

statistical
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newsletter

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STATISTICAL EDUCATION

Ken Russell

Chairman, Statistical Education Section

Last year I spoke on Statistical Education to the Victorian Branch of the Society. This article includes parts of that talk, together with an account of recent developments. The Society has a Statistical Education Section; if you are interested in taking part in its activities, please write to me (address on back page).

Educating the Statistical Profession

An innovation in 1988 was a Continuing Education course on Log-Linear Models held in conjunction with the Australian Statistical Conference. The aim was to provide a basic knowledge of the topic, a set of examples using several common computer packages, and a list of references. One or more Continuing Education courses will be held in conjunction with the 1990 Conference.

The biennial Conferences are an educational medium where the emphasis is on up-to-date research. They are very useful to keep abreast of the field, and to meet colleagues, but might they not attract a greater proportion of the Society's membership if more expository talks and applied sessions were encouraged? Unfortunate clashes (e.g. Experimental Design with Applied Statistics — both needed by biometricians) should be avoided. Poorly presented papers are of little value, and it's time the profession refused to tolerate them.

The Society has several special interest groups, most of which have meetings or mini-conferences. In relation to statistical education, Victorian members who

teach Statistics were invited to attend a meeting in March, and the attendance was encouraging. We propose to compile a list of the videos and other statistical teaching aids in Victoria, form sub-groups of people interested in special areas (e.g. teaching students in the Health Sciences), and do various other things, some of which are described elsewhere in this article.

The Branches hold regular meetings. Many have highly technical subjects, and I favour a greater mix of technical, expository, and general interest topics. I look forward to the day when meetings attract a large proportion of members, and see this as one of the greatest challenges facing Branch Committees. Senior students should be encouraged to attend appropriate meetings.

The Victorian Branch holds a Young Statisticians' Workshop annually. This is an excellent idea. I spoke at the 1987 workshop, and was heartened by the interest, enthusiasm, and camaraderie of the participants. This year's Workshop will feature a specific educational component on Generalized Linear Models, and is being promoted widely amongst practising statisticians as well as students.

Tertiary Students Majoring in Statistics

Tertiary courses for Statistics majors should be where the best education of statisticians takes place. From personal knowledge and by reputation, some courses are very good; others are appalling. A common fault is that their content is not statistics, nor mathematical statistics, but statistical mathematics. When did you first realise that Statistics was about VARIABILITY?

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

If your experience is like mine, or that of most people I talk to, it was after you graduated. I believe that there should be practical examples and exercises in every course. Students should have to design, and conduct, their own experiments in each year of their study, and they should NEVER, EVER, be allowed to end an exercise with the bald statement "Therefore we reject H_0 ." Variability should be explicitly and frequently mentioned. Lecturers should consider inviting practising statisticians to give part or all of a lecture.

The preceding sections dealt with those groups who have decided that Statistics is worthwhile. I now want to consider the vast majority of people. They have the usual distorted images of statisticians: a statistician is a person who feeds facts to Richie Benaud in World Series Cricket; "statisticians spend all their time drawing up tables and graphs"; "lies, damned lies, and Statistics"; and (most hurtful of all) "Did you hear about the accountant who took up Statistics because he found Accountancy too exciting?"

Service Courses

I am saddened by the many people who tell me that their University service course in Statistics was the course they understood least. Why was this the case? All too often, because statisticians taught statistical mathematics to students whose reason for choosing Science, Psychology, etc. was that they couldn't do Mathematics. Most of these students will use Statistics to design and analyse experiments, or to understand the literature in their field. They need to understand concepts such as the importance of randomization, the control of variation, power and the need for appropriate replication, etc. Any procedure or formula which doesn't help their understanding should be discarded. Such a course must be based on an easy-to-use computer package.

Service courses must involve staff of the discipline contributing the students. These people should attend the opening lecture and several others to explain why the students have to do the course, and how they, themselves, use Statistics (but first check what they are going to say!). They should be asked to provide simple data sets from their discipline for use in the course. (In my talk, I mentioned a Ph.D. student in Botany who had not learnt any Biometry, and I deplored the fact that the Botany department did not insist that research students should have some knowledge of biometrical principles. A few days later, I was told that the Botany Department had, in fact, once asked the statisticians to provide a service course — unfortunately, the statisticians gave such an inappropriate course that they were not asked again.)

We often hear of service courses given by other Departments in which some quite incorrect things are taught. It is true that such courses do Statistics a disservice, but until our profession can demonstrate that we can teach our own Service courses properly, there is little hope of other disciplines being persuaded to entrust their students to us. As an intermediate step, an offer to collaborate on planning courses and giving lectures may have some success.

Consultant statisticians have an educational role. Their clients are intelligent professionals who have little or no statistical background. The folklore is full of tales of the statistical disasters that some of these people have produced. There are fewer tales of how the statistician explained how the experiment might have been greatly improved, often at no greater cost, had s/he been consulted first. The carrot often is more effective than the stick. In most instances, patience and persistent helpfulness are all that can be put to use, plus the publicising of available services.

The biometricians in Departments of Agriculture and CSIRO have a role to play here. In Victoria, an educational video has been produced on the basics of biometry and the principles of experimental design; it has been seen by most agricultural research scientists. As well, a quarterly Newsletter (an idea stolen from Western Australia) is sent to all scientists. It contains articles on topics such as the importance of graphing residuals in regression analysis and ANOVA, what power is all about, why experiments should be blocked, etc. We are heartened by the enthusiastic response from its audience; this is achieved by carefully selecting relevant topics and ensuring that articles are pitched at the right level for the intended readers.

Secondary Education

I hated the Statistics taught at High School. It was boring work on the mean, median and mode, and later came some probability and mathematical expectation — all taught as mathematics, with little mention of its practical applications. No wonder many students were turned off Statistics before they left High School.

I hope that the High Schools do better these days, but I don't really know if they do. I sense considerable ignorance on the part of most statisticians as to what is taught. The curricula are changing in several States. Richard Jarrett has asked Branch Secretaries to collect information, which I will then collate. It does seem that statisticians have little input into the content of these courses. Pamela Shaw ran a one-day workshop at Macquarie University in October, 1988 on "Statistics in the School Curriculum". The attendance was disappointing, but we must keep trying.

Many Mathematics teachers have no training in Statistics, so both secondary students and teachers need assistance. What can the Society do? I sense in some people a belief that the Society should not give any courses, but that it could usefully provide resource material. We can learn from our New Zealand and American colleagues here. The Kiwis have been involved in secondary education for some time, and produced the book "Statistics At Work", which contains some excellent case studies and exercises. We need an Australianised version of that, and I hope to make some progress this year. It will require people willing to contribute suitable articles; expressions of interest, nominations, and enquiries are most welcome. The Americans have produced a set of slides, and a text to be read with it, for use at Careers Nights, etc. The University of

Newcastle has made a few changes to one set to make it more relevant to Australian conditions, and finds it very useful. The Victorian Branch has just bought a set. I hope that we can get more sets, perhaps one or two per Branch, to be used by statisticians in addressing appropriate groups. Do Schools have Careers Nights? If so, we need a statistician talking at each one.

Murray Cameron tells me that CSIRO has an educational centre in most capital cities, to which groups of school students come to learn about science. We hope to have some statistical material on display. New Zealand has regional Science Fairs, at which school students display science projects they have devised. The NZSA awards prizes to exhibitors who have shown good statistical appreciation (e.g. replication of treatments, good graphical display). Are there such displays in Australia? If so, let us get involved in them; if not, we need to get together with other disciplines to organise them.

Each Branch ought to hold a full- or half-day meeting each year, specifically targeted at teachers, at which statisticians talk about their work and illustrate the variety of important applications of Statistics. (The recent meeting in Melbourne suggested that we should follow the Americans and compile a list of statisticians willing to give general lectures about Statistics.) I hope to have a one-day session for teachers at the Pacific Statistical Congress in Sydney next year (as was done at the first PSC in 1985). We need to encourage teachers to attend the Third International Conference on the Teaching of Statistics (ICOTS 3) in Dunedin in August, 1990.

What has the Society done to attract secondary school students? I know of the booklet "Careers in Statistics" and the pamphlet "So You Want To Be A Statistician?", and these are a good start. But I wonder if they are enough, particularly when students are becoming more conditioned to an audiovisual stimulus. What about a professionally-produced video? (No; not directed by Ken Russell!) I can envisage an excellent 5- to 7-minute section on Biometry. Have we the resources and the energy to produce a video?

Educating Other People

During 1988 the position of Director of the (NSW) Bureau of Crime Statistics and Research was advertised. The essential or desirable qualifications did not include any which would ensure that the appointee had any knowledge or experience of Statistics. I wrote to the Recruitment Officer in relation to this, and was supported by a letter from Dennis Trewin. An assurance that such knowledge and experience would be considered by the Selection Panel was received.

One way of ensuring that Statistics is not ignored is

to write to the relevant people when necessary. Governmental bodies sometimes invite tenders to carry out surveys. If you see such an advertisement, and it does not require the tendering organisation to demonstrate statistical expertise, write to the advertiser about it, or contact your Branch Secretary (or me, if you like) and ask them to write.

In 1988, the issue of chemical residues in meat threatened to harm our exports to the United States and Japan. There is a statistical element to this issue. It arises not just in selecting a sample of carcasses to test for levels of contamination, but also in the variability of laboratory results: if a carcass gives a reading of 0.21 parts per million of a pesticide, and the Maximum Residue Limit (MRL) is 0.2 ppm, should the carcass be condemned for exceeding the MRL, or should some account be taken of the variability inherent in the reading? This problem is familiar to statisticians, but many administrators have difficulty coming to terms with it. We need to seize on such opportunities to demonstrate the usefulness of Statistics. The spin-offs in this case include the likelihood that future problems of this nature will be resolved with appropriate statistical inputs, and an increased appreciation within the Department for which I work that biometricians have their uses.

In discussing Statistics in the public sector, let us not forget the politicians. A quote from John Bibby's "Quotes, Damned Quotes, and ..." says it all: "We look forward to the day when everyone will receive more than the average wage." (attributed to the Australian Minister of Labour, 1973). Utterances such as this should prompt a deluge of letters which gently explain the futility of such dreams. We need also to make politicians aware of the implications of variability. While any road death is a tragedy, a rise of 10 in the annual NSW road toll does not represent a significant increase in fatalities, and ought not to be responded to by knee-jerk reactions.

Newspaper editors warrant our attention. By all means complain about a particularly misleading graph or table (provided that you explain how it ought to have been drawn up), but do not forget to praise an article which shows a worthy attempt to explain some statistical aspect of a story. Perhaps the Society should institute an annual prize for the article judged best in explaining a statistical topic.

The final group of people to be educated about Statistics are Joe and Joan Public. These are the people you meet socially, who will not know anything about Statistics unless you tell them. Make them realise that statisticians do interesting things; be an ambassador for Statistics. Perhaps the Society could follow the lead of

New Zealand and form a Survey Appraisals Committee, to comment publicly on any surveys which are referred to it or which it decides to investigate. By doing so, it would play a useful public role while at the same time increasing the public's awareness of our profession.

To conclude, all our educational efforts need people to help put them into effect. Please don't say that "the Society" should do it, because the Society is nothing but its members. And please don't wait for a Super-

man to come along. Superman may be very powerful, but even he can't do anything about intrinsic variability. No, in this situation we need lots of "Superstat"s — mere mortals who have an understanding of statistics. Together we can change the course of mighty issues, straighten confusion with bare facts, and (disguised as mild-mannered people in a great profession) fight a never-ending battle for truth, justice, and the statistical way!

BRANCH REPORTS

New South Wales

Generalized Additive Models

At the February meeting of the Branch, Trevor Hastie (AT&T Bell Labs) spoke on his work on Generalized Additive Models.

Trevor first illustrated several well-known smoothers for scatterplot smoothing; extending these to higher dimensions introduces difficulties.

An additive model has the response as the sum of arbitrary functions of each of the regressors. This includes linear regression, and models with some terms linear and the others arbitrary. The variables can be scalars or vectors, categorical or continuous. The generalized additive model includes also a link function, so generalizes GLIM type models. Trevor provided logistic regression as an example.

Algorithms and properties for the models were discussed, as was the availability of software.

Annual General Meeting

The 41st Annual General Meeting of the NSW Branch was held on 15 March, 1989 at the University of Sydney.

Office bearers and Council members for 1989 are:

| | |
|----------------|---------------------|
| President | Dr R.L. Sandland |
| Past President | Prof. A.J. Dobson |
| Treasurer | Dr N.C. Weber |
| Secretary | Dr S.H. Huxham |
| Assistant Sec. | Mr D.D. Reid |
| Council | Prof. G.K. Eagleson |
| | Dr E.A. Eyland |
| | Dr N.I. Fisher |
| | Mr R.J. McEntyre |
| | Mr P.J. Nicholls |
| | Dr S.J. Sheather |
| | Dr G.Z. Stein |

Optimal Convergence Rates and Bad Guys

At the Annual General Meeting, the President's Invited Address was delivered by Professor Peter Hall (ANU),

on "Optimal Convergence Rates, or Hunting for Bad Guys".

For most, exposure to optimal convergence rate problems in statistical inference is limited to the Cramèr-Rao lower bound. Two main limitations are that it applies only to variance and not to mean squared error and that it applies only to finite parameter problems. Peter described the version of the bound applicable to mean squared error problems, and explained how this could be used in a nonparametric setting involving an infinite number of parameters.

Lower bounds for statistical performance in nonparametric problems may be estimated by minimax theory, which involves identifying the worst possible case, or 'bad guy'. These ideas were illustrated in the setting of a discrimination problem. In this case the bad guy would correspond to a limiting probability of error of discrimination which was neither zero nor one.

Modelling at Neuron Muscle Synapses

John Robinson (University of Sydney) spoke at the April meeting of the Branch on "Modelling the Transmitter Release Process at Neuron Muscle Synapses".

John first provided a biological description of the connection from a neuron to its terminal on a muscle cell. An action potential moving from a neuron to its terminal causes release, from sites on the terminal branches, of quanta of transmitter which produce potential changes across the muscle cell's membrane. The problem is to model this transmitter release process.

There is a large number of sites (100-400) at a terminal, so a model for the times and positions of releases of quanta leads to a non-stationary Poisson process. The number of releases is then a Poisson variate. As this does not accord with experimental results, John proposed an extension of the model in which it is assumed that a release at a particular site causes an inhibitor to spread from that site stopping further releases in the region inhibited. Eventually, either there are no releases or the whole terminal is inhibited. John provided graphical comparisons of simulated results based on this model and experimental data.

For a particularly simple case, theoretical results were obtained. The model gives predictions very similar to experimentally obtained results.

Victoria

Industrial Statistics

For the March 7th Branch meeting Bill Armstrong organised a seminar on Industrial Statistics. Steve Lyons, Ray Mundy and Ray Robbins, who work for different companies involved in manufacturing, plus Graham Peck from Enterprise Australia, spoke about their experiences in the use of statistics. They expressed a need for statisticians to become more involved with industry, but also pointed out the problems. These include the general lack of appreciation by statisticians of the business and industrial climate and the need for statisticians to be able to communicate their ideas in simple and effective ways to management.

A very lively and extended discussion followed. Points included were that statistical consultants often have an educative function but that the approach required was quite different to that in tertiary education; greater success could be achieved if individual statisticians were able to develop a relationship with particular companies and so build up an understanding of the industry and the company; and the general role of statistical education both in schools and at tertiary level for non-statisticians.

Modelling and Forecasting Time Series

Peter Brockwell (University of Melbourne) made a comprehensive presentation of state-space techniques for modelling and forecasting time series at the meeting on April 18th. He described the innovation representation of ARMA models and the associated recursion relations used to obtain maximum likelihood parameter estimates. With reference to standard series from Box & Jenkins and some others, including a monthly series of accidental deaths, he demonstrated the advantages of the linear state-space representation of ARMA processes and transfer function models in terms of

- model identification and estimation;
- estimation of missing values;
- dealing with series of unequal observational periods; and
- forecasting.

South Australia

The South Australian Branch held its Annual General Meeting on Wednesday, 15th March, 1989. John Field, of CSIRO Division of Mathematics and Statistics was elected Branch President, and Debbie Street of the Waite Agricultural Research Institute was elected Vice-president. Alan Branford and Jill Smith, both of Flinders University, remain as Secretary and Treasurer, respectively. Other members of the new Council are Brenton Dansie (S.A. Institute of Technology), Bob Hall (S.A. Institute of Technology), Margaret Meyler (University of Adelaide) and Ari Verbyla (University

of Adelaide). John Darroch (Flinders University) is the Immediate Past President and Assistant Secretary. John Darroch addressed the A.G.M. on the issue of p -values.

Measuring Power in Australian Politics

On April 12th, 1989 the Branch was addressed by Alastair Fischer of the Economics Department of the University of Adelaide. A formal concept of power wielded by individuals and groups within a committee or legislature has been derived from game theory concepts. The concept refers to the power of these individuals or groups to influence a result by changing their votes. In the Australian Senate or the South Australian Upper House, for example, the Australian Democrat Senators or Legislative Councillors arguably have much more power per head than the more numerous Labor and Liberal members because the Democrats hold the balance of power. Beyond such simple exercises, it seems that no-one in Australia has formally investigated the amount of power held by groups in various situations. The object of the talk was to show how a measure of the amount of power held by voters in various electorates in Australia for the House of Representatives may be derived.

Western Australia

Statistics in Robot Deboning

At the first meeting of the year in March, Dr N.R. Achuthan from School of Maths and Stats at Curtin University of Technology spoke on the problem of 'modelling of bone surface for robot deboning of cattle carcasses'. The main discussion was on the methodology used for modelling the humerus bone surface. Dr Achuthan explained that the humerus bone can be approximately modelled as a combination of series of ellipses joined together as one travels from one end of the bone to the other, along the longitudinal axis (x -axis) of the bone. The fitting of an ellipse to the yz cross-section of the bone is formulated as a non-linear optimisation problem and the ellipse parameters are predicted using non-linear regression methods. Dr Achuthan ended his talk outlining further studies under progress.

Biostatistics

On April 18th, 1989, the branch was addressed by Prof. Barry Garner, who is visiting NH&MRC in Perth. Barry walked us all through 'a funny thing happened on the way to the Biostatistics Lab.' in Dalhousie University, Canada. Being the Director of Biostatistics, Barry explained the type of non-standard statistical problems that he encountered. Besides describing approximate solutions to these problems, he also talked about 'Survival' problems, testing of equivalence, and the good old maximum likelihood estimation of random models in biostatistics.

Quasi-likelihood and Optimality

We are looking forward to Prof. Chris Heyde's talk

on "Some current unifying themes of Quasi-likelihood and optimality". Chris will be addressing our May meeting on the 23rd, and will focus his talk on recent progress towards a general unification under the umbrella of quasi-likelihood of two of the principal themes in statistical estimation theory. One of the themes will be 'least squares', which is founded on finite sample considerations; and the other is 'maximum likelihood', whose justification is primarily asymptotic.

11th Australian Statistical Conference

We are pleased to inform all the members that the 11th Biennial ASC will be held in Perth in 1992. The new Branch Committee is currently constituting a conference committee in preparation for the conference. This committee will be seeking input from all Branches with particular reference to programming and directions for the conference.

Canberra

Generalized Additive Models

Dr Trevor Hastie of AT&T Bell Labs, USA, addressed the branch at its February meeting on the topic of generalized additive models. An additive regression model has a general form in which the expectation of a variable is a linear function of arbitrary functions of predictor variables. In his presentation, Dr Hastie discussed algorithms for estimating generalized additive models and noted that in order to do a good data analysis job, we need more than the fitted functions. A variety of tests such as standard error bands, approximate deviance tests and diagnostics were discussed as well as modelling strategies.

Statistical R&D in the Federal Public Service

Dr Ray Chambers gave the presidential address to the branch at its AGM on 28th March, 1989. Dr Chambers gave a review of the statistical work carried out in a selected range of Commonwealth Government departments. The review showed that there are a number of departments with statistical units or statisticians, but with the exception of the ABS, the units are very small. In policy departments there appeared to be a lack of appreciation of the usefulness of statistical analysis in decision making and a problem of communication between policy makers and what are regarded as technicians. In research agencies and the ABS statisticians appeared to be better regarded. The potential application of statistical methods to program evaluation was

pointed to as an area where some growth should occur in the future.

Queensland

Bicentennial Project on Youth Unemployment

Professor William Dunsmuir talked on "The Statistical Society of Australia's Bicentennial Project on Youth Unemployment" at the branch's annual general meeting, which was held on 28th March, 1989. The project focused on youth unemployment as a problem of national significance and social relevance. The Australian Longitudinal Survey was used as the major data source. Ten papers were attracted, and will appear as a special issue of the journal. Professor Dunsmuir classified the articles into two categories — participation analysis and duration analysis — and chose some highlights out of each. The broad aim of participation analysis was to determine the socio-demographic, educational or previous labour market experiences which influence or predict the labour market status of individuals. Duration analysis studied the statistical distributions of times spent in the various labour market states, and how these are influenced by socio-demographic, educational and previous labour market states.

Election of Officers

The following executive officers were elected unopposed at the meeting: Kaye Basford (President), Janet Bodero (Treasurer), Gordon Smyth (Secretary), Helen MacGillivray (*ex officio*), Peter Jones, Ian Saunders, Tony Swain and Richard Wilson (Councillors). A vote of thanks was enthusiastically moved to thank Helen MacGillivray, the outgoing president, for her leadership and enthusiasm over the past two years.

Workshop on Empirical Likelihood and the Bootstrap

Although not organized by the branch, many Qld branch members attended an innovative and successful workshop on Empirical Likelihood and the Bootstrap at Bond University, 28th to 31st March, organized by the Consortium for Research in Computer Intensive Statistical Methods. Participants enjoyed hospitality provided by Bond University as well as a tour of the site. For most participants, it was their first visit to the new campus. Speakers were Art Owen and Tom DiCiccio (Stanford University), Peter Hall (ANU) and Nick Fisher (CSIRO, Sydney).

MISCELLANEA

Moran Medal

The subscription for a medal in honour of the late Professor P.A.P. Moran has been particularly successful, having raised \$11,600. The Australian Academy of Science has formally approved the medal, to be awarded under its auspices. An artist is now working on a design.

The Moran family, the Academy and Pat's colleagues would like to thank all those who contributed so generously to the endowment. The success of this venture is a tribute to the affection and high regard which the many contributors felt for Pat.

Peter Hall
ANU, Canberra, Australia

Workshop on Empirical Likelihood and the Bootstrap

A workshop on Empirical Likelihood and the Bootstrap was held at Bond University over the period March 28 to March 31. The workshop was organised as part of the activities of the Consortium for Research in Computer Intensive Statistical Methods, which is made up of the Australian National University, Bond University and the University of New South Wales. Financial support for the workshop was provided by Bond University.

The speakers at the workshop were Professors Art Owen and Tom DiCiccio of Stanford University, Professor Peter Hall of the Australian National University and Dr Nick Fisher of the CSIRO Division of Mathematics and Statistics. Titles of the talks were: empirical likelihood ratio confidence regions; corrections to empirical likelihood for improved confidence regions; empirical likelihood computation; empirical likelihood for linear models; theoretical aspects of empirical likelihood; bootstrap confidence intervals; some aspects of the bootstrap in estimation and hypothesis testing; efficient bootstrap simulation; some numerical aspects of the bootstrap; approximate confidence limits via resampling methods and least favourable families. Professor Hall was the organiser of the scientific program. Organisation of the other aspects of the workshop was carried out by Professor David Scott, Mrs Lyn Hathaway and Miss Anne Mackintosh of the School of Information and Computing Sciences.

Further workshops sponsored by the Consortium are planned. A workshop on Data Analysis is to be held at the Australian National University in February 1990 and a workshop on Image Analysis also in 1990. If you are interested in these or any other activities sponsored by the Consortium, contact Professor Peter Hall, Statistics Research Section, School of Mathematical Sciences, Australian National University, Canberra.

Elizabeth and Frederick White Research Conferences

Call for Proposals

With the generous support of Lady Elizabeth White MB, BS, and Sir Frederick White FAA, FRS, the Australian Academy of Science conducts a series of research conferences in the physical and mathematical sciences related to the solid earth, the terrestrial oceans, the earth's atmosphere, solar-terrestrial science, space sciences and astronomy. The purpose of the conferences, called the ELIZABETH AND FREDERICK WHITE RESEARCH CONFERENCES, is to advance at the most fun-

damental level the understanding of the chosen subject, to endeavour to introduce to Australian research new aspects or directions not hitherto undertaken and to encourage participation of overseas scientists in the conferences. The conferences are intended to fill in Australia part of the niche filled by the Gordon Research Conferences in the United States.

Up to two conferences are organised each year, with a membership of 20-30, and of about 2 days duration. The conferences are held in the Academy's Ellerton Becker Building in Canberra at a date agreed upon by the conference organiser and the Academy.

Proposals should include the following information:

- (i) a tentative programme, with the names of possible participants
- (ii) a brief statement concerning the aims, value and timeliness of such a programme, including an indication of support from the local scientific community and of the importance of the programme for Australian science
- (iii) the names of two joint organisers
- (iv) a proposed budget

and will be on a form which will be supplied by the Academy Secretariat on request.

The organisers of approved conferences are responsible for the detailed arrangements, and the organisation/society acting as joint sponsor receives and is accountable for the sum allocated for the meeting, up to \$5,000 for each conference. The supplementation of this sum from other sources is encouraged.

The Academy now cordially invites organisations and societies to prepare proposals for meetings in 1990. They should reach the Executive Secretary by 31 July 1989. Organisations and societies intending to submit proposals should give preliminary notice to the Academy immediately.

Telephone enquiries: (062) 47 5777 Mrs Hilary Back.
GPO Box 783, Canberra, ACT 2601, Australia.

Surplus Journals

The offer to members of surplus stocks of the *Australian Journal of Statistics* volumes 13-22 (1971-1980) has been extended until 31st July. Please contact The Statistical Society of Australia, Statistics Research Section, School of Mathematical Sciences, Australian National University, G.P.O. Box 4, Canberra, A.C.T. 2601, if you wish to take advantage of this offer.

New Journal

Soviet-French-Italian joint venture "Interquadro" is organising the publication of a journal in mathematical statistics and its applications which will come out in English. This intention is brought about by the fact that "Interquadro" is engaged in electronic data processing and statistical data analysis research.

The "Statistical Theory and Applied Research" is supposed to come out quarterly starting from 1991.

It will publish articles and reviews on important problems of statistical inference theory as well as papers dealing with data analysis, various applications of mathematical statistics and statistical analysis software.

In our opinion, the journal will facilitate the information exchange between Soviet statisticians and their foreign colleagues.

We shall be grateful if you can help us in any of these respects:

- to recommend a publishing house or a dealer to distribute the journal
- to establish contacts with potential subscribers to the journal (scientific centres, universities, institutes, libraries, etc.) and inform them of our proposals
- to advise articles and reviews to be published in the journal

We would be very glad if you could publish an announcement about our journal in any of your informational publications of your society (University etc.).

Alexander V. Pavlyukov,

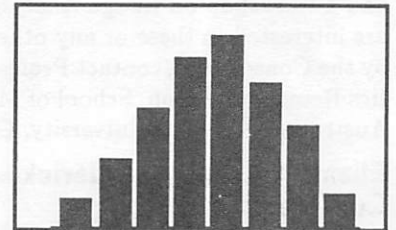
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FEDERATION OF AUSTRALIAN SOCIAL SCIENCE ORGANISATIONS

Excerpts from FASSO Newsletter, April 1989

Theme: Government Research Policy and Practice

One of FASSO's recent concerns has been the uncertainty of Government policy on the funding of research. This is the theme of the first FASSO Newsletter.

Report of the Smith Committee

In November 1988 the Minister for Employment, Education and Training announced the appointment of a Committee chaired by the chairperson of the National Board for Employment, Education and Training, Dr Bob Smith, to review Higher Education Research Policy. The terms of reference were broad. The Committee was initially to report by 30 April 1989 but this was brought forward to 13 March. The Report (200 pages) has just been issued and contains 22 Recommendations. These include increasing research funding to higher education institutions, increasing the number and value of Commonwealth Postgraduate Research Awards, evaluating research performance "based on a set of input and output indicators including peer assessment", and the ARC pursuing its goals ("the economic, cultural and social development of Australia") by, among other means, "supporting initiatives to concentrate human and physical resources on outstanding research, especially in high cost areas".

Australian Research Council Structure

In November 1988 the ARC set up a new committee structure. The committees are Planning and Review; Institutional Grants (including Key Centres and Special Research Centres); Research Training and Careers; Research Grants.

A matter of considerable concern to FASSO has been the non-appointment of one of the (four) Chairs of the Discipline Panels to membership of the ARC. This is Professor Fay Gale, Chair of the Humanities and Social Sciences Panel. FASSO has been joined by FASTS and by all four Academies in expressing concern. This step is seen as the first in excluding *all* Panel Chairs from the ARC, which will deprive it of expert advice from those most aware of directions taken by actual and proposed research.

Procedures for "Small Grants"

The ARC has established procedures under which some higher education institutions will make effective decisions as to the awarding of small grants, though these will formally be allocated by the ARC. The new system applies to grants between \$5,000 and \$15,000 in the Hu-

manities and Social Sciences and in Mathematics and between \$5,000 and \$25,000 in other fields.

Analysis of 1989 Grants

The Newsletter gives extracts from a draft ARC Report on 1989 grants. The main conclusions are:

1. There has been a marked increase in the total number of projects funded and also in the average size of grants. Both of these propositions apply to the Social Sciences, though to a somewhat less extent than to other areas of research.
2. The proportions of grants provided in the different social science areas changed little. Most grants were provided for research in various areas of psychology, while another large grouping includes economics, agricultural economics, accounting and commerce and economic history.
3. The variation in the level of funding between different Social Science disciplines was reduced.

National Interest Areas

The five approved "Priority" research areas are: Marine Science and Technologies; Materials Science; Cognitive Science; Molecular Techniques in the Conservation of Australia's Natural Resources; Scientific Instruments and Instrumentation. It is anticipated that approximately \$3 million will be added to provide funding for these areas. Special panels will be established to assess such proposals, which will retain their "priority" for five years.

Discussion of future priority areas has been foreshadowed. A statement by Professor Don Aitkin, Chair of the ARC, says:

Council will shortly begin its consultation process for priority areas. This year we shall call for comments across almost the full range of the Council's funding programs: research grants, research fellowships, special research centres and key centres of teaching and research. Letters inviting comment will go to a large list of interested organisations, and there will also be a public advertisement along the same lines. Some three months will be allowed for the preparation of submissions and comments.

A copy of the Newsletter can be obtained from FASSO's Secretary, Dr Sue Wilson, Statistics Research Section, School of Mathematical Sciences, ANU, GPO Box 4, Canberra 2601 (062-494460).

NEWS ABOUT MEMBERS

Statistician Wins 1989 Lyle Medal

The joint winners of the Thomas Ranken Lyle Medal are a statistician from the Australian National University, Professor Peter Hall, 37, and a theoretical physicist from the University of Tasmania, Professor Robert Delbourgo, 48. The research careers of the two Lyle medallists have already been recognised by their election to the Fellowship of the Australian Academy of Science.

The Thomas Ranken Lyle Medal was instituted by the Australian National Research Council in 1931. Recipients have included such eminent scientists as the first chief of the CSIRO Division of Radiophysics, Dr D.F. Martyn (who won in 1947), and a former professor

of applied mathematics at the University of Melbourne, Professor T.M. Cherry (1951). Both were Foundation Fellows and former Presidents of the Academy.

Professor Hall has achieved a place of eminence in the theory of statistics and probability unrivalled, in the history of these subjects, by any Australian. In his early work he studied the central limit theorem. He has just completed a book on coverage problems and has contributed to image-processing theory. He leads theoretical work on computer-intensive methods of data analysis that rests as little as possible on prior assumptions.

Excerpt from the Australian Academy of Science Newsletter, March 1989

SPECIAL INTEREST SECTIONS

Medical Sciences

The Medical Sciences Section is considering running a Workshop entitled "Statistical modelling of AIDS and other epidemics" as part of the 10th Australian Statistical Conference in July 1990. This topic is receiving increasing attention (e.g., see *JRSS(A)*, 1988; 151: 3-136), and poses the question of just what statistical theory can contribute to an understanding of the AIDS epidemic, given the practical limitations of available data, and of what are the most useful directions future quantitative research on the disease might take.

The section is planning to invite one or two guest speakers from overseas, and is open to suggestions as to whom might be considered. It is intended also to invite local medical researchers to contribute. For persons interested in the literature on statistical modelling of AIDS, Dr C.S. Withers (Applied Mathematics Division, DSIR, PO Box 1335, Wellington, New Zealand) has compiled an annotated bibliography. Please contact Dr John Hopper (University of Melbourne, Faculty of Medicine Epidemiology Unit, 151 Barry Street, Carlton, Victoria 3053) if you have suggestions or comments regarding the proposed workshop.

Industrial Statistics

In the February edition of this newsletter it was indicated that the Industrial Statistics Section had held a workshop for Statisticians involved in quality management and improvement at Bond University in February.

A number of objectives were identified and considered in detail at the workshop and the outcomes from the discussions were then presented to Industry and Government representatives for their comment.

A comprehensive report has now been prepared by myself and this report has been made available to all

Branch Presidents and all of the participants at the Workshop. In addition copies of the report can be obtained by writing to me at the School of Information and Computing Sciences, Bond University, Private Bag 10, Gold Coast Mail Centre, Queensland, 4218.

The report contains a number of useful recommendations for those involved in quality management consulting, training and education. Some of these are summarised as follows:

- The workshop distilled its ideas on the concepts of modern quality management and the role that statisticians and statistics can play in it and this is summarised in the report. In essence, modern quality management is a philosophy of management which focuses on the customer, the process, teamwork and data based decisions. Statistical thinking focuses on variability and decision making and a structured approach to problem solving. It is also involved in the design of studies to quantify and understand variation and recommend on action to control and reduce it. The unique contribution that statisticians can play in the general context of modern quality management was also identified.

The workshop spent considerable time on issues concerning course planning and the report highlights these. Recommendations were made concerning the general and statistical skills that we thought were advisable for managers, technical professionals, statistical consultants and quality management consultants to have if they are going to work effectively in modern quality management. Details on the recommended skills and comments from the industry and government people are de-

tailed in the comprehensive report. In addition a set of goals, strategies and actions for achieving the educational objectives that we defined were also identified and a number of individuals have agreed to follow these up. Again details can be found in the report.

- Another major outcome of the meeting was the planning for a network of quality management statistical practitioners and, in particular, branch co-ordinators of the industrial statistics section have now been nominated as follows:

| | |
|-------------------|-----------------|
| Victoria | Geoff Robinson |
| New South Wales | Mary Willcox |
| South Australia | John Field |
| Queensland | Ian Saunders |
| Western Australia | John Henstridge |
| New Zealand | Nye John |

Those people should be contacted by anyone interested in being involved in the Industrial Statistics Section or the network of quality management statistical practitioners. It was agreed that the major focus of the Industrial Statistics Section should be on quality management and methods for the next two years as this represented a unique opportunity for our profession in contributing to Australia's improved productivity and competitiveness.

- In support of the network of quality management statistical practitioners a number of tangible outcomes were agreed to. These were:
 - creation of a newsletter to be edited by John Field and to be circulated amongst the members of the network.
 - a case study clearing house to be edited by George Brown of CSIRO.
 - creation of a collection of profiles of members involved in quality management consulting, training and education. This collection of profiles currently has approximately 30 entries representing individuals from CSIRO, tertiary institutions and consulting organisations scattered throughout Australia. If anyone would like to join the network and contribute their profile of expertise in this area please contact me directly or the branch co-ordinators for details of format.

In addition a number of strategies for developing the Industrial Statistics Section's contribution in quality management and methods were identified.

- A list of potential speakers from here and abroad who could be invited to speak in the area of quality management and methods was generated and this list is summarised in the comprehensive report. This will be useful to various groups who wish to co-ordinate the bringing into Australia of overseas speakers.
- QMS 89 was discussed and tentative plans were formulated and I will report on that in the next newsletter item.

The workshop was generously supported by a number of organisations and in particular I would like to publicly thank the National Industry Extension Service for provision of a grant of \$5000 to support the workshop, the Technology Industry Development Authority of Western Australia for covering the round trip airfares of three participants from Western Australia and sending their Chief Executive Officer to attend the Monday discussion group, Australia for Quality for its previous donation of \$1000 to the Industrial Statistics Section which was utilised to run the workshop and Bond University for providing additional secretarial support and refreshments.

The willing contribution of all participants, both the Statisticians and the people from Industry and Government, was greatly appreciated by me. Without their active support and hard work the workshop would not have been the success that it clearly was and we feel that a significant start has been made to the Industrial Statistics Section's activities for 1989.

William Dunsmuir
Section Chairman

Statistical Education

Continuing Education Courses

Following the success of the first Continuing Education course in 1988, one or more courses will be held in conjunction with the Tenth Australian Statistical Conference in Sydney in July 1990. The aim of such courses is to provide a basic knowledge of more recent developments in Statistics. They are NOT research seminars. Lecturers will be selected as much for their communication skills as for their knowledge of the topic. If there is a particular topic which you would like to attend, or to give, please write to Dr Ken Russell, Biometrics, DARA, P.O. Box 500, East Melbourne, Victoria 3002 with this information as soon as possible.

AUSTRALASIAN CONFERENCES

Following a member's suggestion, all Australasian conferences the editors have been advised of will be listed in a format similar to Overseas Conferences, but including the number of the last issue of the Newsletter containing detailed information. Expanded conference notices will be presented only if they differ from those of previous issues.

CONFERENCE SUMMARY

Workshop on Optimization Methods in Statistics, 15-16 June, 1989, University of Wollongong, NSW. (No.46)

Information: O.M.S. Workshop, Department of Mathematics, University of Wollongong, Wollongong, N.S.W., 2500. Telephone (042) 27 0836; fax (042) 27 1675; Email cmg@wolfen.cc.uow.oz

Australian Mathematical Society Conference, 3-7 July, 1989, Macquarie University, Sydney, NSW. (No.46)

Information: Dr Ann Eyland, School of Economic and Financial Studies, Macquarie University, NSW 2109.

STATCOMP 89, 6-7 July, 1989, Adelaide, SA. (No.46)

Information: Chris Brien, School of Mathematics and Computer Studies, South Australian Institute of Technology, The Levels, SA 5095. Telephone: (08) 236 2211 Fax: (08) 349 6939 Email: MACBOLEVELS.SAIT.OZ

International Conference on Computational Techniques and Applications, 10-12 July 1989, Griffith University, Brisbane, Queensland.

Information: School of Australian Environmental Studies, Griffith University, Nathan, Queensland 4111.

15th Australasian Conference on Combinatorial Mathematics and Computing, 10-14 July, 1989, University of Queensland, Brisbane, Queensland. (No.46)

Information: Professor Anne Penfold Street, Director, C.M.S.A., Dept. of Mathematics, University of Queensland, St. Lucia, Queensland 4067.

Australasian Meetings of the Econometric Society, 13-15 July 1989, Armidale, NSW.

Information: George E. Battese, Dept. of Econometrics, Univ. of New England, Armidale, NSW 2351, Australia.

Data Analysis Workshop, February 1990, Australian National University, Canberra, ACT. (No.47)

Information: Dr Sue Wilson, DAW Co-ordinator, Statistics Research Section, Mathematical Sciences School, ANU, GPO Box 4, Canberra, ACT 2601. Telephone (062) 49 4460.

10th Australian Statistical Conference, 2-6 July 1990, University of NSW, Sydney, NSW. (No.47)

Information: Dr Doug Shaw, Chairman of the Programme Committee, SIROMATH Pty Ltd, Level 5, 156 Pacific Highway, St Leonards NSW 2065.

The Third International Conference on Teaching Statistics (ICOTS 3), 19-24 August 1990, University of Otago, Dunedin, New Zealand. (No.46)

Information: The Secretary, ICOTS 3 Local Organising Committee, Dept. of Mathematics & Statistics, University of Otago, P.O. Box 56, Dunedin, New Zealand.

CONSORTIUM FOR RESEARCH IN COMPUTER INTENSIVE STATISTICAL METHODS

Data Analysis Workshop, February, 1990

The date of the first Workshop has been changed to February 1990. The venue is the Australian National University, and the theme is the formulation, fitting and statistical analysis of linear simultaneous equation models. These models are used in Econometrics, Marketing, Quality Control, Education, Psychometrics, Physical and Chemical Sciences, Biological and Medical Sciences, Statistical Science, Behavioural Science, Social Science and Political Science. It is hoped to attract data analysts from all these disciplines. Linear simultaneous equation models have many alternative names, including covariance structure models, latent variable models, structural equation models and LISREL models. Many users may not be aware of the extensive literature under these different titles. It is hoped to rectify this situation.

Professor Brian Everitt, author of the monograph *An Introduction to Latent Variable Models* (Chapman and Hall, 1984), will be the Workshop's keynote speaker. The Workshop will confront the methodological and practical problems of linear simultaneous equation models with a novel format designed to have maximum impact.

Complementary data sets (either real or simulated) that highlight the fundamental methodological problems will be distributed to potential participants. To gain maximum benefit from Workshop participation, researchers are encouraged to present either an analysis of (part of) the data, or a theoretical contribution relevant to the Workshop's theme, one month prior to the Workshop. These contributions will be circulated to participants before the Workshop. The greatest value of the Workshop will be the Discussion Sessions.

The Workshop co-ordinator, Sue Wilson, is currently organising data sets. Further suggestions or ideas are welcome. Please contact Sue on (062) 49 4460, or at the address below. More information is available from:

Dr Sue Wilson
DAW Co-ordinator
Statistics Research Section
Mathematical Sciences School
ANU, GPO Box 4, Canberra, ACT 2601.

10th Australian Statistical Conference, 2-6 July, 1990

The 10th Australian Statistical Conference will be held in Sydney, at the University of New South Wales, from July 2 to July 6, 1990. This conference will also constitute the 2nd Pacific Statistical Congress, and will occur in the year of the centenary of the birth of Sir Ronald Fisher.

Keynote speakers who have accepted invitations for the Conference are

- Professor George Box — "Quality"
- Professor Brad Efron — "Computer intensive methods in statistics"
- Professor Adrian Smith — "Analysis of dependent data"
- Professor Hans Föllmer (Universität Bonn) — "Financial mathematics"

In addition, invitations have been accepted by Professor Alistair Mees (University of Western Australia)

to speak on "Chaotic systems" and Professor Alistair Scott (University of Auckland) to speak on "Fitting ordinal regression models with correlated observations". There will also be Conference sessions devoted to medical statistics, to image analysis and to the 1990 round of population censuses.

The opportunity exists for Australian organizations to extend the visits of Keynote Speakers, subject to the speakers' availability. To provide some co-ordination, it is requested that initial approaches to the overseas speakers be made through the Chairman of the Programme Committee, Dr Doug Shaw, SIROMATH Pty Ltd, Level 5, 156 Pacific Highway, St Leonards NSW 2065.

Suggestions from members as to sessions to be included in the Conference programme, and as to appropriate speakers, would still be welcomed by the Programme Committee through the Chairman at the address given above.

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The benefits applying to this position include:

- salary commensurate with experience, ability and qualifications.
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- relocation assistance if required.
- generous long term rental assistance for appointees required to relocate either within Australia or from overseas.
- superior working environment including offices located in attractive settings, excellent library and computing facilities.
- a unique opportunity to develop a thriving project into a world-class quality activity and carry out work of major importance to Australian Industry.
- choice of either Sydney or Melbourne as the centre of your activities.
- other benefits commensurate with a high level CSIRO appointment may be negotiated.

Further information, including copies of the job description and selection criteria, is available from Dr. Ron Sandland, (02) 467 6063.

Applications, framed against the selection criteria, should include details of personal particulars, qualifications and experience. Quoting reference No D0021 they should include the names of at least two professional referees and be forwarded to:

The Chief,
CSIRO Division of Mathematics
& Statistics
PO Box 93,
North Ryde, NSW 2113, Australia
by 21 July, 1989.



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OVERSEAS CONFERENCES

Joint Summer Research Conferences in the Mathematical Sciences, 3 June–5 August 1989, Arcata, CA, USA.

Information: Carole Kohanski, Summer Research Conference Coordinator, American Mathematical Society, P.O. Box 6248, Providence, RI 02940, USA.

1989 IEEE International Conference on Computer Vision and Pattern Recognition, 4–8 June 1989, San Diego, CA, USA.

Information: Rama Chellappa, PHE324, Dept. EE-Systems, Univ. of Southern California, University Park, MC-0272, Los Angeles, CA 90089, USA.

6th Annual Conference on Quality and Productivity Research, 5–7 June 1989, Waterloo, Canada.

Information: Jerald F. Lawless, Dept. of Statistics and Actuarial Science, Univ. of Waterloo, Ontario, Canada N2L 3G1.

International Symposium on Bayesian Decision Theory, 5–9 June 1989, Sherbrooke, Canada.

Information: Jean-Francois Angers, Dept. of Math & Information, Univ. of Sherbrooke, Sherbrooke, PQ, J1K 2R1, Canada.

Singapore Probability Conference, 8–16 June 1989, Singapore.

Information: J.H. Lou, The Organising Secretary, Singapore Probability Conference, Dept. of Mathematics, National University of Singapore, Lower Kent Ridge Road, Singapore 0511, Republic of Singapore.

SRCOS-ASA Summer Research Conference, 11–14 June 1989, Ulico State Park, GA, USA.

Information: Michael Kutner, Dept. of Epidemiology and Biostatistics, Emory Univ., Atlanta, GA 30322, USA.

Conference on Multiple Statistical Integration, 17–23 June 1989, Arcata, CA, USA.

Information: Robert Tsutakawa, Dept. of Stat., Univ. of Missouri, 316 Math Sciences, Columbia, MO 65211, USA.

2nd Conference of the International Federation of Classification Societies, 27–30 June, 1989, Charlottesville, VA, USA.

Information: IFCS-89, Dept. of Math., Univ. of Virginia, Charlottesville, VA 22903, USA.

GLIM 89 and 4th International Workshop on Statistical Modelling, 17–21 July 1989, Trento, Italy.

Information: Brian Francis, Ctr. for Applied Statistics, Univ. of Lancaster, Fylde College, GB-Lancaster, LA1 4YF, UK.

39th Gordon Research Conference on Statistics in Chemistry and Chemical Engineering, 31 July–4 August 1989, New Hampton, NH, USA.

Information: Lewis Sheiner, Univ. of California, C255, San Francisco, CA 94143, USA.

18th International Congress of the History of Science, 1–9 August 1989, Hamburg and Munich, Federal Republic of Germany.

Information: Professor C.J. Scriba, Institut für Geschichte der Naturwissenschaften, Bundesstr. 55, D-2000 Hamburg 13, Federal Republic of Germany.

1989 Joint Statistical Meetings, 6–10 August 1989, Washington DC, USA.

Information: ASA, 1429 Duke St., Alexandria, VA 22314-3402, USA.

6th International Conference on the New Quality Philosophy in Statistical Research and Statistical Education, 6–10 August 1989, Washington, DC, USA.

Information: V. Shvyrkov, IS-SSE, 536 Oasis Dr., Santa Rosa, CA, USA.

Eleventh International Joint Conference on Artificial Intelligence, 20–26 August 1989, Detroit, MI, USA.

Information: Claudia Mazzetti, AAAI Office, 445 Burgess Dr., #100, Menlo Park, CA 94025, USA.

International Conference on Recent Developments in Statistical Data Analysis and Inference, 21–24 August 1989, Neuchatel, Switzerland.

Information: Yadolah Dodge, Univ. of Neuchatel, Groupe d'Informatique et de Statistique, Pierre-a-Mazel 7, CH-2000 Neuchatel, Switzerland.

11th World Computer Congress (IFIP Congress '89), 28 August–1 September 1989, San Francisco, CA, USA.

Information: Adrian Basili, AT&T, 30 Knightsbridge Rd., Piscataway, NJ 08854, USA.

47th Biennial Session of the International Statistical Institute, 29 August–6 September 1989, Paris, France.

Information: ISI Permanent Office, 428 Prinses Beatrixlaan, P.O. Box 950, 2270 AZ Voorburg, Netherlands.

10th Annual Meeting of the International Society of Clinical Biostatistics, 11–14 September 1989, Maastricht, Netherlands.

Information: Dr R. Does, Dept. of Medical Informatics & Statistics, Univ. of Limburg, P.O. Box 616, 6200 MD Maastricht, Netherlands.

33rd Annual Fall Technical Conference, 26–27 October 1989, Houston, TX, USA.

Information: Rick Lewis, Bldg. 770, Rm. 201C, Union Carbide Corp., 3200 Kanawha Turnpike, South Charleston, WV 25303, USA.

Supercomputing '89, 13–17 November 1989, Reno, NV, USA.

Information: F. Ron Bailey, M/S 258-5, NASA Ames Research Ctr., Moffett Field, CA 94035, USA.

International Conference on Forensic Statistics, 2–4 April 1990, Edinburgh, Scotland.

Information: C.G.G. Aitken, Dept. of Statistics, The King's Bldgs, Univ. of Edinburgh, Mayfield Rd., Edinburgh, EH9 3JZ, UK.

44th Annual Quality Congress, 14–16 May 1990, San Francisco, CA, USA.

Information: Shirley A. Halladay, American Society for Quality Control, 230 W. Wells St., Milwaukee, WI 53203, USA.

World Organization of Systems and Cybernetics 8th International Congress, 11–14 June 1990, New York, NY, USA.

Information: Constantin V. Negoita, Congress Chairman, Dept. of Computer Science, Hunter College, CUNY, 695 Park Ave., New York, NY 10021, USA.

7th Annual Quality and Productivity Research Conference, 13–15 June 1990, Madison, WI, USA.

Information: Thomas J. Snodgrass, Dept. of Engineering Professional Development, 801 Extension Bldg., Univ. of Wisconsin, Madison, WI 53706, USA.

1990 Joint Statistical Meetings, 6–9 August 1990, Anaheim, CA, USA.

Information: ASA, 1429 Duke St., Alexandria, VA 22314-3402, USA.

Institute of Mathematical Statistics 53rd Annual Meeting & 2nd World Congress of the Bernoulli Society, 13–18 August 1990, Uppsala, Sweden.

Information: Uppsala Turist & Kongress AB, "Bernoulli Society", Box 216, S-751 04 Uppsala, Sweden.

International Congress of Mathematicians, 21–29 August 1990, Kyoto, Japan.

Information: ICM-90 Secretariat, Research Inst. for Math Sciences, Kyoto Univ., Kitashirakawa, Sakyo, Kyoto 606, Japan.

AUSTRALIAN BUREAU OF STATISTICS

RESEARCH FELLOWSHIPS AND ASSOCIATESHIPS 1989/90

The ABS seeks senior researchers and advanced graduate students or recently qualified postgraduates to conduct research relevant to the ABS. A number of Research Fellowships and Associateships will be available during 1989/90 and applications for these awards are invited. Research proposals by applicants should fall into one or more of the four broad categories:

- **STATISTICAL METHODOLOGY**
- **SOCIAL AND DEMOGRAPHIC STUDIES**
- **ECONOMIC STUDIES**
- **APPLICATIONS OF TECHNOLOGY**

Applicants are encouraged to put forward proposals they believe to be relevant to the ABS. At present the ABS has as its objectives, amongst others

- **the measurement and reduction of non-sampling errors**
- **increasing the amount of objective statistical analysis and interpretation of its data**
- **improving the efficiency and productivity of its operations.**

Proposals consistent with these objectives are especially encouraged.

The awards will usually be for 12 months, although shorter awards may be considered. Successful applicants will usually be expected to move to Canberra for the duration of the award and be able to work full time on the research. The salary will be commensurate with qualifications and experience, for Research Associates: \$26965 - \$37033 p.a. and Research Fellow: \$31525 - \$61876 p.a.

Applications are due by **14th July 1989**. Further details regarding the awards, including application forms and information on research topics, can be obtained by contacting

P. N. Kokic
W3 2b
Australian Bureau of Statistics
PO Box 10
BELCONNEN ACT 2616

or telephoning (062) 52 7300

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 CSIRO, DMS
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 Glen Osmond, SA 5064.

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President: Dr R.L. Sandland
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 School of Math. Sciences, UTS
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 Department of Mathematics
 University of Queensland
 St. Lucia, Qld 4067.

SECTION CHAIRS

Statistics in the Medical Sciences

Dr J. Hopper
 University of Melbourne
 Faculty of Medicine Epidemiology Unit
 151 Barry Street
 Carlton, Vic 3053.

Statistics in the Earth Sciences

Dr N.I. Fisher
 CSIRO, DMS
 P.O. Box 218
 Lindfield, NSW 2070.

Statistics in the Biological Sciences

Mr R.B. Cunningham
 Department of Statistics
 Australian National University
 G.P.O. Box 4, Canberra, ACT 2601.

Survey and Management

Mr D.J. Trewin

c/- Australian Bureau of Statistics
 P.O. Box 10
 Belconnen, ACT 2616.

Statistical Education

Dr K. Russell
 Biometrics, Department of Agriculture
 P.O. Box 500
 East Melbourne, Vic 3002.

Statistical Computing

Mr C. Brien
 School of Maths. & Computer Studies
 S.A.I.T., North Terrace, Adelaide
 SA 5000.

Industrial Statistics

Dr W. Dunsmuir
 School of Information & Computing Sciences
 Bond University, Private Bag 10
 Gold Coast Mail Centre, Qld 4217.

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Enquiries and subscriptions should be sent to:

Statistical Society of Australia,
 Statistics Research Section,
 School of Mathematical Sciences,
 ANU, GPO Box 4,
 CANBERRA, ACT 2601.

Advertising will be carried in the *Newsletter* on any matters which the Editors feel are of interest to the members of the Society. In particular, advertisements of statistical vacancies, statistical literature and calculators will be welcome. For details of advertising rates etc. contact either the Editors or Dr J.T. Wood at the address above.

Moving?

Members are requested to notify their local branch secretaries (see this page of the *Newsletter*) of change of address, in order that *Newsletters* and *Journals* can continue to be despatched to them.