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SSAI newsletter

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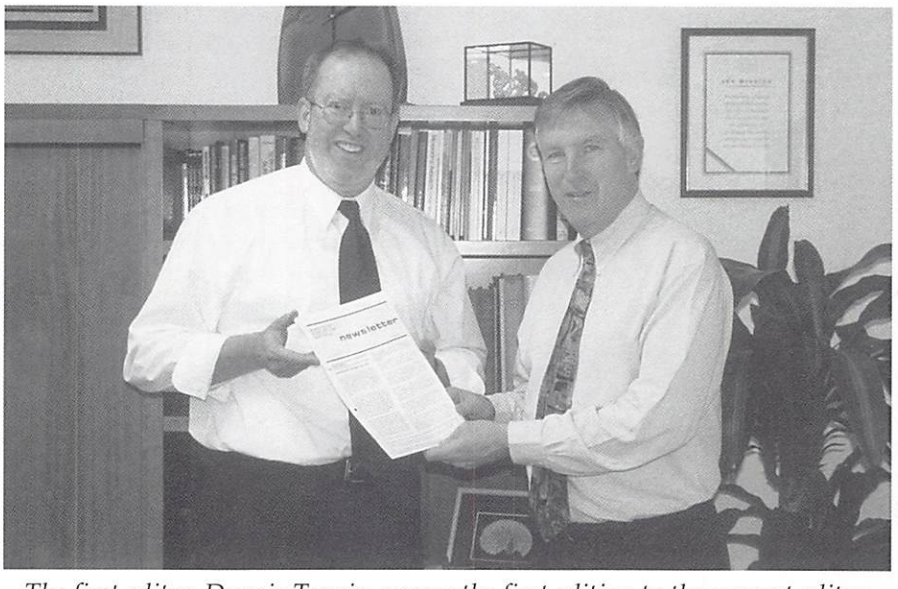
Our 100th Edition!

It is a great pleasure to make this contribution to the 100th edition of the SSAI Newsletter. Richard Tweedie and I were the founding editors.

In preparing this article, I re-read our first issue back in May 1977. The design has been modernised of course, and the volume of material is clearly greater but the overall structure has not changed much.

One of the things that has changed considerably is the method of production – that is clearly much easier now. We were using the very basic word processing facilities at CSIRO offices in Yarralumla. The material we received was usually on hand written manuscript with much of the typing being done by Richard or myself with occasional help from my wife. Everything had to be tagged – new paragraphs, new pages, italics. There were no WYSIWYG facilities so there were frequent prints during the fine tuning stage of the layout. Richard and I spent many nights at Yarralumla - some of them were very frustrating, but Richard's sense of humour and many cups of coffee pulled us through.



The first editor, Dennis Trewin, passes the first edition to the current editor, Eden Brinkley.

Although the Newsletter was originally planned for one year only on an experimental basis to see whether it was filling a need, Richard and I fully expected it would be there for the long term. The initial feedback was positive and we didn't really have a great deal of difficulty obtaining contributions. It is pleasing to see that our belief in its need has proven justified.

Anniversaries are always a good time to contemplate the future. There are several ways that the Newsletter could change, such as its content, frequency and the means of dissemination, particularily given the increasing penetration of the internet.

A Newsletter may not be needed anymore. It could be a dynamic "News and Notes" component of SSAI web site. The Editors no doubt would appreciate some feedback. It seems to me that this is inevitable, using broadcast e-messages when it is important to get a message to all SSAI members. Although there will be set up costs, the ongoing costs will be considerably cheaper and readers will be able to receive more timely information.

Finally, I would like to congratulate all the Editors that succeeded Richard and myself. They have certainly carried on the tradition.

Dennis Trewin

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DEADLINE FOR NEXT ISSUE: 20 October 2002

Editorial

The Editors are proud to bring you the 100th edition of the Newsletter. To celebrate, we have reproduced the entire first issue and we hope you find it interesting to see what has changed (and what has stayed the same!) since May 1977. We would also like to thank previous Editors for their efforts in founding the publication and keeping it lively for the past twenty-five years. Those Editors are: Richard Tweedie, Dennis Trewin, C. Edwards, Bob Forrester, Ian McRae, Ray Barge and Doug Shaw. This issue features photos of a selection of these Editors, namely Dennis, Bob and Doug. Dennis' co-editor, Richard Tweedie, died last year and we are sorry that he will not see this milestone reached.

The current Editors are Eden Brinkley and Alice Richardson. You'll find photos of both of them in this newsletter, and Alice introduces herself at the end of this editorial.

This issue features an article from the first editor, Dennis Trewin. Dennis uses the opportunity of the 100th issue milestone to raise some important ideas about the future of the Newsletter. We expect that for at least a few years to come, the quarterly paper format of the newsletter will continue. A survey of Society members a year ago revealed that a substantial number were not yet willing or able to move to an entirely electronic newsletter. Many members like to have something in their hands, and as the Editor of the NZSA newsletter pointed out recently, the newsletter goes well with a cup of coffee. We see the newsletter and website as playing complementary roles, with the website being the primary vehicle for Central Council reports and other administrative and promotional material.

We would like the newsletter to concentrate more on feature articles, such as the ones by Melissa Dobbie and Ray Lindsay that appear in this issue. If you have done an challenging consultancy recently, been on study leave or to an overseas conference, or completed a interesting project that deserves an airing in a relatively informal way, then why not submit an article and share your experiences.

We also encourage members to submit articles on topics of interest to the statistical profession. For instance, there as been much talk in the news recently of the difficulties professionals are experiencing in obtaining professional indemnity insurance. If any member has researched this topic in relation to statisticians and has information or advice to pass on, we would love to publish it.

We encourage Branches to ensure that a full set of Branch reports, with photos, appears in each issue. These reports have been a feature of newsletters from the beginning, and as the Editors pointed out then, they are an excellent way to make members more aware of the full range of activities of the Society. We also encourage Branches to commit to preparing just one feature article per year. The article could be about an aspect of the history of the Branch, about colourful characters from the past, or about current and future activities of particular departments or agencies which employ Branch members.

Finally, we would like to institute new regular columns in the newsletter. We hope to carry regular communication from the Society's President, including something from the presidential address from ASC16 (notwithstanding Nick's busy schedule!). We would also like to feature websites of interest to statisticians in each issue, so please let us know if you have been somewhere interesting in your virtual travels. Any funny stories or puzzles that you encounter

along the way would also be appreciated.

The Editors also encourage letters from members. Our contact details appear on page 2 of the Newsletter, along with the deadline for copy for the next issue.

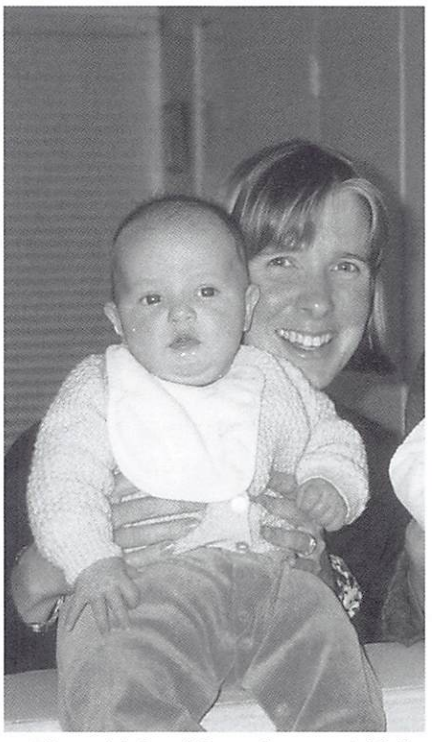
Eden Brinkley and Alice Richardson

Introducing the New Editor

My first contact with statistical societies dates from 1982, when as a schoolgirl in Wellington, New Zealand, I carried out a project for the Wellington Science Fair entitled "Graphs of a Library Survey". I won the New Zealand Statistical Association prize for my efforts, and now that I look back it seems to me that this award really marks the start of my interest in Statistics. After completing an Honours degree in Statistics and Operations Research at Victoria University in Wellington, I moved to Canberra in 1991 to undertake post-graduate study at the ANU. I joined the Statistical Society of Australia in 1992, and I was Canberra Branch correspondent for the Society's Newsletter from 1995 to 1998. I have also served on the Canberra Branch Council since 1996, including a stint as President in 1999 and 2000. I took over as Newsletter Editor when Bob and Doug retired in mid-2001.

I look forward to helping keep Society members informed through the Newsletter, and encourage you to respond to the suggestions in the Editorial.

Alice Richardson



Alice with her "dependent variable"

Lesley Sieper receives Certificate of Appreciation

In recognition of her outstanding support of the Society's central administration, the Accreditation Committee, the Newsletter and Journal over recent years, Lesley was awarded a Certificate of Appreciation at the conference dinner at ASC. Lesley came to the Society from the ABS in 1998 and is the only paid member of SSAI. She handles Society business from an office in the suburbs of Canberra under a generous arrangement with Michael Adena of Covance. The certificate is a tangible measure of the Society's appreciation for her work.

Lesley Sieper receiving her award from Nick Fisher.

Archival Material

Archival material relating to the early history of the Statistical Society of New South Wales was lodged some years ago with the library of the Australian Academy of Science. I have recently added to those archives 127 applications for membership of the Statistical Society of New South Wales, covering the period from the formation of that Society up to October, 1954.

Those with an interest in the history of our Society can view the archives at the Australian Academy of Science library in Canberra. I have extracted from the early membership application forms a list giving name, affiliation and application date; I can send the list as a Word document if you email me at doug.shaw@csiro.au

Doug Shaw

ATTRACTING, TEACHING AND RECRUITING STUDENTS TO CAREERS IN STATISTICS

One of the major issues facing our profession is the declining number of graduates majoring in statistics. Employers of statisticians are certainly feeling the impact – as demand for statisticians increases they're finding it increasingly difficult to recruit statistics graduates.

To help address this problem, Dennis Trewin convened an informal lunchtime meeting to discuss these issues during the recent Australian Statistical Conference in Canberra. Attendees included representatives from government organisations, the private sector, tertiary institutions, the Maths Society and the senior science adviser to Minister Nelson. John Mack, who had worked with maths teachers over a long period, also attended the meeting. The discussion covered a range of issues, with a particular focus on what might be done at school level – both primary and secondary, but particularly secondary – to help redress declining graduate numbers.

Three broad components for a strategy were identified. It's hoped actions in respect of these components will help to reverse the downward trend in graduate numbers:

a. interest students at primary and secondary schools in Statistics, so that they are keen to learn more;

b. with their interest captured by what they have been exposed to at school, endeavour to attract them to major in Statistics at university; and

c. once they have graduated, seek to attract them to postgraduate study in Statistics, or to enter the job market directly.

To stimulate the interest of school children in Statistics, one suggestion was that we don't call what children are learning 'statistics'. The word 'statistics' has all sorts of negative connotations to school children (mostly associated with the word 'boring'). The term 'Data Science' is coming into use in the USA - it may be a better alternative? It was also suggested that Statistics be taught separately from both Mathematics and Probability, and mainly as methods for obtaining, extracting and presenting information from interesting data sets which are

L-R: Tony Pettit, Kerrie Mengersen, William Dunsmuir, John Mack, Dennis Trewin, Nick Fisher and Murray Cameron.

relevant to real life. Formulas should not be part of teaching at schools.

Attendees agreed that if teachers don't know their material well they won't teach it well. Helping to provide high quality teaching materials, and providing good training and continuing development opportunities to help teachers 'get up to speed' and stay current, were important aims. Statistics also occurs in many disciplines - we need to take advantage of this situation. Having Statistics (Data Science) taught by Science or Geography teachers is one possibility. Developing subject-specific case studies tailored to Physics, Chemistry, Geology, Biology, Geography, etc., is another.

The ABS web site already includes a lot of resource materials for teachers and this may be a good starting point for extending/ improving the material that is available to teachers. There has also been good work in other countries which might be a good source of ideas.

Getting school students to consider studying Statistics at university is a particular challenge. Finding ways to target key influencers (i.e. parents, Careers Advisers, etc.) is one option. Preparing comparative salary figures (e.g. starting packages for Honours graduates, expected salaries a couple of years into their careers, etc.) was another suggestion, as was actively enhancing Statistics courses at university to improve a graduate's job prospects (e.g. offering interesting double-major programs linked to Computer Science, Biological Sciences, Medical Science, Economics or Financial Mathematics).

Encouraging students to take up a career in Statistics is the final hurdle. Some of the suggestions highlighted above will help with this aim, but other good ideas were proposed. Several suggestions centred around creating more opportunities for Statistics students to meet recent Statistics graduates to talk about their work experiences. The introduction of more cadetship schemes was another option, as was offering automatic GStat (and a year's SSA membership) on graduation for students undertaking accredited undergraduate Statistics programs.

A number of government and private sector organisations employing statisticians, the Department of Education, Science and Training and professional bodies such as FASTS were identified as possible sources of assistance for progressing the broad strategy. The next steps to move the strategy along will be to identify a small group with the interest and authority to take action, to prepare a plan of action, and to identify a person or persons (suitably resourced) to manage the plan over a one to two year period. A submission will be made to the Minister, to ensure he is aware of the issue and the impact, as well as making constructive suggestions to redress the situation.

In conclusion, congratulations are due to Dennis and Nick Fisher for initiating discussion on this important issue. Updates of progress against the broad strategy will be given in upcoming editions of the Newsletter.

Eden Brinkley

Statistics Education Resources

The Australian Bureau of Statistics (ABS) has an Education Resources theme page on its website. Soo Kong, from the National Educational Services Unit at the ABS, will prepare a short article for the next Newsletter outlining the educational resources available. If you would like to browse the theme page in the meantime, you can access it through www.abs.gov.au and the link "Education". If you have more specific queries about the theme page you can ring Soo directly on 1800 623 273.

Web site of the month

The Barr Smith Library of the University of Adelaide has created a website at www.library.adelaide.edu.au/digitised/fisher/. It has a complete list of R. A. Fisher's publications, and a biography by Yates & Mather. Fisher died in Adelaide in 1962, following an operation for cancer of the colon. He made the University of Adelaide his literary executors. The real executor is Professor J Henry Bennett, now retired Professor of genetics. He has edited reprints of Fisher's statistical books, prepared the complete list of his publications, and published a collection of all his papers.

John Ludbrook

WORK EXPERIENCES IN VANCOUVER, CANADA

By Melissa Dobbie, Environmetrics Group, CSIRO Mathematical and Information Sciences, Queensland.

I've recently returned to Australia after spending one year working in Vancouver, Canada. I had such a rewarding time that I want to share some of my experiences with the wider statistical community, particularly to current and recently graduated PhD students of statistics who may be thinking about doing something similar themselves.

It all started when my husband Dave decided he wanted to follow-up some business opportunities in Vancouver. So I made contact with Professor Jim Zidek, head of the Department of Statistics at the University of British Columbia in Vancouver, to find out about the statistics job scene in Vancouver. Jim and one of his collaborators, Dr Nhu Le of British Columbia Cancer Agency, happened to have some money to fund a postdoctoral position, and seeing as I was about to submit my PhD, it was a matter of very good timing! The department was short on lecturing staff, so I was offered the opportunity to take on some teaching as well, and this is how I came to hold a Teaching Postdoctoral Fellowship in the Department of Statistics at the University of British Columbia, Vancouver.

For the teaching component of the fellowship, I taught two subjects, one in each semester. The first subject was on statistical inference to 12 fourth-year and masters-level statistics students, and for the second, I taught 108 second-year statistics, mathematics and computing students all about introductory probability and its applications. Having had a fairly applied background in working for the federal government in Australia (ABS and CSIRO) and no prior experience in university lecturing, I opted to teach two subjects to try out lecturing and to get experience in different subject matters, class sizes, levels of student motivation, and lecturing styles and approaches.

Overall, my first-time experiences of teaching were enlightening, enjoyable and rewarding, yet challenging and very overwhelming! To clarify the latter experience, I was surprised at how much effort and time were required to prepare lectures, assignments, exams, solutions, homework questions, etc., especially when starting from scratch, not to mention the time required to present the lectures, have office hours, do marking ..... This observation is apparently common amongst many first-time lecturers (which was reassuring to know!) and the other demands placed upon first-time lecturers should take this into consideration. Generally speaking, assistance in the form of tutors, support/mentoring from colleagues, and availability of a course outline or better still, lecture notes from previous years, should ease the burden and free up some time for the overwhelmed lecturer to become involved with other activities of their own and in the department. I was lucky to have the assistance of two tutors for my larger class, the course outlines were provided for both of my courses, and my colleagues (and collaborators) were very supportive.

Balcony view

Bike riding in Maui

For the postdoctoral part of my fellowship, I helped develop and test computational methods for forming spatial predictions of spatial-temporal data. This work was initially motivated by problems in predicting air pollution levels at unmonitored sites in the Greater Vancouver Regional District, with the aim of application to a wider variety of problems. My two collaborators, Jim Zidek and Nhu Le, have a rich wealth of knowledge in the area of spatial-temporal modelling, both in the development of cutting-edge statistical methodology and through its application to environmental data, especially for modelling and predicting air pollution, so I felt like I was in capable hands.

From my understanding, postdoctoral positions may serve a variety of functions,

including writing up PhD papers, exploring new research areas with the view to establishing new research directions and collaborations, widening your network amongst new peers, and providing opportunity to think about future career directions, all of which are essential activities for recently-graduated PhD students. Therefore, obtaining a postdoctoral position (usually, but not necessarily, at a different institution from where you obtained your PhD) is widely advocated and therefore is worth further consideration. However, as you can probably guess, from my earlier comments, my teaching commitments dominated my fellowship at UBC and whilst I appreciated and certainly don't regret the teaching experience, in retrospect, I should have only taught one class or extended my stay to two years with no teaching in the second year of the fellowship in order to heighten my postdoctoral experience. And some would argue that 10 months is not nearly enough time to establish oneself in a new area of research. However, it was still a very rewarding and worthwhile experience and I plan to continue collaborating with Jim and Nhu from Australia.

Apart from this time spent at UBC, Dave and I spent quite a few weekends exploring our own backyard; we recommend the UBC Museum of Anthropology, Granville Island markets and a cycle around Stanley Park as a must for visitors to Vancouver! Most Monday nights we headed up to the local resort (only 40 mins drive away!) for some skiing and snowboarding in superb conditions and for amazing views of Vancouver at night. We also ventured further afield and hit the slopes at Whistler-Blackcomb on a number of occasions; the snow conditions and skiing are really unbelievable. For something different, we also explored parts of British Columbia and Alberta by bike! In particular, we pedalled 500km through the Rockies from Calgary to Jasper (via the famous Icefields Parkway), and also along the length of Vancouver Island (also about 500km). Then, before returning to Australia we spent a week cycling 500km around the island of Maui in Hawaii, including a trip up (!) and down the 3055m high dormant volcano, Haleakala.

In conclusion, my UBC experiences have taught me that lecturing is very rewarding but demanding for first-timers. Even if assistance is provided, it may still be overwhelming and limit your other work activities, which tend to be of a longer-term nature and don't have as frequent and as short-term deadlines, as lecturing does. My postdoctoral experiences were also very worthwhile and allowed me to explore a new area of research and make new acquaintances. Finally, Vancouver itself is a really beautiful city and even though we admit the weather could be slightly drier between October and April (it's true that it does drizzle a lot there!), we found ourselves outdoors more often than not enjoying the multitude of activities and breathtaking scenery on offer. Viva Vancouver!

Cochran-Hansen Prize

Competition for Young Survey Statisticians from Developing and Transition Countries 2001

In celebration of its 25th anniversary, the IASS established the Cochran- Hansen Prize to be awarded to the best paper on survey research methods submitted by a young statistician from a Developing or Transition Country.

Participation in the competition for the Cochran-Hansen Prize is open to nationals of Developing or Transition Countries who are living in such countries and who were born in 1963 or later.

Papers submitted must be unpublished original works. They may include materials from the participant's university thesis. They should be in either English or French. The papers should be submitted to the IASS Secretariat at the address below, to arrive by 31 December 2002. Each submission should be accompanied by a cover letter that gives the participant's year of birth, nationality, and country of residence.

The author of the winning paper will receive the Cochran-Hansen Prize in the form of books and journal subscriptions to the value of about 500 EUROS and will be invited to present the paper at the Berlin Session of the ISI, August 13 – 20 2003, with all expenses paid (i.e., round trip airfare between place of residence and Berlin and a lump sum to cover living expenses).

For further information, please write to: Madame Claude OLIVIER, IASS Secretariat, CEFIL-INSEE, 3 rue de la Cité, 33500 Libourne, France

E-mail: Claude.olivier@insee.fr

FUNDING FORMULA FOR NON GOVERNMENT SCHOOLS

The Commonwealth Government currently funds some non-government schools according to a formula that relies on the socioeconomic score (SES) for the Census Collection District (CD) where students reside[1]. This note discusses a major question of potential bias in this methodology.

Specifically, for each student attending a non-government school that participates in the scheme (it should be noted that the Catholic education system opted out of the SES funding formula), the student's residential address is geocoded to a CD and the SES score for that CD is assigned to that student, $SES_{CD\ student}$. Then the SES score for the school, SES_{school} is derived as:

$$SES_{school} = \sum_{students} SES_{CD\ students} / n_{students}$$

The SES score for a CD is a custom score, but is derived in a similar fashion to other ABS socioeconomic indexes, in that it is based on a linear combination of the responses of households in a CD to census questions.

In the following I take it as axiomatic that an unbiased SES formula would be one which averaged the SES scores of the *families whose children attend a school:*

$$SES_{school^{unbiased}} = \sum_{students} SES_{students\ families} / n_{students}$$

To see the potential problem, consider a group of CDs, all with the same SES score which have two non-government schools A and B each drawing all of their students from those CDs [but not necessarily all students in those CDs attending either school]. Schools A and B would be given the same SES score by the funding formula.

Suppose that school A has low fees and so families whose dependent children attend that school do not need to be wealthy. It is plausible that the SES scores of the families involved may be close to that of the whole CD.

Suppose that school B charges relatively high fees, and so only parents from the more affluent families in the CD can afford to send their children to that school. Then the average SES score of such families is necessarily higher than the SES score for the whole CD, because the lowest SES scores are likely to be excluded. The larger the fee, the larger is this disparity likely to be.

As both schools are given the same SES score, they get the same government subsidy. Putting these observations together implies that the current funding formula is potentially biased, with the potential for bias to increase with the fees charged by the school. Of course the potential bias also depends on the diversity of the geographic catchment area of the school.

To assign a CD score to an individual is an example of the ecological fallacy[2]. If the process of selection from all families to those with students attending non-government schools were random this would not matter as the positive errors would likely balance the negative. [So the SES methodology could be quite good for measuring the socio-economic status of the community of a non-selective (government or non-government school), or any other purpose involving random subsets of the population].

In the case of non-government schools the selection process is likely to depend on a range of socioeconomic factors, but is very unlikely to be random, especially for schools that charge higher fees. Consider an extension of the two school model above. Suppose that the average SES score of the CDs is 100, with a standard deviation of 20. Suppose the school fees are measured in units of the SES score and suppose further that general household expenses consume part of a household's score. If the household expenses consume, say, 80 of the SES score and school fees are, say, 20 for school B, then households with a score of 80 would have great difficulty sending a child to that school, whereas for a household with a score of 100 or more affordability is less of an issue. But if school A charged fees of, say, 2, then the affordability issue is reduced for all families.

Alternative measures

A measure of socioeconomic status which could eliminate most bias would be one which collects assets and income at the level of detail required to receive Centrelink benefits[3]. If this were not feasible then an alternative would be to modify the formula by incorporating the probability of a family sending their children to a particular non government school:

$$SES_{school_k^{probability}} = \frac{\sum_{students} \Pr(student_i\ in\ CD_j\ attends\ school_k)\, SES_{CD\ students_{ijk}}}{\sum_{students} \Pr(student_i\ in\ CD_j\ attends\ school_k)}$$

Those probabilities are not available from census data at the school level, but a simpler measure is available at the all non-government school level. The Basic Community Profiles (BCP) for the 2001 census are freely available on the ABS web site down to statistical local area level[4] and from those it is possible to calculate the proportion of secondary (or pre secondary) students attending non-government schools. The following table is derived from the BCP for Australia, the ACT and a (non random) sample of Canberra suburbs, which include suburbs from the highest and lowest taxable income postcodes (ATO data for 1998-99). As the Catholic education system is

	All students: **other** non government/all secondary (numerator excludes students in the Catholic system)	Persons whose income > $78000 pa
Australia	15.9%	6.9%
ACT	13.5%	7.0%
Red Hill	62.2%	15.3%
Hughes	24.2%	9.5%
Narrabundah	11.0%	8.5%
Melba	10.4%	6.1%
Spence	8.6%	4.7%
Bonython	6.9%	5.8%
Charnwood	4.6%	2.2%

This table suggests a proxy for Pr(*student*$_i$ *in CD*$_j$ *attends school*$_k$):

$$SES_{school} = \sum_{students} (\text{Proportion non government students}_{CD})^{\alpha} SES_{CD\ students} / n_{students}$$

not covered by the SES funding formula, the second column corresponds only to those students covered.

where Proportion non government students$_{CD}$ is the number in the second column in the table and α is a parameter to be estimated, and possibly dependent on school. The current formula has α=0 and a uniform value of α=1 would be readily understandable. This modification may still not differentially treat different schools according to their fees, and would still give the same funding to the two schools A and B in the example above.

Other issues

According to its web site, in September 2003 the ABS will release the standard socioeconomic indexes for areas, derived from the August 2001 Census. Hence the SES score will generally be between 2 and 7 years out of date.

The SES scores are linear combinations of census responses, converted to zero-one variables. Hence the SES score of a household is a less informative measure than household affluence or wealth, however measured. Also as the highest income range collected in the Census is $1,500 per week ($78,000 per annum), and some schools charge fees of more than $10,000 per annum, the families that are just over that threshold are less likely to be able to afford the fees than those who are considerably over.

Conclusions

The SES formula on which funding for non-government schools is based is potentially biased, with the potential bias increasing with school fees. An unbiased result would result from a detailed collection of household assets and income, but at increased cost of administration. Within the paradigm of the existing formula, a suggested modification has been made which would reduce, but not eliminate the potential bias.

Disclaimers

1) While I have discussed the issues above with some other members of the SSAI, the views expressed are mine alone, and in particular are not those of my employer.

2) I have no personal interest in the funding of non-government schools, other than as a taxpayer.

Ray Lindsay AStat
ray.lindsay@netspeed.com.au

1. See
   http://schoolgrg.detya.gov.au/Help/SESInfo/SESInfo.asp
   http://www.dest.gov.au/schools/ses/index.htm
2. See for example http://www.xrefer.com/entry/609113
3. The maximum per student school subsidy is of the order of 52% of the maximum age pension, for example.
4. www.abs.gov.au -> Census -> Community Profiles and snapshots -> Basic Community Profiles

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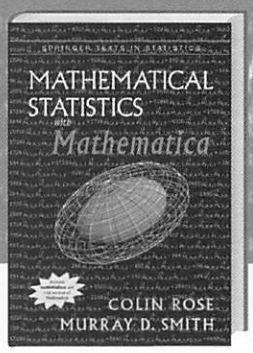
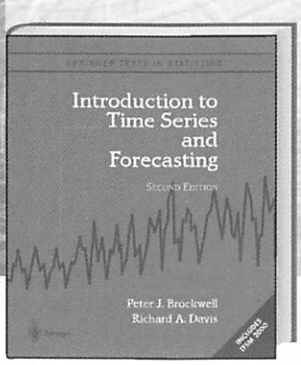
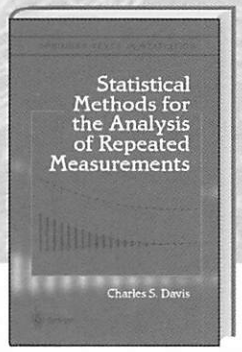
Springer for Statistics







C. Rose, M. Smith

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2002. XXIV, 415 pp. 20 figs.
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€ 84,95; £ 59,50; sFr 141,–
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Ian James awarded SSAI Honorary Life Membership

Professor Ian James has made outstanding contributions to the scientific community through his statistical research and consulting; to academia through his teaching, administration, research supervision and leadership; and to the statistical profession, particularly through his various roles in the SSAI.

Ian obtained a BSc with First Class honours in Statistics in 1969, and was awarded a PhD in 1973, after studying under Professor John Darroch at Flinders University in South Australia. He has held various positions at Flinders University, CSIRO, University of Western Australia, and Murdoch University, and is currently Professor and Head, Mathematics and Statistics, at Murdoch University.

Ian James is the complete academic. He has made, and continues to make, outstanding contributions to research, research leadership, teaching, and to university administration. His research interests have ranged from meteorology to fetal growth, and have been captured in some 60 publications in scholarly journals. Of particular note are his contributions to the theory and practice of medical statistics, extending over more than two decades. For example, Mark Segal comments:

> ... Indeed, the Buckley-James regression approach (Biometrika, 1979), for which Ian was largely responsible, was highly influential in the subsequent development of rank regression methods for censored data ... Ian's involvement with survival analysis naturally led to a number of biostatistical collaborations and applications. In particular, a lasting investment in immunology in general, and HIV disease specifically, resulted in not just a number of significant papers but also the formation of the Centre for Clinical Immunology and Biomedical Statistics (CCIBS) at Murdoch University. Ian had a foundational role in the establishment of this productive enterprise and continues as one of the Directors.

Tim Brown and Doug Shaw chat with Ian James (HLM recipient) and Michael Adena (Service Award recipient).

In relation to his activities with the CCIBS, Dr Simon Mallal (its Executive Director) writes:

> Prof. James has made a major practical contribution to the area of HIV Medicine since he first fostered collaboration with clinicians in 1990. His work on AIDS incubation periods, opportunistic infections, immune restoration disease, viral-host genetic interactions and the long term complications of anti-retroviral therapy have had major international impact and have provided practical benefits for patients. Work in this area has also motivated novel statistical methods that are have found broad applications. He is Director of the Centre for Clinical Immunology and Biomedical Statistics which was established in early 2000. The Centre provides excellent post-graduate training and has attracted National Health and Medical Research Council and industry support and published over 30 manuscripts, reviews and book chapters in the last year.

As a research leader, Ian has supervised some 24 Honours and Graduate theses, including 9 PhD theses.

Member Briefs

The Pitman Medal for 2001 was awarded to Professor Terry Speed. A citation will be published in the Australian and New Zealand Journal of Statistics.

Congratulations to SSAI Member Alan H. Welsh, Professor of Statistics, University of Southampton, who has recently been named Fellow of the American Statistical Association.

Ian has taught courses in probability, statistics, biostatistics and mathematics at all levels from introductory to postgraduate, at Flinders University, La Trobe University, University of Western Australia, Murdoch University, University of Washington and University of Aarhus. As far as contributions to university administration are concerned, he has been head of the Mathematics and Statistics group at Murdoch since 1990, and has served on a wide range of Committees at UWA and then later at Murdoch.

Ian has also been a very active contributor to the profession, and to the Society, for many years. Contributions in the former category include stints on the ARC Mathematical, Physical and Chemical Sciences Panel; the ANU School of Mathematical Sciences National Program Committee; and the International Council of the Biometric Society, as well as being an ongoing reviewer for about 12 international journals and research granting bodies. However, it is his contributions to the SSAI at both Branch and national levels that have been particularly outstanding.

At Branch level, he has, in fact, had executive roles on three different Branch Councils, having been Vice President of the South Australian Branch in 1974, Executive Council member of the Victorian Branch in 1977, and Executive Committee member (1979, 1983-84, 1997), Secretary (1980-81), Vice-President (1986), and President and Central Council Delegate (1987-88) for the West Australian Branch.

At the national level, he was Program Chair for the Australian Statistical Conference in Perth, 1992, Vice-President and President of SSAI during 1997-2001, Associate Editor of *The Australian Journal of Statistics* during1989-91 and Editor of *The Australian Journal of Statistics* during 1991-97.

Two specific contributions during his time as Editor of *ANZJS* deserve special mention. During this period, he arranged for the journal to be assessed for inclusion in the Science Citation Index, a process that took several years. He also had major involvement in the early negotiations with Blackwell (and others) concerning professional publication of the journal. Blackwell had discussions with several SSAI and NZSA officers at various stages, with the decision to merge the journal with NZSA being made in 1996 and the decision to go with Blackwell in 1997. This has proved to have been a very successful move.

Amongst the many activities that he fostered as President of the SSAI, one of the most important was the professional design and implementation of a Web site for the Society, housed in Canberra close to the SSAI Office. Not only did he guide this process through Central Council, but he was intimately involved in the specification, implementation and successful launch of the site in 2000, and has been (and remains) its founding Webmaster.

In summary, Ian James has been a unique contributor to the furthering of Statistics in Australia, in terms of the quality and breadth of his academic work and the extensive contributions he has made to the profession, particularly through his work for the Statistical Society of Australia.

Michael Adena receives SSAI Service Award

Dr Michael Adena has made an outstanding contribution to the Society over many years at both the Branch Council and Central Council levels. His many and varied contributions include representation on Canberra Branch Council (1994 to 1998) and Central Council, President of the Canberra Branch (1995 and 1996), the role of Circulation Manager (1995 to present), a founding member of the Accreditation Committee (1997 to 2000), and Chair of the Organising Committee of ASC16 held in Canberra in 2002.

Of particular note, Michael was instrumental in helping to establish and maintain the centralized membership database and has remained active in helping to organize the distribution and collection of membership renewals and keeping the membership database up-to-date. Michael was also active on the Accreditation Committee in assessing applications in the fields of medical and survey statistics during this time.

Michael has provided an excellent home for the Society's office for many years via a sub-lease on his business premises. Not only is this office space ideally suited to our needs, but Michael has provided a warm, friendly and supportive environment for our Administrative Officer Lesley Sieper.

Alan Branford receives SSAI Service Award

Dr Alan Branford performed the role of Secretary to the South Australian Branch from 1988 to 1996, bringing a new level of professionalism and dedication to the running of the Branch. In addition to the superb organizational efficiencies he instituted, he was a stalwart in organizing and attending branch meetings and in looking after speakers. During his time as Secretary Alan was also a delegate to Central Council where he proved to be an active contributor.

Of special note, Alan undertook substantial work to establish Society's first website, and he maintained the website very efficiently for many years. This was at a time when websites were relatively new and knowledge surrounding their creation and maintenance scarce.

In memoriam: Professor H.O. Lancaster

On March 26, 2002 in the Old Geology Theatre at the University of Sydney, Professor Eugene Seneta addressed the NSW Branch on the topic, *In memoriam: Professor H.O. Lancaster*. The audience of 44 included Paul, Jon and Rick Lancaster, many of the current Statistics staff at the University of Sydney, and two of Oliver's lifelong colleagues: Max Kelly and Tim Wall, professors of Pure Mathematics at the University of Sydney in the 60s and beyond.

It is clear that in many ways Lancaster cast a long shadow. Staff from the 60s include John Robinson, now professor and the current head of school, and Geoff Eagleson, also now professor, at the Australian Graduate School of Management at the UNSW. Harry Mulhall is no longer with us, but Mary (Pusey) Phipps was a tutor back then. She and Harry inspired generations of students into the profession. Those students include many significant people in Australian and world statistics. Some that we remember or know of are Murray Cameron, John Eccleston, Robert Bartels, Howard D'Abrera, Richard Madden, Bob Griffiths, Geoff, John and Graham Pollard, Nick Fisher, Sue Wilson, Ron Sandland, Chris Heyde and ourselves.

One technical point from Eugene's talk was that Lancaster's contribution to goodness of fit was glossed over, being less important than several of his other contributions. However we see his work as having a substantial influence, especially in modern smooth and data-driven testing. The tools and vision Lancaster gave us as students have enabled us to contribute to this development. We're certain many others would say the same.

Had Oliver been a more charismatic communicator, he would have been one of the legends of our profession. Instead he will be remembered as a complex man who made significant contributions to the statistical literature, to the statistical profession, and through the people he gathered around him and the vision and example he gave them, to the statistical education of many Australians.

John Rayner and John Best

EJG Pitman Prize

Congratulations to Dr Peter Dunn of University of Southern Queensland on being awarded the EJG Pitman prize of $500 for his talk at the recent Australian Statistical Conference in Canberra. Dr Dunn's talk was entitled "Generalised linear models for continuous data with exact zeros" and impressed all of the judges.

The EJG Pitman prize is aimed at encouraging young statisticians and commemorates the life of Professor Edwin JG Pitman who became a famous Australian statistician during his lifetime. Candidates for the prize must be (i) a person enrolled for a degree who is studying either full-time or part-time without age limit, or (ii) a person who graduated with a Bachelor's degree within the past five years, or (iii) a person awarded a postgraduate degree within the past year. In awarding the prize, the prize committee considered motivation and setting of the general context of the talk, organization and structure of the talk, originality of the substance of the talk and presentation of the material and rapport with the audience.

The committee considered fifteen candidates and we were pleased to have so many contenders who gave some excellent presentations. Thanks go to the award committee that comprised Caro Babcock, John Best, Borek Puza, Tony Swain, Berwin Turlach and Neville Bartlett (chair).

Neville Bartlett

Professor C.R. Rao Receives National Medal of Science

Professor Emeritus of Statistics and Director of the Center for Multivariate Analysis at Pennsylvania State University, C. R. Rao was honoured at the White House with the National Medal of Science on May 29, 2002.

Rao has spent his entire career promoting statistics and their usefulness in society. "If there is a problem to be solved, seek statistical advice instead of appointing a committee of experts. Statistics can throw more light than the collective wisdom of the articulate few," said Rao.

The National Medal of Science honors individuals for pioneering scientific research that has enhanced our basic understanding of life and the world around us.

Professor Rao was a visiting Professorial Fellow of the Institute for Mathematical Modelling and Computational Systems at the University of Wollongong from mid December to mid February.

Accreditation - where are we up to?

Accreditation has been with us since the beginning of 1998, so we are approaching the end of our first five years. This is a good time to review progress and talk about plans for the future.

Why accreditation?

The main purpose in any profession is to identify a group of practitioners who are judged by their peers to offer the required standard of expertise. This is only of value if the "customers" know such a list exists. Hence the chicken and egg analogy - we need a list of competent statisticians to offer to the community, and joining the list is only of value if the community knows about the list.

We now have about 150 Accredited Statisticians, most listed on our webpage. The impending marketing campaign will promote the value of accreditation and will offer that list. We will also supply Accredited Statisticians with material they can use in talking to potential clients about the importance of using Accredited Statisticians.

The process

Application forms for accreditation at the A.Stat. or G.Stat level are available from the webpage http://www.statsoc.org.au/professional.html . Since you need to be a member in order to have accreditation, application forms for membership of each Branch are also to be found there. Applications for A.Stat. and G.Stat. are assessed by a committee of seven via a regular monthly teleconference. As well as two referee reports, two members of the Committee review the reports and papers that are sent in with the application.

The requirements

The Rules & Regulations state:

> "The practical experience component of the requirements shall be judged by the Accreditation Committee as follows. The candidate must have taken responsibility for the statistical content of their work for at least three years of the qualification period. The Accreditation Committee will consider any practical experience which the candidate believes to be relevant. The candidate needs to demonstrate an appropriate level of competence in the application of statistical methods."

Accreditation thus has a practical focus. Applicants need to be involved in statistical work with clients. While research papers in statistical journals may establish competence as a statistician, they do not necessarily imply that the person has "practical experience". If however they describe a practical problem and demonstrate competence through the design or analysis of data, then they are of value to the Committee.

About 10% of applicants are unsuccessful, for a variety of reasons. The major reasons are (i) lack of experience, (ii) inability to provide reports/papers either because they were never written or because of confidentiality limitations and, rarely, (iii) lack of competence. This last category occurs when inappropriate methods are used, at the design or analysis stage, or where clients are not warned of the dangers, e.g., of analysing non-random surveys as if they were properly randomised. In the case of confidential reports, applicants can exclude up to two members of the committee from seeing the materials, and those who do see the materials sign a confidentiality agreement.

Numbers and time taken

We aim to process applications within two months - a first meeting to decide who will review the materials, and then a month later to make a decision. Delays occur when we need to ask for additional reports (for example, if people supply only pure research papers, we request something more practical). The following

A.Stat.	Applied	Accepted	Rejected/Withdrawn	MeanDays	Outstanding
1998	98	80	18	134	0
1999	35	30	5	105	0
2000	10	9	1	76	0
2001	9	6	1	99	2
2002	9	3	0	74	6
Total	**161**	**128**	**25**		**8**
G.Stat.					
1998	17	15	2	101	0
1999	7	7	0	36	0
2000	5	4	1	98	0
2001	12	10	2	53	0
2002	2	1	0	71	1
Total	**43**	**37**	**5**		**1**

table show the numbers and the mean days it takes from application to accreditation for successful applicants. After the heavy workload of the first year, we have reduced the mean time down to a point where it is about 2 months.

Reaccreditation

The first A.Stats., awarded early in 1998, are due for renewal by the end of December 2003. In order to spread the load, those accredited up to June 1998 will be sent forms with their subscription renewals in November 2002, to get them through the system by June 2003. Those who were accredited in the second half of 1998 will receive forms in June 2003, to get them through by December 2003. No points system will be used at this stage, but the data collected will inform later discussions on the topic. The form for re-accreditation will be on the website shortly. It focusses on professional development activities, and there will be no reviewing of reports/papers, since that aspect was covered in the original accreditation process.

Future plans

Three areas are under consideration. Firstly, given the reducing opportunities for students to obtain Honours degrees in Statistics, and given that one avenue to accreditation is a Pass degree in Statistics plus 6 years of experience, the Committee is proposing to Central Council that G.Stat. be open to Pass graduates with a major in Statistics.

Second, as a direct result of this, there will be a strong need for the Society to nurture our G.Stats. and help them achieve A.Stat. requirements through mentoring and professional development. The Society will need to publicise the existence of various courses, e.g. Grad.Diplomas or part-time Honours degrees that will assist in their professional development, and will also need to run professional development workshops and courses for the benefit of all members of the statistical community. Central Council is establishing a new committee for Continuous Professional Development(CPD) to do this.

The third area is the accreditation of courses. The Accreditation Committee examined 37 successful GStat applications and found they came from 22 different Universities. Clearly, a blanket evaluation of all possible courses is untenable. However, the Committee will consider approaches from Universities which supply details of particular programs, and the Committee will provide a determination as to whether students from such a program would qualify for a G.Stat. This can then be used in the marketing of courses and in setting standards for minimum requirements for a Major in Statistics.

Richard Jarrett, Chair, Accreditation Committee

Meet some recently accredited SSAI members

Bernard A Ellem

I have consulted in biometrics in CSIRO and taught statistics in the university sector. My doctoral research was on "Curvature Measures for Generalized Linear Models". I am currently a Senior Lecturer with the School of Mathematics, Statistics and Computer Science at the University of New England.

Michael Jones

I have been involved in epidemiology and clinical research since 1984 including periods as a biostatistician at a teaching hospital and teaching statistics to Psychology majors. I am currently in private statistical consulting in academic specialist medical topics and government rural health policy research as well as commercial projects mostly in pharmaceutical and health economic topics.

Peter Howley

I am a lecturer in Statistics at the University of Newcastle, completing (2002) PhD research into Bayesian techniques for analysing and reporting clinical indicator data. I have been statistician with the Health Services Research Group from 1995 – 98; projects included the "Quality in Australian Health Care Study" (assessing error levels and identifying areas for improvement) and "Cancer Action in Rural Towns" (determining the impact of anti-smoking campaigns on communities). My broader interests lie with research and application of statistics in the fields of finance, management and quality improvement activity in industry, business, health care and education.

Ross Taplin

After working briefly as a statistical consultant and completing a PhD in Statistics at the University of Washington I have held an academic position at Murdoch University since 1992. I collaborate with colleagues, mainly in commerce, environmental science and bio-informatics and have an interest in teaching statistical consulting to undergraduates.

Kim Colyvas

After 30 years in industry as an analytical chemist and process improvement specialist my main interest is in statistical consulting in the areas of data analysis, applying statistical methods in industry and research, process improvement and statistical education. I am currently conjoint Lecturer in Statistics at the University of Newcastle.

16th Australian Statistical Conference, Canberra 2002

"Statistics is the science of managing uncertainty" Nick Fisher

Another Australian statistical conference came and went, and as a member of the organising committee, I can tell you that in organising a conference in Canberra in the middle of winter there were plenty of uncertainties to manage. Fortunately, everything went all right and we did not have any major hiccups. Even the weather behaved, being cold but with plenty of sunshine.

Around 300 registrants turned up at the National Conventions Centre to attend the ASC 2002. The opening address was presented by Peter Donnelly from the University of Oxford. During the first day of the conference we had sessions on surveys and related themes, non-parametric statistics, statistical modelling, statistical consulting, statistical education, modern probability and inference and biostatistics, to give us a little bit of flavour of what was coming. In the evening we had the welcome reception where we enjoyed drinks and nibbles and proved statisticians' social skills by meeting and networking with colleagues.

On Tuesday, nice and early again, John Eltinge from the US Bureau of Labor Statistics presented the Foreman Lecture. The first sessions on government statistics and environmental statistics also started. This was a short conference day, so at lunchtime we picked our packed lunches and some went on adventurous tours around Canberra and others, like me, went back to work at the office :(

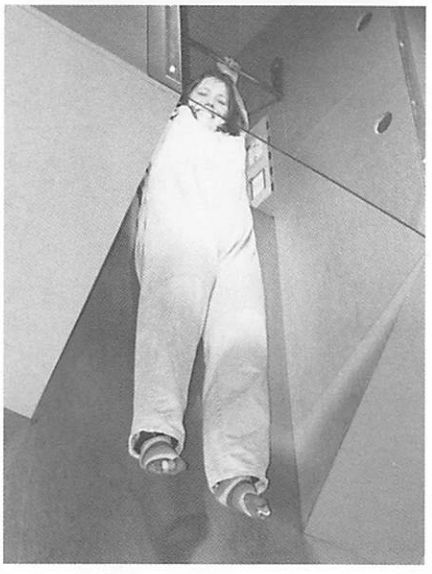
On Wednesday, first thing in the morning, Nick Fisher presented the presidential address and awards. Terry Speed was presented with the Pitman Medal, Ian James was awarded an Honorary Life Membership and Michael Adena and Alan Branford were awarded Service awards.

The conference dinner was held at Questacon, which is a science museum with interactive exhibitions. Here we started with drinks and entrees at the top gallery, where some very fit statisticians tested their athletic skills against Australian elite athletes. An award was presented to Lesley Sieper in recognition to her services to the society. Then we started moving down the galleries experiencing natural events like cyclones and earthquakes while savouring delicious food and drinks. Some very brave statisticians ... or more fortified than usual ... risked themselves by trying the free fall slide. At the ground level desserts and coffee were waiting to finish a very entertaining evening.

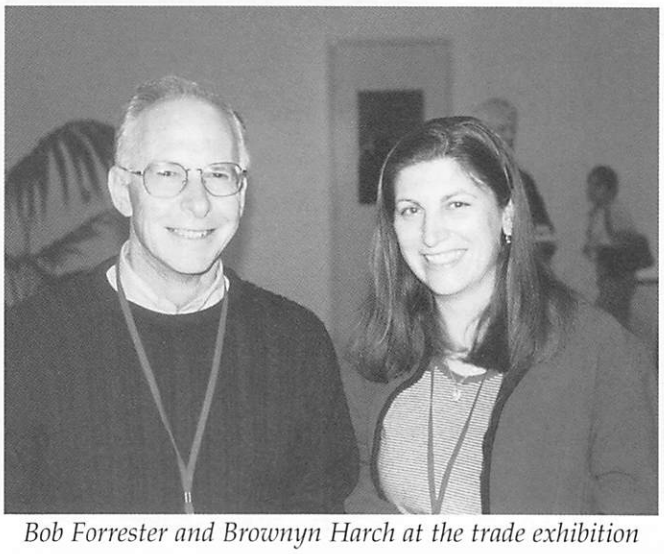
On Thursday, the last day of the conference, Jim Ramsay from McGill University presented the closing address. The Pitman Prize for the best talk by a Young Statistician, was awarded to Peter Dunn from the University of Southern Queensland for his talk Generalised linear models for continuous data with exact zeros.

Finally we got an introduction to what is to come in the next Australian Statistical Conference. So, get your sunnies and swimmers ready and I will see you all in Cairns 2004.

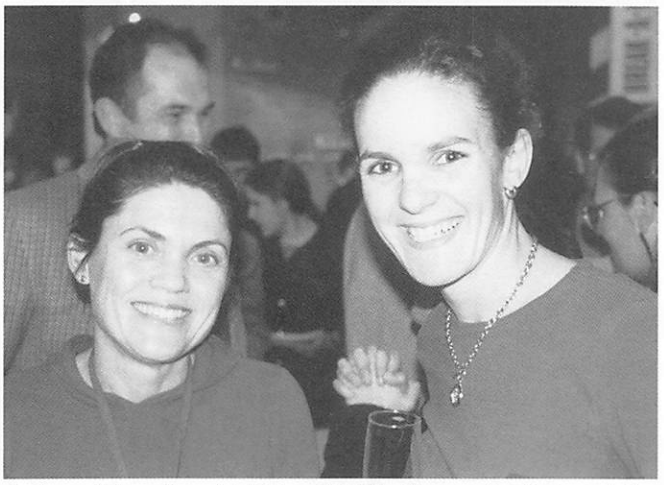
Veronica Rodriguez



Jo Lea "hanging out at the conference dinner"



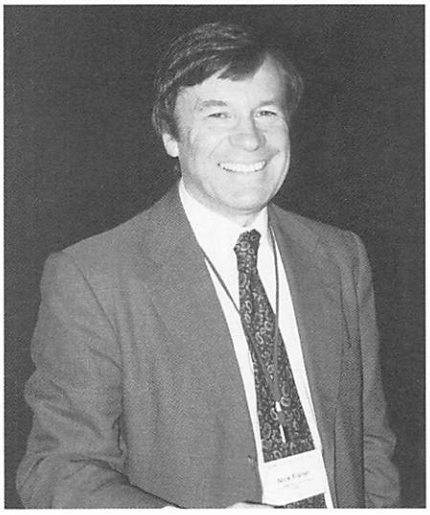
Bob Forrester and Brownyn Harch at the trade exhibition



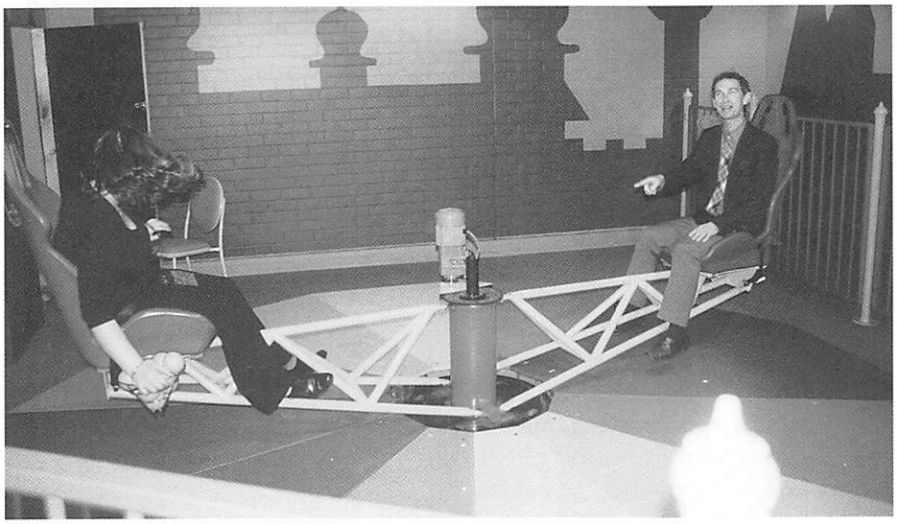
Robyn Attewell and Melissa Dobbie line up for their entrées at Questacon

Joe Gani and Niels Becker enjoy luch at the Trade Exhibition.

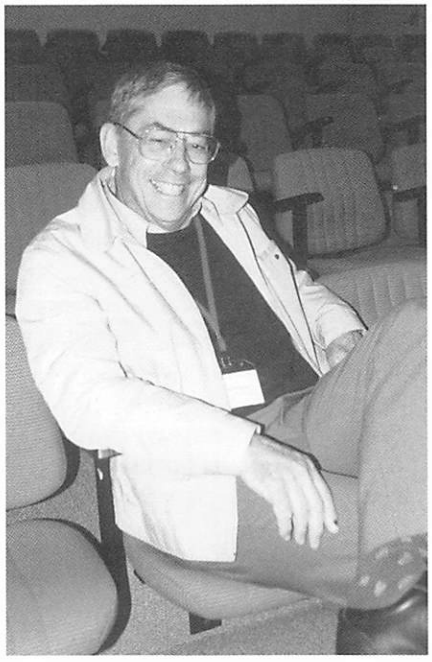
Anna Poskitt relaxing in Sideshow Alley



Nick Fisher gears up for his address

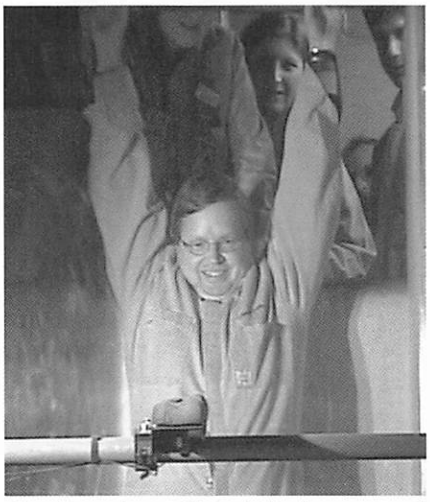


"Go carefully now!" Geoff Lee has an eye on the basket of balls in Jo Lea's hand



Des Nicholls "first to arrive" for Nick's address

Patrick Cilione, Helen Johnson and Brownyn Whiting queue for dinner at Questacon



Ian Saunders taking full advantage of Questacon's facilities

VICTORIA

Victorian Branch news

Several members of the Victorian Branch attended the recent ICOTS (International Conference on Teaching Statistics) meeting in Cape Town, South Africa. Brian Phillips, a well-known local identity from Swinburne University of Technology, was a principal organiser of the meeting. The Branch made a financial contribution to the conference, which was acknowledged (with other sponsors in a lengthy list) by the organisers in their presentation at the Conference Dinner. Some branch members spent an evening enjoying the hospitality of Professor Stephan Maritz, an honorary life member of the Statistical Society of Australia and a former Editor of the Australian Journal of Statistics. Stephan, now retired permanently in Cape Town, scarcely seems to have changed. He is in good health, plays squash regularly, works at the Medical Research Council three mornings per week and retains his characteristic charm and good humour.

Statistics of menstrual cycles in the menopausal transition

At the May meeting of the Victorian Branch, John Taffe of Swinburne University of Technology presented a talk, neatly subtitled "How to predict the Menopause", on the statistics of menstrual cycles. John opened by recalling the definition of menopause as the cessation of menstruation due to ovarian failure, and pointed out that it is a relatively "recent" phenomenon. Women in ancient times had much shorter life spans and experienced frequent periods of "lactational amenorrhea" while breastfeeding their offspring.

In very careful language, the World Health Organisation has defined the menopausal transition as "that period of time before the final menstrual period (FMP) when variability in the menstrual cycle is usually increased". The time preceding this transition is usually described as a period of "regular" cycling, but John revealed that there is no agreed definition of "regular", and no agreement about how to define the beginning of the transition. John posed a raft of questions: How long does the transition last? What are typical menstrual cycle patterns during the transition? Can we predict the FMP using only cycle length information? Can we predict it using hormone AND cycle length information?

John attempted to answer some of these questions by describing work done in collaboration with the Melbourne Women's Midlife Health Project, a 9-year follow up of 500 volunteers from a random sample, taken in 1991, of 2000 Melbourne women aged from 45 to 55. Participants completed annual interviews with fieldworkers and gave annual blood samples. In addition, many who were initially premenopausal recorded details of their menstruation in diaries. These records were studied with a view to adding to knowledge of the natural history of menstrual cycling during the menopausal transition and with the secondary aim of developing a method of "predicting" the date of the final menstrual period. There is only one published record of a complete cycle sequence from menarche (beginning of menstruation during puberty) to menopause, and although the current study did not have an equivalently long history on its subjects there were considerable data on sequences of individual cycle lengths in the premenopausal period. Previous studies have indicated that the "premenopausal pattern" is typically associated with cycles becoming more variable and longer on average in the years prior to the FMP, and that a period of minimum variability precedes this expansionary phase. In the Melbourne Women's Midlife Health Project researchers attempted to characterise regularity in sequences of cycles recorded early in the project, and departures from regularity that are typical of the menopausal transition in sequences that end with the FMP.

John described a number of approaches to analysing a subsample of "early" sequences, including within-sequence regression and examination of autocorrelation. This led to a proposed definition of "regular" cycle sequences as those that remain within the 21-35 day range but have deviations as low as 14 and as high as 56 days occurring not more than 1 in 20 cycles. Increasing variability of cycle sequences was assessed using a "running range" technique (difference between the maximum and minimum cycle length up to the current point of the cycle sequence). This yielded a proposed definition of the increased pre-FMP variability being indicative of the approach of the FMP (indication that fewer than 20 cycles remain) when the running range of cycle length exceeds 42 days, although John concluded that this should not be used as a marker of the beginning of the transition. Additional information on hormone profiles was incorporated using a Cox Proportional Hazards approach to show that time to FMP from the day the running range first exceeds 42 days is related to ages, serum FSH (follicle stimulating hormone) and self-rated menopause status, and that this time can be expected to be 1-2 years. John concluded by acknowledging the many investigators in the Melbourne Women's Midlife Health Project. John celebrated his successful presentation to the Branch by leaving soon afterwards to go overseas for six weeks!

Lyle Gurrin

QUEENSLAND

Correspondence analysis for three-way tables: Basic theory and some examples.

During Pieter Kroonenberg's June-July visit to the University of Queensland as an Ethel Raybould Fellow (visiting both the Department of Statistics and the School of Land and Food Sciences), the Qld branch was fortunate enough to have Pieter as a guest speaker. Pieter had addressed the branch on a previous visit and so it was interesting for members to get an update on Pieter's research and the progress being made.

Catching up after the June meeting of the Qld Branch were (from the left) Ky Mathews (UQ), Bronwyn Harch (CSIRO), Pieter Kroonenberg (guest speaker), Peter Baker (CSIRO), John Eccleston (UQ) and Kaye Basford (UQ).

Pieter eased the audience into the area of log-linear analysis with a rather light hearted treatment of the topic using a study of newly married couples and the duties they performed in the home. The correspondence between the sex of the partner and the type of duty performed duly acknowledged the typical stereotypical roles of the sexes. Additionally, as time progressed it was interesting to note which duties one sex continued to predominantly perform, while for other duties they became equally shared.

Pieter outlined that log-linear analysis is the standard approach for analyzing multiway contingency tables. However, when the numbers of categories get large the problem of interpreting interactions, which are bound to exist, becomes a more challenging task than fitting the models themselves. Essentially, log-linear analysis is based on multiplicative modeling or additive modeling on a log-scale. In 1951 the Australian H. O. Lancaster suggested additive (chi-squared) modelling for multiway tables. His ideas are one of the bases in the development of correspondence analysis of three-way tables. Another Australian John Darroch wrote in 1974 about the relative merits of the two approaches and that there was little to choose between the two, but so far it seems that the multiplicative approach has made the day. Pieter's presentation considered the balance and trade-offs between both of these approaches.

Tony Swain (Qld Branch President), Jess Mar (Recipient of the Qld Branch scholarship for attending ASC16) and Petra Kuhnert (Speaker for May meeting of the Qld Branch).

Pieter illustrated the utility of correspondence analysis for three-way tables using an example from psychology (mother-child interactions in the first six month of the infant's life) and from marine biology (analysis of an experiment on the biological diversity given different levels of physical disturbance and organic enrichment).

BIOGRAPHY:

Pieter M. Kroonenberg is a senior lecturer at the Department of Education, Leiden University. He wrote his PhD thesis on three-mode principal component analysis and has been active in the general area of three-mode analysis ever since. Part of his activities consist of developing a program suite for performing three-mode analysis in many different forms and hosting a website on the techniques dealing with the analysis of three-way data. The website includes an extensive bibliography, address list of active researchers, and an overview of available programs. He has published papers promoting three-mode analysis in various disciplines, such as education, psychology, agriculture, medicine, and ecology. Recent interests centre on correspondence analysis for the three-way table and analyzing data with different measurement levels.

During this (fifth) visit from 28 April to 20 July 2002 to the University of Queensland, he is an Ethel Raybould Fellow and is a guest of both the Department of Statistics and the School of Land and Food Sciences. For more information please see http://www.fsw.leidenuniv.nl/~kroonenb.

Predicting Eucalypts in South-East Queensland using Classification Trees and Bayesian Modelling

After the Qld branch's May meeting, we had the great fortune of being able to hear about Petra Kuhnert's research efforts that were the result of her PhD studies. Her research over the past 3 years has focused on the application, integration and development of statistical methods for large and/or complex data sets. At the time of her presentation to the Qld branch, Petra was also preparing to present her research at the 7th Valencia International Meeting on Bayesian statistics in Tenerife, Canary Islands in June.

Petra's talk focused on two aspects of her research. Initially we were familiarised with the more flexible and sophisticated modelling methods that include classification and regression trees, multiple additive regression trees, multivariate adaptive regression alpines, aggregating methods such as bagging and boosting. From this basis, Petra went on to highlight that in this set of methodologies the reliability of predictions has often been overlooked. We were then presented with her work on addressing this issue by her use of local node assessment of the reliability of the forecast prediction probabilities and classifications using classification tree methods. Bootstrapping methodology was used to assess the

Peter Baker (CSIRO) and Peter Jones (CSIRO) enjoying the Thai food and the company of fellow Qld branch members at the dinner after Petra Kuhnerts' talk in May.

reliability of predictions from such a model and aimed to highlight those classification and prediction probabilities resulting from the bootstrap implementation that were reliable in some sense. Petra used an environmental data set (the presence or absence of a species of eucalypt, *Eucalyptus cloeziana* at a given sampling location in response to a suite of environmental covariates) to illustrate the utility of her approach, with visual diagnostics being an important part of her interpretation of the results.

Petra then went on to illustrate the incorporation of spatial information into modelling scenarios, where instead of smoothing over the geographic neighbourhoods to arrive at a prediction, an approach smoothing over the covariate space was employed. This approach has the capability to implicitly accommodate complex covariate interactions, which would remain otherwise undetected using geographic smoothing methods or traditional regression models. This was achieved in a Bayesian framework using reversible jump Markov Chain Monte Carlo methodology. Again, Petra's emphasis on visual diagnostics in the interpretation of results was refreshing (and very welcome at an after work seminar!).

The relevance of Petra's work for applied problems was highlighted with the number of questions posed after her presentation and the continued conversations over dinner afterwards.

BIOGRAPHY:

Petra completed an honours degree in statistics at QUT in 1994 and took up a research position at CSIRO Division of Mathematics and Statistics in Sydney working on multivariate methods applied to medical data. In 1997, she moved to Brisbane to work in the Epidemiology Department at the Queensland Institute of Medical Research. Petra has recently submitted her PhD thesis at QUT with its focus on methods applied to large and complex datasets. She is working at the Ecology Centre at the University of Queensland developing decision support models for weed containment and eradication using statistics and mathematical modelling.

Browyn Harch

SOUTH AUSTRALIA

What do wedding cakes have to do with experimental design?

Dr. Chris Brien from the University of South Australia gave an interesting talk on the randomization of experiments to the May meeting of the South Australian branch. His talk was based on work that he and Rosemary Bailey from the School of Mathematical Sciences, Queen Mary, University of London have done.

Chris, an active member of the South Australian branch, took some time out of his talk to sell some of South Australia's finest whites and burgundys. I think that this was the primary reason that he volunteered to talk at the society meeting, but we aren't ones to knock back a good speaker or a good wine for that matter.

The title of Chris' talk was "Randomization: the simple and the not so simple". His topic was all about the randomization of one group of factor sets to another set. In the simplest case, there are only two factor sets involved, as is the case with completely randomized designs. These factor sets are called tiers; the simplest experiment has two tiers.

After describing in more detail what tiers are and what role they play in randomization, he went on to demonstrate the processes used in a randomization. Chris described three processes which include the permutation of plot labels, permutation of treatment labels and the random selection of a design. He then informed us that effective randomization can occur if only the first process is used (ie: permutation of plot labels).

Then came the real 'crux' of his talk and research, the design (randomization) of multi-tiered experiments. What are multi-tiered experiments, I hear you say? Well multi-tiered experiments are characterized as involving multiple randomizations. These include sensory experiments, superimposed experiments as well as in animal and plant experiments.

Chris went onto explain how to go about randomizing treatments to plots in multi-phase experiments and pointing out some of the shortfalls in some of the current methods that scientists currently use. An example of this is when a field trial is processed in the laboratory, where this is processed in 'field' order. Chris highlighted that this can confound systematic laboratory effects with 'field' trend, he explaining that it is often thought that systematic laboratory effects are insignificant. However, this has been found to be incorrect in recent publications. In a multi-tiered experiment there are two randomizations involved but three tiers of factors. You have the treatments (tier 1, factor set 1) which need to be assigned to the field plots (tier 2, factor set 2), these field plots are then assigned to the laboratory phase (tier 3, factor set 3). Any experiment which has multiple randomizations is a multi-phase experiment.

There are several ways in which to randomize these factors to the various phases and Chris went onto explain what they are. There are 6 types of multiple randomizations; these comprise composed, randomized-

inclusive, unrandomized inclusive, coincident, double and independent.

He then went onto explain the differences between a split-plot and a two-phase experiment, which basically boils down to the fact that a split-plot design uses only a single randomization. He then went on to give examples of the various randomization methods and how to analyse these using ANOVA.

Chris has a website for his multi-tiered experiment work; readers are encouraged to visit this if they have any further interest or enquiries regarding Chris and Rosemary's work. The web address is: http://chris.brien.name/multitier.

Also, by all accounts the wine was excellent.

Does the source of drinking water influence incidence of gastroenteritis among young children in South Australia?

Jane Heyworth of the Department of Public Health, University of Western Australia addressed a joint meeting of the local Branch and Public Health Association In June.

Tank rainwater is an important source of drinking water in South Australia. More households (42%) use tank rainwater as their main source of drinking water compared with those using public mains (40%). The community preference for consumption of this untreated water supply has highlighted the need for policy on its safe use. The studies were undertaken to provide epidemiological data in support of a risk assessment of tank rainwater consumption.

First a prevalence study of 9,500 children indicated that there was a slight increase in risk of gastroenteritis associated with consumption tank rainwater in rural South Australia. This was followed by longitudinal study to investigate more fully the temporal relationship between risk of gastroenteritis and levels of exposure to tank rainwater. One thousand rural children were selected on the basis of their tank rainwater consumption. Parents were asked to keep a daily diary of their child's gastrointestinal symptoms and water consumption for a period of six weeks.

There were 414 episodes of gastroenteritis among 965 children over the six-week diary period. Thirty-three per cent of 965 children (n=317) had one episode, nine per cent had two episodes (n=84) and one per cent had three episodes (n=3). The incidence of gastroenteritis among 4-6 year-olds was 4.9 per child-year (95% CI 4.5-5.4). The unadjusted risk of gastroenteritis was significantly less among children drinking tank rainwater alone compared with those drinking chlorinated and filtered public mains water (OR=0.67, 95% CI: 0.52-0.87). When the full model was developed, adjusting for other potential risk factors for gastroenteritis, the risk associated with tank rainwater water was still significantly reduced.

In conclusion, the incidence of gastroenteritis in this age group was higher than expected, however the definition covered mild to severe gastroenteritis, with the majority of episodes being 1 day in length. Regardless, the burden of this illness on the community is substantial. In South Australia, young children drinking tank rainwater were not at greater risk of gastroenteritis compared with children drinking treated public mains water. In fact the data suggest that those children drinking treated public mains water were at increased risk of gastroenteritis. The implications of the findings with regard to tank rainwater beyond South Australia, depend upon local conditions such as maintenance and construction of rainwater tanks and catchments, as well as carriage of pathogens by local fauna.

Patrick Lim

WESTERN AUSTRALIA

WA Branch news

The prize for the most outstanding student currently enrolled in Honours in Statistics in Western Australia was presented at the May WA Branch meeting to Ms Laura Firth. Laura is working on a project concerning prediction of rainfall in WA farming regions as part of her Honours course at the University of WA. This work involves the use of forests of regression and classification trees to make sense of a very large number of predictor

Laura is pictured receiving her award from Branch president Dr Martin Hazelton.

variables (including sea surface temperature and oscillation index for the Indian ocean). The project is collaborative, involving researchers at CSIRO in Perth.

Laura is an outstanding student with a keen interest in applications of statistics. She receives our congratulations on winning this award, and a warm welcome to the WA Branch.

Sense and nonsense in perinatal statistics

Associate Professor Sharon Evans, Senior Biostatistician at the Women and Infants Research Foundation, King Edward Memorial Hospital, Perth, spoke at the May meeting of the WA Branch. Her presentation related to statistical issues surrounding the recent Ministerial Inquiry into perinatal deaths at the hospital to which she is attached. She started her talk by stating that although statisticians know that interpretation is the key to understanding, unfortunately hospital administrators do not realise this. The difference was illustrated using data from King Edward Memorial Hospital with interpretation of the raw figures, and rates from indirect and direct standardisation of the perinatal statistics for the period covered by the Inquiry. These figures included stillbirths and neonatal deaths over a ten year period.

Associate Professor Sharon Evans

Associate Professor Evans told the branch that the Inquiry process began with shock at the high rate of perinatal deaths, moderated a little when evidence from indirect standardisation was presented and then nearly disappeared when the consortium of expert opinion (including two Eastern States statisticians) demonstrated with direct standardisation, that the high mortality rate was almost certainly due to patient mix at the hospital. She then illustrated this by diagrams of patient mix comparisons and further possible explanations which demonstrated that King Edward Memorial Hospital probably had a lower rate of perinatal mortality than expected, rather than the original higher rate which prompted the Inquiry.

Discussion was quite lively, as befitted a subject dear to Western Australian hearts (we are not to blame, sir) and was followed by dinner at a local restaurant.

Inverse Estimates from a Multiresponse Model - an Example of Estimating Rhinoceros Age from the Lengths of Two Horns

Professor Peter Clarke (formerly of the University of Natal in Pietermaritzburg, and now at Agriculture WA) spoke at the June meeting of the WA Branch. His presentation began with a series of graphs depicting prediction intervals for linear regression models (including intervals for the "inverse prediction" problem). Then a little statistical magic followed. Add a hypothetical data point here or there, calculate a revised sum of squares based on the augmented data, and lo and behold, a profile likelihood has been conjured out of thin air! Professor Clarke went on to discuss how this wizardry can be extended to more general regression models.

The speaker then moved to the application in hand – estimating a rhinoceros' age from the lengths of its two horns. Following a little banter with the irrepressible Frank Hansford-Miller regarding the different species of rhino (and how many horns each has), Professor Clarke explained that both horns continue to grow more or less throughout a rhino's life. The anterior horn is much longer than the posterior in young animals. However, constant use of the anterior horn (combined with the protection that this horn affords the posterior one) means that in older animals the posterior horn can almost match the anterior in length. Regarding the two horn lengths as multiple responses, and age as a covariate, Professor Clarke developed a non-linear regression model for data from 13 rhinos. He showed that inversion prediction of age was much better employing information from both horns than from either horn on its own. He then applied his sorcery to derive prediction intervals for rhino age. The speaker finished his enjoyable presentation with a few comments on the ease with which profile likelihoods can be conjured up using only the most basic of statistical software.

Fourteen branch members then accompanied Professor Clarke to dinner at a local and the discussion continued apace.

Sharon Evans

CANBERRA

Logistic discrimination versus tree-based modelling: a case study exploring Australian companies' use of derivative markets

At the April meeting, the Canberra branch enjoyed a talk given by Dr Steven Stern from the School of Finance and Applied Statistics at the Australian National University. He used a case study to compare logistic discrimination and tree-based modelling.

Steve used data from 513 company reports for 1999. He needed to distinguish the characteristics of the companies that use derivative markets. The response variable was

whether a company uses derivative markets and the explanatory variables were financial distress, taxation, growth, economies of scale, etc.

A normal approach to this problem is to use logistic discrimination. The predictors are chosen a priori, usually based on subject knowledge. Steven fitted logistic models to the companies' data. He measured the accuracy of the model using specificity and sensitivity. He checked the interpretation by examining whether the coefficients were in line with the theory, analysed the diagnostics and checked for outliers. He also used step-wise selection of predictors to check the model based on theory.

Then he moved to tree-based modelling. Tree-based modelling partitions the predictor space and finds the best split. It keeps splitting until all cells are homogeneous or they have less than ten data points. In the case of the companies' data, a full tree is very complicated and it does not tell very much about the characteristics of the companies that use derivative markets. It also tends to over-fit. To fix these problems he pruned the tree, used 10-fold cross validation to select size and sequentially pruned least useful branches for cost-complexity balance. It is possible to find the characteristics of the users and non-users of derivative markets by interpreting the classification tree.

Steven also showed techniques to assess classification trees like burling and cross-validation. Burling is examining the unmade splits. Cross-validation tests consistency of split choices, particularly for the first three splits. Then he mentioned some methods that might improve the trees like bootstrap aggregation or bagging and boosting.

Steven concluded that a good way to evaluate these methods it to look for balance between insight, usability and accuracy and for exploration of data it is better to start with a tree and then move to a logistic discrimination model.

The statistics of mapping and other stories

Dr Simon Barry from the Bureau of Rural Sciences (BRS) gave a talk at the Canberra branch May meeting. Simon talked about producing land use maps and its applications.

BRS developed the National Landuse Map of Australia as a component of the National Land and Resources Audit. This map comprises a fundamental dataset containing themes in terms of vegetation, salinity, water resources and land use data.

Previously, maps were not spatially specific enough. They were based on Statistical Local Areas (SLAs) but since SLAs change boundaries it was not possible to produce time series. They also wanted to use complicated models so they needed improvement to these maps.

Land use mapping tries to produce a snapshot of land use in 1996/97. A consistent approach was applied to the whole country using a database of land use layers. This database uses existing non-agricultural land use datasets, ABS AgStats and AVHRR imagery control sites for agricultural land use. Land use is classified according to a nationally agreed scheme. The AVHRR is satellite data with 1 kilometre pixel resolution. BRS used Spatial Reallocation of Aggregated Data (SPREAD) methodology.

Simon finished his talk by showing some applications of the National Landuse Map such as an indicator of dryland salinity risk measured by type of vegetation and also using it with other national datasets to produce derived products.

Confidence intervals for small proportions from samples from a complex design

Alistair Gray, from Statistics New Zealand was the presenter at the Canberra branch June meeting. He talked about using the Korn and Graubard method for producing confidence intervals for proportions from samples from a complex design for the 1999 gaming survey.

The gaming survey was designed and run by Statistics New Zealand for the New Zealand Department of Internal Affairs. A key result was the proportion of problem and pathological gamblers, which at the national level were estimated to be 1.3 and 0.5 per cent respectively. This was a telephone survey of people 18 years old and over. Eighteen Telecom directories were used as strata; the strata size ranged from 23,000 to 1,000,000 people. Proportional allocation was used and households within strata were selected using simple random sampling and finally, one person per household was selected. Since this was a real life survey there were coverage and bias issues but Alistair pointed out that the 1999 NZGS is among the most statistically sound gaming surveys around.

The usual initial proposal to estimate confidence intervals for small proportions from complex surveys is to use logit transformation, i.e. calculate usual symmetric confidence interval and back transform. Clopper and Pearson gave 'exact' confidence intervals using the F distribution. Korn and Graubard suggested a modification to make them applicable for a proportion estimated from complex survey data.

Alistair explained the bootstrap analysis they carried out to examine the coverage properties of the Korn and Graubard confidence intervals, including exchangeable bootstrap. The confidence intervals using this methodology are similar, and sometimes shorter, than those obtained using the Korn and Graubard method. Then he concluded that the Korn and Graubard method is a reliable way of calculating confidence intervals for small proportions in the 1999 New Zealand Gaming Survey.

Veronica Rodriguez

Australasian Conferences

Annual Conference of the Australian Mathematical Society

30th September – 3rd October 2002
the University of Newcastle
More information about the Conference may be found at http://maths.newcastle.edu.au/austms
There will be a Special Session on Statistics at this conference. This will comprise a series of themed sessions depending on interest and participation. This is a great opportunity to share ideas and promote networks with our mathematician friends.
Contact: Kerrie Mengersen (Kerrie.Mengersen@newcastle.edu.au)

International Clinical Trials Symposium

21 – 23 October, 2002
Sydney Convention and Exhibition Centre
Hosted by the NHMRC Clinical Trials Centre, University of Sydney
Information: ICTS Secretariat, ICMS Pty Ltd, Tel: +61 2 9290 3366, e-mail: trials@icms.com.au.
www.ctc.usyd.edu.au

Australasian Genstat Conference 2002,

4 – 6 December, 2002
Abbey Beach Resort, Busselton, Western Australia
Information: http:/www.agric.wa.gov.au/biometrics/genstat2002 or email genstat2002@agric.wa.gov.au

Pre-Conference Workshop on Matrix Population Models

4 – 6 December 2002, Dunedin, New Zealand
Information:
http://maths.otago.ac.NZ/SEEM4/or email igoodwin@maths.otago.ac.nz

Fourth Conference on Statistics in Ecology and Environmental Monitoring Population Dynamics.
The Interface between Models and Data

9 – 13 December, 2002
Dunedin, New Zealand; and

New Zealand Statistical Association Conference 2003

2 – 4 July, 2003
Massey University, Palmerston North
website will be at http://www-ist.massey.ac.nz/stats/nzsa2003/
Contact: Duncan Hedderley, D.I.Hedderley@massey.ac.nz

Overseas Conferences

4th Conference of Asian Regional Section (ARS) of the International Association for Statistical Computing (IASC)

5-7 December, 2002
Westin Chosun Beach Hotel in Busan, Korea.
Conference theme is 'e-Statistics for Information'
Information: http://ars.ssu.ac.kr

International Conference on Applied Statistics, Actuarial Science and Financial Mathematics

17 – 19 December, 2002
University of Hong Kong and The Hong Kong Polytechnic University.
Organised by The Hong Kong Polytechnic University, The University of Hong Kong. The co-organisers are Commonwealth Scientific and Industrial Research Organisation, Peking University and The Chinese Academy of Sciences.
Information: //web.hku.hk/~icaaf/content.htm

SCRA2002-FIMIX: International Conference on Statistics, Combinatorics and Related Areas and the Ninth International Conference of the Forum for Interdisciplinary Mathematics

21-23 December, 2002
Allahabad, India.
Information:
http://www.allduniv.edu/scra2002

8th Islamic Countries Conference on Statistical Sciences (ICCS-V111).

21 – 24 December, 2002
University of Bahrain, Bahrain.
Conference Theme: "Business, Population, Environment and IT Strategies of the Islamic World"
Information: Dr Akram M Chaudhry, email: akrammoh@internic.uob.bh

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