statistical society of australia incorporated

SSAI newsletter

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Jim Douglas DSc Honoured

Jim Douglas celebrated his 80th birthday earlier this year, and was awarded the degree of Doctor of Science honoris causa on 2 May 2003 by the University of New South Wales.

The award honours Jim Douglas, one of the founders of the field of Statistics in Australia, with an international reputation for his pioneering contributions to both the discipline and the profession.

Beginning at the University of NSW even before its first incarnation as the NSW University of Technology, he was appointed as Lecturer in Mathematics in November 1947, retiring as Associate Professor of Mathematical Statistics in 1983. However, his "retirement" was never anything of the kind: over an unbroken period of 56 years, and now nearing his 80th birthday, he still regularly attends the University, teaching, mentoring students, and maintaining his scholarly interest in the discipline and the profession. Very few statisticians of his generation or otherwise attend as frequently as he does meetings of their Branch of the Statistical Society. Fewer still, either here or overseas, have seen so many former students establish their own luminary international careers.

Jim Douglas

Statistics is centrally concerned with decision-making in the face of uncertainty. As an academic statistician before Statistics was widely recognized as a discipline distinct from Mathematics, Jim Douglas understood early that research which successfully elucidates probabilistic problems also enhances the discipline's independent standing. His research achievements are testimony to this understanding. His work on statistical distribution theory from the 1950's on, and in particular his comprehensive book entitled "*Analysis with Standard Contagious Distributions*" (published in 1979) has long been considered as classic. He is also responsible for a long list of other publications, focusing primarily on educational statistics, and continuing into the present century. His reputation justified an invitation to write two separate articles for the *Encyclopedia of Statistical Sciences* (one on "Contagious Distributions" and one on the "Polya-Aeppli Distribution", published in 1982 and 1986 respectively): such invitations are an honour reserved for leading world researchers.

Parallelling his academic career, Jim Douglas has served the profession, both nationally and internationally. In the Statistical Society of Australia he has filled with distinction many formal and informal roles, including that of NSW Branch President. In addition, he has served on the Council of the Australian Mathematical Society and as

In this issue

SSAI

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Disclaimer

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

Subscriptions

The Newsletter of the Statistical Society of Australia is supplied free to all members of the society. Any others wishing to subscribe to the Newsletter may do so at an annual cost of A$25.00 for an issue of four numbers.

Advertising

Advertising will be carried in the Newsletter on any matters which the Editors feel are of interest to the members of the Society. For details of advertising rates, etc. contact the Editors at the above addresses.

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DEADLINE FOR NEXT ISSUE: 10 OCTOBER 2003

Jim Douglas DSc Honoured

Australian Regional President for the Biometric Society. Internationally, he played a crucial role in organizing the 1967 Session of the International Statistical Institute in Sydney. Combined with another of his involvements, an International Biometric Conference the same year, this attracted important speakers such as Sir David Cox and Professor G. P. Patil to stay and offer an extended lecture series, to the considerable benefit of the developing Australian profession. Later, Jim Douglas played an active part in preparations for the first and second International Conferences on Teaching Statistics (in 1982 and 1986). He also promoted important scientific collaboration between the International Statistical Institute, the International Association of Ecology and the Biometric Society, serving as their jointly-sponsored International Statistical Ecology Program.

He has been equally concerned with statistical education, his own career dedicated to good teaching and to mentoring successive generations of students and thus of future teachers, researchers and practitioners. Jim Douglas has also always sought to inspire others to teach what many see as a dry and demanding subject in novel and effective ways. He pioneered the first Summer School for Teachers of Secondary School Mathematics in 1962, a series which continues today, and served for many years as the UNSW representative on the State's Secondary Schools Maths Syllabus Committee. It was Jim with his keen eye for the interaction between statistics and education who helped oversee the introduction of standardisation procedures for the Higher School Certificate (giving us the TER and now the UAI).

To encourage students to pursue their studies at UNSW, Jim put forward the idea as early as 1960 for the award of University Cadetships in Statistics, and in Mathematics, Physics and Chemistry as well. He personally introduced Vacation Employment schemes for statistics students, and established the industry-based University Statistics Advisory Panel to assist with career counselling and placements. Building on these undergraduate initiatives, he then established an industry-sponsored Research Fellowship in Statistics.

Beyond his work in his own School, Jim Douglas has long played a unique role in offering interest and support for the technical work of countless colleagues pursuing research across a wide range of other academic disciplines. He gave unstintingly in time and advice to help ensure that the statistical bases for the work of others were sound.

Statistical computing is another field in which Jim made visionary contributions in Australia. He facilitated access to the University's first computer by undergraduate statistics students doing class projects and later pioneered in Australia the use of the powerful APL computer language for programming statistical calculations.

All his students left the University imbued with the spirit of clear statistical thinking. Many have also been inspired by him as a role-model to promote innovative education in statistics and, in this and other ways, to advance the discipline, the profession and an informed society at large.

from the Citation read at the Award Ceremony

Reproduced with the kind permission of *The Australian Mathematical Society Gazette.*

Editorial

Have you ever tried collecting your own data? It's a fascinating exercise. One New Zealand colleague keeps a record of kilowatts of electricity consumed daily, and he can see the steps in consumption as winter comes and goes, as visitors pass through and so on. Many people keep records of petrol purchases, whether for private interest or taxation purposes. It should be easy to remember to fill in the book each time you fill the tank, but a quick glance back showing the car has gone 1043 km since the last fill soon makes you realise that the discipline of data collection is easily broken. New mothers are often encouraged to keep a record of feeds, sleeps and nappy changes for their new babies. It's hard to imagine how such a collection can be rigorous in the sleep-deprived and emotion-charged atmosphere of a household with a baby. Looking back at the record a few years later would make you realise what a busy time those first few months are!

There are of course many other personal or household related data collections that you could engage in. The experience of colleagues who have done so suggests the following general approach. Ask yourself – why am I collecting this data? Ask yourself – have I defined all variables in an unambiguous fashion? These questions should be very familiar from consultations with clients (in the broadest sense of individuals or groups seeking statistical advice). Then you may like to ask yourself – can I keep to the same standard that I demand of my clients?

The SSAI Newsletter Editors.

This issue of the newsletter is full of material to stimulate tea-room discussion. The issue of electronic publication of the Journal is addressed in the Society's Annual Report, the article by the Journal Editor, a letter to the Editor and response by the President. The Editors are seeking further correspondence on this issue - if you have a view, please contact the Editors at the addresses on page 2.

There's also notification of several upcoming conferences, Branch events and competitions. The Editors look forward to your entries for the competitions, and your reports on the meetings you attend.

Does SSAI have your correct contact details?

Did you receive an email in late July with the cover of the September 2003 issue of the Australian & New Zealand Journal of Statistics? If not, then yours could be one of the 9% of emails that bounced back.

If you did not receive the message, and would like to receive email notices from SSAI please send an email with 'EMAIL ADDRESS' as the subject to: ssai@ozemail.com.au

Don't forget to include other contact information that may have changed.

Competition

The Editors are seeking more entries in the competition announced in the last issue. Who is the best-known statistician who ever lived, and why? Who *ought* to be the best-known statistician who ever lived, and why? Submit your answer to either or both questions to the Editors by 20 October. The answer to each question should be 25 words or less and you can plunge straight into your answer. "The best-known statistician who ever lived is …" does not form part of the word count!

Here's one to inspire, from Geoff Robinson, responding to who is the best-known statistician who ever lived.

"Florence Nightingale. She showed passion, dedication and skill in collecting data and presenting it appropriately to argue for changes that improved people's lives."

Ken Brewer has also turned his hand to the question, answering with Florence Nightingale. Why? "The brilliant use of her analytical and presentational skills to improve the everyday lives of ordinary people".

Letter to the Editor

Dear Editors,

We write concerning the decision of the Statistical Society of Australia Inc to change the Australian and New Zealand Journal of Statistics (ANZJS) to a purely online publication. We are motivated to write because we feel that the Society's decision, at this point in time, may not be in its best interests; and because it is prudent that the decision be discussed more fully by the Society's members. The previous low level of consultation is of significant concern to us.

We appreciate that the Society has a good business case for making the transition, which its Council has already approved. However, the Society should have a strong scientific case, highlighting the interests of members and of the profession, before it develops a business case; the latter should not take precedence over the former.

It is certain that the scientific standing of the ANZJS, in the eyes of some members and some potential authors, will be adversely affected by such a change. For reasons such as this, no hard-copy statistics journals have, so far, taken the step of dropping hard-copy versions altogether. Moreover, a small journal, published by a small society, is arguably more vulnerable to negative impressions, or to being overlooked because it is not sufficiently visible, than is a more established journal.

Many members of the Society, particularly those in universities, gain two main benefits from their membership: the Journal and the Society's biennial conferences. If they see the standing of the ANZJS reduced, or their ability to use the Journal impaired, they may not continue their membership. Likewise, potential new members, with similar views of the benefits of membership, will probably not join. Therefore, the Society runs the risk of losing members if it changes too fast, or if it changes without adequate consultation. The SSAI's membership is already in decline, as it is too for kindred societies.

The statistical community has been conservative about electronic publication. Some might question the wisdom of this, but nevertheless there does not exist, at the present time, a wave which the Society can ride safely towards achieving purely online publication of the ANZJS. Certainly, in cognate areas which are evolving very rapidly, purely online journals are starting up. However, transitions from hard-copy to purely online journals are not, at present, being made in statistics. The fact that the Society has already approved the removal of the hard-copy version of the ANZJS, and needs now only to determine the timing of the hard copy's demise, does not augur well for either the Journal's standing or the Society's relationship with its members.

Sincerely Ray Chambers, Ann Cowling, Daryl Daley, Joe Gani, Peter Hall, Chris Heyde, Alan Welsh, Mark Westcott and Jeff Wood

Response

Dear Colleagues,

For now, I do not propose to debate the details of the points raised in this letter but rather explain where we are up to regarding the publication of the Australian and New Zealand Journal of Statistics (ANZJS) in electronic form only, and the steps that will unfold over the coming months.

Firstly, the Central Council of SSAI has not made what it regards as the final decision to make the ANZJS available in electronic form only. Central Council voted 9 to 3 (unweighted for proxies) in favour of the resolution: "In principle that the journal become fully electronic, subject to the reactions of institutional subscribers and a satisfactory business case. The Executive to decide on receipt of this information." The phrase 'in principle' and the caveats provide plenty of opportunity for the idea to be halted but it does indicate an inclination to move towards 'electronic only' publication. Members can be assured that hardcopy will continue until the end of 2004 regardless of which way the debate goes, so there is plenty of time for well-informed discussion to take place.

Secondly, the business case has not yet been developed in sufficient detail that it is likely to be accepted by either the Executive or Central Council. All that we have so far is some rough indications regarding costs and no information about institutional subscriber reaction to 'electronic only' publication of the ANZJS. There is much to be done here.

All non-confidential SSAI reports and minutes (that is, almost everything) is available at the SSAI web site (http://www.statsoc.org.au/admin.html). Anyone can go directly to this address but be warned that there is not a link to it from the main SSAI web pages. In this location, there is a copy of a report on electronic publishing produced by a team led by the ANZJS Editor (Chris Lloyd). This document is a good starting point for anyone wanting further information.

Some important aspects are not included in the Central Council motion described above.

Response

Continued

First of these is the need to inform members of SSAI about what is involved, the cases for and against electronic only publication, and to seek member feedback based on well-constructed evidence. The Executive does not see this issue simply as one where we stop sending members hardcopy of the ANZJS in order to save a few dollars and leave it at that. Any changes that are made will be directed at improving the standing of the journal by decreasing the time to publication, relaxing the limits on page space imposed by the need to produce hard copy and the advantage of being able to use colour graphics as standard practice.

In conjunction with Chris Lloyd, I am preparing a presentation of the background information, some of the options that are available, and the pros and cons of electronic only publication from several different perspectives. The concerns expressed in the letter by Chambers et al will be incorporated into this presentation. Over the next few months, I propose to make this presentation available to each of the Branches and to include new ideas, suggestions, concerns and criticisms as we go along. A summary of the material will then be published in the newsletter for all members to review.

Secondly, we publish the ANZJS in partnership with the New Zealand Statistical Association (NZSA) and major changes to the ANZJS will not be made without their agreement. The NZSA has been asked to form its own view on 'electronic only' publishing and no doubt they will observe what is happening in Australia while reaching an independent view on the subject.

I look forward to having many discussions on this subject over the coming months and will treat all points of view with respect.

Neville Bartlett, President
Email: neville@nrbartlett.com.au

President's Corner

When invited to provide material for this segment of the newsletter, the prospect of having to provide something of interest to members seemed rather daunting. Upon reflection it seemed like a great opportunity to provide background information and ideas that may not otherwise reach members. So I will endeavour to make comments and suggestions that are meant to be constructive.

Well Done Nick

Congratulations to Nick Fisher, the outgoing president, for a job well done. Nick's drive and enthusiasm have led to many activities getting up and going and one can only marvel at the amount of work that he has put into SSAI activities over the years. Nick has provided a truly hard act to follow.

Strategic Plan

The previous newsletter contained a copy of our strategic plan and I would recommend that you at least dig it out and have a glance at it (a copy is also available on the SSAI web-site http://www.statsoc.org.au/). It forms the basis of most of the society's activities and as events unfold over the next year you will be able to see how much we have been able to achieve. One of the activities foreshadowed in the plan is the establishment of a national visitor programme along similar lines to that organised by CSIRO in the late 1970's. A draft proposal is now circulating around the branches and some excellent suggestions have been received from Peter Hall. More details will be available in the next issue of the newsletter.

ASC 2004

Planning is well under way for ASC 2004 that will be in parallel with IBC 2004 in Cairns from the 11th to 16th July 2004. An outline of the 'invited speakers' part of the scientific programme is provided elsewhere in this newsletter and the conference web-site (http://www.ozaccom.com.au/cairns2004 or take the link from http://www.statsoc.org.au/) is the best place to look for details of all aspects of the conference and related activities. I would welcome any suggestions for short courses or workshops that you would like to see given at the conference. Kerrie Mengersen will be organising a workshop on Bayesian analysis and there is plenty of room for more on other topics. The IBC short courses have already been arranged so have a look at the web-site and send me any suggestions that you have.

Feedback

I welcome feedback on this column or any other aspect of SSAI's activities. My email address is neville@nrbartlett.com.au .

You are invited to attend the

2003 Australian Young Statisticians Conference

To be held at the

Boulevard on Beaumont, Hamilton, Newcastle

26-27 September 2003

The conference is a *fantastic opportunity* for statisticians currently studying or who have graduated in the last 5 years. You will be given the chance to:

- **Share** your work with each other
- **Learn** from experienced statisticians
- **Connect** with other young statisticians through a great networking opportunity

The program will include invited talks; posters and short presentations contributed by participants; and a discussion on networking, professional development and other needs.

Confirmed invited speakers are:

- **Ross Sparks,** CSIRO
- **Dennis Sinclair,** Sinclair Associates
- **Caro Badcock,** Covance
- **Kerrie Mengersen,** Newcastle University

Participants are encouraged to prepare posters, with short 5-minute presentations.

Activities include a trip to Nelson Bay for whale watching, a trip to one of Newcastle's beautiful beaches on Saturday PLUS there will be an optional winery tour of the Hunter Valley on Sunday September 28.

Registration fee for the two days will be $120 – book before 31 July OR $150 – book after 31 July. This does not include accommodation.

Enquiries can be made to Simon McGregor-Macdonald smacdonald@market21.com.au,
or to register, contact: Alison Williams, Executive Secretary
TUNRA (The University of Newcastle Research Associates) Ltd.
Alison.Williams@newcastle.edu.au
Ph: 02 49 218777 ; Fax: 02 49 218778

Young Statisticians

First of all, what is Young Statisticians? The Young Statisticians form a Section of SSAI. The aim of the Section is to provide social contact, contacts for discussion and sharing of statistical work, career and academic guidance and to promote the interests of the Young Statisticians. The phrase "young statistician" is used loosely, and is independent of a participant's age. A young statistician is considered to be a person early in their professional statistical career, regardless of age.

There are a few things going on for Young Statisticians in NSW as of late. We've been having monthly get-togethers for Sydney people. These meetings are informal and aimed to be a social night out, but there is also the opportunity to discuss statistics. One of our group, Chris Howden, wrote the following brief report on our gathering on March 18.

"Well a few of us turned up at the Bank in Newtown for a few bevies and a good chat. We couldn't actually be bothered going out to dinner this time so we just stayed in the pub until one of us suggested we should head down to the Harp to check out Emily (a band from Canada) and Penelope Swailes.

Luckily we didn't want to pay the cover charge to get into the music listening area since we hung out until 11:00 and they still, hadn't started playing!!!!!! (I mean that's kinda expected on the weekend.....but on a Tuesday night?)"

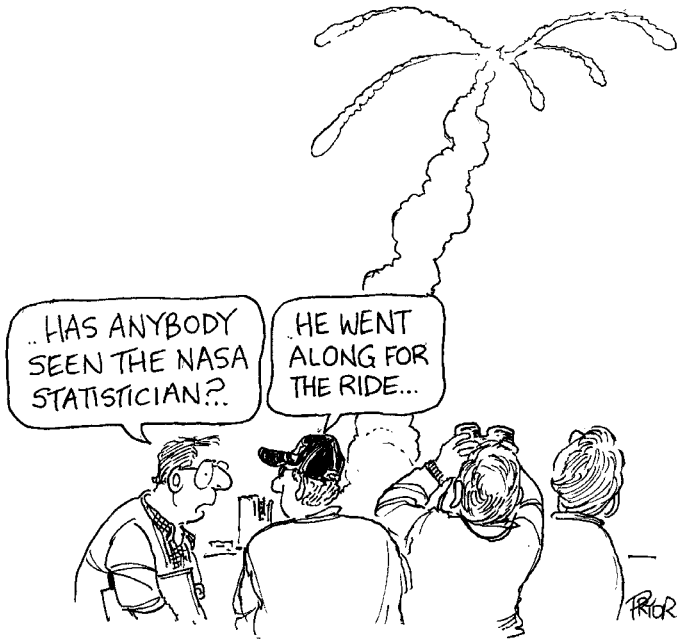
Since then we've had a meeting every month, with a variety of young statisticians turning up, and they've all gone well.

Coming up not far away is the Young Statisticians Conference, to be held in Newcastle over 2 days, September 26-27. The conference is a *fantastic opportunity* for statisticians currently studying or who have graduated in the last 5 years. You will be given the chance to *Share* your work with each other; *Learn* from experienced statisticians; and *Connect* with other young statisticians through a great networking opportunity. Further details are available by referring to the full-page ad for the conference found on page 6 in this newsletter, or referring to our flyer on the web (http://www.geocities.com/statsnsw/Confflyer.doc).

Young Statisticians has been quite active in Western Australia for a while now, with a workshop back in February, and plenty of ongoing activity. There are groups in Victoria and Queensland running some Young Statisticians events also, and opportunities for others to do so in other parts of the country. Anybody interested in participating in Young Statisticians activities should contact their Branch Young Statisticians representative, or the current Young Statisticians Section Chair.

For more information about Young Statisticians, including contact details for state reps, and details of upcoming events, please refer to the Young Statisticians website (http://www.daa.com.au/youngstats/).

Simon McGregor-Macdonald



Challenger – a statistical disaster

When Space Shuttle Challenger exploded before the horrified eyes of the world on January 28, 1986, it was as much a statistical as an engineering disaster.

Prior to launch, the risk of catastrophic failure in the shuttle was estimated by NASA management at 1:100,000. Engineers put it at between one in 100 and one in 300.

When statisticians analysed the same figures afterwards they calculated the actual risk of disaster was 12–14 per cent or about one chance in eight. And this calculation could have been performed before the shuttle was launched!

The professional statistical work should have been done in the first place.

Statistics: a job for professionals

www.statsoc.org.au/PublicAwareness

Highlights of the forthcoming September Issue 45(3) of the Australian and New Zealand Journal of Statistics

APPLICATIONS

- On modelling data from degradation sample paths over time by *Tsung I. Lin & Jack C. Lee*

THEORY & METHODS

- Variable kernel density estimation by *Martin L. Hazelton*
- Effective directed tests for models with ordered categorical data by *Arthur Cohen, David Madigan & Harold B. Sackrowitz*
- Generalized discriminant analysis based on distances by *Marti J. Anderson & John Robinson*
- Towards optimal regression estimation in sample surveys by *Yves G. Berger, Mohammed E.H. Tirari & Yves Tillé*
- On the convergence of moving average processes under dependent conditions by *Jong-Il Baek, Tae-Sung Kim & Han-Ying Liang*
- A multivariate parallelogram and its application to multivariate trimmed means by *Jyh-Jen Horng Shiau & Lin-An Chen*
- A note on the correlation structure of transformed Gaussian random fields by *Victor De Oliveira*
- Non-parametric group sequential designs in randomized clinical trials by *Uttam Bandyopadhyay & Atanu Biswas*

The first article in the September issue is an applications paper by Tsung Lin and Jack Lee. If you've ever wondered whether that little crack in your windscreen is going to lengthen and become catastrophic then you should read about Lin and Lee's random effects ARMA model for modeling degradation sample paths.

The Theory and Methods section contains eight articles on a wide variety of topics including design, sample surveys and multivariate methods.

Martin Hazelton from the University of Western Australia has a contribution on *Variable kernel density estimation*. Variable kernel density estimates aim to give the flexibility of a narrow bandwidth in regions where the true density has important and interesting fine structure, while imposing a wider bandwidth in regions where the density is relatively flat and uninteresting. As always, the challenge is in choosing the bandwidths. While some important work in this area has already been done, the finite sample performance has been disappointing.

Hazelton proposes and investigates a new cross-validation method of choosing the variable bandwidths – one for each observed value of the variable. A simulation study suggests that the new method outperforms the best fixed bandwidth estimators in cases where we would expect it to i.e. when the density contains some regions with narrow modes and others regions that are relatively flat. The computational load of the new method is also less than that of competing methods. Hazelton also makes some interesting observations on integrated squared error as opposed to mean integrated squared error.

Another noteworthy paper is *Effective directed tests for models with ordered categorical data* by Arthur Cohen, David Madigan and Harold Sackrowitz of Rutgers University. This paper deals with the problem of one-sided tests in RxC contingency tables where the columns are ordered.

A typical example might be the following: you have two treatments that give a response on C ordered categories. From a randomised trial you obtain a 2xC contingency table and you want to test whether one row distribution is stochastically larger than the other row distribution. This corresponds to one treatment dominating the other.

The proposed test has several advantages. First, it is exact rather than asymptotic and so could be used where the data is sparse (though the actual P-value is computed using simulation in practice). Second, the proposed test has advantages in terms of power and robustness over competing methods such as the linear test. Third, the proposed family of tests can also be applied to censored data.

The authors give a wide range of applications of their theory, for instance to testing whether at least one of the last R-1 rows is stochastically larger than the first, given that none are stochastically smaller than the first. Indeed, considering the range of application of their theory this paper could easily have been published as two or three separate papers.

Some members may not be aware that an important decision was taken at the recent central council meeting, concerning the possible change of the journal to an electronic only format. Further details can be found in this newsletter.

Chris Lloyd and Russell Millar

Australian and New Zealand Journal of Statistics

Dear SSAI Members and Colleagues,

Below is a (subset of) an email that has been circulating around the profession from Jan Kratochvil of the Department of Applied Mathematics, Charles University, Prague.

"I would like to bring to your attention the efforts to restore the Mathematics Library of Charles University in Prague whose funds were ruined during the recent floods (of 2002) … Compared to the overall situation and to (fortunately very few) human casualties, it may seem frivolous to care about physical possessions. But in the long run, the loss of books and journals from the Mathematical Library of the 650-year-old Charles University will prove to be tragic. The largest Czech mathematical library was located in the building of the Faculty of Mathematics and Physics, Charles University, at Karlin, the most damaged part of Prague. It contained books and journals from all fields of pure and applied mathematics, statistics, numerical analysis and computer science … The restoration of the library will be a painful and costly job.

Taking into account that the whole country was extensively damaged by the flood, one cannot expect much financial support from the government. Aware of this, people from Charles University have launched a campaign for collecting donations, both financial and of replacement volumes. It is clear that some books and older journal issues cannot be acquired at all, but the library needs books and textbooks to supply the students and researchers … At this occasion, I would like to ask you for help. Aid of any kind is welcome … In the name of the library, I wish to thank you for support of any kind."

The executive council of SSAI has decided to contribute a collection of the *Australian Journal of Statistics* and the *Australian and New Zealand Journal of Statistics*. We want this collection to be as complete as possible. A stocktake of the SSAI office revealed a quite large coverage of old issues but we are missing some, as marked with an "X" in the following table.

I would like to invite members to contribute unwanted issues of the journal to this worthy cause. This is an opportunity for members to demonstrate their appreciation of and commitment to the broader academic community. Please send your unwanted back issues **on the list** by mail to:

Jane Waslin
Executive Officer
SSAI
P.O. Box 85
AINSLIE ACT 2602

Chris J. Lloyd
Managing Editor
Australian and New Zealand Journal of Statistics

Missing Issues					
Vol		**Issue 1**	**Issue 2**	**Issue 3**	**Issue 4**
2	**1960**	X			
3	**1961**	X	X	X	
5	**1963**			X	
6	**1964**			X	
8	**1966**	X	X		
18	**1976**	X			
23	**1981**	X	X		
30	**1988**				Special Vol 30B
31	**1989**				Special Vol 31A
35	**1993**	X			
36	**1994**		X		
37	**1995**	X			
38	**1996**		X		
39	**1997**		X		
40	**1998**	X			
41	**1999**			X	
43	**2001**		X		

SSAI

Statistical Society of Australia Inc.

Annual Report

April 2002 to March 2003

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

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

In order to hold Annual General Meeting of the SSAI and the annual meeting of Central Council in association with Australian Statistical Conferences or other mid-year conferences, the financial year for the Society is from 1 April until 31 March. Branches may choose, through their own constitutions, to retain a different financial year.

1. Membership of the Society

Based on payments in 2001 the Society had 680 ordinary members, 17 Members at Large and 67 student/retired members, making a total of 764. There are also 17 Honorary Life Members. Equivalent figures (excluding Life Members) since 1994 are 966, 956, 971, 898, 927, 874, 789, 733.

2. Central Council

Two meetings were held. The Annual General Meeting of the Society and the Annual General Meeting of the Central Council were held on 7 & 8 July 2002, at the National Convention Centre, Canberra, and a general meeting of the Council was held on 11 February 2003. The Executive of the Society has had monthly one-hour telephone meetings during the year.

The Central Council for 2002 – 2003 comprised:

President	N.I. Fisher
Vice-President	N.R. Bartlett
Editor	C.J. Lloyd
Secretary	R. Robertson
Treasurer	S.R.T. Horn
Accreditation Committee Chair	R.G. Jarrett
Circulation Manager	M.A. Adena
Delegates	
Canberra Branch	G. Lee
New South Wales Branch	J. Rayner
Victorian Branch	N. Diamond
Queensland Branch	A. Swain
South Australian Branch	G. Glonek
West Australian Branch	M. Hazelton

Several scholarships and prizes for the Honours Year in Statistics were awarded by Branches during the year.

Much of the Society's business is conducted by the SSAI Executive on a monthly basis by telephone hook-up. Members of the SSAI Executive for 2002-2003 were:

President	N. I. Fisher
Vice-President	N.R. Bartlett
Editor	C.J. Lloyd
Secretary	R. Robertson
Treasurer	S.R.T. Horn
Section Chairs' Representative	K. Mengersen
Branch Presidents' Representative	A. Branford
Young Statisticians' Representative	S. McGregor-Macdonald
Office Manager / Executive Officer	L. Sieper/ J. Waslin

3. Association with other bodies

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

The Society is a constituent member of the Australian Mathematical Sciences Council, and through this Council a member of the Federation of Australian Scientific and Technological Societies (FASTS). N. Fisher represented the Society on the Council.

The Society was represented on the National Committee for Mathematics of the Australian Academy of Science by N. Bartlett *ex officio*.

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

The Society is a member of the Australian Foundation of Science. S.R. Wilson was the Society's representative this year.

4. Finances

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

This will show an operating surplus of $16,794, influenced by the healthy surplus from ASC16. Subscription income is down on the previous year even though Subscriptions have begun to rise, because of the realignment of payments to the year of membership. Projections show uncertainty on income side, depending on outcomes of Society sponsored workshops and conferences; with a rising operating cost, as the Strategic Plan becomes operational, and as we adjust administrative resources accordingly. My prognosis is for a neutral result over four years from last year. I am assuming a modest recovery in members, and static capitation rates.

Capitation of $70 for full member and $35 for retiree/ student has applied since 2000-2001. Follow-up efforts in 2001-2002 and in 2002-2003 are raising renewal rates; recruiting new members is the next challenge. Whilst the Society is backing a number of strategic initiatives to do just that, with implications for increased staff and executive costs and costs of underwriting activities by sections or branches, from its cash reserves, an operational funding balance should apply over the 2-year span of the Society's principal activity cycle. The neutral result relies on continuing delivery of surpluses on conferences and workshops, as well as pick-up in member numbers. The last year has shown both are possible; they must now be sustained.

In 2001—2002 a fund was established to promote the Accreditation program through a combination of corporate donation and surpluses from CPD workshops. Spending has been carried over to this year and will be sustained into the following year at least.

5. The Australian and New Zealand Journal of Statistics

The Society would like to thank Managing Editor Chris Lloyd and Editors Rob Hyndman and Russell Millar and the Editorial Board for their contributions to the smooth production of the journal in 2002.

6. Accreditation

The accreditation process continues to run smoothly thanks to the efforts of the Accreditation Committee and the Society's Administrative Officers, Lesley Sieper and after her resignation, Jane Waslin. It meets once a month, generally via telephone conference, and spends a considerable time examining each of the applications and referees' reports to ensure that a high standard for accreditation is established. Those members granted GStat and AStat status are listed in the *Newsletter* once the recommendations have been approved by the Executive.

The Graduate Statistician qualification has been amended in the past year to require only a major in Statistics (or the equivalent), rather than an Honours degree. This gives the Society a responsibility to ensure that adequate professional development opportunities are available for GStats as they develop towards AStats. In addition, a re-accreditation process has been established and re-accreditation forms will be sent in the next month to those whose accreditation expires at the end of 2003. Two other issues are currently under consideration: how to accredit University programs (thus assuring successful graduates of GStat status), and how to provide better support and professional development opportunities to existing Accredited members,

We would like to take this opportunity to thank all members of the committees for their efforts, especially Richard Jarrett, who is stepping down from being Chair of the Accreditation Committee and also retiring from the Committee after being a foundation member.

7. Planning

Central Council adopted a Strategic Plan for 2003-2007 at its February 2003 meeting, and developed an Operational Plan for 2003. Both Plans have been distributed to members via the Newsletter and the Society's web site. Progress with the Operational Plan is monitored at the monthly Executive meetings. The Society expresses its gratitude to all the members of the Planning Committee – Eden Brinkley, John Carlin, Brenton Dansie, Teresa Dickinson, Steve Duvall, Joe Gani, Rodger Robertson, Des Nicholls, Peter Hall, Philip McCloud, David Scott, Eric Sowey and Jodie Thompson – who worked for well over a year with the President to bring the Strategic Plan to fruition.

8. Public Awareness Campaign

After several years of slow progress, a Public Awareness Campaign was finalised, for launch later in 2003. The campaign was developed in consultation with Julian Cribb, and comprises presentations to target groups, a series of advertisements in national and Canberra newspapers, press releases, and a booklet of Success and Disaster stories featuring cartoons by Geoff Pryor. Its twin thrusts are: the need for professionalism in the practice of Statistics; and to support Professional Accreditation, hence its campaign slogan: *Statistics: A Job for Professionals*. The initial target will be Government departments. The Society appreciates the considerable assistance of Eden Brinkley, Dennis Trewin and Jane Waslin in bringing this to fruition.

9. Conferences, Workshops and Symposia

It has become evident to the Executive that the biennial Australian Statistical Conference (ASC) has become too much of a burden for many of the Branches to bear. Because of its importance to SSAI members, the Executive has moved to make the organisation more of a national responsibility. The host Branch will be responsible for Local Arrangements, including contracting (in consultation with Central Council) of a professional conference organiser. The Chair of the Scientific Program will now be appointed by Central Council. An ongoing advisory panel (called the Scientific Program Advisory Group) has been established with the objectives of:

- Ensuring that (over time) all major areas of the discipline are themes at an appropriate number of conferences,
- Striking a balance between 'hot' new topics and well-established areas, and
- Providing a list of names of top-notch key-note speakers.
- Members of SPAG have a 6-year tenure to ensure continuity and corporate memory.

A well-documented 4-year planning process for these conferences will be installed on the Society's website, with the ASC Director expected to report regularly to the Executive against its milestones. The Society will actively seek the collaboration of other professional societies and regional groups in these meetings. ASC 2004 is scheduled to be held in Cairns, in parallel with the International Biometrics Conference; and ASC 2006 will be held in conjunction with the New Zealand Statistical Association and hosted by them in Auckland. The Society also plans to collaborate in a Satellite Meeting on Industrial Statistics, again in Cairns, just after the ISI 2005 Session planned for Sydney (April 2005).

Another proposal is to hold a Special Topics conference in Canberra in non-ASC years, in conjunction with Continuing Professional Development (CPD) courses, the Foreman Lecture sponsored by the Australian Bureau of Statistics, and the SSAI Annual General Meeting. An initial round of two CPD courses, generously hosted by the Australian Bureau of Statistics, was presented very successfully in Canberra in July 2001 by Richard Jarrett and Rob Hyndman, and Michael Martin and Steve Stern.

10. Named Lectures

The E.K. Foreman Lecture was given at the ASC 2002 Conference by J. Eltinge.

The Knibbs Lecture was given by O. Mayo.

The Belz Lecture was given by R. Watson.

11. Sections

Current Sections and their 2002 - 2003 chairs are:

Survey and Management Statistics	R. Clark
Statistical Computing	K. Kumar
Statistics in the Medical Sciences	T. Mills
Statistics in the Biological Sciences	S. Barry
Statistical Education	D. Griffiths
Industrial Statistics	A. Phatak
Young Statisticians	S. McGregor-Macdonald

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

12. Acknowledgement

The Society's Business Office has been playing an ever-increasing role in SSAI activities. The Society records its deep appreciation to Lesley Sieper (who resigned early in 2003, after several years of service) and Jane Waslin (appointed to replace Lesley), for their enthusiasm, good humour and contributions.

For the Society,

N.I. Fisher	R. Robertson
President	Secretary

More than 200 ABS staff were part of a promotional video which has been prepared to invite delegates to the 2005 ISI Session which will be held in Sydney 5-12 April 2005. .

ABS gives the world a wave – Planning underway for 2005 ISI Session

The ABS is very pleased to be hosting the 55th Session of the International Statistical Institute (ISI), which will be held in Sydney between 5 and 12 April 2005 at the Sydney Convention and Exhibition Centre. The 2005 ISI Session will provide an arena for the exchange of ideas on, and knowledge of, statistics among participants. The ISI Session will serve to enhance the coordination and integration of statistics and to strengthen the existing ties between statisticians in government and academic circles, as well as between statistical societies and official and non-official organisations.

The National Organising Committee (NOC) for the 2005 ISI Session, comprising Australian Statistician, Dennis Trewin (Chair), members from the ABS (Siu-Ming Tam, Jonathan Palmer, Graeme Hope, Geoff Lee and John Stuik) and representatives from the Statistical Society of Australia (Nick Fisher and Eden Brinkley), recently held a meeting in Sydney with TourHosts, the professional conference organisers, to discuss promotional, budget and marketing requirements.

Representatives of the NOC also participated in the 2003 ISI Session, which was held in Berlin, Germany, 13 – 20 August 2003, to encourage delegates to attend the 2005 Session and to promote Australia as a fun, safe and interesting place to visit. The NOC were also interested to learn first hand the approach taken to make the ISI Session a success.

A number of satellite meetings will be held around the 55th ISI Session, including a meeting to be held in Wellington, New Zealand on the likely theme of "statistics for special populations, including minority populations". It has also been proposed that the IAOS will hold a satellite meeting in Noumea, New Caledonia on statistical issues associated with small countries. The Industry and Business Statistics Committee is also considering a satellite meeting in Cairns, Queensland. Other satellite meetings are also likely to be developed.

Further information on the programs and arrangements for the Session will be included in future SSAI newsletters and updated regularly on the 2005 ISI website.

Register your interest now!

Attached is your copy of the invitation brochure to the **55th Session of the International Statistical Institute** to be held in Sydney, Australia 5-12 April 2005.

Register your interest in the 2005 ISI Session by completing the expression of interest form contained in the brochure and mail to: Statistics Conference Managers, GPO Box 128, Sydney NSW 2001, Australia

Alternatively, register your interest on the 2005 ISI Session website: **www.tourhosts.com.au/isi2005**

Accreditation

This is my last contribution as Chair of the Accreditation Committee. It has been a pleasure to serve on this Committee for the last five years and to take part in assessing the qualifications and professional standards of our members. I would like to thank my fellow committee members for their hard work and support during that time and the Executive of the Society for their support. Special thanks go to Siu-Ming Tam and Annette Dobson who are also standing down from the committee.

The Committee aims to have a broad coverage, both geographically and by field of interest. Three new members of the Committee have been appointed by Central Council. They are Teresa Dickinson of the Australian Bureau of Statistics, David Steele from the University of Wollongong and John Carlin from the University of Melbourne. For the first time, the Committee will have a member from each Branch of the Society! The new Committee will be electing their Chair at their first meeting in early August.

The next few months will be a busy time. As well as the usual applicants for A Stat and G Stat, the Committee will be assessing applications for re-accreditation by people who were first accredited during 1998, and assessing applications for University degree programs to be accredited.

Richard Jarrett

Meet some recently accredited SSAI members

Dr Ann Solterbeck, AStat

My first degree, including PhD, was in pharmacology. Working as a clinical research scientist in the pharmaceutical industry I discovered my interests lay in study design, analysis and interpretation. Therefore I completed a Masters in Statistics by coursework through Melbourne University with a Minor thesis on Meta-Analysis. I have worked in medical and pharmaceutical statistics since then. I enjoy making statistical analysis concepts in those areas understandable to non-statisticians. I am now the Director of my own consulting company.

Dr Gregory V. Fant, GStat

I am a Federal Health Statistician in the US Department of Health & Human Services with expertise in research design, sample size calculations, and statistical data analysis. I like graduate-level teaching and studies exploring the public health needs of the underserved. I am an elected Member of the American College of Epidemiology and Fellow, Royal Institute of Public Health.

Mr Frank Yu, AStat

I am in charge of the Statistical Services Branch within the Australian Bureau of Statistics. I am responsible for sample survey design and estimation for the ABS's business and household surveys, and for time series analysis and research. I develop strategies and plans to ensure efficient and sound methodology is used in ABS's collections.

Dr Adrian Esterman, AStat

I graduated with an honours degree in Statistics from Bath University, UK, in 1968, then received an MSc in Medical Statistics from the London School of Hygiene and Tropical Medicine in 1974. My subsequent career includes seven years as a staff member for QHO in Geneva and Copenhagen.

Mr Chris Howden, GStat

I started as an Ecologist but finished with a double major in Ecology/Stats. Since then I have worked as a Biometrician for DLWC and various academic laboratories. Ideally I would like to develop a way of constructing multivariate geo-referenced eco-system models.

Dr Richard Gerlach, AStat

PhD from UNSW in Bayesian time series analysis and diagnostics and I have done two years research for international investment house (GMO). Previously I was consultant to Sydney Water, Government Employees Health Fund and Commsteel. I am interested in financial time series, model selection, investment strategies, co-integration and statistical programming. I am the webmaster for the NSW Branch of SSAI.

Mr Christopher Milne, GStat

I graduated with First Class Honours degree in Statistics in 2001, with a thesis on robust estimation. During my studies I was involved in many tutorials and programs to teach statistics to other students. Joined Data Analysis Australia in 2002 and have done a lot of analysis on medical and biological data.

Dr Kelvin K Yau, Astat

NEW RANGE OF HEALTH INSURANCE PRODUCTS FOR SSAI MEMBERS!

New, simplified product range with Specially Negotiated Rates

Member Advantage Health, in alliance with IOR Health Benefits, is delighted to release its range of **NEW** health insurance products for SSAI members. IOR is a fully owned subsidiary of one of Australia's largest health funds, The Hospital Contributions Fund of Australia (HCF).

Member Advantage Health provides peace-of-mind health cover for you and your family. As an SSAI member, you receive:

- ✓ 5% member discount off approved rates
- ✓ No excess payable for same day admission or accidents[1]
- ✓ Waiver of the normal two-month waiting period[2]
- ✓ Family policy that covers your children up to 22 years of age
- ✓ On-the-spot electronic claims[3]
- ✓ 30 days free trial[4]
- ✓ Simple to choose product range that allows you to mix and match to suit your needs

Because life can be unpredictable,
why risk the health of you and your family?

Contact your dedicated Member Advantage Team on 1300 853 352
Email us at info@member-advantage.com
or visit www.member-advantage.com/ssai

[1]IOR will waive the excess for all same day procedures or for hospital treatments which are the result of an accident. The excess is waived if treatment is within 12 months of the accident. [2]Does not cover pre-existing ailments. A 12 month waiting period applies to these. Waiting periods of 2 months are waived. Some conditions apply [3]This service is only available through optometrists, chiropractors, physiotherapists, podiatrists and dentists who have special arrangements with IOR. [4]30 days free trial – if you decide to cancel your membership, IOR will gladly return your money provided you have not made a claim

Tax Accountancy Services

Member Advantage offers you significant savings on tax return preparation and lodgement. The costs for SSAI members and their partners are:

	MEMBER	PARTNER
Level 1 (simple salary)	$65	$85
Level 2 (some other income)	$95	$110
Level 3 (significant other income)	$120	$130
Level 4 (complex returns)	Quote	Quote

Other services available include preparation of company, partnership and trust returns. Ask us for a competitive quote.

For more information, contact SSAI Member Advantage on 1300 853 352,
visit www.member-advantage.com/ssai, or email info@member-advantage.com

Continuing professional development workshop on longitudinal data

Friday 4th July saw the long awaited return of the societies' continuing professional development workshops. A team from the Longitudinal Studies Unit of The University of Queensland presented a one-day course titled, "Applying Generalised Estimating Equations to Longitudinal Data". The course was designed to give a working knowledge of Generalised Estimating Equations (GEEs). Lectures on theoretical background, descriptive analysis, and non-Gaussian data were interwoven with hands-on tutorials using real data sets from health research.

A small data set of stroke recovery patients was used to show the similarities between the GEE and random effects approaches. The correlation between subjects in this data set was high; a descriptive analysis showed a steady decay in the correlation suggesting an AR(1) structure. A naive analysis ignoring the correlation gave similar estimates for the mean results but much narrower standard errors. This is a consequence of ignoring the correlation between observations, which increases the risk of a type I error.

A longitudinal study of mothers' mental health was used to highlight the importance of descriptive analysis. The mental health index had a skewed marginal distribution, which could be made to look more Normal with an appropriate transformation. Scatter plots of the mean mental health over time were used to examine patterns of change. A three-dimensional plot of the observed correlations in mental health was used to select an appropriate correlation structure. Many of the audience picked up on the unbalanced timing of the observations, which has a large impact on the choice of correlation structure. Given the design an exchangeable structure was thought most suitable.

After an excellent lunch (as rated by 24 out of the 25 attendants! 95% confidence interval [22,25]!!) the problem of non-Gaussian data was addressed using a data set of tumour counts that contained both Binomial and Poisson outcomes. The data contained a lot of missing values (around 80%) and the first problem was to assess if missing values were related to the treatment or the baseline characteristics of the subjects. The counts of tumours were then modeled using a Poisson distribution and an offset of the time between visits. An ideal write-up of the GEE method for a non-statistical journal was presented. During the practical session on the tumour data a common problem was how to choose the best GEE model. Unfortunately the GEE cannot give an Akaike Information Criteria statistic and the mean square error is, of course, dependent upon the number of parameters. This was acknowledged as a current failing in the GEE methodology.

The course was unusual in that the tutorials were run simultaneously in three different software packages: SAS, Stata and R; this worked very well.

Twenty-five people from a range of working backgrounds attended the workshop. They came from Queensland, New South Wales, Victoria and the ACT. Six attendants were AStat or GStat accredited, 10 were ordinary members, 7 were students, and 2 were non-members.

The feedback on the course was very positive, with one person even stating it was, "The best training course I have attended". Seventeen people expressed an interest in another workshop on the sticky problem of dealing with missing data in longitudinal studies. Watch the unit's website for further details: http://hisdu.sph.uq.edu.au/lsu/.

The course will be repeated at the University of Western Australia, Perth on the 24th November; e-mail Adrian Barnett for more information (a.barnett@sph.uq.edu.au).

The course was presented by: Annette Dobson, Gail Williams, and David Purdie. The course tutors were: Adrian Barnett, Philip Schluter, Rob Ware, and Jolieke van der Pols.

Adrian Barnett

Annette Dobson presents a lecture at the society's continuing professional development workshop on longitudinal studies. AStat Ken Russell listens keenly in the front row.

GStat and course coordinator Adrian Barnett talks to society member Chris Carter from CSIRO (left), whilst Annette Dobson and Rob Ware help out society member Marissa Lassere (right). Society member Ian Shannon (right foreground) helps himself!

You are invited to the next Australian Statistical Conference ...

ASC 2004	CAIRNS 11–16 July, 2004

Registration and abstract submission is now available at the conference website: http://www.ozaccom.com.au/cairns2004

Key Dates

Abstract submission closes 1 December 2003
Early bird registration closes 1 March 2004

Note that space for contributed papers is limited. If you would like to present a paper then please submit an abstract even if you do not wish to register yet.

World class venue ...

- Cairns Convention Centre, rated one of the top ten convention facilities in the world

Two conferences for the price of one ...

- The International Biometrics Conference, IBC 2004, will be held in parallel, at the same venue

Rich and diverse program ...

- Up to 8 parallel sessions of IBC and ASC

Start planning now to be a part of it!
www.statsoc.org.au/asc2004

Forthcoming Events

Data Availability and Statistical Methods for the Use of Government Data in Social Research

Mark this in your Diary! SSAI Workshop 9 September 2003 1: 30-7:00, ABS House, Canberra

The title is a bit of a mouthful but this workshop promises to be lively and informative. A range of speakers from government and academia will talk about both strategic and "how-to" issues in social research using government data. Data access issues are likely to be a common theme. The intended audience is professional statisticians, social researchers using government data, or anyone interested in the role of statisticians in the use of government data. Please pass on this notice to any of your colleagues who might be interested even if not society members.

The workshop will run all afternoon/evening with breaks for afternoon tea and a catered dinner. The registration form is up on the web page http://www.statsoc.org.au/~ssacanb .

The speakers will be:

- Dr Diane Gibson (Australian Institute of Health and Welfare); Issues and Strategies in the Analysis of Welfare Issues;
- Dr Peter Brandon (Australian National University); Analysis of Longitudinal Surveys for Policy Research;
- Mr Stephen Horn (Family and Community Services); Base Evidence to Policy Gold – Statistical Alchemy in social research;
- Dr Phil Kokic (Australian Bureau for Agriculture and Resource Economics) Linking climate variability data with farm financial performance using microsimulation;

Mr Geoff Lee (Australian Bureau of Statistics) will give the Canberra Branch presidential address on Issues and Directions in Microdata Access at ABS and Overseas.

Computing Competition

The statistical computing section of the Statistical Society of Australia Inc. is co-sponsoring a student paper/software competition on the topic of statistical computing, data mining, statistical graphics and intelligent data analysis. Students are encouraged to submit papers in one of the above areas. Papers should be original and demonstrate some novel computing or graphical application in statistics, software or some interesting data analysis.

The selected winners will be invited to attend ASC 2004. The SSAI will pay registration fees for the winners. There will be other prizes sponsored by other organizations. Anyone who is a full time student (undergraduate, postgraduate or PhD) is eligible to apply. Age limit is 35 years. Only students from Australia and New Zealand can take part in this competition. Students should submit an abstract, a eight page (maximum) manuscript, a CV and a letter from faculty member. All material must be in English.

All papers must be received by 5:00 PM 28th November, 2003 preferably by e-mail at the following address. The selection criterion will include innovations and significance of the contribution. Awards will be announced by 15 March, 2004. Please address any enquiries to Dr Kuldeep Kumar at email kkumar@bond.edu.au. Address for enquiries and submission of paper:

Student Paper Competition
c/o Associate Professor Kuldeep Kumar
School of Information Technology
Bond University, Gold Coast, Queensland 4229 AUSTRALIA
Email: kkumar@bond.edu.au

G.S. Watson Annual Lecture for 2003

La Trobe University, Bendigo is pleased to announce the details of the G.S. Watson Annual Lecture for 2003. This annual lecture has been established in memory of Professor Geoffrey S. Watson (1921-1998). Geoffrey Watson was born in Bendigo and educated at Bendigo High School before going on to university studies and a distinguished career in the mathematical sciences. He became Head of the Department of Statistics at Princeton University. The aim of this event is to remember the contribution of Professor Watson through a lecture on aspects of contemporary mathematics. The 2003 lecture will be presented by Professor Fima Klebaner (Monash) on Tuesday, 16 September 2003, 5pm to 6pm at La Trobe University, Bendigo. For further information, see http://www.bendigo.latrobe.edu.au/mte/maths/2003Lecture.htm or contact Dr Robert Champion (r.champion@bendigo.latrobe.edu.au).

ATSE Clunies Ross Award for 2004

Nominations are now invited for the ATSE Clunies Ross Award for 2004, providing an opportunity to reward and celebrate Australia's outstanding scientific achievers

Since 1991 this Award has now recognised and honoured 74 people for their successful application of science and technology for the economic, social or environmental benefit of Australia.

Please note that nominations closed on 31 July 2003.

Award recipients will be publicly announced and presented with a silver medal at the Award Dinner in March 2004.

Nomination forms and further information is available on the Clunies Ross website at www.cluniesross.org.au or by contacting Mary Bolger, Award Secretary, on (03) 9347 0622 or email maryb@atse.org.au.

CANBERRA

Emlyn Williams' 30 years as a statistician at CSIRO

At the monthly meeting of the Canberra Branch of the Statistical Society of Australia on 27 May 2003, Dr Emlyn Williams gave a talk on his more than 30 years of experience as a statistician at CSIRO. After completing a PhD in statistics at Edinburgh, Scotland, Emlyn began his career with CSIRO in 1971, in the Division of Mathematical Statistics, Adelaide. He has worked full time for CSIRO ever since.

When Emlyn started, the CSIRO consisted of 35 divisions and 40% of its staff were scientists. In contrast, it currently has 20 divisions and 70% of its staff are scientists. Interestingly, the organisation's overall numbers have not changed much, being about 6000 in both 1971 and 2003. During the three intervening decades the most notable changes have been the adoption of a "One CSIRO" policy (e.g. the creation of a single library), and an increased emphasis on marketing the organisation's innovations. Computers existed back in 1971 but were of course very limited. Emlyn used to type commands onto cards, send them off by plane to Canberra for processing with a computer, and have to wait two days for the results to return.

Working for the CSIRO, Emlyn has learnt to speak a "biological" language. He stresses the advantage of being in the place you work for, as distinct from working remotely. Without the constant contact he feels he could not have written the books that he has. Emlyn also stresses the need for good experimental design. This is important because "two hours on design may save two weeks later". Experimental design is in fact Emlyn's main focus of research.

Currently, Emlyn works for the Forestry and Forest Products Division. As the only statistician in a division of 200 people, he is very busy. In order to free his time for research, he has produced several computer packages to assist scientists with the design of their experiments. One of these packages is called *CycDesigN*. This software is very versatile and accommodates a wide variety of situations, including unequal block sizes, factorial/nested treatments and spatial models. It has been very well received and currently has licenses in 35 countries. Another of Emlyn's packages is *OUTMAP*. This was developed specifically for mapping outcrossed forest trees.

One of the projects Emlyn has been working on recently involves seed viability and vigour testing for the tree *Eucalyptus camaldulensis*. This project consists of observing the germination rates of seeds that were harvested at various times in the past going back to 1972. In this context good experimental design involves carefully randomizing the planting locations of seeds within greenhouses and germination cabinets so as to exclude the possibility of bias due to systematic variations in temperature, moisture, light, etc. The case of germination cabinets is problematic because it involves a third dimension. It therefore requires a complex design, and Emlyn has pioneered new work in this area.

Another of Emlyn's projects is the development of a genetic linkage map with a view to enhancing rust resistance in *Acacia mangium*. Yet another is an agroforestry trial to determine the spacing of tea trees for optimal oil production, the current industry standard being 35 cm. Some of the work in this area also involves planting other crops (e.g. millet and soy) in close proximity to tea trees with the aim of discovering synergistic effects and minimising losses should one of the crops fail.

Martin Bland and the Horizon Dilution Experiment

At the monthly meeting of the Canberra Branch of the Statistical Society of Australia on 29 April 2003, Professor Martin Bland of St George's Hospital Medical School, University of London, gave a talk on a homeopathic experiment carried out by the BBC program "*Horizon*" which recently aired in Australia on ABC's "*Catalyst*" program (Nathan Williams and Rosie Schellenberg, BBC 2002). Martin, the statistician on the project, presented some very interesting detail which did not get mentioned in the TV program. This additional detail provides insight into the way poor statistics can lead to wrong conclusions.

The experiment was conducted according to the most rigorous scientific standards, under the auspices of the Royal Society, and with randomisation and double blinding at every stage. First, a homeopathic treatment was created by diluting a histamine with water one part in 100, repeated 15, 16, 17 or 18 times, so as to make it very unlikely that any molecules of the histamine remained. The control substance was made by treating pure water in the same way. The object of the experiment was to see whether the homeopathic dilution is any different from plain water in its effects on human blood. The hypothesized effects were suggested by positive results in a similar experiment by Madeleine Ennis at Queens University, Belfast, in 2001. The Horizon experiment in 2002 was conducted in an attempt to reproduce Ennis's findings.

In the Horizon experiment, there were 5 tubes of histamine at each dilution, 20 tubes in all, and 20 control tubes. These were split and the halves of each tube's contents sent to two separate laboratories. The assay used measured basophil activity in human blood. In each laboratory, blood samples were taken from each of 5 human volunteers. The proportion of active basophils in each blood sample was measured after mixing with the test dilutions. All measurements were done blind and in random order. The resulting 200 measurements were then averaged over the 5 subjects. The result was 40 observations, together with their 40 matching numerical labels (20 corresponded to the homeopathic dilution and 20 to the plain water).

The code which identified the origin of the dilutions was broken on camera. To make the presentation televisual, for each laboratory, the 40 labels were listed on a flipchart in two columns of 20, in order of the observations' size, awaiting a code which would match

Martin Bland and Ann Cowling.

each label with either C (standing for control) or D (standing for dilution). If the homeopathic dilution had some effect, it was reasonable to expect more D's than C's in the first column, and vice versa in the second. It turned out that for the first laboratory there were 9 D's and 11 C's in the first column, and 11 D's and 9 C's in the second column. This is almost exactly what one would expect if the homeopathic substance had no effect. For the second laboratory there were 11 D's and 9 C's in the first column, and 9 D's and 11 C's in the second column.

Thus overall there resulted *exactly* what one would expect if the homeopathic substance had no effect. Accordingly, Martin Bland said on the Horizon program: "There's absolutely no evidence at all to say there is any difference between the solutions that started as pure water and the solutions that started off with the histamine". Also John Enderby (the adjudicator for the experiment from the Royal Society) said: "What this has convinced me is that water does not have a memory."

The above is the essence of what was shown on the Horizon program. What the Horizon program did not show was that there was a *time trend* in the 40 observations for each subject, possibly because of an ageing of the blood samples as they awaited processing. In particular, the results from the first laboratory exhibited a roughly cubic trend, with the first 20 values for each subject generally smaller than the last 20. Thus if the treatment had been applied to the first half of the blood samples and the control to the second half, it might have been concluded that the homeopathic dilution is different from plain water. For the Horizon experiment a cubic regression was used to adjust in each laboratory separately and the residuals averaged across the laboratories to give the final outcome variable. The mean basophil activity was compared between the dilutions, with no evidence for any effects. This trend may partly explain why Madeleine Ennis's experiment in 2001 led her to a positive result and that conclusion. The Horizon experiment was protected against this type of error by way of randomisation. It was also guarded from other types of error by way of being double blind. It is not clear whether Ennis's experiment was double blind or the order randomised, both of which desirable practices are often absent in laboratory science.

Martin and the team of researchers (including the famous James Randi who offered to pay US$1,000,000 in the event of a positive result) have written a paper on the Horizon experiment which has been turned down by *Nature*, where the controversy began, on the grounds that the subject has moved on to the specialist literature. They are hoping for a better result elsewhere.

Borek Puza

QUEENSLAND

May Meeting

While Professor Charmaine Dean, from the Dept of Statistics and Actuarial Science, Simon Fraser University, Canada was on sabbatical at the University of Queensland she kindly agreed to present some of her recent research to the Queensland branch.

Professor Dean's talk, titled "Autoregressive Spatial Smoothing and Temporal Spline Smoothing for Mapping Rates" detailed the use of generalized additive mixed models for the analysis of geographic and temporal variability of British Columbia infant mortality data.

The objective of the modelling exercise was to identify temporal trends and produce smoothed maps from which spatial patterns of mortality risks can be monitored over time. These models incorporated random spatial effects and fixed and random temporal components. Professor Dean presented details of models incorporating local smoothing across the spatial dimension and B-spline smoothing over the temporal dimension were considered. The model identified regions with consistently high mortality rate estimates which required further investigation.

The talk was an excellent application of statistical modelling and generated much discussion which continued during a meal at a nearby Chinese restaurant.

Ross Darnell

Professor Charmaine Dean (second from right) with locals Petra Kunhert, Melissa Dobbie and Charis Burridge. Melissa was our speaker at the July meeting.

June Meeting

Professor Martin Bland, Professor of Medical Statistics, Department of Public Health Sciences, St George's Hospital Medical School, gave a personal account of his experiences involving the design and analysis of cluster designs.

Professor Bland is well known in the area of medical statistics, as is his book, "An Introduction to Medical Statistics".

Apart from his own involvement with cluster-randomised trials, Professor Bland has had the privilege of reviewing many grant applications and papers in which cluster designs were used, sometimes not recognised as such by the authors. The talk presented sometimes with some levity warned listeners of the seriousness of ignoring the issues associated with clustered observations. Anyone interested in Professor Bland's talk can find his slides at http://www.sghms.ac.uk/depts/phs/staff/jmb/clustalk.htm.

July Meeting

Local member, Dr Melissa Dobbie, working at CSIRO's Mathematical and Information Sciences, in Brisbane gave an excellent presentation titled "Correlated, zero-inflated count data: recent modelling approaches".

Motivated by ecological observations, namely counts of possums in country Victoria and bandicoots in the Northern Territory, Dr Dobbie started her talk with an overview of models for zero-inflated count data. Such data often feature many zeros, more than would be expected from the Poisson or negative-binomial models. Dr Dobbie then discussed mixture models, starting with the Neyman Type-A distribution, using the possum count data as an example.

Dr Dobbie then discussed an extension to these models to take account of possible serial dependence between repeated counts. The approach she chose was a two-component marginal Poisson model. For the bandicoot data, counts taken over seven years at several sites. Explanatory variables included seasonal trends, fire regime, transect position and catchment location. Ignoring correlations between non-zero observations underestimated standard errors. Discussions of possums and bandicoots continued at nearby restaurant.

Slides from Dr Dobbie's talk can be viewed at http://www.maths.qut.edu.au/ssaqld/talks_2003/mdobbi_talk080703.ps

NEW SOUTH WALES

Professor Martin Bland: "Cluster Design: A Personal Account"

The May meeting of the NSW Branch of the SSAI was held in the ABS Offices in Sydney. Professor Martin Bland from St George's Medical School, University of London, delivered his talk on "Cluster Designs: A Personal Account". Martin described his experiences of the increasing awareness of the importance of clustering in study design, using examples in which he has been involved. This covered both cluster-randomised trials and observational studies, and included carrying out his own research and reviewing study proposals and papers. The talk was not technical, but rather included only one formula, right at the end (we were referred to his website for detailed content: www.mbland.sghms.ac.uk). The talk was delivered with good humour, and was enjoyed by all.

Cluster designs are those where research subjects are not sampled independently, but in a group. They can be experimental, such as a trial where all the patients in a general practice are allocated to the same intervention, the general practice forming a cluster. They can be observational, such as a study where several towns are selected and then people are chosen for interview within those towns, the people in the town forming a cluster. In either case, members of a cluster will be more like one another than they are like members of other clusters. People need to take this into account in the analysis, and preferably the design, of the study. Methods which ignore clustering may mislead, because they assume that all subjects are independent observations. This is not the case in a cluster design, because observations within the same cluster are correlated. This may lead to confidence intervals which are too narrow and p-values which are too small.

Clustering is an area in which Martin has always been interested from a practical point of view, particularly in terms of encouraging others to take clustering into account. He feels he is on a "personal odyssey", which reflects the increasing importance which the medical research community attaches to the appropriate treatment of clustering.

Martin began by mentioning a couple of books that he had written. The first was a book about mistakes in design and analysis. In this book he refers to a Derbyshire Smoking Study, a study based in schools, with children in various age groups invited to participate. The analysis had ignored clustering. It simply had not occurred to the analyst, and Martin pointed out that it doesn't occur to very many researchers to consider clustering.

Another book he wrote was an introduction to medical statistics. In this book he talks about the clustering concept, but doesn't use the word cluster. Instead he refers to "unit of allocation" or "unit of analysis". In this way he was considering the clustering concept without having adopted the terminology.

Martin discussed a number of

examples of cases he was involved in where the issue of clustering came up. First he talked about a trial of general practitioner education, which was run to improve treatment of asthma. This trial ignored the clustering with its sample size calculations. The design was treated as a comparison of two groups of patients. Martin revised the trial, producing a sample size based on the number of GPs, not patients. The cluster nature of the trial was self-evident to Martin, but not to others involved.

In another trial, the MPC Project Board put forward a proposal to compare four different interventions in hospital wards, using four wards, one ward per treatment. Proposals ignored clustering in the design. They treated samples as though independent. Then they tried multi-level modelling, with sample sizes based on intra-class correlations. Applicants were actually warned that proposals must not ignore clustering, because, they were told "Professor Bland would not allow it." Martin mentioned that he preferred to be seen as a helpful person rather than in this way.

Another case Martin spoke of was refereeing a case study. Intervention was carried out at the residential home level. The randomisation was clustered, and applied to case staff (not patients). In the analysis, clustering was totally ignored, with patients used as the unit of analysis.

Martin went on to discuss the increase in the general use of clustering among other users, and the increase in publications on cluster design. Publications include how-to-do-it papers, articles in journals, special editions of journals, papers. There has been a big increase in the number of papers in this topic from 1990. He highlighted the fact that there is interest in the UK, but not in the USA or Canada. Allan Donner, an American author of a 1982 paper on clustering, upon coming to Britain was highly surprised to find himself in the same room as a lot of people interested in the topic. When Martin began his career in medical statistics in 1972, the importance of clustering was appreciated only by a few statisticians. In 1990, knowledge spread in the medical research community and generated more interest. But there is a long way to go on dealing with clustering in observational studies.

Martin has been very influential in pushing the increase in awareness of clustering. At the Bupa Foundation (an insurance company) there was a meeting on clinical guidelines, where Martin gave a talk on sample size, which went into clustering in design and analysis. After hearing the talk one attendee proclaimed that her life's work was in ruins now, since the whole time she had not considered what she now understood to be vital. Martin's attitude was that at least now the rest of her life's work won't be in ruins, so he had done a good deed. Furthermore, Martin put out an invitation for others to join him in his noble endeavour. "There is more to do. More papers to write, talks to give, lives to rescue from ignorance and ruin."

The style and humour of the talk was enjoyed throughout by all, and the talk was concluded with rapturous applause and many questions.

Simon McGregor-Macdonald

VICTORIA

We congratulate yet another new Victorian Statistics Professor. News has just come through that Peter Smith has been appointed to a Chair of Mathematics and Art at RMIT University. Great title, Peter! It is due recognition of all that Peter has given to RMIT, statistics and art over many years. Two examples of Peter's art are reproduced (with permission) here.

Challenger (detail)

The polar front, 2002 (detail)

These were displayed at the Science-in-Salamanca exhibition in Hobart last year. See http://www.science-in-salamanca.tas.csiro.au/. The Challenger data (as described in Tufte's 1997 book Visual Explanations) is graphically treated in the painting on the left-hand side.

After a period of dormancy the Victorian Young Statisticians Group is being reactivated. A team of enthusiasts has planned a smorgasbord of activities: parties, job familiarisation sessions, statistical problem discussions, parties, bushwalks, workshops, parties, preparation of brochures advertising the SSAI and Young Statisticians, and parties. If you fit the bill (even more so if you can pay it), please contact Natalie Karavarsamis (Natalie.K@cancervic.org.au), Te-Chieh Hung (tdhung@ms.unimelb.edu.au) or Martin Donadio (m.donadio@abs.gov.au) for further details.

We remind members that they can receive email about Victorian Branch activities by subscribing to SSAVic-L@BusEco.monash.edu.au. This list is self-maintained. If a member's email address changes, he or she should unsubscribe using the old address and resubscribe using the new one. More details are available at http://matilda.vu.edu.au/~ntd/statsvic/index.html. Just click on SSAVic Mailing List on the left-hand side and follow the instructions.

After taking his audience to challenging heights, David Fox recuperates at the Basecamp Nepalese Restaurant after the May meeting. Photo: Brian Phillips

Environmental Statisticians. Missing, Inaction?

Only a few years ago, the Australian environmental statistics landscape was almost a desert. But now there are signs of growth, in some places vigorous. David Fox, currently a Professorial Fellow in the Department of Civil and Environmental Engineering at the University of Melbourne, is a pioneer of this change. His presentation to the May meeting of the Victorian Branch was an impassioned plea for the environment, or at least for members of our profession to consider applying their talents to this field. David has a wealth of experience on which to draw. He has been, for example, Director of the Environmental Projects Office in CSIRO, and has worked on numerous environmental projects, including the Port Phillip Bay Environmental Study, the Gippsland Lakes Water Quality project, Toxicity Studies in Brisbane and the North West Shelf Environmental Study, to name just four in a lengthy list. Such projects are typically expensive, involve multiple agencies and disciplines, and take several years between conception and completion.

David cited several examples demonstrating that environmental problems are characterised by complexity and uncertainty. For example, chlorofluoro-carbons (CFCs) were banned because they cause ozone depletion, but their replacements require more energy to achieve the same effect, giving rise to increased secondary emissions. Statisticians are adept at handling uncertainty, but, as David was at pains to stress, the complexity means that statistical tools must be grounded solidly in environmental science.

David went on to identify four Research Themes in environmetrics to which statisticians could contribute. Theme 1 is quantification of space-time trends. A mining company used an Excel regression line to argue that there was no increase in river arsenic levels downstream from their operation, whereas a smooth non-parametric regression curve through the same data unearthed seasonal fluctuations superimposed on a subtle but persistent increasing trend. Theme 2 is environmental monitoring design. The significant funds generated from the part-sale of Telstra have been spread widely and thinly among community groups leading to the 'vegemite effect', but, with little or no monitoring in place, we have no way of knowing if the dollars spent have made any difference. Theme 3 is monitoring and assessment. Treated effluent from the eastern half of Melbourne is piped into the ocean at Boags Rocks. The effluent plume is at the mercy of winds, tides and currents, thus rendering difficult the placement of fixed sampling locations for

Rob Hyndman at Forecasting Workshop at the University of Adelaide.

monitoring the outfall. Numerical oceanographical models can help the statistician make sensible decisions about sampling design and analysis. Theme 4 is education and outreach. David knows that the spring growth in environmetrics could wither without proper nurturing. The USA has solved this problem by establishing Centres of Excellence: the National Research Centre for Statistics and the Environment at the University of Washington, and the Centre for Integrating Statistical and Environmental Science at the University of Chicago. He believes that a similar centre in Australia would have a major impact on local environmental practice and the profile of the statistical profession.

David finished with some advice on how to tell the Prime Minister the facts! John may have the numbers, but his environmental managers need more: at least two for each environmental decision variable, and tools that describe uncertainty and risk concisely. David's presentation drew numerous questions and comments from the audience. It was a pleasure to listen to a speaker with a stirring message.

Geoff Laslett

SOUTH AUSTRALIA

Forecasting Workshop

On April 14, the South Australian Branch held a very successful one-day workshop on Time Series and Forecasting. The course was held at the University of Adelaide and presented by Rob Hyndman of Monash University. The workshop had 19 attendees from a wide range of organizations including the universities, various government bodies and private companies. Such a good response indicated that time series is a statistical area often neglected in statistical courses and also of the professional development needs of the non-academic arena.

The workshop provided a useful overview of the area of statistical forecasting covering graphical display of time series data, time series decomposition, forecast accuracy, ARIMA models and regression models with ARIMA errors. The software of choice for the workshop was R, which has some very useful graphical developments such as the decomposition graphs and lagged scatterplots.

The statistical analysis of barley quality traits – Tiers for Beers

Patrick Lim of BiometricsSA, The University of Adelaide/ SARDI, addressed the June Branch meeting. Other co-authors acknowledged were Brian Cullis and Alison Smith of NSW Agriculture Wagga Wagga Agricultural Institute and Joe Panozzo of Agriculture Victoria.

Although there have been many advances in the design and analysis of yield data in plant improvement programs in Australia, little progress has been made in routine analysis of quality traits. The measurement of most quality traits involves a complex multi-phase experiment with a field phase and several laboratory phases. Quality trait data is rarely subjected to a proper statistical analysis. Routine selection in most plant improvement programs is based on tabulation of raw means across one or more environments of composite field samples. Generally there is no replication at the field phase and most laboratories only process laboratory checks at a very low frequency. The efficiency of this approach is unknown as there is little knowledge of the relative magnitude of the sources of variation in the field and laboratory. Furthermore, since most quality traits are linked to grain protein, which is linked to yield, it is quite likely that spatial heterogeneity exists in the field phase. The selection for quality is a key component of the selection process and it is therefore crucial that resources be allocated to maximize genetic gain.

The talk considered the analysis of barley malting trait data taken from a subset of the National Barley Molecular Marker Program. Since virtually all field plots were sampled and partially duplicated in the laboratory the opportunity existed to examine the sources of variation for these types of data. A thorough description of the malting process and the experiment design was given in the first part of the talk. In the second part the linear mixed model was developed for a randomization based analysis using the concept of tiers (Brien, 1983) and then how that model was extended to this model accommodating important sources of heterogeneity.

For example, phase one consisted of a series of trials, also known as a multi-environment trial (MET). Smith et al (2001) present an approach for modeling genotype by environment interaction in the analysis of grain yield data from MET's. It was then shown how that approach can be integrated with the randomisation based analysis for quality trait data to account for spatial dependence in both phases of the experiment.

The talk generated many questions prompted by some novel design applications for this highly applied but complex area.

WESTERN AUSTRALIA

An Evening With Young Statisticians

The WA Branch of the SSAI enjoyed a wonderful evening with young statisticians at their May Branch meeting. To begin the evening, Christopher Milne was presented with his Graduate Statistician (GStat)

accreditation certificate, and Ellen Bandarian from the School of Mathematics and Engineering at Edith Cowan University was presented with the 2003 SSAI Honours Scholarship Prize (including student membership to the society), after submitting an outstanding application. Ellen has a strong interest in statistics and mathematics and is currently researching the use of principal components in the analysis of multivariate spatial data, using real data from the Murrin Murrin nickel mine in Western Australia.

In keeping with the young statisticians theme, the two previous winners of the SSAI Honours Scholarship Prize each presented a talk discussing their Honours dissertations.

Christopher Milne (the 2001 winner) from Data Analysis Australia began the meeting with a talk entitled 'Small Sample Bias of Robust M-estimators'. M-estimators encompass a wide class of estimators including maximum likelihood and method of moments, and are primarily used for estimation of location and scale. While having the desirable quality of allowing the user to choose between efficiency and robustness to deviations in the assumed distribution, M-estimators of scale suffer from bias, particularly for small sample sizes.

Chris discussed Huber's Proposal 2 and the 3-Part Redescending estimators in detail and, using the biased sample variance as an example, discussed bias reduction methods that he had investigated. Bootstrapping and jack-knife are valid methods, but add substantially to the already computationally intensive calculation of M-estimators. An analytical calculation of bias, although difficult to work out as the M-estimators are implicitly defined, results in a bias-reduced estimator requiring little extra computation. Chris finished his talk by showing how Huber's Proposal 2 estimator presented superior estimates of location and scale for Cushny and Peebles' (1905) small dataset (n = 10) containing the difference recording the difference in sleep gained between 2 drugs.

Given the severe droughts across Western Australia's wheat belt, Data Analysis Australia's Laura Firth, the 2002 scholarship winner and the evening's second speaker, presented a discussion on a very topical issue – 'Statistical Prediction of Winter Rains in the South-West of Western Australia'. Working with the CSIRO, Laura had investigated the factors that affect rainfall, in order to be able to predict the timing of the winter rains for farmers.

Recent research has demonstrated that Indian Ocean sea-surface temperatures may explain rainfall patterns in WA. This observation leads to a large number of potentially explanatory variables and a method to cope with this had to be found. Laura discussed how she used random forests, a modern classification tool that combines many potentially unstable classification trees, (created by sampling from the dataset with replacement), to provide a more stable predictor of the onset of the wet season. In line with other research results, Laura's results demonstrated that the Indian Ocean sea-surface temperatures do have an effect on the onset of the winter rains, and interestingly, that this effect has changed since the mid-1970s.

After the meeting, a number of branch members went to dinner at a local Italian restaurant for dinner with the two speakers. For a number of young statisticians this was their first social contact with the Statistical Society of WA and wonderful discussions between young and not-so-young statisticians were the flavour of the evening!

Anna Munday

Six Sigma – Panacea, Pandemic or Pancake?

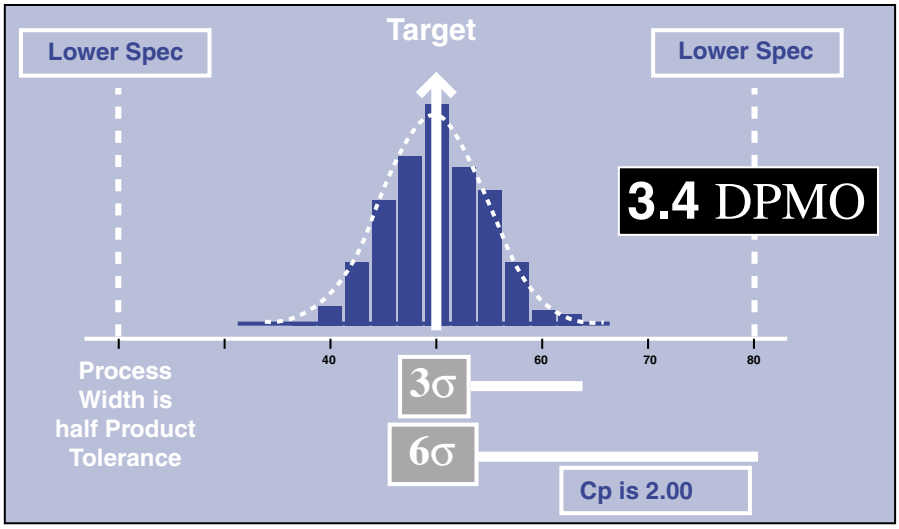
Greg Peterson from Alcoa World Alumina made an equationless presentation entitled 'Six Sigma - Panacea, Pandemic or Pancake?' at the July meeting of the WA branch of the Statistical Society of Australia. Six Sigma is a business improvement strategy which aims to achieve and sustain near perfect quality through customer focus, process management and improvement, and the wise use of facts and data. It was developed at Motorola from their Total Quality Management efforts and is credited with saving Motorola and boosting General Electric. It is used in Australia by Telstra, Qantas, Alcoa, BHP-Billiton and Kodak. However, the methodology is applicable wherever a service or product is supplied to a customer.

The "Six Sigma" name of the strategy is based on a normal process distribution with a width that is half the product tolerance, or in other words, with upper and lower product specifications six sigma from the distribution mean. This is equivalent (after a bit of hand-waving) to 3.4 defects per million opportunities and a 99.9997% yield of acceptable products. While this level of quality may not be necessary for all processes, it is certainly what we might expect for products like commercial air flights.

The underlying assumption of the Six Sigma strategy is that each process outcome is a function of a number of factors. At this point our speaker introduced something that looked like an equation but wasn't

Paint Thickness ≈ f(Paint Viscosity, Spray Angle, Spray Pressure, Standard Operating Procedures, ..., Spray Pattern)

The process can be improved using DMAIC – Define, Measure, Analyse, Improve, Control – and is known as the Six Sigma Roadmap. This methodology



An example of Six Sigma in practice.

employs a wide range of statistical procedures and Six Sigma training courses cover simple techniques including control charts, histograms, distribution curves, Pareto charts, sample size determination and correlation, as well as more complex methods like regression, p-values and hypothesis tests, confidence intervals, analysis of variance, design of experiments, contingency tables, cluster analysis and factor analysis.

Within an organisation a network of Six Sigma experts is trained and established – from yellow belts to green belts and black belts, followed by master black belts and finally Six Sigma champions.

There are opportunities for statisticians to be involved in all aspects of this methodology as trainers, practitioners and consultants. As an example of this our speaker showed us advertising for a black belt course at RMIT which specified that a chartered statistician (RSS) would conduct the course.

Finally our speaker concluded that Six Sigma is neither a pandemic nor a panacea but more likely a pancake – very nutritious, sustaining the body but perhaps needing a special topping of something like the tools of Lean Sigma.

The talk was followed by a lively discussion among the large audience which was drawn from a wide range of age groups and a variety of industries. Topics ranged from the implementation of Six Sigma in large organizations, to the social responsibilities of large companies, to a statement that "Toyota make the best cars in the world". Berwin, the man with no customers, begged to differ!

Jane Speijers

Web site of the month

The website of the Ian Clunies Ross Memorial Foundation is http://www.cluniesross.org.au . The Foundation's mission is "to advance science, its communication and application to best benefit a developing Australia and the challenges of our global environment." Their most high profile activity is the annual presentation of Clunies Ross National Science and Technology medals, which took place this year in March. Statisticans do feature amongst the medal winners: in 1999, Jane Watson of the University of Tasmania received an award for her commitment to "enhancing the statistical literacy which young people will need as active citizens in the modern community". Check out the website for citations of other past medal winners, and instructions for nomination in 2004. Although the closing date is 31 July, there's always next year!

Member News

Ross Maller arrived in Canberra on 18 June to take up his appointment as Professor in Financial Mathematics at ANU. He has a joint appointment between the Mathematical Sciences Institute and the School of Finance and Applied Statistics in the Faculty of Economics and Commerce.

Ross completed his PhD at ANU in 1977 and worked in CSIRO (the then Division of Mathematics and Statistics), rising through the ranks to Principal Research Scientist and Senior Regional Officer of the WA Region. He joined the University of Western Australia in 1988 and became an Associate Professor in the Mathematics and Statistics Department. In 1998 he transferred to the Department of Accounting and Finance, ultimately becoming a Full Professor.

Ross has a very diverse background. He has done much in practical statistics, but he is best known internationally for his work on random walks, particularly concerning the fine structure of their asymptotics. Recently he has been bringing this expertise to bear with good effect in Finance.

Chris Heyde

Australasian Conferences

Australian Young Statisticians Conference

26 – 27 September 2003 — Boulevard on Beaumont Hotel, Newcastle, NSW
Contact: Simon McGregor-Macdonald, smacdonald@market21.com.au

2003 Market Research Society State Conference – 'Market Research – Exploring Frontiers'

20 August 2003 — Burswood Resort, WA
Contact: Carmen@marketresearch. com.au or visit www.mrsa.com.au

Australian Mathematical Sciences Institute Symposium on Statistical Learning

2 – 3 October 2003 — University of New South Wales
Details and registration: www.maths.unsw.edu.au

Australasian Region of the Biometric Society Conference

3 – 5 December 2003 — Australian National University, Canberra
The conference will be in conjuction with the Australian Mathematical Sciences Institute "Summer Symposium in Bioinformatics".

Contact: Simon Barry, simon.barry@brs.gov.au

Summer Symposium in Bioinformatics

4 – 5 December 2003 — Australian National University, Canberra
Details: www.maths.anu.edu.au/events/BioInfoSummer

Workshop on Contaminants and Ecological Risk Assessment

5 – 7 April 2004 — Adelaide
Details: www.clw.csiro.au/conferences/contaminants

Australian Statistical Conference

11 – 16 July 2004 — Cairns, Queensland
Contact: Neville Bartlett, neville@nrbartlett.com.au

International Biometric Conference

11 – 16 July 2004 — Cairns, Queensland
Contact: Kaye Basford, k.e.basford@mailbox.uq.edu.au

Overseas Conferences

The Thirteenth International Conference on Quantitative Methods for the Environmental Sciences and The Twelfth General Meeting of the International Environmetrics Society (TIES)

21 – 24 August, 2003 — Friendship Hotel, Beijing, China
Major Theme: Quantifying how our environment affects us.
Information: http://www.cmis.csiro.au/ties2003/

6th International Conference of The Mathematics Education into the 21st Century Project

19 – 25 September, 2003 — Brno, Czech Republic
"The Decidable and the Undecidable in Mathematics Education!"
Contact: Alan Rogerson, email: arogerson@vsg.edu.au

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