



statistical society of australia incorporated

newsletter

30 November 1993

number 65

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**TWELFTH AUSTRALIAN STATISTICAL SOCIETY CONFERENCE**

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**4th July - 8th July 1994  
Monash University, Clayton, Victoria**

This meeting will be the twelfth biennial Australian Statistical Society conference. Speakers have been invited for sessions on environmental statistics, image analysis, industrial statistics, mathematical and statistical genetics, statistical inference (including a talk on Pitman's contribution to statistical inference), statistics in meteorology and medical statistics.

International invited speakers will include:

David Clayton (Medical Statistics) Cambridge, UK;

Andrew Gelman (Markov Chain Monte Carlo, Bayesian Statistics) Berkeley, USA;

Stuart Hunter (Industrial Statistics) Princeton, USA;

Michael Kenward (Repeated Measures) Rothamsted, UK;

Simon Tavaré (Mathematical Population Genetics, Random permutations) University of Southern California, USA;

Terry Speed (Statistical Genetics) Berkeley, USA.

A workshop on Statistical Methods in Epidemiology and Clinical Research, with David Clayton as an invited speaker, will be held 7-8th July. The workshop is co-sponsored by the Clinical Oncological Society of Australia (Epidemiology Group) and the Melbourne Epidemiology Group.

A Statistical Education workshop will be held on the weekend prior to the conference.

The first circular is enclosed with this newsletter. For further copies and more information about the conference please send mail to:

ASC12 Conference Secretary,  
Mathematics Department,  
Monash University,  
Clayton, VIC. 3168,  
AUSTRALIA

or email [asc12@monash.edu.au](mailto:asc12@monash.edu.au)

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*The views of contributors to this Newsletter should not be attributed to the Statistical Society of Australia, Inc.*

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## PRESIDENT'S REPORT

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Statistics '93 held at the University of Wollongong was a fine example of a boutique conference. The conference focussed on a small number of important current themes — statistical education, statistical computing and quality.

Its size, a little under half the attendance at a biennial Statistical Society conference, made people very accessible. So one of the major purposes of attending a conference, meeting and talking to people from other cities, countries or institutions, was splendidly realised.

There were several very good talks that I heard (I could only stay for two days). Trevor Hastie was an excellent choice as the international invited speaker. The atmosphere of the conference was epitomised by Ann Eyland's wonderful after dinner speech. I particularly enjoyed the idea that it was possible to recognise a statistician in a crowd. Congratulations to David Griffiths, Chandra Gulati and their enthusiastic team of helpers, and also to the organisers of the individual sessions.

Elsewhere in this newsletter a summary of the outcomes of the Central Council meeting held in Wollongong appears. One issue that will take on increasing importance is membership fees and how they are structured. At present our fees are low by the standards of most professional societies. Members of the Society are continually coming up with initiatives that are almost always worthwhile. But

these initiatives are putting pressure on our fees. The Society continues to operate without a permanent secretariat and this puts tremendous demands on the time (not to mention the family life) of many people. In short, the society is freeloading at a time when free resources and free time of the employed members of society are becoming ever scarcer.

So we have some important decisions to make in the reasonably near future. What sort of Society do we want? What resources will be required to run the Society towards our vision? How do we find those resources? Do we need a strategic plan to chart the Society's future course? It became clear during the Central Council Meeting that the somewhat happenstance addition of new initiatives to the Society's portfolio was unacceptable to the Branches if it meant fee rises to cover the cost. A major challenge for Central Council is to develop the mechanism for planning the Society's future. Such a mechanism would have to include capturing the views and aspirations of the membership. I would be very interested in your views on an appropriate mechanism. Please feel free to contact me by phone (02) 325 3203, fax (02) 325 3226 or email rons@syd.dms.csiro.au if you would like to contribute to the discussion.

Ron Sandland

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## CENTRAL COUNCIL

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### From Central Council meetings in Wollongong, September, 1993

#### FASSO

A letter from Don Rawson, Acting President of FASSO, and Dr Eyland's reply had been included with the agenda papers. The Rawson letter discussed the question of demise or continuation of FASSO, and Dr Eyland's reply informed of the decision of the Council AGM in May to discontinue membership of FASSO, expressing regrets about the present difficulties of the organisation.

#### Amendment of Rules to meet requirements of new ACT Associations Incorporation Act

The Secretary reported that apart from one query soon after submission of the Rules to the ACT Registrar's office, there had been no communication, hopefully indicating that there were no problems. The consultant lawyer, obviously sharing this view, had submitted his bill to the Society, the bill being less than the amount that had been budgeted. Each Branch had received a copy of the Rules as submitted; the Secretary will inform Branches immediately on receipt of communication from the ACT Registrar's office.

#### Capitation

The Treasurer tabled an interim financial report. Dr Sandland spoke of the tabled motion from the Annual General Meeting and the extra financial information detail

that had been subsequently sent to Branches, and requested comments from each Branch. The general consensus of Branch feedback was desire to keep the capitation as low as possible, but that all the current ongoing commitments were very important. Apart from running and meeting costs, these ongoing commitments are to membership of AMSC and hence FASTS, ISI membership, public liability insurance, honours scholarships, awards and postgraduate sponsorship; conference floats, profits or losses were not included in the calculations of ongoing costs, except to note that SSAI's reserves provide the underwriting of conferences. However it was felt that Central Council sponsorship of postgraduate students to conferences should be restricted to the ASC's. It was decided that the 1994 capitation to SSAI should be \$23.00 for full member, to cover current costs plus a small amount for such things as careers material, and that the sponsorship of postgraduates to conferences be kept to ASC's only. Both Council and Branches will continue to assess and explore the financial aspects of their activities, and possibilities for increasing membership and also identifying other revenue sources.

The current ASPAI capitation of \$20.00 per full member is only just covering the cost of running and producing the journal and newsletters, but with no assistance to the Editors in routine matters such as filing, acknowledgements, etc. It was decided that the ASPAI capitation for 1994 be \$22.00 per full member. It was noted that an annual subscription of \$45.00 for

professional membership plus journal and newsletter, plus a Branch component to support Branch activities, compared very favourably with other organisations.

The consensus feedback to the suggestion of multiple membership fee levels was that it should be considered, but not before the accreditation issue is resolved.

### Accreditation

Dr Ron Sandland reported that he had been invited to represent the Society at a meeting on certification at the 49th ISI, and Dr Murray Cameron had acted as his proxy. Dr Sandland reported that the ASA is aiming for compatibility with the RSS model, with the earliest possible start being 1995; that the RSS would like their qualification recognised internationally, that NZSA wishes to co-operate closely with Australia; and that the Italian Statistical Society is aiming to certify statistics courses rather than statisticians. (UK and USA delegates commented their experience was that it is difficult to accredit courses across the country. The ASA is proposing to develop an examination for entry.) Dr Sandland also reported on a letter from the RSS urging use of their standards.

Dr Sandland suggested adapting the UK model to a model compatible with the Australian situation, and putting it to the membership. It was decided that Dr Sandland would proceed on this basis, in consultation with the accreditation working party and with NZSA. The model would then be sent to Branches for feedback to be given to Council which would then put a suggested model to the membership.

### Australian Mathematical Sciences Council, FASTS

Professor Brown reported from the AMSC Executive Committee that the profiles issue is still very much a

problem; that the apparent decision by the Education ministers to halt the profiles project for re-assessment had not in fact had much effect. In answer to queries, Professor Brown commented that the profiles in statistics were outstandingly bad, and that the core of the overall problem of all the National Statements and Profiles is the lack of distinguishing between the principle of having national statements and the value of what is in them.

Council requested Professor Brown to provide a brief written summary of the problems with the profiles in statistics, and any other relevant matters from the AMSC, and the Branches to report on their impressions or otherwise of the situation in each State.

### Conferences

ASC11, Perth, July 1992.

The reports sent to Councillors were commended by Council.

ASC12, Melbourne, 1994.

Dr R. Griffiths tabled a draft first circular and a draft budget.

ASC13, Sydney, July, 1996.

Dr Sandland tabled a report from Dr Nick Fisher, giving membership and responsibilities of the Organising Committee and the Program Committee, and their planning to date, and information on the liaison arrangements with the IMS and the Interface Foundation, and with a number of Australian and overseas professional organisations and individuals.

### Date and place of next meeting

Tuesday, 5 July 1994 in Melbourne (to be confirmed).

H.L. MacGillivray, Secretary  
12 October 1993

## BRANCH REPORTS

### Victoria

#### Has the Economic Recession reduced the Victorian Road Toll?

On 27 July, Dr Tim Fry (Department of Econometrics, Monash University) gave a talk on assessing the effect of various variables, including economic variables, on the Victorian road toll.

The road toll in Victoria has been declining since 1989. A number of measures have been introduced over that period, and a lot of different people want to claim credit for the reduction. But Tim pointed out that if we want to reduce the road toll further, it is important to understand the factors that influence it. He discussed the importance of using monthly disaggregated data for different road user groups, and of basing the analysis on a conceptual model. The details of the two models based on the conceptual framework of the road trauma chain and trivariate normal or Poisson linear regression models were discussed. The most useful way of including an indicator of economic activity in the models was via the unemployment rate, and there was evidence that this was an important factor. The

two models were in reasonable agreement and consistent with expectations, except that the increase in the number of random breath tests did not appear to have been a major factor in the reduced road toll. Tim felt that the more sophisticated approach to modelling these data had been useful and that maybe one should build a more elaborate 'System Model' including road usage data, but no suitable data are available.

#### The Relationship between Theory and Practice in Statistics — A Case Study

On 24 August, Dr Paul Feigin (Technion, Israel) discussed a conceptual model of the way statisticians work (or should work) in solving problems. This model involved a cycle of 1. thinking about the problem and discussing it with the client, 2. using or developing appropriate theory to solve the problem and 3. applying the theory to compute a solution. Often several cycles are needed to arrive at a satisfactory solution.

He demonstrated these ideas via a study in which it was necessary to forecast the maximum load on the Israel electricity grid for the next 12 months. Paul went through

several cycles of his conceptual model before arriving at a satisfactory solution using smoothing splines for a series of regression coefficients. The final model involved a piecewise-linear regression of the maximum daily load on the temperature for the day. Different regressions were done for each season. Then the regression coefficients were smoothed using splines allowing for the correlation between parameters. Letting the coefficients change smoothly over time allowed structural changes in electricity demand (such as increased use of air-conditioners) to be modelled.

### **E-mail News**

The Victorian branch has set up an e-mail news service, mainly for the distribution of our monthly newsletter but also for members to use for distributing other information. About 140 people are currently on the e-mail list. A message sent to [ssavic@stats.mu.oz.au](mailto:ssavic@stats.mu.oz.au) will be automatically sent to everyone on the list. It has proved a convenient method for advertising seminars, jobs vacant, conference information, etc. If members in other states would like to be added to the Victorian list, please send a message to Dr Rob Hyndman ([hyndman@stats.mu.oz.au](mailto:hyndman@stats.mu.oz.au)).

## **Queensland**

### **Rain Forest Logging Impact Study**

Dr Mervyn Thomas (CSIRO IPP&P Biometrics Unit) described a Bayesian analysis of an experiment to estimate the impact of logging on rain forest species at our meeting on July 12. Species abundance was modelled using a negative binomial distribution, and the mean abundance included parameters for the effect of logging and for other design features. Laplace approximations were used to obtain marginal distributions and moments, and these approximations compared favourably with the results of brute force Gauss Hermite integration.

Prior beliefs about the effect of logging were elicited from a sample of people which included foresters and full time activists in conservation politics. Priors were highly polarised, and captured very divergent views about the effects of logging. Posterior densities for the logging parameter were estimated for all priors, and were compared. The more common species showed similar posterior distributions for all priors, indicating that the study contained enough information to produce consensus for these species. However, that is not to say that people were convinced by the data to change their views that logging reduced the incidence of a particular species.

### **Moving Median Smoothing**

At our meeting on August 4, Professor William Dunsmuir (Bond University) presented a variety of simulation and theoretical results for moving median smoothers applied to time series signal estimation, forecasting, robustified control charts and estimation of two dimensional surfaces embedded in noise. He spoke about methods for smoothing that robustify the traditional exponentially weighted moving average by introducing weighted medians.

William has now left Queensland to take up his new position as Professor of Statistics at the University of New South Wales. We wish him well on behalf of all members of the branch.

### **Wheat Variety Trialling System**

Dr Brian Cullis (New South Wales Agriculture) presented a seminar (to which our members were invited) on the analysis of the NSW wheat variety trialling system at the University of Queensland on September 2. He presented preliminary results of the analysis of the NSW wheat variety trialling system database which consists of ten years of advanced trial yield data from silo groups 3, 4, 5 and 6. The initial aim of the analysis was to examine resource allocation via estimation of variance components for genotype by year, genotype by location and genotype by year by location. The results indicated that, based on variety precision and a simple cost-benefit analysis, there can be a major reduction in the numbers of trials sown per annum. The next stage will aim to determine the "best" subset of locations for conducting the trials.

### **Variation and Mismanagement**

At our meeting on September 14, Professor J.A. John (University of Waikato) discussed total quality management - the philosophy that seeks continuous improvement in the quality of performance of all the processes, products and services of an organization. It emphasizes the understanding of variation, the importance of management, the role of the customer and the involvement of employees at all levels of an organization in pursuit of such improvement.

Nye's view is that a central problem in management and in leadership is the failure to understand the information in variation. Thus managers often make inappropriate decisions because they fail to understand the nature of variation present in their processes and, in particular, because they are unable to distinguish between special and common causes. From his experiences working with New Zealand Companies, at least 85% of problems are in the system and less than 15% are under a worker's control. Nye used the classic example of the Red Beads - 2,000 beads of which 200 are red - to illustrate the variation in the number of red beads in a sample of 100 beads. This produced much amusement from the audience as he explained how this experiment was used in teaching managers about variation and quality control.

As an aside, Nye presented several points against performance appraisal in that it disregards the fact that employees work within a group, within a system, within variability and instability and that they are evaluated within an appraisal system that is inescapably biased and inconsistent. People must be paid for quality, not just the quantity of the work they do.

## South Australia

### Experiments in a Market with a Supply Response Lag

Margaret Meyler of the Department of Economics at University of Adelaide gave a talk about experimental economics to the July Branch meeting.

Members of the Australian Centre for Experimental Economics have completed a set of experiments to investigate the effect of computerisation and of providing different kinds of preliminary instruction to participants in an experimental market with a supply response lag (a 'cobweb' market) of the kind first studied by Carlson.

It was hypothesized that the speed at which equilibrium is approached might be greater if participants were made explicitly aware that, for a competitive optimum, marginal cost should be equated to price. Changes in the slope of the demand curve in experiments of this type are known to affect the speed of convergence. In order to explore possible interactions between the slope of the demand schedule and the availability of extra information, two different demand schedules were used in each series of experiments, one with a steep slope and one with a moderate slope. To allow for the possibility that participants may learn more quickly when the demand schedule is steep and that this knowledge will be carried over to the medium slope scenario, half of the series were run with the steep demand schedule first and the others with the medium slope first.

The use of computers makes running experiments, and particularly record keeping, considerably less laborious. It is therefore important to investigate whether, and if so, in what ways, the performance of participants is altered when computers are used. In this series it seemed possible that the speed of the approach to equilibrium could be affected. Sixteen series of experiments were performed, with treatments allocated as two replicates of a 2x2 factorial design. The treatment factors were:

1. Computer versus manual operation.
2. Explicit explanation or not of the rule that marginal cost should be equated to price.
3. The order in which the demand schedules appeared within each series of experiments.

Each series involved ten participants, who spent about two hours on the experiment. Payment was in proportion to earnings. A sum of about \$A200 was allocated for each group and, typically, each participant emerged with between \$A15 and \$A25. All participants had the same cost function, which remained unchanged throughout. In the eight 'explanation' series the participants were also given a written example in which it was clear that production should be undertaken up to, but not exceeding, the level at which a rising marginal cost of production equals the price of the commodity. Each group was guided initially through a few practice sessions with a shallow demand schedule so that they became accustomed to the procedures.

After the preliminary sessions, each demand schedule was used in a series of decision-making rounds for about 45

minutes or a maximum of 25 rounds. The effects of the treatment factors on the average quantity produced, and on the variance of the quantities among participants in each round show some significant differences. The data on individual production decisions have also been used to test some hypotheses about the formation of price expectations.

Margaret Meyler is well known in the Adelaide statistics community and is a former Society Branch President. From 1963 until 1969, Margaret was in the Biometry Section, Waite Institute, working originally for Graham Wilkinson. From 1970 Margaret has been in the Economics Department, University of Adelaide, teaching Economic Statistics and Econometrics, with the occasional excursion into Mathematical Economics and the teaching of time series analysis to the third year students in the Statistics Department at Adelaide University. Margaret has collaborated with research workers in various fields, the largest job being on an NHMRC-funded study of the value of multiphasic screening of patients admitted to the Royal Adelaide Hospital.

### Attributable Risk and Attributable Synergism

John Darroch, Professor of Statistical Science, The Flinders University of South Australia, gave the talk "Attributable risk and attributable synergism" to the August meeting.

In a population exposed to asbestos, the proportion who get lung cancer is greater than it would have been had the population not been exposed. The difference between the two proportions is the attributable risk of getting lung cancer.

For a population exposed to both asbestos and cigarette smoking, there are four kinds of attributable risk, one of which is the risk attributable to the synergistic action of asbestos and cigarette smoking. The talk focussed on the problem of measuring the four kinds of attributable risks.

John Darroch has been Professor of Statistics at Flinders University since 1966, prior to which he worked at the Universities of Michigan, Adelaide, Manchester and Cape Town. He has published research on several topics including log-linear models, iterative scaling, capture-recapture analysis, quasi-stationary distributions, finite population sampling and probability in criminal trials. Three of John's past research students are full professors in Australasia. He is a past president of both the national Statistical Society and the South Australian Branch.

## Canberra

### Bootstrap on a Shoestring

The 1993 bootstrapping season opened at the July meeting when Dr Michael Martin, an ex-ANU student now at Stanford University, gave a talk "Bootstrap on a Shoestring". Michael spoke about his work on approximating iterated bootstrap procedures using a single level of bootstrap sampling, the second level being replaced by use of saddlepoint approximations to tail probabilities (his method uses approximate rather than exact solutions to the set of saddlepoint equations). These approximation methods produce accurate approximate double bootstrap confidence intervals and can reduce computation times by up to 99%.

### Bootstrapping for the Proportional Hazards Model

Dr Kim-Anh Do of Canberra University continued the bootstrapping theme with her talk, "Bootstrapping for the Proportional Hazards Model". She gave a resampling plan for the Cox proportional hazards model when the explanatory variables are non-random constants. The resampled quantities are a form of generalised residuals and have a distribution that is independent of the explanatory variables. The plan does not require resampling of the explanatory variables. An invariance property of the Cox likelihood allows these residuals to be transformed into a convenient scale. The method allows censoring from a class of censoring distributions. She illustrated the talk with an application to carcinogenesis in rats, and discussed the problem of constructing bootstrap confidence intervals with considerations for correction for true coverage probability and empirical importance resampling.

Kim's collaborators in this work are Ken Koehler and Tom Loughlin of Iowa State University. She also told us of her dramatic recent visit to ISU beset by tornadoes and floods.

### Quality and Quantity: Experiences in Consulting in Australian Industry

At the September meeting, Teresa Dickinson from CSIRO DMS presented a talk which she also gave later at the Young Statisticians Workshop, entitled

"Quality and Quantity: Experiences in Consulting in Australian Industry".

She used a number of case studies to illustrate various aspects of the process of consulting with industry. In particular, she talked about the roles statistical consultants can play, how cultural values contribute to the interaction between client and consultant, and the statistical and personal skills that statisticians need to consult successfully with industry.

## Western Australia

### Consulting with the Australian Bureau of Statistics

Daniel Elazar of the Australian Bureau of Statistics spoke at the June meeting on the work of the Statistical Support Unit within the Western Australian branch of the Australian Bureau of Statistics. This consulting group is a new initiative of the Bureau and is related to the decentralisation of much of the Bureau's work. Daniel described how his section provides advice on statistical problems to the various groups within the Bureau in Western Australia which are involved in implementing various collections such as Average Weekly Earnings. Naturally most of these problems relate to sampling, but they also extend to the treatment of outliers and the jack-knife estimation of errors.

### Statistics and Environmental Problems

Matt Williams of the Western Australian Department of Conservation and Land Management described his work as a bio-statistician at the August meeting of the Western Australian branch. CALM has a dual role in Western Australia. One is the management of state forests and their commercial exploitation while the other is engaged in managing a number of environmental issues concerned with land care. Matt described how he is located within the Scientific Services section which deals with a range of environmental issues. An example of this is his most recent work on species area relationships, which are one aspect of the ecology of mammals on small islands.

### Swimming Pool Safety

The isolation fencing of home swimming pools has become an issue in Western Australia recently, with possible changes in government regulations. A local member of the Society, Dr Nick De Klerk of the Department of Medicine of the University of Western Australia, spoke at the September meeting on his own analysis of some of the available data on this. Whereas some of the participants in the debate had used this information to promote the cause of isolation fencing, Nick showed how this interpretation is by no means clear cut. In fact his analysis of the information showed that at best the data were inconclusive about the benefits of isolation fencing.

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## MEDICAL SCIENCE NEWS

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### Statistical Methods in Epidemiology and Clinical Research

Monash University, July 7-8, 1994

In collaboration with the Clinical Oncological Society of Australia and the Melbourne Epidemiology Group, a workshop featuring Dr David Clayton of the MRC Biostatistics Unit, Cambridge, will be conducted in conjunction with the Australian Statistics Conference.

Dr Clayton has over 25 years experience as a biostatistician, collaborating and communicating with epidemiologists on projects ranging through cardiovascular, perinatal, nutritional, cancer, geriatric and genetic epidemiology. He has interests in statistical computing, spatial modelling, and Bayesian approaches to random coefficients in generalized linear models. He has taught many courses, is well known as a lively and clear teacher, and has recently published an excellent textbook (with Michael Hills); "Statistical Models in Epidemiology" (Oxford University Press, 1993).

The workshop will consist of four sessions over two days, covering:

1. New developments in design and analysis of case-control and cohort studies,
2. Problems in measurement of exposures in epidemiology,
3. Analysis of survival and event histories, and
4. Genetic epidemiology.

The level of discussion and presentation will be suitable to the practising biostatistician and epidemiologist, with an emphasis on practical concerns rather than mathematical details. Some contributed papers from participants will be sought. A limited number of travel grants will be available.

For more information please contact:

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Telephone: (03)345-6362; FAX: (03)345-6000  
e-mail: carlin@cryptic.rch.unimelb.edu.au

John Hopper

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## SURVEY AND MANAGEMENT NEWS

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Following Dennis Trewin's move to Statistics New Zealand, Susan Linacre has been appointed Section Chair for the Survey and Management Section. To be effective in this role, Susan is keen to establish a network of members of the Statistical Society with an interest in sharing information about statistics in management or about research in survey design or methods. The latter could include the development of surveys in new subject areas or the use of innovative methodologies, or new approaches to evaluation or to the assessment of data quality, as well as new software developed relevant to survey work. Susan can be contacted at the Australian Bureau of Statistics, PO Box 10, Belconnen ACT 2616, phone (06) 252 7163, Fax (06) 252 5172.

Susan also provides the Country Report for Australia to the *Survey Statistician*, the journal of the International Association of Survey Statisticians (IASS), so news of any innovations in this field can be shared through her.

### IASS News

The Annual General Meeting of the IASS was held at the 49th Meeting of the ISI in Florence in August/September. Lars Lyberg of Sweden has now taken over as President of the IASS, with Dennis Trewin, now of New Zealand, elected as President Elect. There was some discussion at the AGM about membership levels for IASS and the need for the society to be more active in international meetings and conferences.

An International Conference on Survey Measurement and Process Quality is in the early planning stages. Tentative plans are to hold the conference in Bristol, UK, April 1-4, 1995. Monograph papers are currently being sought on Design and Specification, Data Collection, Post-Survey processing and Operations, Quality Assessment and Control, and Error Effects on Estimation, Analyses and Interpretation. For information, contact Lars Lyberg, Statistics Sweden.

### ACSPRI's 10th Summer Program

The ACSPRI Summer Program, of two sets of week-long courses, will run from 30th January to 11th February 1994 at the ANU, Canberra. There is a long list of courses including survey and sample design, regression analysis, factor analysis and scaling, and longitudinal analysis. The Course Booklet for the program is available from:

ACSPRI - SP94  
Social Science Data Archives  
Research School of Social Sciences,  
The AUstralian National University  
Canberra ACT 0200  
Tel: (06) 249 4400  
Fax: (06) 249 4722

Course places are limited and are allocated on a 'first come first served' basis.

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## LETTER ON ACCREDITATION

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I am in favour of accreditation. Although it is not likely that it will solve our problems instantly, I see accreditation as a step leading towards increased statistical awareness and statistical thinking in the Australian community. As a matter of fact I came to the conclusion that accreditation was a professional necessity five years ago when I transferred myself from academia to industry. Then I had my first contact with a wide range of management consultants and Statistics in practice: I must admit that I experienced a "statistical horror". The "horror" itself has not changed since then but I have become less sensitive.

Management consultants use Statistics and other modelling techniques extensively. Unfortunately, most of them do not have any understanding of Statistics and they use statistical packages applying the "push-the-button" approach. Regression analysis is the most abused and misused technique, usually performed on Microsoft Excel or Lotus 123 packages, which do not have any diagnostics.  $R^2$  is virtually the only criteria used to assess soundness of the regression analysis. Statistical data analysis is virtually non-existent in most management consultants' "statistics applications". During these five years I have not met a management consulting group which knew how to determine a sample size for a project properly. They all seem to believe that the sample size depends on the size of the population. The notion of variance seems to be largely unknown in this context.

Management consultants are not the only ones who misuse statistics. In general, university graduates with only basic courses in Statistics, often a one-year Introduction to Statistics course, are not at all in a position to apply statistical techniques correctly. As a matter of fact, even graduates with Operations Research and Statistics majors need some years of experience to be able to apply statistical techniques in practice. See Debbie Nash's article published in the proceedings of the ASOR conference, Adelaide, July 1993, and also to appear in the ASOR Bulletin soon, to find many valid comments on education of Statistics and its applications in practice.

Examples of misuse and misapplication of Statistics are in abundance. The examples themselves are not so important as the fact that there are many people who claim that they are experts and mislead business clients. This of course does a disservice to the profession and to statistics professionals in general.

On most occasions the ignorance and knowledge gaps are the key factors in the misuse of Statistics. However, there

are also examples of not "doing it properly" because of lack of time, and time constraints imposed by management. "Do anything quickly that can have some business meaning" may be a matter for management consulting groups of getting a contract job or not. We all know how easy it is to "lie" with Statistics, the more that management is totally unaware of its misuse. Managers usually do not read research reports because

- they are too busy with the day-to-day operations; and
- they perceive research too complex and too technical.

I have only met one senior executive who actually wanted to know "technical" details before making a decision.

This attitude will not change unless management develops the ability of statistical thinking and statistics will mean more than just the collection of numbers and number crunching. However, it will not eventuate until management does recognise the need for statistical thinking. At present they are happy as it goes.

I see the role of accreditation as a vehicle explaining to business students who are our future managers, and even to science and engineering students, and the general public that "there is much more to it" and that statistics is not a collection of the "push-the-button" techniques, despite the widely available statistical user-friendly software. This type of software is a great tool in the hands of a statistical expert, and totally useless in the hands of statistical ignorants. I know people who do not have any statistical, or any science or engineering background for that matter, who have left a one day SPSS promotional seminar with a deep belief that they "can do it all" now.

For those interested in this topic, I have summarised some related issues in the following two articles "Further to "The image of OR — the way ahead"" and "OR/Statistics in practice in the Commonwealth Bank" published in ASOR Bulletin, Vol 11, No 3, pp.10-12 (1992) and Vol 12, No 2, pp.8-12 (1993), respectively.

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- \* The views expressed in this article should not be attributed to the Commonwealth Bank of Australia.

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## NEWS ABOUT MEMBERS

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Richard Tweedie is having no trouble filling in those spare moments. Apart from being Head of his Department at Colorado State University, he is Editor-elect of the *Annals of Applied Probability*, President-elect of the

Colorado-Wyoming Chapter of the ASA, and recently appointed to the ASA committee on Law and Justice Statistics.



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**LETTER TO THE EDITORS**


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**TO:** The Editors, SSAI Newsletter

**SUBJECT:** The use of acronyms

The use of undefined acronyms in this otherwise worthy newsletter is driving me crazy! Take, for instance, the section entitled 'CENTRAL COUNCIL' on page 2 of the August issue. In two-thirds of a page there are nine acronyms, only four of which are defined or self-evident. Their meanings may be obvious to the initiated, but they aren't to me - or they may have been once but have since slipped my memory. With some of them I can make an intelligent guess, but I'd rather not have to spend the time. Here is my reaction to the nine:

SSAI Can't complain about this one, I guess.

ASPAI I wouldn't have a clue what this stands for.

AGM Fair enough.

NSW Self-evident except perhaps for the odd Western Australian or two.

FASSO A mis-spelling of LASSO? Seriously, I can conjecture words such as 'Federation', 'Australian' and 'Statistical', and I may even get it right, but why should I have to bother?

RSS Presumably 'Royal Statistical Society', although 'RSS model' might conjure up 'Residual Sum of Squares' if you weren't concentrating. Incidentally, one speaker at Statistics '93 in Wollongong kept referring to the 'Royal Stat Association'. The RSS acronym would be of limited value to such a person.

AMSC This is actually defined, hallelujah! However, it would be even more helpful if the acronym were placed in parentheses alongside the full name, viz. Australian Mathematical Sciences Council (AMSC).

FASTS I happen to know this one because of its higher profile, but I'm sure there are some for whom it is no more illuminating than FASSO.

The next page then starts with references to ASC13 and IMS. It reminds one of ASCII and IMSL. But I think I've said enough.

GH

DAV

(In the Department of Agriculture, Victoria, GH usually stands for Glass House or Growth Hormone, but occasionally for Graham Hepworth)

# TSA-32

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- (e) Construct randomized field plans using treatment labels rather than a number sequence.
- (f) Generate designs with unequal block sized for situations where the number of treatments is not a multiple of the block size.

ALPHA+ also produces a log file containing details of the interactive session.

ALPHA+ is available for DOS-based computers. It requires PC-DOS 2.0 or a more recent version. A mathematics coprocessor is not required.

Further information and purchase details for ALPHA+ can be obtained from:

Emlyn Williams	
CSIRO Division of Forestry	Tel: +61-6-281-8288
PO Box 4008	Fax: +61-6-281-8312
Queen Victoria Terrace	
CANBERRA ACT 2600	

## STATCOMP '93 and STATISTICS 93

Statistics'93 was held under the auspices of the Statistical Society of Australia and the International Association of Statistical Computing at the University of Wollongong from 27 September to 1 October. It attracted delegates from Australia (naturally) and also from Hong Kong, Italy, New Zealand, Swaziland, Thailand, UK and USA.

Statcomp '93 took place during the first three days of this conference, 27 September - 1 October where other strands were Statistical Education and Quality. The conference attracted over 160 participants.

### STATCOMP '93

The conference programme started with a combined education/computing talk by Dr Nev Davies (of Nottingham Trent University) representing the UK consortium from several universities working on the development of teaching materials for computer based learning. We were exposed to some of the more fundamental problems of designing such software with a large team — controlling the predilection of one member to use as many colours as possible on one screen when the 'standard' number was four. We also were shown some of

the challenging statistical problems which students would be confronted with in the future.

The next invited session was one organised by John Eccleston (University of Queensland) on computational techniques for construction of experimental designs. He was ably joined by Ken Russell (University of Wollongong) and Nye John (University of Waikato) and they put together an almost seamless series of three excellent presentations which was claimed to have occurred by telepathy ....

Murray Cameron (CSIRO, DMS Sydney) organised a session on software developments which included an almost mandatory pair of talks on S/S-PLUS given by Mark Walmsley and Bill Venables (University of Adelaide). These talks were to be contrasted with that given by Ken Johnson (ANU, Canberra) who described the computer based learning system (GRAFIX) which he had developed to utilise the latest technologies available on workstations.

Tuesday commenced with invited talks from Murray Aitkin (University of Western Australia) and Ari Verbyla (University of Adelaide) who tackled one of the major themes of current theoretical and computational

development, namely estimation of variance parameters, through two contrasting talks. Murray Aitkin described the analysis for a large study in Israel involving the education attainment of school children and Ari Verbyla carefully described Residual Maximum Likelihood estimation in terms of conditional distributions. Ari's talk gave one other speaker some anxiety as he spent an hour trying to reconcile his definition of REML with Ari's before he spoke later in the morning. The invited speaker from overseas was Trevor Hastie from AT&T Bell Labs, New Jersey who gave an excellent overview of Generalized Additive Models, both from a theoretical point-of-view and from their implementation in S/S-PLUS. This might have been Trevor's  $n$ th talk on this popular topic but he gave no indication of staleness in an enthusiastic presentation.

The afternoon invited session was on Image Analysis and was organised by Malcolm Hudson (Macquarie University). Brian Hutton (Royal Prince Alfred Hospital, Sydney) gave an exceedingly well illustrated talk about the practical aspects of Single Photo Emission Computed Tomography (SPECT) and Position Emission Tomography (PET) and some of the challenging statistical problems which are being considered jointly with researchers at Macquarie University. In contrast the second talk by Bob Anderssen (CSIRO, DMS, Canberra) gave us a technical insight into the stability of some of the recent algorithms (eg. EM Smooth) introduced to analyse SPECT images.

Wednesday morning's programme involved three invited sessions. The first, organised by Terry O'Neill (ANU, Canberra), involved government statistical developments and speakers from ABS and ABARE.

Ray Lindsay's (ABARE, Canberra) talk described developments in sample design, survey estimation and mapping of data for ABARE's regular survey of farms' financial and agricultural performance. Colin Rogers (ABS, Canberra) talked about Geo Link which is a user friendly computer system which takes data from various sources so that it can be integrated on a common geographic unit. David Williams (ABS, Canberra) described what products had been developed from the 1991 Census.

The second invited session of the morning involved two speakers from AGSM, UNSW, Simon Sheather and Matt Wand. Simon Sheather described joint work with colleagues at AGSM and the Sydney Water Board about time series modelling using Markov chain Monte Carlo. (Incidentally MCMC is a topic which is 'very hot' in North America, UK and Europe but there were only two talks on it at Statcomp '93 — is this because Australia is a Bayesian desert?). Matt Wand expertly described how binning could speed up computations for multivariate kernel estimators. The Statcomp part of the conference concluded with Trevor Hastie's intriguing talk on nonparametric discriminant analysis (or was this subtitled 'Statistics fights back', as new 'opponents' such as neural networks were beaten in trial problems) which took an old faithful, the linear discriminant, and generalised the 'linear' part in various ways to make powerful new statistical tools.

The 'invited' part of the programme was well complemented by several contributed sessions and they jointly provided a stimulating programme over the 2 and a half days of Statcomp.

The conference would not have taken place of course without the support of the Wollongong Applied Statistics Department who were in charge of the local arrangements. In particular, Dave Griffiths and Chandra Gulati must be thanked for their hard work before and during the conference. (Were those very willing and friendly third year students all guaranteed HDs in their courses?).



Bob Hall, Peter Dixon, Peter Martin, Nev Davies, Lyn Roberts, Gordon Smythe, John Eccleston and Bob Griffiths enjoying the social scene at Statcomp.

### Innovations

Away from the formal part of the conference, two cocktail parties were organised for the Monday and Tuesday evenings and enjoyed heartily. As an innovation, education workshops were organised for the Monday evening and these started before all the cocktail party drink'n eats were finished. (Another correspondent can report on the success or otherwise). A second innovation involved the writer trying to lose himself and the overseas invited speaker on Mt Keira just before his Wednesday talk. A thank you to the local Wollongong Monier tiles representative who drove us back to base.

A third innovation was the conference tee-shirt which caused some discussion. Didn't they know what a normal curve was in Wollongong? Why the platykurtic distribution? Came the reply from Dave Griffiths modelling the above mentioned, it was no distribution, it was Mt Keira, the backdrop of the Wollongong campus. Now the lighthouse could only be a lighthouse but ...

A fourth innovation was to close the conference on Friday lunchtime with communal singing of 'Happy Birthday'. It certainly made Friday a special day for Sid. (Perhaps an idea for further conferences, get spouses/partners/friends/parents to sponsor ... and all registrants to give DoB).

In retrospect, Wollongong provided excellent spring weather, local organisation and hospitality to make the

Society's "off-year" conference an undoubted success for those that attended.

That brings attention to two years' time. I would like to know what members'/readers' reaction might be to a joint Statcomp meeting with the Biometrics Society (Australasian Region) in July 1995 to be held on the Sunshine Coast, North of Brisbane.

Tony Pettitt  
Chair, Statistical Computing Section

### Statistics '93

The three themes of Statistics '93 were Statistical Computing, Statistical Education and Quality.

There were two overseas invited speakers in the Education section: Nev. Davies (U.K. Statistics Consortium) and Doug Stirling (Massey University). Neville presented material developed for computer-based learning. Doug is the developer of the Models'n'Data statistical software package, and used this package in a talk entitled "Using Simulations in the Teaching of Statistics".

An interesting collection of invited talks covered a range of topics. Naturally, computer-aided learning featured prominently, but there were many other topics, perhaps most easily summarised by some of the session titles: Learning Processes, Statistical Needs of the Community, Psychology of Learning, Statistics for Schools, Teaching Combinatorics & Probability. Two interesting and informative Education Workshops were held on the Monday evening, and strong commendation is due to those who tore themselves away from the still-proceeding cocktail party, stayed with the group even when the first venue was found to be locked, and continued on to the ultimate presentations.



How many faces can you recognise? Six or more to be eligible to win one of two T-shirts with Statistics '93 logo (size 18). Entries please to Statistics '93, Dept. Applied Statistics, University of Wollongong NSW 2522.

The Quality strand featured Peter Lee (Queensland) and Sid Dalal (Bellcore) as invited speakers. Peter included some provocative remarks on how statisticians need to lift their game in teaching statistics to engineers and others in service courses. Sid spoke on "Statistical Software Engineering". The quality component included a session on Quality in the Academic Workplace, in which Brenton Dansie spoke on attempts to introduce quality improvement in a university department, and was followed by an invited discussant (John Montagner, of Wollongong's Dept of Mechanical Engineering) who related his Department's progress towards accreditation. The smaller number of talks in the Quality strand permitted a slower pace than early in the week, a feature that was much appreciated by those who had been around since Monday.

Those at the conference Dinner were addressed by Ann Eyland (Principal of Women's College at Sydney University), who spoke entertainingly of hunting snarks and statisticians (and of the Undoing of Lamia Gurdleneck). For those with the stamina for a fourth evening out, the local Illawarra Statistical Group held a meeting on the Thursday evening, at which Murray Aitkin and John Eccleston were the featured speakers.

The prize for the best talk presented by a student was awarded to C.M. (Thomas) Lee of Macquarie University, who presented a paper written jointly with Malcolm Hudson and entitled "Deblurring Images subject to Poisson Variability".

It is not expected that Statistics'93 will be held again in Wollongong for another hundred years. The great success of our 1993 conference is due to the very substantial efforts of the staff and postgraduate students of the Department of Applied Statistics, together with Tony Pettitt, who organised invited speakers for the Computing Strand, and Ann Eyland and Peter Thomson who met delegates at Sydney airport.

Special mention must be made of Brenda Evans and our 3rd year students, Philip Dransfield and Gabriel Medin, whose work behind the scenes ensured that the conference ran smoothly.

Comments during the conference, confirmed by a survey of the delegates, showed that most delegates were impressed by the beauty of the campus and the region, the range of facilities in our "state of the art" lecture theatre, the quality (fatness of purpose?) of teas and cocktail parties, and by the friendliness of the organisers.

Ken Russell  
University of Wollongong

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## YOUNG STATISTICIANS' PROFESSIONAL DEVELOPMENT WORKSHOP

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### A Report by QUT Participants

We first became aware that a YSPD workshop was being organised, from an article in the March 1993 issue of the SSA newsletter. From our sunny Queensland abode there were only vague recollections of previous workshops held in the ACT and NSW and so the call for expressions of interest from 'young' statisticians nationwide, to attend the workshop, raised a great deal of interest and enthusiasm. It also resulted in lengthy discussions regarding the meaning of 'young' but we finally decided that each of us should qualify. We were keen to meet and share experiences with fellow statisticians embarking on their careers and promptly registered our interest with Ann Cowling so we wouldn't miss out on a place. So after a long but warm winter in Brisbane Ingrid, Jodie, Robert, Andrew and myself packed parkas, beanies, scarves and other winter woollies in the hope of experiencing some cold weather and perhaps even snow in our National Capital. Surprisingly (from our point of view), the few days we spent in Canberra from 29 September to 1 October inclusive were warm and sunny (even warmer than it was in Brisbane for those few days) which added to the enjoyment of our visit.

As we had been attending the Statistics '93 Conference at Wollongong earlier in the week, our trip to Canberra began with the scenic (but hair-raising) drive over the Macquarie Pass. The occupants of the first car were shown how to avoid semi-trailers approaching on the wrong side of the road and leading a procession of cars, on a hair-pin bend, by rally driver Helen Mac. while our second vehicle was fortunate enough to observe an adult echidna crossing the road. On arriving in Canberra we managed to find our way to the Brassey Hotel where the workshop was held, and were impressed by the old but stately and classy atmosphere of the building. There were a few problems with room allocation due to over-booking, however these were soon rectified.

The workshop began with registration at 4 p.m. There were approximately 60 registered attendees, six of these being invited speakers, so the workshop had obviously received a lot of support. Registration was followed by drinks and dinner. This was a great way to start the meeting as everyone relaxed over drinks and food and much social interaction took place. I was pleasantly surprised to be reunited with a friend (Kate), from my undergraduate days at the University of Newcastle, whom I had not seen for a number of years. Towards the end of dinner the invited speaker, Helen MacGillivray from QUT, gave a very interesting talk "It's academic: life at the chalkface" in which she explored the roles of the academic statistician, including references to past experiences.

After a scrumptious buffet style breakfast on Thursday morning, we were down to serious business with talks beginning at 8.30 a.m. Most of the participants had offered to give talks and even though they were only 15 minutes long, some talks had to be held in parallel which

led to some shuffling between two rooms. The first invited speaker of the day was Sue Wilson of CMA, ANU who spoke on her work on the statistical modelling of the AIDS epidemic. The talks which followed, by the 'young' attendees, included accounts of work experience, postgraduate research and honours projects, covering a wide range of topics such as fractal properties, fitting the generalised lambda distribution, image restoration for medical images and statistical consulting (to name a few). Of particular interest to me were the talks by fellow consulting statisticians which involved discussions of problems faced by statistical consultants including the difficulty of extracting relevant information from the client and convincing the client that there may be a 'better' way to analyse their data. It was emphasized that clients should be encouraged to consult the statistician before beginning their project. After gorging ourselves with the irresistible chocolate eclairs provided for morning tea, the next invited speaker, Teresa Dickinson from DMS, CSIRO, complimented the talks on consulting by sharing some of her experiences as a consultant.

Following lunch, Thursday afternoon had been set aside for informal activities which included visits to either the old or new parliament house, the national gallery of Australia, the national science and technology centre, the beautiful floriade festival on the banks of Lake Burley-Griffin and the casino. There was also the option of going to a statistics seminar at the ANU given by Dr. Trevor Hastie (AT&T Bell Laboratories) on Nonparametric Discriminant Analysis.

During dinner, the invited speaker was Tim Brown from Melbourne University who spoke on the work involved in establishing the Victorian Certificate of Education. Following dinner, a group of lively attendees which included Tim (but only for a short while), headed off to the casino returning at 4 a.m. the next morning (confirmed by Helen who counted the number of doors slamming around this time). The Friday session began with an interesting and encouraging talk by Tom Pettigrew, a private consultant from Melbourne. Tom stressed the need for the new generation of statisticians to develop techniques for presenting statistical concepts in simple, easily understandable graphical forms. The day's talks consisted of a variety of topics including stacked boxes, estimating the number of heart attacks in Australia, DNA fingerprinting, survival analysis and biometry. The final invited speaker was Matt Berger from the ABS who gave a very vivid talk on the merits of working as a statistician with the ABS.

At the end of the workshop participants were asked to vote on the best presented talk. Our congratulations go to Susan Hoffman of Sydney University who spoke on her honours' project work "Robust Regression and Outlier Detection". Susan also won a caramello koala award, the Toastmasters' Award for the most robustly articulate talk. Helen and Tim selected delegates and award titles for the caramello koala awards including the brylcream award for

the smoothest approach to roughness and the Latin American award for the best song and dance act.

Many thanks go to Ann Cowling and Peter Hall for organising such a worthwhile and successful workshop. Thanks also to the sponsors DITAC, the NSW and ACT Branches of the SSA and the Centre for Mathematics and its Applications, ANU for enabling the workshop to

happen. We look forward to seeing everyone at next year's workshop wherever that may be.

Michele Haynes

(with the assistance of  
Ingrid Baade, Jodie Kelly,  
Robert King and Andrew George)  
Queensland University of Technology

## AUSTRALASIAN CONFERENCES

### CONFERENCE SUMMARY

**Workshop on Statistical Variable Selection**, 2-4 December 1993, La Trobe University, Melbourne.

Information: Paul Kabaila, Department of Statistics, La Trobe University, Bundoora, Victoria 3083; email: stapvk@lure.latrobe.edu.au. (Further details in Newsletter 64.)

**Second International Conference on Financial Econometrics**, 13-14 December 1993, Queenstown, New Zealand

Information: David Giles, Economics, University of Canterbury, Christchurch, New Zealand.

**Statistics in Ecology and Environmental Monitoring**, 13-17 December 1993, University of Otago, Dunedin, New Zealand

Information: Centre for Applications of Statistics and Mathematics, University of Otago, PO Box 56, Dunedin, New Zealand, tel: +64 3 479 7774, fax: +64 3 479 8427, email: CASM@math.otago.ac.nz. (Further details in Newsletters 62 and 63.)

**Biological Community Structure and the Effects of Pollution**, 7-11 February 1994, AWT-Science & Environment, Water Board, Sydney.

Information: Dr Raghid Nahhas, PO Box 73, West Ryde NSW 2114, tel. (02) 334 0945, Fax: (02) 334 0840. (Further details in Newsletter 64.)

**Workshop on Stochastics and Finance**, 21-25 February 1994, ANU, Canberra.

Organizer: Dr Eckhard Platen, Information: Jenny Goodwin, CMA, SMS, ANU, Canberra ACT 0200, tel. (06) 249 3697, fax. (06) 249 3918. (Further details in this issue.)

**Twelfth Australian Statistical Society Conference**, 1994, Monash University, Victoria.

Information: R.C. Griffiths, Mathematics Department, Monash University, Clayton VIC 3168, email: apm466b@vaxc.cc.monash.edu.au. (Further details in Newsletters 62 and 63.)

**The A C Aitken Centenary Conference**, incorporating 3rd Pacific Statistical Congress and Annual Meeting of New Zealand Statistical Association, 28 August - 1 September 1995, University of Otago, Dunedin, New Zealand.

Information: The Aitken Conference Secretary, Department of Mathematics and Statistics, University of Otago, PO Box 56, Dunedin, New Zealand, tel. +64 (3) 479 7774, fax. +64 (3) 479 8427, email casm@maths.otago.ac.nz. (Further details in this issue.)

### **The A C Aitken Centenary Conference 28 August - 1 September 1995 University of Otago, Dunedin.**

Incorporating the 3rd Pacific Statistical Congress and the Annual meeting of the New Zealand Statistical Association.

This is the first announcement of a five day conference to celebrate the 100th anniversary of the birth of the famous New Zealand mathematician A.C. Aitken, who was born in Dunedin on 1 April 1895. In keeping with Aitken's own interests, the conference will include invited and contributed papers on the three general themes of Actuarial Mathematics, Numerical methods, and Statistics.

For further information and to be put on the mailing list, contact:

The Aitken Conference Secretary  
Department of Mathematics and Statistics  
University of Otago  
PO Box 56, Dunedin, New Zealand

Tel: +64 (3) 479 7774  
Fax: +64 (3) 479 8427  
Email: casm@maths.otago.ac.nz.

## Workshop on Stochastics and Finance, 21 - 25 February 1994

The workshop will be divided into two parts. The first part on Monday 21 and Tuesday 22 aims to bring together Australasian and overseas experts from the finance industry in research and development and interested specialists from universities representing the areas of finance and commerce, stochastic analysis, stochastic numerics and statistics of stochastic processes. It will be focussed on theoretically challenging and practically relevant problems in finance, such as:

- interest rate options
- option pricing and hedging
- stochastic PDEs and term structure modelling
- stochastic numerics in finance
- interest rate term structure and arbitrage information
- statistics of stochastic processes in finance and commerce
- stochastic control in finance
- heavy tails modelling.

The second part, during the rest of the week, is planned as a more theoretically-oriented working seminar, facilitating joint research.

Organizer: Dr Eckhard Platen

For further information and registration, please contact:

Jenny Goodwin  
Stochastic Analysis Group, CMA  
School of Mathematical Sciences  
Australian National University  
Canberra ACT 0200  
Tel: (06) 249 3697  
Fax: (06) 249 3918.

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## OVERSEAS CONFERENCES

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**Second ICSA Conference in Statistical Research & Applications and the 1993 Taipei International Statistical Symposium, 17-19 December 1993, Taipei, Taiwan.**

Information: Smiley W. Cheng, Department of Statistics, University of Manitoba, Canada R3T 2N2.

**International Conference on Statistics and the Quality of Life: A Third World Perspective, 9-12 January 1994, Luxor, Egypt.**

Information: P.K. Sen, Department of Biostatistics, University of North Carolina, Chapel Hill, NC 27599, USA.

**Third International Conference on Lattice Path Combinatorics and Applications, 12-14 January 1994, Delhi, India.**

Information: Kanwar Sen, Head of the Department of Statistics, University of Delhi, Delhi-110007, India.

**48th Annual Quality Congress (AQC), 24-26 May 1994, Las Vegas, NV, USA.**

Information: ASQC Conferences and Exhibits Department, PO Box 3005, Milwaukee, WI 53201-3005, USA.

**Fifth Valencia International Meeting on Bayesian Statistics, 5-10 June 1994, Alicante, Spain.**

Information: Prof. Jose M. Bernardo, Centro de Documentacion y Analisis, Presidencia de la Generalidad, Caballeros 9, 46001 - Valencia, Spain.

**Fourth International Conference on Teaching Statistics, 25-30 July 1994, Marrakesh, Morocco.**

Information: Mr EL GHAZALI Abdelaziz, Chairman of the Local Organizing Committee, I.N.S.E.A., PO Box 6217, Rabat-Instituts, Rabat, Morocco.

**17th International Biometric Conference (IBC94), 8-12 August 1994, Hamilton, Ontario, Canada.**

Information: IBC94 Local Organizing Committee, Department of Mathematics and Statistics, McMaster University, Hamilton, Ontario, Canada L8S 4K1.

**Frontiers of Statistical Ecology and Ecological Statistics, 20-26 August 1994, Manchester, United Kingdom.**

Information: G.P. Pail, Center for Statistical Ecology and Environmental Statistics, Department of Statistics, Pennsylvania State University, University Park, PA 16802, USA, Tel: 1 814 865-9442, fax: 1 814 863-7114, email GPP@PSUVM.bitnet.

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