, Pennsylvania State University, USA discussed the effects of a variable proportion of defectives on quality control procedures. Initially the underlying assumptions of Deming's all or none rule for acceptance sampling was discussed. Then followed a brief discussion of the total cost function for sampling assuming that the binomial distribution was applicable. The intuitive conclusions of if the process is under control no sampling is required followed; to this was added that if the cost of sampling is very cheap, and the process is usually under control, then it may be better not to sample and leave the user of the goods to do any sampling. In practice some balance between the two is required and happens.

Discussion then centred on what changes were required to the analyses if the proportion of defectives,  $p$ , changed from batch to batch. By using the beta distribution which is the conjugate for the binomial, expressions for the expectation and variance were obtained for the number of defectives left in the sample. The resulting cost function was then obtained, concluding with the result: Acceptance sampling is important when there is considerable variation from batch to batch with the value of the sample diminishing as the variation decreases. A number of examples using the P-chart description, the use of the two for deciding between narrow and wide control limits together with the use of Minitab, followed.

### **Being Bayesian in biostatistics: what does it mean in practice?**

The March talk was given by Dr. John Carlin, Clinical Epidemiology and Biostatistics Unit, Royal Children's Hospital, Melbourne. John began his talk by giving us an overview of what a bio-statistician does, discussing his own research, and briefly about a book of which he is a coauthor. The discussion then moved to discuss the differences between Bayesian and Classical interpretation of statistical problems. For example, most users of statistical methods in medical research are unaware of the strict sampling-theory interpretation of a confidence interval. A proposed advantage with the Bayesian approach to problems is that they sometimes provide relatively simple computational strategies for obtaining inferences. A number of examples where the power and flexibility offered by the Bayesian approach combined with some modern computational methods, such as Markov Chain Monte Carlo, were then detailed.

### **Statistical Tools for Analysing Melbourne's Weather**

The April talk was given jointly by Dr Gary Grunwald, Department of Statistics, The University of Melbourne and Dr Rob Hyndman, Department of Mathematics, Monash University. Melbourne's weather is always a lively and interesting topic as it rightfully attracts great interest from Melbournians. This month's talk, presented in four quarters like an AFL match, started with

Melbourne's daily minimum and maximum temperatures as a tool for students to come to grips with data quality issues as part of proper data analysis. Moving onto some basic questions that might be asked about weather data it quickly became apparent that standard box plot and kernel smoothing tools needed to be extended to highlight a blend on mono modal and bimodal data.

Gary Grunwald presented two quarters of the talk that tackled box plots for the temperature data and seasonal transition models for rainfall data. Rob Hyndman presented a discussion on conditional densities and autocorrelations that changed with season.

Both speakers demonstrated that analysis of the data acted as a great learning tool for students and provided excellent research topics for more advanced study to extend existing techniques.

### **Water Quality in the Murray-Darling Basin**

The May talk was presented by Dr Neville Bartlett of N.R. Bartlett Consulting, Albury - Wodonga who described a database of water quality information that has been gathered since July 1978. About 30 physico-chemical variables are regularly monitored at 35 sites in the Murray Darling basin. Water quality is becoming a very significant issue in the basin, primarily because of the effects of salinity, but other parameters such as phosphorus levels are also important. Dr Bartlett described how a series of tables and profile charts had been constructed to illustrate how water quality declined as water travelled down the River Murray. It was particularly interesting to see the increase in salinity after water reached South Australia and it was explained that this is primarily due to ground water that drains into the Murray. Each profile chart highlighted the difficulties faced by central South Australia as this area relies heavily on Murray water.

Techniques that had been successfully used for market planning/forecasting were described and examples were presented. These methods fitted smooth trend and estimated multiplicative trend factors to monthly means and are proving a useful means of highlighting some of the vagaries of flow and other quality measures in the Murray-Darling system. One particular example was used to quantify the impact of the Darling River on phosphorus loads reaching South Australia.

Geoff Bruton

## **Queensland**

### **Methods for estimating patient injury caused by health care in Australia**

At the May meeting held in the Kym Beazley Room, Queensland University of Technology, Associate Professor Bob Gibberd (Director of Health Services Research Group, Department of Statistics, University of Newcastle) spoke on 'Methods for estimating patient injury caused by health care in Australia'.

Bob gave a candid and stimulating account of the woe and rewards reaped by his statistical research group when dealing with sensitive issues in the medical world. He

focused on his latest project, the Quality in Australian Health Care Study, a large and expensive study to estimate the proportion of hospital admissions associated with an iatrogenic injury or adverse event (AE). The project is near the end of data collection phase and preliminary analyses have started. Much of the design and statistical analysis was carried out by staff at the Health Services Research Group, University of Newcastle.

In existing literature, most work on quality involves pseudo-measurements (length of stay (LOS), mortality rate, etc.). However, one should aim to measure 'disquality' (as in J Smyth, 1959, *Med J Aust*) since financial accounting is tight but patient care quality is slack. The project is based on a major Harvard study. To be included in the study as an AE, all of the following three criteria have to be satisfied: injury or complication; disability (including LOS); and causation by health care management rather than disease event.

The aim was to provide a population-based measure of incidence of adverse patient outcomes through a randomised study. The method was to review 14655 medical records between 30 hospitals stratified by state (NSW and SA) and by type of hospital (teaching or non-teaching). The sampling design was a two-stage cluster design.

Care had to be taken to minimise disruption of hospitals and to avoid comparing hospitals. The design was based on the Harvard estimate of probability of injury ( $p=3.5\%$ ). Major problems were encountered due to large variation between large hospitals and that the estimated probability of injury in Australia is  $p=13\%$ . Hence the actual number of medical records sampled was 2353 per hospital rather than 500 as initially planned. This inflated the research cost (\$40 per record) at least fourfold: fortunately the research group was able to find the extra funding. Other problems encountered included the refusal of some hospitals to participate (finally only 28 hospitals took part); unexplained missing health records; and over 20% of records had an unplanned readmission over the previous twelve months.

A well-trained nursing staff was employed for initial screening of AEs: 44% were screened to be positive AEs, resulting in 35% of true positives. These numbers are double the size presented by the Harvard study (20% screened positives resulting in 17% true positives).

SUDAAN was the software used to calculate standard errors associated with relevant estimates and to fit models to the data. More problems were encountered here since SUDAAN requires knowledge of quantities such as the probability of a particular hospital to be included and the probability of the joint inclusion of any two hospitals. Analyses should be undertaken with caution since large biases of estimates may be observed if the small hospitals had large AE rates in comparison to large hospitals. It was observed that logistic regression shared characteristics of the design resulting in a 10% increase in standard errors of regression coefficients.

Overall, the recent major findings indicated that in Australia, 16.6% of admissions were associated with an AE, and that 18.5% of the AEs resulted in varying levels of permanent disability, including death. As the result of the ongoing study, there has been a push in health care to monitor quality in hospitals and to provide data for clinical indicators; however, simple statistical analyses showed that clinical indicators seem to bear no relationship to AEs. The main message from Bob is that simple measures of quality do not function well. Also cost can be minimised if a well-trained nurse is employed for first stage screening since there is evidence that a nurse's assessment has good agreement with doctors'.

Rodney Wolff

## South Australia

### On the use of artificial neural networks for the analysis of survival data

Dr Alan Branford, Department of Mathematics and Statistics, The Flinders University of South Australia spoke to the May branch meeting on the use of artificial neural networks for the analysis of survival data.

Artificial neural networks (ANNs) are non-linear operators which take a finite number of inputs and return a finite number of outputs. The crucial characteristic of ANNs is that they adapt to training data. For this reason, they are often applied to situations where there are complicated non-linear interactions between the inputs and the outputs. Early applications of ANNs were in cognitive tasks such as hand-writing recognition.

ANNs have been increasingly applied to more traditional areas of statistics, and recently in particular to the analysis of survival data. Covariates for each subject form the inputs, and the single output is usually the subject's survival time. However, ANN approaches to survival analysis have typically regarded censoring as a nuisance to be handled in an ad hoc fashion, rather than as a fundamental aspect of survival data.

In the presentation, an introduction to ANNs was given and existing applications to survival analysis and their shortcomings were described. A new approach to applying ANNs to survival analysis in which a discretised hazard function is learned was discussed. That approach allows a natural handling of censoring. Examples of the efficacy of the method were presented.

*Biographical Sketch:* Alan Branford obtained a BSc(Hons) in Applied Mathematics from the University of Adelaide in 1979. He received an MSc in 1980, also from the University of Adelaide, for research in Applied Probability in the area of birth-and-death processes, and a PhD from the Statistical Laboratory of the University of Cambridge in 1983, studying paroxysmal phenomena in stochastic models involving indirect feedback. Since 1984, Alan has been a Lecturer in Statistical Science (Senior Lecturer as from 1996) at Flinders University. He is a member of the Cooperative Research Centre for Sensor Signal and Information Processing (CSSIP).



Recent interests are in biostatistics, particularly the analysis of survival data, and in image processing.

### **Improving Our Statistics Ambassadors : Applying Statistical Methodology to Teaching of Statistics**

Marg Correll, of School of Mathematics, The University of South Australia, spoke to the June branch meeting on Improving Our Statistics Ambassadors: Applying Statistical Methodology to Teaching of Statistics.

The first, and sometimes only, statistics subject undertaken by tertiary level students usually has the largest student numbers of any statistics subject and it brings substantial economic benefit to the statistics teaching department or school. Products of this subject are the most influential ambassadors for the field of statistics to the general community. What is the message that these students carry? Two former presidents of the American Statistical Association have stated that "students frequently view statistics as the worst course (subject) taken in college (university)".

For some years, there have been calls for change in the general approach to statistics education but, disappointingly, there are few signs of a major overhaul. Can improvement be made in the first statistics subject which is often a toolkit of chisquare, one/two way ANOVA and regression testing?

Suggestions were made about how academics can look at the content covered and the teaching methods used. Reference was made to integration of a statistics subject with other parts of the course and the use of a problem solving model. The usefulness of consultants, researchers, professional workers and the general community in the process was noted.

*Biographical Sketch:* Marg Correll holds qualifications of BSc, DipEd, BA(Hons) and DipCompSc. She has had a variety of teaching and non-teaching experiences. After six years of technical work in the Division of Mathematical Statistics in Adelaide, she graduated to child rearing interspersed with pure mathematics and statistics teaching at James Cook University. Geographic necessity forced her to home teach her profoundly deaf son to read and talk. Returning to Adelaide, she undertook a stint of secondary mathematics and music teaching which led into several years of educational administration with the Commonwealth Department of Education. She then started her own computer education and commercial programming business while teaching computing, musicology, mathematics and statistics at tertiary level. She is now employed as a Lecturer in Statistics at the University of South Australia and is fascinated by the challenges of classroom and research aspects of statistics education. She gave an invited paper at the 4th International Conference on the Teaching of Statistics in Morocco and was one of two Australians invited to speak on statistical education at the Sydney International Congress on Statistics in 1996.

Gary Glonek

## **Western Australia**

### **Alexander C. Aitken and his PhD students**

Dr Robin Milne gave a fascinating account of his historical research on Alexander C. Aitken and his PhD students. Aitken was born on 1 April 1895 in Dunedin NZ and graduated in mathematics from the University of Otago. This was interrupted by two year's war service in Europe. In 1923 he went to Edinburgh to study for a PhD. It was supervised by E.T. Whittaker, and he was awarded a DSc in 1925 for his dissertation. Aitken was elected FRSE in 1925, and FRS in 1936. Matrix algebra, numerical analysis, and mathematical statistics comprise his best known research areas. Significant contributions include the implicit discovery of the information inequality, independence of linear and quadratic forms in normal variates, and the use of matrix methods in statistics.

Amongst his influential mathematical texts, "Statistical Mathematics" (1939) remained significant through to the mid forties, when it was eclipsed by the publication of Cramer's monograph. Aitken was known for his prodigious memory and powers of mental calculation. He was intensely devoted to music, being a gifted violinist and composer. Aitken spent the whole of his working life at the University of Edinburgh, and after his retirement in 1963, he wrote "Gallipoli to the Somme -- Recollections of a New Zealand Infantryman", which earned him a fellowship of the Royal Society of Literature.

Over the period 1928 to 1957 Aitken supervised some twenty-two PhD students, of whom thirteen worked in statistics. The topics he supervised covered actuarial statistics, bivariate distributions and orthogonal polynomials, and some estimation problems. Two students worked on probability and matrix problems related to Markov chains. Four of the remaining students researched topics in matrix theory and four studied matrix representations of the symmetric group.

Following a lively period of questions and discussion, the meeting adjourned for dinner with the speaker at a local restaurant.

### **Super-saturated Designs**

Dr K. Vijayan, another stalwart of the UWA mathematics department, and Branch President for 1996, addressed the June meeting on super-saturated designs. Industrial production contexts can involve experiments with very large numbers of factors, 100 or 200 for example. The aim is to design experiments which exploit the fact that usually there exist only a handful of dominant factors. A well conceived super-saturated design should identify the important factors in just a few runs.

Vijayan motivated his discussion using the familiar counterfeit coin problem. For example, given four coins, one of which weighs differently to the others, find a design giving the least number of weighings with a small pan balance which will identify the counterfeit coin. An extension asks for the design which reveals whether the counterfeit is lighter, or heavier, than the other coins. The answers are 2 and 3 weighings, respectively. If  $n$  coins are

given, then about  $\log_2 n$  weighings are necessary to find the counterfeit.

The general ideas of super-saturation were then illustrated by analysing afresh a couple of data sets taken from the literature. Stunned by the erudition thus displayed, the audience retired for revivification at a nearby watering hole.

### Detecting Change Points in the Dynamics of Non-linear Time Series

Dr Neville Davies from Nottingham-Trent University certainly earned the fine meal to which he was later treated by addressing the July meeting on two rather different topics. The first concerned a graphical method he has devised for detecting change points in the dynamics of non-linear time series. Neville began with a quick review of first order threshold models where the local dynamics depends on which of several regions of the state space is currently occupied.

By contrast, a change point occurs if the dynamics change as a temporal, rather than a spatial, threshold is crossed. He introduced a statistic of  $R^2$ -type which is based on kernel density estimation. When graphed as a function of time it should show a global minimum at the change point epoch. This was illustrated with a couple of synthetic examples. One of these was a Gaussian random coefficients model whose 20 parameters changed at  $t = 100$ , and the series comprised 200 data points. Time series plots showed evidence of a change in level near the expected epoch. The graphical diagnostic successfully detected the change point in most cases, but not in all. Next, the diagnostic was applied to some much studied real series: The IBM share price series, the Hang Seng index series, and Nicholson's blowfly series.

In each case a change point is believed, with more or less certainty, to have occurred. The diagnostic coped quite adequately with the first examples. For example it located a change in the Hang Seng index in the year 1970, which agrees with finance-folk belief. It did not cope well with the blowfly data — it failed to unequivocally identify a change point. [Of course the trajectories of time homogeneous nonlinear dynamical systems can show very different qualitative behaviours over time. Perhaps the diagnostic knows this!]

Neville concluded that graphical methods are under-represented in time series analysis, and a particular need is for ways of detecting when the dynamics switch in and out of stationary regimes.

He then turned to a commendation of the variogram for identifying classes of time series models. For a series  $\{Y_n\}$  define

$$G(m) = [\text{Var}(Y_{n+m} - Y_n)] / [\text{Var}(Y_{n+1} - Y_n)]$$

$$D(m) = G(m) - G(m-1),$$

which depend only on  $m$  if the series is stationary. This can happen too for some non-stationary models. This quantity is easy to compute and graph. The idea is to determine the algebraic behaviour of these quantities for a family of models, such as an ARIMA family with a fixed order of differencing, members of which may model a

given series. Plots of  $G(m)$  or  $D(m)$  are compared with expectations to check for special behaviours. For example  $G(m)$  is linear in  $m$  for an integrated MA process, and the slope vanishes when the MA constant is unity, i.e., the process is a random walk. Again, suppose the series is a first order AR process with a Gaussian random coefficient, mean  $a$  and variance  $V$ . Then  $G(m)$  exhibits either convex super-linear or concave sub-linear behaviour if  $V > 0$ , and neither of these if  $V = 0$ . This gives a simple graphical check for random coefficients within the AR(1) family.

Neville illustrated the theory with simulated and real series. He concluded that the variogram is a useful addition to the TS analysts tool kit, and his experience with it indicates that random coefficients may be more prevalent than previously suspected.

The Branch President, Dr Vijayan, formally welcomed long-time member Brian Murphy who was attending for the first time since having a severe stroke last year while on leave in the USA.

Brian and Mrs Murphy were the guests of the Branch at the dinner which followed the meeting.

Tony Pakes

## Canberra

### Statisticians as Methodologists at the ABS

The May meeting of the Branch was addressed by Ms Susan Linacre, of the Australian Bureau of Statistics. After a brief introduction to the ABS and its main aims and functions, she pointed out that in official statistics agencies such as the ABS, statisticians are called methodologists, with methodology being defined in the dictionary as the study of the orderly arrangement of ideas.

Sue gave several examples of the work of methodologists at the ABS. For example in the area of household surveys, as well as being involved in sample design, methodologists deal with issues such as the best use of auxiliary information in adjustment for non-response, small area estimation, and the complex statistical issues that can arise through the interactions between the survey design and analysis of the output.

Methodologists are also involved in the implementation of new collection methods such as computer assisted interviewing, evaluating their impact on optimal design, and testing for any effect on response.

Business surveys also provide interesting issues for methodologists. The ABS Register of Businesses contains about 450,000 functioning businesses. The vast majority of businesses are small and rapidly changing, with many "births", "deaths" and mergers. About 12,000 new businesses join the register each month. Sample design for business surveys is relatively straightforward, but dealing rigorously with businesses that turn out, on selection, to have changed in status from that on the frame, is more complex.

Methodologists are also involved with evaluation of surveys, considering how the fixed amount of money available for each survey could be spent in different ways to improve different aspects of the survey, with the aim of optimisation for the survey as a whole.

Sue then discussed the kind of skills sought when recruiting methodologists to the ABS. Communication skills, problem-solving skills and a high level of mathematical and statistical skills were all important. She finished by describing two connections between ABS methodologists and other interested groups. Firstly, a proposed Advisory Group in Methodology, which would provide peer review of the ABS's methodological work, and include statisticians and research economists from both universities and other research institutions. Secondly, the potential for a shared research program, through such initiatives as sponsored post-graduate research, consultancy, outposting, inposting and maybe even shake-it-all-about-posting.

The meeting did not conclude with the Hokey Pokey, but with very pleasant Italian cuisine at the Cafe Pronto.

### Some Bootstrap Data Analyses

In June, the Branch was addressed by Dr Anthony Davison of the University of Oxford. He introduced the bootstrap as a simulation approach to data analysis that works well for small-sample and ill-specified problems, where analytical calculations are difficult. He then discussed three bootstrap analyses in detail.

The first example, a "toy" one to ease us into the topic, concerned carbon monoxide (CO) transfer in smokers hospitalised with chickenpox. A grand total of seven patients were studied, with the data consisting of CO transfer rates on admittance to hospital, and one week later. The change in CO transfer rate was the quantity of interest, and a studentised bootstrap was used, since the distribution of the estimate was short tailed compared to the normal distribution. In fact, use of the studentised bootstrap is the analog of use of the  $t$  distribution for normal data when the standard deviation is unknown.

The second example concerned a table of the number of AIDS diagnoses in England and Wales between 1983 and 1992, classified by date of diagnosis and delay in reporting. The table was incomplete, and the counts were to be modelled using a simple Poisson model. Anthony described two approaches to bootstrapping in a generalised linear model such as this.

The first, sampling from cases, simply involved sampling from the original data. The second, model-based sampling, involved estimating the parameters, calculating residuals, then sampling from the residuals and constructing data using the parameter estimates again. The AIDS data was overdispersed and the residuals in a generalised linear model are not exchangeable, and so the bootstrap had to be used with care to take account of these.

The third example concerned the survival time of 205 Danish patients with malignant melanoma. Anthony demonstrated the use of the bootstrap to investigate the

effect of tumour thickness on survival via the proportional hazards model. Because of censoring in the data, three approaches to bootstrapping were available. The first two, sampling from cases and model-based sampling (generating a censoring time, survival time and constructing data) were much as described before. The third approach was like model-based sampling, but conditioned on the censoring pattern.

Anthony summarised with a warning - to watch out for artefacts of the simulation. Although the bootstrap is a handy automatic method, its use does not absolve the analyst from thought!

During questions, Anthony promised to tell us over dinner about a trick he knew for extracting overall confidence limits from pointwise confidence bands, but throughout the entire banquet at the Great Wall Chinese Restaurant, no-one remembered to ask.

### Compensating for non-ignorable non-response in surveys

Following SISC 96 in July, Professor Chris Skinner of the University of Southampton addressed the Branch. His talk opened with a cautionary tale of the disastrous opinion polling leading up to the British General Election in 1992. Polls on election eve showed the Conservative and Labour parties were neck and neck - but in the election, support for the Conservatives outstripped support for Labour by 8%. A report by the Market Research Society identified several causes of the misleading results, including late swing, the inadequacy of the quota sampling method used, and the fact that Conservative voters were less likely to respond. Such an outcome is a good example of non-ignorable non-response.

Chris's main example concerned a panel survey of British voting behaviour, with 1323 people interviewed on several occasions between 1987 and 1992. Chris presented the responses first in a table classified by sex (male or female), social class (1, 2, 3, 4, or 5) and party voted for (Conservative, Labour, Democrat, other or No Response).

But he pointed out that in order to model the non-response, it is more useful to consider the results in a table classified by response (yes or no), sex, social class and party voted for (Conservative, Labour, Democrat or other). Clearly the half of the table under "no response" is missing and needs to be modelled.

Chris used log-linear models to model the non-response. The cell counts were presumed to be multinomial, and maximum likelihood estimates were produced via the EM algorithm. Looking at the deviance associated with various models, it appeared that the non-ignorable non-response model provided the best fit. However, in this case, the "truth" is known in that the actual election results are available, and the model that produced point estimates closest to the "truth" was in fact the ignorable non-response model. So it appeared that maximum likelihood may be a very poor estimation method, and outliers or small cell counts may be the cause of the

problem. Furthermore, associated profile likelihoods are very flat, resulting in very wide confidence intervals. The asymptotic validity of the interval estimates is not clear either.

Chris's conclusion, which was endorsed by members of the audience, was that in the long run it may be better to design studies including appropriate covariates which would help to ensure ignorable non-response.

Dinner followed, at the Siamese Kitchen, which constituted a suspension of Branch's census of Canberra restaurants, as statisticians have enjoyed meals there in the past.

Alice Richardson

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## SPECIAL INTEREST SECTIONS

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### Young Statisticians

#### WORKSHOP FOR AUSTRALIA'S YOUNG STATISTICIANS 1996

presented by the Young Statisticians' section of the Statistical Society of Australia, at the Charles Sturt University, Wagga Wagga NSW, from 2 - 4 October 1996.

#### Sponsored by:

CSIRO Division of Mathematics and Statistics  
Statistical Society of Australia

Victoria University of Technology, Department of Computer and Mathematical Sciences

#### The workshop

The Workshop for Australia's Young Statisticians (WAYS) is a meeting place for young statisticians from all areas of application to share their common background in an informal environment. This year the workshop will be held in Wagga Wagga, NSW, from 2nd to 4th of October. The event has been gaining strength over the last 5 years (being held previously in Wollongong, Newcastle, Canberra, Sydney and Coolangatta). Traditionally participants have been mainly from eastern Australia, but participants from other areas of Australia and New Zealand are encouraged to attend.

The purpose of the workshop is three fold:

1. to provide young statisticians from different environments with an opportunity to meet and discuss their work or research in an informal and non-threatening environment. Young statisticians fill diverse roles in government, business and academia, and it can be difficult to make or maintain contact with other young statisticians working in different roles. The workshop is especially aimed at those people who would otherwise be professionally isolated in their workplace.
2. to further the professional development of young statisticians. Participants can establish a network of people with similar backgrounds which could benefit their future. In addition, listening to talks by invited speakers and other participants will broaden their scope and possibly encourage further learning.
3. to be the national meeting of the Young Statisticians section of the Statistical Society of Australia.

#### Format

The workshop will run as a series of talks given by invited speakers and participants, with ample time for informal discussion during the workshop. All participants are encouraged to give a 15 minute presentation on their work, research or of interest to other young statisticians.

#### Venue

This year's venue is the Charles Sturt University in Wagga Wagga. Charles Sturt University is situated 10 km from the centre of Wagga Wagga in an attractive rural setting, with the well-known Charles Sturt University winery close by. Often known as the "Garden City", Wagga Wagga is the demographic heart of the Riverina area, which is famous for its wheat and horticulture industries. Some of the facilities of Charles Sturt University, such as the gym, and tennis/squash courts, will be available for use by participants free of charge.

There may be organised transport from nearby capitals, especially (but not exclusively) intended for participants who are travelling from New Zealand or other parts of Australia to ease transport costs. If you are interested in this, please indicate on the registration form.

#### Note on the phrase "Young Statisticians"

The phrase "young statisticians" is used loosely, and is not referring to the age of participants. A "young statistician" is considered to be a person relatively inexperienced in their professional statistical career, regardless of age.

#### Invited speakers

Dr Brian Cullis	Agricultural Research Institute, Wagga Wagga NSW
Mr Ross Cunningham	Australian National University
Mr Paul Livingstone	CSIRO DMS, Melbourne
Ms Margaret Correll	University of Adelaide
Mr Woh Choo	Senior Manager, NRMA Research and Development

If there are any queries, please contact

Damian Collins, PMB Agricultural Research Institute,  
Wagga Wagga 2650, tel: (069) 381876, fax: (069)381809,  
email: collind@agric.nsw.gov.au.

or

Colin Sharp, School of Information Studies, Charles Sturt University, Wagga Wagga 2650, on (069)332517, email: on csharp@csu.edu.au.

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## ANNUAL REPORT 1995

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The Society was founded in 1962 as a national "umbrella" organisation to support and further the work of the state statistical societies. The overall objective of the Society and its Branches is to further the study and application of statistical theory and methods in all branches of learning and enterprise.

The Society is incorporated in the Australian Capital Territory (ACT). The constitution was revised in accordance with the Associations Incorporation Act 1991 (ACT) on 7 May 1993.

In order to hold Annual General Meetings of both the Society and the Central Council in association with Australian Statistical Conferences or other mid-year conferences, the financial year for the Society was altered to April-March. Branches may choose, through their own constitutions, to retain a different financial year.

### 1. Membership of the Society

Based on the capitation fees in 1995 the society had 819 ordinary members, 123 student/retired members, and 10 honorary members, making a total of 952. Equivalent figures since 1989 are 832, 871, 906, 897, 910 and 954. These figures do not take into account those capitation fees in arrears.

### 2. Central Council

The Annual General Meeting of the Society was held at the University of Sydney on 13 July, 1995 and a general meeting was held on 16 February, 1996 at DMS, CSIRO, Sydney.

The Central Council for 1995 comprised:

President	Associate Professor Helen MacGillivray (from July 1995)
Vice-President	Dr Ron Sandland (from July 1995)
Editor	Professor Ian James
Secretary	Dr Neville Weber
Treasurer	Mr Eden Brinkley (from July 1995)
Branch Delegates:	
Canberra	Dr Alan Welsh, Dr Michael Adena
New South Wales	Dr Ann Eyland, Ms Pamela Shaw, Ms Caro Badcock, Ms Jenny Kelly
Victorian	Mr Nick Garnham, Dr Rob Hyndman, Mr Geoff Bruton
Queensland	Dr Margaret Mackisack, Mr Ross Darnell
South Australian	Dr Alan Branford, Dr Brenton Dansie
West Australian	Professor Murray Aitkin, Dr Ian Wright

Scholarships for the Honours Year in Statistics were awarded to:

NSW	Anthony Carolan and Patrick Kelly
VIC	Kim Bowater, Konstantin Gredeskoul and

Jennifer Lewis

QLD	Barbara Chan, David Chan and Andrew Rieck
SA	Andreas Kiermeier
WA	Andrew Pike

### 3. Association with other bodies

The Society is an affiliated organisation of the International Statistical Institute, with the President as the Society's ex-officio member.

The Society is a constituent member of the Australian Mathematical Sciences Council, and through this Council a member of the Federation of Australian Scientific and Technological Societies (FASTS). Mr Nick Garnham and Associate Professor Helen MacGillivray represented the Society on the Council.

The Society was represented on the National Committee for Mathematics of the Australian Academy of Science by Professor Chris Heyde.

The Society is a corporate member of the New Zealand Statistical Association.

The Society is represented on the Australian Statistical Advisory Council by Dr Ron Sandland, and on Committee QR/4 - Statistical Quality Procedures of the Standards Association of Australia by Dr Geoff Riley.

The Society is an Associate Member of the Australian Geoscience Council, and its representative is Dr Nick Fisher.

The Society is a member of the Australian Foundation of Science. Professor Chris Heyde is a member of the Board of Directors and Professor Sue Wilson was the Society's representative this year.

### 4. Finances

The Society's financial affairs for the year are detailed in the Financial Statement.

The capitation fee for 1995 was \$45, comprising an ASPAI (Australian Statistical Publishing Association Inc) component of \$22 and a general component of \$23. The financial state of the Society is generally healthy.

Central Council warmly thanks Mr David W. Siström for his time and effort in auditing the accounts.

### 5. The Strategic Review of the Mathematical Sciences

The Society participated in the "Strategic Review of Mathematical Sciences Research and Advanced Mathematical Services in Australia". The Review was completed by a Working Party appointed by the National Committee for Mathematics and chaired by Professor van der Poorten. Major sponsors were the Australian Research Council, CSIRO, professional societies and many university mathematical sciences departments. The final report is entitled "Mathematical Sciences: Adding to Australia."

"The Review showed the extraordinary extent to which mathematical sciences penetrate other disciplines, and clearly demonstrated the essential role they play in the economic competitiveness of the nation. A few of the many applications cited in the review were manufacturing, biometrics, services and defence. The Review made 20 recommendations to develop the profession and enhance its contribution to the nation."

(From the Foreword by Ian Sloan and Jan Thomas for the National Symposium to launch the report.)

## 6. Accreditation

During 1995 a Working Party lead by Associate Professor MacGillivray revised and refined the model for optional accreditation. Details of the model are in the November 1995 Newsletter. The Rule changes that will enable optional accreditation to be implemented will be put to the members at the 1996 Annual General Meeting of the Society.

## 7. Conferences, Workshops and Symposia

In 1995 the Society established the EJJ Pitman Prize. The prize will be awarded for the most outstanding talk presented by a "young statistician" at an Australian Statistical Conference (see the March 1996 Newsletter). The Prize will available for the first time at SISC-96.

Various Sections of the Society ran successful workshops and symposia during the year. Reports on these meetings have appeared in the Society's Newsletter. These meetings included a Workshop for Australia's Young Statisticians held at Coolangatta in September, a workshop on "Bayesian Computation using BUGS" held in Brisbane in December, and the Australian Conference on Industrial Statistics 95 held in Sydney in December.

## 8. Awards

The Thomas Rankin Lyle Medal was awarded by the Australian Academy of Science to Professor Chris Heyde at its meeting on 27 April 1995 in recognition of his distinguished work in the field of probability limit theory and its applications. At the same meeting the inaugural Hannan Medal was awarded jointly to Professors Peter Hall and Chris Heyde for their distinguished research in statistical science.

The 1995 Medal of the Australian Mathematical Society was awarded to Professor Adrian Baddeley for his "outstanding research in the closely related areas of stereology, spatial statistics, stochastic geometry and statistical image analysis".

## 9. Named Lectures

The Belz Lecture was given at a meeting of the Victorian Branch on 24 October 1995 by Dr Ian Gordon. The title of his lecture was "Tall tales but true: some data-based short stories".

The Knibbs Lecture was given at a meeting of the Canberra Branch on 28 November 1995 by Mr Bill McLennan AM and titled "The ABS Product - Issues and Prospects".

The H.O. Lancaster Lecture was given at the Annual General Meeting of the New South Wales Branch on 21 March 1995 by Professor Geoffrey Eagleson. The title of his lecture was "Is there a role for statistical thinking in business?"

## 10. Sections

Current Sections and their 1995 chairs are:

Survey and Management Statistics Section	Ms Sue Linacre
Statistical Computing Section	Professor Tony Pettitt
Statistics in the Medical Sciences Section	Dr John Hopper
Statistics in the Biological Sciences Section	Assoc. Prof. Kaye Basford
Statistical Education Section	Ms Pamela Shaw
Industrial Statistics Section	Dr Geoff Riley
Young Statisticians Section	Ms Kathy Ruggiero

Other Sectional and Branch activities have been detailed in the Society's Newsletter.

## 11. In Memoria

The Society recorded with deep regret the passing of Dr Harry Mulhall, a founding member of the Statistical Society of NSW and Dr Helen Newton-Turner, the first President of the Statistical Society of NSW.

For the Society,

Assoc. Professor Helen MacGillivray, President  
Dr Neville Weber, Secretary

July, 1996

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<http://www.dms.csiro.au/world/Splus/>

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## SUBMITTING PAPERS TO THE NEW ZEALAND STATISTICIAN

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I encourage all statisticians in Australia and New Zealand to consider submitting articles to the New Zealand Statistician.

I have made some changes to the rules for submitting new articles. I would request that intending contributors follow these rules rather than those printed in recent issues.

At present publication delay should be only a few months. Currently the NZSA is liaising with the SSA on the possibility of combining the New Zealand Statistician with the Australian Journal of Statistics. If this eventuates articles accepted for publication in the New Zealand Statistician will appear either in the New Zealand Statistician or in the new combined journal.

The new submission rules follow:..

### GUIDE TO AUTHORS....

The New Zealand Statistician is published by and for The New Zealand Statistical Association, and we aim to publish articles of interest to our diverse membership. Your submissions are welcome. They are most likely to be accepted for publication if they are also non-technical, entertaining and succinct, no longer than 3,000 words or 10 manuscript pages.

Do you have a clear message on any of the following topics?

- Public policy issues of interest to the statistical profession
- Interesting projects or challenging questions from the workplace, consultant's desk or teacher's forum
- Teaching of statistics or training of statisticians
- Contributions to statistical theory or the history of statistics

- Interesting or innovative analyses of data, including graphical presentations and computational methods

Your article should be set out in the format as published in recent issues of The New Zealand Statistician, with a short summary, decimal-numbered sections and any references at the end. Diagrams, photographs and tables that assist your message are acceptable provided that they are suitable for camera-ready reproduction: include them on individual pages at the end of your manuscript. We are moving to mutual anonymity of author and referee, so please supply a title page without your name.

If sending hard copy, submit three (original + 2) copies of your manuscript, typed doubled-spaced with 3 cm-wide margins.

We will also accept articles in the above format as documents attached to email messages having a form that we are able to process. Currently this means that the attached file should be a plain text file containing TeX or LaTeX source, or a Microsoft Word file containing the article. If TeX or LaTeX is sent any auxiliary files needed to process the source file should also be sent.

Submission of an article to The New Zealand Statistician implies that it is not published or submitted elsewhere.

Send your article, prepared as outlined above and together with a short (60 word) biography on the author(s), to the Editor, The New Zealand Statistician, Dr M. A. Jorgensen, Department of Statistics, University of Waikato, Private Bag 3105, New Zealand; facsimile 07 838 4666; E-mail maj@waikato.ac.nz.

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## ACCREDITATION COMMITTEE - EXPRESSIONS OF INTEREST

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The Central Council of the Statistical Society of Australia Inc. is seeking expressions of interest from experienced, senior statisticians to be members of the initial Accreditation Committee of the Society. The Committee shall consist of six members and it should be as representative as possible of the Branches and interests of the Society, the statistical profession, and of areas of statistical expertise.

The Terms of Reference for the Committee and details of the Accreditation Model are given in the November 1995 Newsletter. Members of the initial committee will be appointed for 1, 2 or 3 years with two members retiring each year. It is anticipated that the initial committee will meet, possibly via a telephone conference, for the first time in November 1996.

Those interested in applying for membership of the Accreditation Committee should send their name and contact details along with a brief outline of their areas of expertise and relevant professional experience to

Associate Professor H. MacGillivray,  
 President, SSAI,  
 School of Mathematics,  
 Queensland University of Technology,  
 GPO Box 2434  
 BRISBANE QLD 4001  
 Facsimile: (07) 3864 2310  
 by 30 SEPTEMBER, 1996.

As noted in the November 1995 Newsletter the Nominating Committee of Central Council may act as a search committee.



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## CONFERENCE REPORT

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### Statistical Education Workshop: satellite meeting at SISC-96, the Sydney International Statistical Congress

On 5-7 July 1996 just prior to SISC-96, the Australian Statistical Society sponsored a statistical education workshop in Sydney. Some 55 people attended from all around Australia, and from New Zealand, UK and USA. About 30 universities in Australia and overseas were represented.

The 23 presentations at the workshop were arranged by five themes: "Graphical perception and other psychological aspects of understanding statistics" (7 papers); "Teaching statistics at secondary and tertiary level — where are the interactions?" (3 papers and a group discussion); "Multimedia" (8 papers); "Designing a first course in statistics" (3 papers); and "Bringing gown and town together in applied statistics" (a round table discussion with audience participation).

As is usual at a workshop, a single stream of presentations was maintained throughout the entire meeting and the programming of sessions allowed ample time both for unhurried exposition and for extended discussion from the floor. Experience shows that such structuring is valued highly by participants, and this occasion was no exception.

Each speaker's delivery was of very high quality and, though the themes were familiar, what speakers had to say generally avoided the trap of reinventing the wheel. About a third of the speakers issued a written paper. This practice should be encouraged, for it is useful to be able to recapture later a speaker's own statement of ideas.

Many of the talks reported on educational initiatives of a highly practical kind which listeners could usefully adapt

for their own teaching. Particularly interesting was a demonstration by Sue Finch from Melbourne University of a new software package, StatPlay, which is very flexibly designed for interactive demonstration and simulation of statistical principles. Three speakers addressed the broader subject of student adjustment to university study of statistics, one focussing on the transition from school to university, one on the difficulties of non-mathematically-inclined students, and the third on the special needs of aboriginal learners in higher education.

There was a lively discussion on an appropriate syllabus for the statistics strand of the senior high school mathematics syllabus. The discussion had heightened significance since this syllabus is currently in course of revision in New South Wales.

Two speakers from the university sector and two from outside that sector, took part in the session on "bringing gown and town together". They dwelled on the growing separation between the level of sophistication of statistical technique in the scholarly literature and in the industrial and commercial workplace. Together with members of the audience, they considered what role statistical education can and should have in bridging that divide.

At SISC-96, itself, there were three further sessions on statistical education: a session with four invited papers and two sessions with seven contributed papers in each.

For further information please contact Eric Sowe, School of Economics, University of NSW, NSW 2052. Fax: (02) 9313-6337, email: E.Sowe@unsw.edu.au

Eric Sowe

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## AUSTRALASIAN CONFERENCES

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### CONFERENCE SUMMARY

Workshop for Australia's Young Statisticians 1996, 2-4 October 1996, Charles Sturt University, Wagga Wagga.

Information: Damian Collins, PMB Agricultural Research Institute, Wagga Wagga, 2650, tel. (069) 381 876, fax (069) 381 809, email collind@agric.nsw.gov.au or Colin Sharp, School of Information Studies, Charles Sturt University, Wagga Wagga 2650, tel. (069) 332 517. (Further details in Newsletter 75 and this issue.)

Australasian Genstat Conference, 4-6 December 1996, Adelaide.

Information: email genstat96@adl.biom.csiro.au (Further details in Newsletter 72 and this issue.)

**APORS'97, Fourth Conference of the Association of Asian-Pacific Operational Research Societies within IFORS**, 30 November - 4 December 1997, World Congress Centre, Melbourne, Victoria

Information: APORS97, c/o PR Conference Consultants Pty Ltd, PO Box 326, BALWYN VIC 3103, or Pam Richards, e-mail: APORS97@sci.monash.edu.au; tel. (03) 9816 9111; fax: (03) 9816 9287. (Further details in this issue.)

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### GENSTAT 96: A statistical conference for GENSTAT users

Adelaide, Australia  
4-6 December, 1996

The Australasian GENSTAT conferences attract many practising agricultural and environmental statisticians. The invited and contributed papers in the past have been practical, but firmly based in statistical theory. This year spatial statistics and longitudinal data will be featured as major themes.

Invited speakers include:

David Baird	AgResearch, NZ
Brian Cullis	NSW Department of Agriculture
Peter Lane	Rothamsted Experimental Station, UK
Roger Payne	Rothamsted Experimental Station, UK
Granville Tunnicliffe Wilson	Lancaster, UK
Jeff Wood	CSIRO, Canberra

Prior to the conference, three one-day courses will be run. The topics are:

Genstat for Windows	Nov 29
Modelling dependence between time series	Dec 2
Analysis of repeated measures in Genstat	Dec 3

The social program includes a weekend visit to a National Park, Cocktail Party in the Historic Urrbrae House and Conference Dinner at Warrawong Sanctuary, with dusk walk if you desire.

Full details are available from the web site:  
<http://www.adl.dms.csiro.au/world/genstat96.html>

Alternatively, further information and registration brochures may be obtained from the Genstat96 committee via the following contact addresses: email: genstat96@adl.biom.csiro.au; tel: (08) 303 8772; fax: (08) 303 8763; or postal: Genstat96, c/o Rita Middelberg, University of Adelaide - Waite Campus, Private Bag No 1, Glen Osmond SA 5064

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## OVERSEAS CONFERENCES

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**InterCASIC '96; International Conference on Computer-Assisted Survey Information Collection**, 11-14 December 1996, San Antonio, Texas, USA.

Information: AAAS Meetings Office, 1333 H St, NW, Washington, DC 20005; phone +1 (202) 326-6450; fax +1 (202) 289-4021.

**IASC 2<sup>nd</sup> World Conference**, Pasadena, CA, USA

Information Patricia Huezo, Conference Coordinator, +1 (213) 342-2052, web sites <http://www.stat.unipg.it/iasc.html> and <http://icarus2.hsc.usc.edu/iasc>.

**International Symposium on Contemporary Multivariate Analysis and Its Applications**, 19-22 May 1997, Hong Kong.

Information: Multivar 97, c/o Dept. of Mathematics, Hong Kong Baptist University, Kowloon Tong, Hong Kong; fax: +852 2336 1505; tel: +852 2339 5056; email: [multivar97@hkbu.edu.hk](mailto:multivar97@hkbu.edu.hk)

**International Biometric Society (ENAR) Spring Meeting**, 23-26 March 1997, Memphis, Tennessee, USA.

Information: ENAR Conference Manager, 11250 Roger Bacon Dr. Suite 8 Reston, VA 22090, USA; fax +1 (703) 435-4390.

**Third International Conference on Health Effects of Low Dose Radiation: Challenges for the 21<sup>st</sup> Century**, 11-14 May 1997, Stratford-upon-Avon, UK.

Information: Rachel Coninx, Conference Executive, BNES, One Great George Street, London SW1P 3AA, UK; fax +44 (0) 171 233 1743.

**1997 Joint Statistical Meetings**, 10-14 August 1997, Anaheim, California.

Information: American Statistical Association, 1429 Duke St, Alexandria, VA 22314-3402, USA; email [meetings@asa.mhs.com](mailto:meetings@asa.mhs.com)

**IASS/IAOS Satellite Meeting on Longitudinal Studies**, August 27-31, 1997, Jerusalem.

Information: Gad Nathan, Central Bureau of Statistics, 91905 Jerusalem, Israel; Fax: +972-2-6553-319; E-mail: [gad@olive.mscc.huji.ac.il](mailto:gad@olive.mscc.huji.ac.il) or Susan Linacre, Australian Bureau of Statistics, PO Box 10, BELCONNEN ACT 2615, Fax: 61 6 252 5239, Email: [sisd.exec@abs.telememo.au](mailto:sisd.exec@abs.telememo.au)

**IMS and Bernoulli Society European Regional Meeting: Mathematical Statistics and its Applications to Biosciences**, first week in September 1997, Rostok, Germany.

Information: F. Liese, W.R. Richter, University of Rostok, Germany.

**International Biometric society (ENAR) Spring Meeting**, 27 March - 1 April, Pittsburgh, Pennsylvania, USA.

Information: ENAR Conference Manager, 11250 Roger Bacon Dr., Suite 8, Reston, VA 22090 USA; fax +1 (703) 435-4390.

**Seventh International Congress of Ecology, Frontiers of Statistical Ecology with Environmental Statistics**, 19-25 July 1998, Florence, Italy.

Information: Prof. Wolfgang Urfer, Department of Statistics, University of Dortmund, D-44221 Dortmund, Germany, tel. +49 231 755-3121, fax +49 231 755-5303, email [urfer@omega.statistik.uni-dortmund.de](mailto:urfer@omega.statistik.uni-dortmund.de) or Dr Phil M. Dixon, Savannah River Ecology Lab, University of Georgia Drawer E, Aiken SC 29802, USA, tel. +1 803 725-2472, fax +1 803 725-3309, email [dixon@srel.edu](mailto:dixon@srel.edu).

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