ISSN 0112-2649

The New Zealand Statistical Association

Newsletter

Number 43 December 1996

1996 Conference

The first annual conference of the New Zealand Statistical Association to have an education theme, *Research in the Learning of Statistics*, was held at Victoria University, Wellington, on 30 and 31 August 1996. Although general statistics papers were also presented statistics education research papers dominated throughout the two days. Invited speakers included:

David Vere-Jones (Victoria University) 'Statistical education in the next 10 years: past perspectives and future prospects'

Maxine Pfannkuch (Auckland University) 'Statistical interpretation of media reports'

Kay Lipson & Peter Jones (Swinburn University, Australia) 'Teaching statistics in the 21st century' and 'An introduction to the statistical capabilities of the graphics calculator: the TI-83'

Larry Weldon (Simon Fraser University, Vancouver, Canada) 'On learning to use statistical theory'

Brian Phillips (Swinburn University, Australia) 'The latest research in statistics education'.

Other New Zealand statistics education speakers were Andy Begg, Mike Camden, Jocelyn Dale, Sharleen Forbes, Siva Ganesh, Philippa Graham, Alex Neill, Robin McIntyre, David Nightingale, Caroline Smith, Ian Westbrooke, Ramaija Naidu and a group from the New Zealand Qualifications Authority. Other Australian speakers were Glenys Bishop, Sharon Gunn, Anne Porter and Lyn Roberts.

Maxine Pfannkuch speaking on 'Statistical interpretation of media reports'

Ray Hoare, Hoare Research Software, who sponsored the SPSS Prize in Statistics for the best student paper at the conference with students Robert Ware, James O'Malley (second $300), Sashi Sharma and Philip Schlüter (first $700).

The conference was deliberately planned around the traditional annual conference so that other statistics practitioners and academics would have the opportunity to hear the latest statistics education research. Efforts were also made to attract secondary school teachers to the conference, and it appears that the conference has been more successful in this regard than the former (a number of teachers have provided positive feedback already).

We planned on about 50 participants, and achieved 115, plus a few more people who dropped in to visit. The 115 included 10 students, 16 one-day registrants, 8 overseas people, and numerous teachers.

Conference proceedings were produced and

Continued on Page 5

Highlights for December

Published by the New Zealand Statistical Association (Inc.), P.O. Box 1731, Wellington, New Zealand. Printed by Waikato Print, University of Waikato, Hamilton. The views expressed by contributors to this *Newsletter* should not be attributed to the New Zealand Statistical Association.

President's Column

I was disappointed that I was unable to attend the Annual Conference of the Association in Wellington on 30-31 August, which by all accounts was highly successful. I extend my appreciation to Mike Camden and his team who made the conference, with its theme on *Research and Learning of Statistics*, a success. I am also grateful to Harold Henderson who chaired the Annual Meeting.

I left New Zealand mid-August to travel via Singapore and Hong Kong to attend the 4th World Congress of the Bernoulli Society for Mathematical Statistics and Probability in Vienna, August 25-31. The conference which was held at the Wirtschaftsuniversität in Vienna was small by international standards (approximately 700 participants, 45 nationalities, 530 paper presentations, 138 seminars including 34 invited sessions and 11 special invited lectures) but large enough to ensure that a sufficient number of researchers with particular sectional interests were in attendance. There were some outstanding plenary sessions presented by key figures in the field of probability and statistics. The lecture by Prof. Benoit Mandelbrot, the pioneer in the field of "Fractals" was another highlight. The next congress will be held in four years time in Mexico. (The year 2000 has been declared a "Mathematical Year" by the International Mathematical Union. This also establishes an alternating cycle with the International Congress of Mathematicians which next meets in 1998.)

This column is being written before the next teleconference meeting of the Executive is held. The affairs of the Society continue to tick over with the able secretarial assistance of Siva Ganesh. We are in contact with our Australian colleagues regarding the joint publication of the journal from next year but with little to report at present.

On the national scene we have yet to be advised of the status of the proposed review of the mathematical sciences in New Zealand by the Ministry of Research Science & Technology. A significant amount of spade work has however been done through the production of the Area Profiles in the Mathematical Sciences in New Zealand in response to a request from MoRST. Two reports, the Area Profiles on Probability and Statistics (compiled by myself and Mark Bebbington) and Statistics (compiled by Bryan Manly) give very good summaries of the status of these areas in the country at the present time. Both Area Profiles are in this *Newsletter* (see pp. 12-17). Responses and comments to Bryan, Mark, or me are welcomed.

Another report of interest is a summary of the findings and recommendations of the First Subject Conference on the Teaching of Statistics in New Zealand Universities which has been submitted to the New Zealand Vice Chancellors Committee. Copies of that report are available from Bryan Manly, University of Otago (*due to space limitations the summary will be in the next Newsletter - ed.*).

One of the major concerns highlighted in this latter report is the funding status of Statistics within Universities. The current Ministry of Eduction EFTS funding for this discipline is at the lowest possible level. Efforts are being made by various University groups to see if this situation, which also applies to Mathematics, can be reviewed and to see if appropriate funding similar to that obtained by Computer Science can be obtained.

It is interesting (and, to some of us, quite stressful) to observe how management structures in organisations continue to undergo change. We have seen over the past five years how the restructuring of government research organisations leading to the formation of CRI's has brought about more accountable structures. The same phenomenon now appears to be impacting on Universities. A recent report recommends a reorganisation of Victoria University of Wellington into four new Faculties. A similar merging of Faculties at Massey University is underway as the University prepares to introduce a devolved funding regime with strong line management and accountability features.

It appears that a similar trend is occurring in Australia. The thrust is to lead to more responsive and efficient organisations but there is a danger that this could lead to a separation of the management and academic (teaching and research) functions of the University. I also have concerns, especially since not many academics have management training or experience, that such management roles could be performed by those not well versed in the academic entities that they are expected to administer. We are in for some interesting times, brought about by the impact of external influences.

NZSA President: Professor Jeffrey J. Hunter
Dean, Faculty of Information and Mathematical Sciences, Massey University, Palmerston North, New Zealand

Phone	Office +64 6 350-5082
	Home +64 6 354-7886
Fax	+64 6 350-5611
Email	J.Hunter@massey.ac.nz

Editor's Musings

As I sit at the computer typing in these words, I can look out the window and see the snow falling. As mentioned in my last column I am editing this edition from Ottawa in Canada. I didn't arrange for someone else to do the editing as I expected the task would not be much different from if I was in Christchurch. The only real problems have been getting access to a computer with enough grunt to handle PageMaker, and not being able to ring Harold Henderson (and again many thanks to Harold for his sterling work!).

The fact that the *Newsletter* can be edited anywhere in the world where the editor has access to the Internet started me thinking about how statisticians may be working together in the near future. NZSA Executive meetings consist of groups of one, two or more people in rooms all over New Zealand communicating via the phone system. If it wasn't for the cost even I could have 'attended'. In my job at Statistics New Zealand I work in Christchurch, but half my fellow statisticians are in Wellington. The only time I meet most of them is when we have our annual three days of seminars. So it is becoming more common for people to work together with little face-to-face contact, at least until we get video phones.

Personally I hope we never stop wanting to travel to meet our fellow statisticians. After all, I go to conferences, and came to Ottawa, for this express purpose. However it is clear that we should be examining how this increased ability to communicate can affect the way we work, plus how it can affect others. When I started planning this trip to Ottawa I thought the four months here would be too short to get everything done. However as I near the end of the four months I realize that with the Internet, and its offspring the World Wide Web, four months is enough. Now that they know me, and I know them, it's not as if when I return I cannot easily communicate with my colleagues in Statistics Canada. In some respects conferences can accomplish the same thing. In 20 minutes we cannot cover in any depth the work we are doing. What we hope to achieve is to demonstrate to others that work in the same area that they should get in touch with us. The initial contact is important because with the increasing amount of e-mail I get I focus on that from people I know, or who are responding to specific work I've done. In the last five years I am increasingly becoming part of various 'virtual' working groups of statisticians.

However there is a danger we must be aware of. I remember how frustrated I was before Statistics New Zealand got Internet access. Going to statistical meetings and having people ask you for your e-mail address and not being able to provide one made me feel at times outside the statistical community. Now I am part of the electronic, or virtual, statistical community, and even in Ottawa I can keep up to date with events in Statistics New Zealand, and edit a *NZSA Newsletter*! I am happy with my access to information, but there are still many out there who haven't got easy access to the Internet, if any.

Consider how you work. How many letters do you write a week? How many e-mails? How quickly do you reply to an e-mail compared to a letter? I reply a lot faster to e-mail than to a letter. Perhaps this is just me considering e-mail an extension of telephoning, so it doesn't require the formal approach of letter writing. I certainly feel a letter needs to have a lot more thought put into it.

Consider our recent NZSA conference. Clearly it was a success and teachers realise that many statisticians love their subject and wish to tell others about how useful, and *fun*, it is. But many teachers may not be in a position to tap into our enthusiasm. Why? Because statisticians use the Internet. Recently I was in Slovenia at a conference and it was clear that many of the official statistical agencies in Eastern Europe are struggling to keep up-to-date with developments in official statistics because of problems with access to the Internet and the WWW. At least all of them can get access. What about more isolated countries like Tonga? I worked in Tonga a couple of years ago and the lack of e-mail was particularly frustrating. Putting things on the WWW may not mean you have fulfilled your obligations to widely disseminate your work. So think about what audience you are trying to reach.

Richard Penny

rnpenny@stats.govt.nz

Statistics New Zealand
Private Bag 4741
Christchurch, New Zealand

Phone (03) 374 8769
Fax (03) 374 8899

Deadline for next Issue

All submissions for the next *Newsletter* to me by 6pm Friday 11 April.

Letter

The conference organisers received the following letter from Tony Aldridge shortly after the conference. As it raises issues of interest and concern to many statisticians in New Zealand Mike and Sharleen approached Tony for his permission to publish it in the Newsletter, which he very kindly gave. I hope some of you respond, as the Newsletter is an excellent forum to discuss such issues amongst a wider audience. - Ed.

The purpose of this letter is to outline my concerns and predictions for managing the unit standards. The session at the recent NZSA conference titled *Developments within the Qualifications Authority with respect to Statistics* upset me in a way that has not diminished during the past two weeks. So this is a chance to 'get it off my chest' and give you another perspective of what I see is developing with the framework.

To start at the beginning, in July I participated in a workshop for NZQA assessors in the framework and learned about the advantages of unit standards for industry (I'm an industrial statistician). As part of the workshop I had to write several assessing documents for specific unit standards, which gave me some practical experience of assessing.

Next came the Stats Conference in late August. What blew me away was the burgeoning paperwork and sign-offs said to be needed to maintain the framework 'system'. My ears really pricked up when the paperwork was justified in terms of Quality Assurance and Total Quality Management (or, for that matter, "Quality Systems"). These two management areas are what I have been working with during my twenty years as an industrial statistician. As I listened to the NZQA people I suddenly realised that I was being transported back fifteen years in terms of management theory.

During the last fifteen years much of my work (as a consultant) has been with initiatives to dismantle management systems being proposed now by the NZQA. Hence my alarm at a framework based on theory with known and well-documented flaws. Industry has learned at great cost that increasing inspection (i.e., moderation) and sign-offs not only diminishes profit but is also no guarantee of an effective product. Edwards Deming, using Mood's Theorem, went so far as to say something like "inspect either everything or nothing".

Industry is now learning to trust the person doing the basic work (similar to writing a unit standard or tasks for assessing it). That person does their own inspection while management supplies the resources needed to improve the work. The goal is no impediment to getting the work done and delivery to a satisfied customer. Much has been written about this sort of quality improvement in recent issues of *Quality Progress* (the August issue is devoted to education).

My prediction is that the increasing paperwork (from moderation) and sign-offs will add such cost that within five years there will be just as much effort dismantling a cumbersome bureaucracy.

Finally, an observation on management behaviour that may apply in this situation. Unless managers have some glimmer of understanding of quality improvement they will keep at arm's length anyone who questions assumptions, purpose (hopefully related to customers) and solutions. Because statisticians are well versed in problem solving methods (and with often a system approach) they will be avoided like the plague by managers hellbent on pushing a structural change. Also, I think these same managers have an instinct or gut-feeling for the sort of thinking required to dismantle their imposed structures - again statisticians are well suited for this dismantling, thus should be avoided.

I hope this gives you a flavour of the basis for my concerns for the framework. The next year or two will be very stressful for NZQA developing their moderation system. What is needed is the ear of top management so the dismantling of the system can be anticipated and under way in three years from now.

Tony Aldridge, Dunedin

NZSA
48th Annual Conference

University of Auckland
Wednesday, July 9 to
Friday, July 11 1997

Themes of the Conference are Bayesian Statistics, including Markov Chain Monte Carlo, and Statistical Ecology. It is expected that there will also be sessions on Official Statistics, Biostatistics, Statistical Theory and Statistical Education. Contributed papers in any area of statistics will however be accepted for the conference program.

Keynote speakers who have accepted invitations to speak at the Conference are Peter Hall (ANU), Luke Tierney (Minnesota), Steve Buckland (St Andrews), Keith Worsley (McGill), and Richard Huggins (La Trobe).

Peter Hall's talk will be presented jointly with the joint meeting of the Australian Mathematical Society and the New Zealand Mathematics Colloquium, which is being held in Auckland from July 7 to July 11.

Steve Buckland is to present a Workshop on Line Transect and Distance Sampling for Estimation of Wildlife Populations on the morning of July 11. The Workshop and the sessions on Statistical Ecology are intended to be interdisciplinary, bringing together researchers from Biology, Ecology and Statistics.

Accommodation has been reserved for participants in the student residence Grafton Hall which is close to the University.

The deadline for submission of abstracts is May 23, 1997.

For further details concerning the Conference, or to register your interest, there is a link on the home page of the Statistics Department at the University of Auckland (http://www.stat.auckland.ac.nz/). Alternatively, contact

Associate Professor David J. Scott
Department of Statistics
Tamaki Campus
The University of Auckland
Private Bag 92019, Auckland
New Zealand

Phone: +64 9 373 7599
Fax: +64 9 373 7177
d.scott@auckland.ac.nz
dscott@scitec.auckland.ac.nz

1996 Conference *From Page 1*

Some of the participants at the 1996 conference

made available to all participants. The post-conference flyer produced about 35 requests for copies. There may be also a few left which can be obtained (at $20) from Jim Neyland at Victoria University (jim.neyland@vuw.ac.nz).

It seems that this Conference was an idea whose time had come, a meeting place for practitioners, educators and students, and a timely step forward for statistical eduction in NZ. It seemed to convey a unified message that Statistics today is largely about critical thinking towards solutions: "Statistics is moving away from Maths and back towards its roots as a scientific enquiry process" (Maxine), "The essence of statistical theory is that it enables people to get information from data: the theory is essentially utilitarian" (Larry) and "The challenge for today is to develop knowledgeable and critical statistical thinkers" (Kay and Peter).

We hope that future conferences too will encourage us to reflect on what we do when we act as statistical educators.

Sharleen Forbes and Mike Camden

Most of the organising committee for the 1996 conference

NZSA Committee and Convenors 1996-97

Greg Arnold
Minute Secretary
Department of Statistics
Massey University
Private Bag 11222
Palmerston North
g.arnold@massey.ac.nz

Jennifer Brown
Committee Member
Department of Statistics
Massey University
Private Bag 11 222
Palmerston North
j.a.brown@massey.ac.nz

Mike Camden
Convenor Education
Mathematics and Statistics
School of Engineering
Wellington Polytechnic
Private Box 756
Wellington
mikec@directorate.wnp.ac.nz

Gary Dunnet
Treasurer
Statistics New Zealand
Private Bag 4741
Christchurch
gdunnet@stats.govt.nz

Sharleen Forbes
Committee Member
Statistics New Zealand
PO Box 2922
Wellington
sdforbes@stats.govt.nz

Siva Ganesh
Secretary
Department of Statistics
Massey University
Private Bag 11222
Palmerston North
s.ganesh@massey.ac.nz

S Ganesalingam
Committee Member
Department of Statistics
Massey University
Private Bag 11222
Palmerston North
s.ganesalingam@massey.ac.nz

Steve Haslett
Convenor SAPQC
Department of Statistics
Massey University
Private Bag 11 222
Palmerston North
s.j.haslett@massey.ac.nz

Harold Henderson
Committee Member
Statistics
AgResearch Ruakura
Private Bag 3123
Hamilton
hendersonh@agresearch.cri.nz

Jeff Hunter
President
Massey University
Private Bag 11 222
Palmerston North
j.hunter@massey.ac.nz

Murray Jorgensen
Editor NZ Statistician
Department of Statistics
University of Waikato
Private Bag 3105
Hamilton
maj@waikato.ac.nz

Donal Krouse
Committee Member
Industrial Research Ltd.
PO Box 31-310
Lower Hutt
d.krouse@irl.cri.nz

Jenny Mason
Convenor Science Fairs
Statistics New Zealand
PO Box 2922
Wellington
jamason@stats.govt.nz

Richard Penny
Editor Newsletter
Statistics New Zealand
Private Bag 4741
Christchurch
rnpenny@stats.govt.nz

James Reilly
Committee Member
Statistician/Senior Analyst
AGB McNair
PO Box 33819
Auckland 9
reillyj@agbmcnair.co.nz

Caryn Thompson
Convenor Young Statisticians
Department of Mathematics and Statistics
University of Otago
P.O. Box 56
Dunedin
cthompson@maths.otago.ac.nz

Jean Thompson
Committee Member
15 Kingston Heights Road
Kingston
Wellington
nzsa@isor.vuw.ac.nz

John Waller
Convenor Publications
Statistics
AgResearch Ruakura
Private Bag 3123
Hamilton
wallerj@agresearch.cri.nz

Three committee members, James Reilly, Jennifer Brown and Siva Ganesh at the conference dinner

Education Committee

We've recently been considering:

1. Whether we need to continue, and
2. How we can continue, when employment places other pressures on us.

We decided that we did need to continue, since a voice for statistical education remains vital. Government (what Government??) policies on the National Qualifications Framework may change, the statistical person (and even the two mathematical persons) on NZQA's National Standards Body for Science and Technology needs our support and input (as do our two people on NZQA's Maths Advisory Group, if it continues), Statistics people need to know what's happening in our area, Unit Standards may get reviewed, qualifications involving Statistics may get developed, Bursary examinations will get transformed, and teachers may benefit from our input to conferences, etc. (e.g., the NZSA conference next July in Auckland, and the NZ Association of Maths Teachers' conference in October at Massey). We have one of the most statistically aware societies in the world, and we want to keep it that way. That's probably enough reasons!

We decided that the Wellington group would meet 4 times a year only, and that we would have a mail server for this group and for any members who would like to contribute. The purposes of this will be:

1. To help us form and action NZSA views on developments in statistical education
2. To spread information on developments in statistical education.

(The purpose is not to swap resources and creative ideas on how to teach statistics. Perhaps NZ needs a separate network for that.)

Any members who would like to be part of this can send the message "subscribe edstat" to maiser@wnp.ac.nz, then any messages they send to edstat@wnp.ac.nz will be broadcast to the subscribers.

Mike Camden, Convenor

The last sentence in the preface to the first edition of *Econometric Methods* by Johnston reads: "The final burden of proof correction was greatly eased by assistance from David Bugg".

President's Report for the 1995/96 Year

It is a pleasure to report on the activities of the New Zealand Statistical Association for the 1995/96 year.

1. Executive

The executive has continued to look after the Association's affairs through regular telephone conference call links on 2 November, 8 February and 26 May. Charles Lawoko's move from Massey University to Queensland University of Technology created a major gap in the Executive but I was grateful to Greg Arnold and Siva Ganesh for stepping in to ensure that the secretarial function of the Association were maintained. I am appreciative of the contributions made by all members of the Executive especially those with specific portfolio responsibilities. They have certainly assisted me in ensuring that the activities reported below have been carried out efficiently.

In keeping with previous organisational arrangements we have maintained the portfolio structure, although our major initiative this year in seeking closer links with our sister organisation in Australia, the Statistical Society of Australia (Inc.) (SSAI), Harold Henderson, Murray Jorgensen and I have all contributed to different aspects.

In summarising this year's activities I will attempt to be brief as many issues have been aired in the *Newsletter* and this report is a way of documenting those issues of importance with additional information being available in the Association's publications. Reports from the Education Committee, Editor of *NZ Statistician* and Survey Appraisals and Public Questions Committee are appended to this report. The report from the Publications Committee was published in the last *Newsletter.*

2. Conferences

Last year's AGM was held at Dunedin on 31 August 1995 in conjunction with the A.C. Aitken Centenary Conference. The organisers ran a most successful conference. A highlight was the SPSS Student Prize for Statistics donated by Hoare Research Software and won by John Koolaard from Massey University.

This year's conference has the theme of "Research in the Learning of Statistics". The Education Committee under the leadership of Mike Camden, ably assisted by the Institute of Statistics and Operations Research and the Mathematics and Science Education Centre at Victoria University of Wellington, have put a lot of work into ensuring that the Conference is a success. On behalf of the Executive, I wish to convey our appreciation for a job well done.

3. Logo

The executive have been exploring the possibility of a new logo for the Association. As part of a Graphics Design project at Wanganui Polytechnic, a student, Kevin Hayman, was commissioned to come up with some concepts. His efforts will be on display at the Conference and the Executive seek comments before deciding whether or not to endorse the proposed design. We have not had to outlay much on this project and there is no commitment at this stage to endorse the designs of the logo for the *Newsletter* and stationery.

4. Closer Relations with Australia

In the light of the decisions taken at our latest AGM, we have been exploring the possibility of merging the journals of the NZSA and SSAI. I was invited to attend the Council Meeting of the SSAI held just prior to the SISC-96 Congress. As reported in the *Newsletter*, a motion that the AJS and NZS merge, subject to discussions between the two societies re editorial responsibilities, was passed. Murray Jorgensen, who was present for the journal negotiations, will report at the AGM on the state of the negotiations. There appear to be many benefits and as the financial implications fall within the bounds approved at the last AGM - that the merger of journals should not result in a subscriptions rate increase of more than $15 - the new journal should be a reality in 1997.

5. Accreditation

At our last AGM an Ethical Code was approved to provide guidance to members of the NZSA in matters of ethics. The SSAI have taken this a step further with the introduction of accreditation, approved at their AGM at Sydney in July 1996 and the introduction of two new forms of membership - Graduate Statistician (GStat) and Chartered Statistician (CStat). The new Executive of the NZSA will need to explore this issue next year. It is worth noting that in an unrelated move the New Zealand Mathematical Society have also approved various classes of membership ranging from graduate members (GNZMZ), accredited members (MNZMS) and Fellows (FNZMS).

6. Science Fairs

NZSA continues to be involved with Science Fairs and we were appreciative of the efforts of Karen Wong (Statistics NZ) in taking over from Vince Galvin, who stepped down through a move to Australia.

7. Royal Society of New Zealand

The July meeting of the Standing Committee on Mathematical and Information Sciences of the RSNZ is reported in our August *Newsletter*. It is worth

highlighting two items. Firstly, the Minister of Research, Science and Technology has agreed to the inclusion of a Review of the Mathematical Sciences in the 1996/97 funding round. This is certainly an opportunity that we should take advantage of and be involved with, in order to ensure that the statistical sciences, as a part of the mathematical sciences, is considered as a major component in the review. It is highly likely that the review will be modelled on the similar review conducted recently in Australia.

Secondly, I have been nominated as the Convenor of this Standing Committee with a seat on the Board of the RSNZ once the Royal Society Bill passes through the House of Representatives. The effect of this is that the NZSA will be able to have a further representative to join Jean Thompson on the Standing Committee from the beginning of 1997.

8. NZVCC Subject Conference in Statistics

The first subject conference on Statistics under the auspices of the New Zealand Vice Chancellors Committee was held at ISOR, Victoria University of Wellington under the convenorship of Prof. Bryan Manly, University of Otago. Harold Henderson represented the NZSA (as well as the many university attendees who were also members of the Association). The opportunity to evaluate the teaching of statistics in the universities of the country was welcomed and it is up to the NZVCC to implement the recommendations (including a plea to place statistics in a higher funding category). Members of the Association interested in receiving a copy of the report should contact Prof. Bryan Manly.

9. Future

As is established custom, I have intimated my agreement to continue as your President for a further year. It is certainly easier for the secretariat to be based where the President is located as has been the recent procedure. As I will not be present at the AGM, I would ask members give consideration to where the "centre of locus" of the Association should next move - perhaps a move to Auckland might be appropriate bearing in mind the increase in statistical activity at the University of Auckland (both campuses) and Massey University at Albany.

10 Acknowledgments

There are many individuals who have willingly assisted with the running of the Association. I have appreciated your support and willing offers to get involved. In particular, I thank Greg Arnold and Siva Ganesh for stepping in at short notice to serve as secretariat, Murray Jorgensen for his behind the scenes efforts involving the *New Zealand Statistician* and new journal negotiations, Richard Penny for taking over the *Newsletter* - a task that, even with the new PageMaker software the Association has purchased, requires full co-operation for all members for material, John Waller for maintaining the Publications portfolio, Gary Dunnet for his stewardship of the Association's financial affairs, Steve Haslett as the convenor of the SAPQC, Mike Camden for his unfailing interest, concern and commitment to the Education portfolio, Caryn Thompson for looking after the Young Statisticians portfolio, as well as advice and assistance from Sharleen Forbes, Harold Henderson, Donal Krouse, James Reilly and Jean Thompson. Many thanks for your support.

Jeffrey J Hunter
President, NZSA
15 August 1996

Education Committee Report - 1995/96 Year

Over the last 12 months, this committee has worked on the following:

We developed and presented workshops with an NZSA source at both NZAMT 95 in Auckland and the Aitken Conference in Dunedin.

We contributed to the Prime Time page in the INZ newspapers in February.

We worked with NZQA though the Maths Advisory Group and a writing group for first year tertiary units, to ensure that Units in Statistics are as healthy as possible.

We tried (unsuccessfully) to increase our representation on the Maths Advisory groups from 2 to 3, but found that it is likely to fade away.

We recommended people to work on the writing group for tertiary Units. This set of Units is substantially complete, but is awaiting a Moderation Action Plan.

We made input into the structure and purpose of the new National Standards Body for Science and Technology, which has one statistical position on it. We arranged for NZSA to nominate a person for this.

We contributed ideas and people to the 1996 NZSA Conference Committee.

We found that our members had increased difficulty with other commitments, and hence increased difficulty in coming to meetings.

For the future, our aim is still "to improve the quality of statistical education in New Zealand", but we need to reassess our resources and activities, and consider

if and how we can continue operating.

Curriculum and Units are now in "maintenance and review" modes, rather than development mode. There is a need for teacher support. We can contribute to this via conferences and seminars, but the Association needs to consider other possibilities.

However, Qualifications are in Development mode. NZSA will need to work with the new NSB on these. NZQA has plans for a 240 credit (two full successful years) Certificate at senior school level. A possibility is that this will require 10 units in numeracy and communication, and that these could be Statistics Units.

I'd like to thank the rest of the committee for their work during the last year. The committee was: Lesley Hooper/Sarah Hone (SNZ), Sharleen Forbes (SNZ), Jean Thompson (JAD Consultants), Paul Ackerley (NZQA), Caroline Smith (Correspondence School), Peter Fleming (NZQA), Diane Leggett (Teacher Support Services), Brian Corbitt (TOP), Irene Cassidy (CIT), Mike Camden (Wellington Polytechnic) and (until November) Pip Arnold.

Mike Camden
Convenor

New Zealand Statistician Report - 1995/96 Year

Negotiations with the Statistical Society of Australia for a merger of the *New Zealand Statistician* with the *Australian Journal of Statistics* are reported on separately. If the AGM approves the merger, and if a 1997 start to the combined journal is possible, there will be 3 more issues of the *New Zealand Statistician*.

Since I took over from Hugh Morton as editor 11 papers have been received. Five have been rejected or returned for major revision, and six are still in the reviewing or revising process. I expect to have enough papers for an issue shortly.

Supply of material of appropriate quality, then, is still a problem. I have approached Mike Camden to investigate whether any speakers at the NZSA Conference this year would like to revise their papers into suitable form for publication in the *New Zealand Statistician*.

I have investigated prices for printing the New Zealand Statistician at Waikato, but Hugh reports that they are not very different from those available at Massey, so I do not plan to make any changes in printing arrangements, especially in view of the proposed merger.

Murray Jorgensen
Editor, New Zealand Statistician

Survey Appraisals and Public Questions Committee Report

Scope

The Survey Appraisals and Public Questions Committee (SAPQC) is a standing committee of the New Zealand Statistical Association (Inc.). The objective of the SAPQC is:

"To raise the standard of practice and level of public understanding of statistics in New Zealand by:

1. Conducting independent appraisals of the methodology and other technical aspects of the surveys, including sample surveys and opinion polls, in relation to their statistical validity, and to the needs of the users of the survey results.
2. Conducting examination of statements made in the public domain and of significant public interest, that have statistical content, or whose validity depends on statistical considerations."

Appraisals

The appraisal of the Business and Economic Research (BERL) report on the accuracy of their assessments of the costs and benefits of an amendment to the Marine Transport Act to require safety inspections of foreign owned yachts was completed in June/July 1995. Information from foreign owned yachts indicated that the extra cost of search and rescue for boats without certain types of safety equipment needed to be balanced against the cost of foreign owned yachts boycotting New Zealand if New Zealand regulations were applied to such boats. The methodology used by BERL for its cost benefit analysis was extended beyond the available data, and in a number of conclusions their analysis overreached the limits imposed by this constraint. In particular there was no evidence that foreign owned yachts were more prone to accidents at seas. Indeed, in terms of fatalities there was some evidence that the opposite was true. However BERL was aware that their conclusions were tentative and stated so in their report. More importantly however, there was general agreement among all parties that 'improved safety standards are desirable'.

The other appraisal conducted this year was completed in December 1995, and considered the second Evening Post survey on voter preference for candidates in the Wellington mayoral election 1995. The request for appraisal was submitted by Ms. Elizabeth Tennet. The survey was carried out by the Evening Post using Polytechnic students as telephone

interviewers. The difference in support between Mr. Blumsky and Ms. Tennet at the time of the poll was 7%, and this difference (given the response rate of 56% and a sample size of 460) was only marginally significant. There were also a number of other technical objections raised by Ms. Tennet which are covered in more detail in the appraisal.

Summary

The SAPQC has continued to provide appraisals on request. The proactive role on statistical aspects in public issues which was outlined in last year's SAPQC report has been constrained by time available to committee members providing an essentially free service. Reports such as that carried out last year on the methods used for setting Social Welfare benefits levels, while important in themselves and for the profile of the Association, require more effort than can be maintained on a regular basis within the present framework.

Stephen Haslett, Convenor

History of NZ Statistics Information Wanted

Since people in retirement are expected to have time on their hands, I have been asked to organise something about the above. Not having any time on my hands, I am trying to fit the above task between my other activities. While I do not envisage actually writing such a history, I am trying to gather together material on which to base it, and am asking any member or non-member if they could spare a little time between their multifarious affairs and send me any information they might have, or know about and where it is available.

Following are my first thoughts about the possible Chapter Headings of such a History: (The order is random.)

Definition of Statistics
- Gathering and Publication of Data (e.g., Stats NZ)
- Interpretation of data. (Everybody interprets data as they see fit.)
- As a Science.
- Statisticians (or Mathematicians) of note (e.g., A.C. Aitken, Harold Silverstone, J.T. Campbell, Peter Whittle, George Wood).

Institutions
- Department of Statistics
- Department of Agriculture
- DSIR Applied Mathematics Laboratory
- Universities
- Polytechnics
- Education: Primary, Secondary, Tertiary
- Other

NZ Statistical Association:
- Holdings (e.g., Turnbull Library 1950 -)
- Founding Members
- General Membership (Change over the Years?)

Landmark Developments
- Gosset-Hudson Correspondence
- Appleby Experiments (Completely Replicated 1930) (Cawthron Institute, Department of Agriculture, DSIR)
- Books and Journals Published Overseas:
  - Who were the overseas authors who had the greatest influence on the development of Statistics in NZ?

Publications
- Where were early papers published?
- NZ Statistician
- Books published by New Zealanders or in NZ

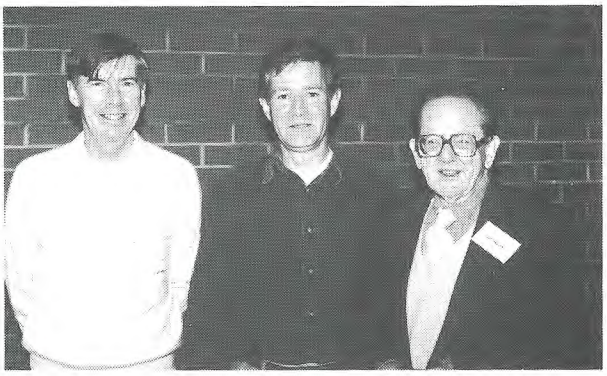
Computing
- Manual
- Electric
- Punched cards
- Differential analyser
- Computers
- Hand-held calculators
- Calculator Fairs

Operations Research
- Should this be considered as part of Statistics?
- Some early work in NZ done by Statisticians

Any Other Headings?

I welcome comments on any of the above, and also suggestions as to the nature of a history, e.g., whether it should follow these headings, and suggestions as to an author. Whether an author should be paid, should it be a Statistician, Mathematician, or a thesis by a PhD student in History?

Please send any thoughts, information, suggestions, etc., to *Stan Roberts*
54 Balfour Street
Mornington, Wellington 2
Phone (04) 389-9571



Stan Roberts (right),Barney Campbell (left) and Tony Aldridge (see page 4) at the 1996 Conference. They all previously worked at the Applied Maths Division, DSIR.

Area Profile
Probability and Stochastic Processes

1 Introduction

The field of probability and stochastic processes is a large one, with many separate specialisations. The AMS subject classification divides the area into: foundations of probability theory, probability theory on algebraic and topological structures, combinatorial probability, geometric probability, stochastic geometry, random sets, distribution theory, limit theorems, stochastic processes (including martingales), stochastic analysis, Markov processes (again with many sub-classifications), renewal theory, reliability, queuing networks, queuing theory, interacting random processes and spatial processes.

Since the field gives rise to many applications, there are many links with other fields. For example, stochastic modelling has applications in fields as diverse as physics, chemistry, biology, geophysics and economics to list but a few. There is feedback in the other direction as well, many theoretical developments being inspired by natural processes. In NZ, most work in this field is interdisciplinary in nature, and/or motivated by applications.

2 New Zealand's Knowledge Base

2.1 Overview

2.1.1 Historical development in New Zealand

The pattern for New Zealand contributions in this subject was fixed through the setting-up of the Applied Mathematics Laboratory in the 1940's and the appointment to its staff of Peter Whittle. Whittle already had an international reputation in time series from his thesis work with H. Wold at Uppsala, and used the range of problems arising from the consulting work with AML to lead him into pioneering studies of spatial variation, applied time series analysis, econometrics, etc., producing papers now widely regarded as classics. From that time onwards, an emphasis on applications and time series, often involving significant collaboration with scientists outside the mathematical fields, has been a characteristic of New Zealand work in stochastic processes and time series. Through the AML's programme of summer student employment, and under the eye of high calibre staff, a number of young mathematicians developed an interest in these fields during the 1950's and 1960's, and subsequently proceeded to PhD studies and professional careers in stochastic processes or related areas.

The local emphasis on time series was enhanced by the appointment of Geoff Jowett to the first university chair in Statistics in New Zealand. However, the AML, later the Applied Mathematics Division of the DSIR, remained the main New Zealand centre for work in stochastic processes throughout the 1960's and into the 1970's. It was really only in the 1980's that the university groups became large enough to sustain a research culture of their own. In particular, the setting up of the Institute of Statistics and Operations Research as a separate institution at Victoria University, and the massive expansion of student numbers in Auckland, allowed both universities to develop significant groups working in probability and stochastic processes. The decimation of the AMD, at about the same time or a little later, significantly reduced the national capability in these areas, among others.

2.1.2 Examples of New Zealand research findings significant in development of area

Outstanding in the early work done in New Zealand are Whittle's papers on spectral estimation, spatial processes, smoothing, combinatorial properties of Markov chains and multivariate extensions of Chebyshev's inequality, all undertaken while with the DSIR/AMD during the 50's. Some of these found later expression in his book "Prediction and Regulation". David Vere-Jones's initial work was in the theory of Markov chains, and he did much to shape the development of quasistationary distributions. Later he and co-workers made important contributions to the theory of point processes and its links to earthquake modelling (Vere-Jones, 1970). Also in Wellington, Peter Thomson and others have developed an international reputation for their work on improved seasonal adjustment methods, a topic of particular importance for a small country with relatively volatile economic indicators. Jeffrey Hunter did some of the pioneering work on discrete time queues which is just coming into vogue.

2.2 Strengths

2.2.1 Geophysical Modelling

A strong group in Wellington, both University and CRI based, and with connections in Palmerston North, are among world leaders in modelling of earthquakes. Three seminal models/techniques introduced are the branching model for crack propagation, the stress-release model (Zheng and Vere-Jones, 1991) and methods for probabilistic expression of earthquake hazard.

There has also been recent work of significance in analysis of volcanic eruptions, in climatology, and

in oceanography where recent work (Moore, Thomson and Shirtcliffe, 1988) challenged accepted views concerning the interpretation of spectra relating to ocean turbulence. Again, most of these practitioners are in Wellington and Palmerston North.

2.2.2 Probability in Forensic Science/Genetics

While not technically sophisticated from the area point of view, the work under this heading is certainly at the leading edge internationally in their field. Individuals in Wellington and Auckland are collaborating independently with legal/forensic experts on methods for presenting evidence in the courtroom and in DNA evidence. There is also an interdisciplinary group at Massey working on stochastic models of biological sequence evolution, whose work is highly cited internationally.

2.2.3 Stochastic Networks

A strong group in Auckland (and an outlier or two in Palmerston North), are working in conjunction with world centres at Cambridge (U.K.), AT&T/Bell Labs (U.S.A.) and Adelaide (Australia) on models for networks of queues and telecommunications systems.

2.2.4 Time Series Analysis

A group in Wellington have expertise in inference for time series and stochastic processes and are active in signal detection, seasonal adjustment methods and non-standard forecasting problems. This work is internationally recognised and has been part of recent or on-going FRST projects as well as international collaborations. In addition, there are more isolated researchers in other centres.

2.3 New Zealand Characteristics

Most research in this area tends to be generic in nature, generating techniques that have universal application. That which has a New Zealand character is usually driven by specific applications. In particular, the earthquake and volcano models use New Zealand data, and the climatology research is tailored to New Zealand conditions. The interpretation of DNA mixtures in forensic science does pose some singular problems due to " ... small populations, undergoing rapid genetic change due to migration and racial mixing, and very diverse in their genetic composition."

2.4 Gaps in the Knowledge Base

This is a large field, with few (<30) practitioners in the country. Some major topics with little, if any, research output are: stochastic differential equations, extreme value theory, stochastic geometry, stochastic optimisation and computational methods. There are single, isolated, researchers in: spatial processes/ image analysis, foundations of probability, theory of stochastic processes, convergence of Markov chains, limit theorems and large deviations.

2.5 Overlap with the Statistics Profile

One major area in the interface is that of epidemiology and population theory, where the researchers involved seem to regard themselves, and their work, as being statistics rather than probability/stochastic processes.

3 New Zealand's Capability

3.1 Strengths

Geophysical modelling (Wellington/Palmerston North) and stochastic processes (Auckland - both universities) are both reasonably large (but cohesive) groups with a clear focus and strong international links. An advantage for the former is the applicability of the work to New Zealand and consequent participation by CRIs and the government.

The field has also seen the recent appearance of a number of young, high-potential researchers, some returning to New Zealand from training overseas. The impact from this has yet to be fully seen, but a common characteristic seems to be the keenness with which they approach collaborative work, both within the area and interdisciplinary.

Because of the small number of researchers and the geographic isolation of New Zealand, there has been an emphasis on the practical application of methods, particularly within the now defunct DSIR/ AMD. This ethos continues today, with a consequent strength in interdisciplinary research.

3.2 Disadvantages/Limitations

3.2.1 Disadvantages

Because of the inherently technical nature of the subject, few researchers are CRI (rather than University) based (some 3 or 4 out of 30, roughly). Consequently the subject is poorly catered for in the research funding schemes. Also, the small number of researchers means that many are isolated, with the nearest person in the area being in a different institution or even city.

3.2.2 Limitations

A common theme from the respondents was the lack of time, both to do research, and to keep up with developments and extend their own knowledge. Many mentioned qualms about research funding, in particular "Much applied modelling is better suited to PGSF funding than the 'blue skies' Marsden, but FRST categories don't fit well." Also mentioned were the lack of research assistance "My main problem, shared by many others, is lack of local graduate students,

coupled to the restrictions on overseas students which prevent us from recruiting them." Inadequate computing facilities and library holdings were other areas of concern.

3.3 Absent and/or Declined

There are few researchers into the more technical aspects of the area, although there is one exceptional researcher of international reputation. The exceptions to this are in point processes and time series analysis, where New Zealand possesses expertise in both theory and applications.

There are fewer than a handful of Ph.D. students, due largely to the fact that the mathematical prerequisites are such that prospective students often receive offers from overseas institutions, which their supervisors recommend in the student's interest. This of course contributes to the lack of research assistance mentioned above, and results in the necessity of recruiting researchers from overseas. The comments made in this connection by Bryan Manly in the statistics profile are as valid for this area. There are a large number of expatriate researchers of high reputation in this field.

4 Opportunities

Aside from those groups mentioned in Section 3.1, which should be maintained and further strengthened, perhaps the greatest opportunity is in the field of time series, where New Zealand possesses a number of high quality researchers who are geographically separated, with individuals in Dunedin, Christchurch, Hamilton and Palmerston North. Wellington alone has more than one researcher, but even there they are split between institutions. There seems to be little collaborative work between them, except in Wellington. To a lesser extent, the same applies to reliability theory, with individuals in both Wellington and Palmerston North.

With regard to knowledge opportunities, research in this field is technical and fundamental in nature, and thus not specific to New Zealand. Problems of current international interest (Cf. Programme of the 4th World Congress of the Bernoulli Society, Vienna, 26-31 August 1996) where New Zealand possesses researchers with the ability to make significant contributions include limit theorems, stochastic networks, signal processing, large deviations, stochastic models in biology, theory of Markov processes, reliability theory, financial modelling, and queuing theory. Possible New Zealand contributions are not limited to this list, and the breadth of the field makes difficult the recognition of any clearly identifiable opportunities. New Zealand involvement in the development of this field would be both the result of, and motivation for, international collaboration.

5 Conclusions

In this field, there are two main groups: stochastic processes in Auckland, and geophysical modelling in Wellington. Massey University (with it's dual campuses) has strong links to both of these groups. There are also isolated researchers at Hamilton, Dunedin, and Christchurch (3 in different departments).

Aside from the groups identified, the main opportunity lies in the field of time series, where there is already a strong group in Wellington, with extensive collaboration between the university and CRIs, and with overseas institutions. Because of the size and multiple specialisations of the area, it is not really feasible to attempt to cover all the holes. The exception is the desirability of increasing emphasis on technical aspects, since the New Zealand experience shows that this is likely to generate many spin-offs into the more applied areas.

Of the 30 or so active researchers in this area, ages range from the early 30's to the mid 60's. However, just 4 are under 40, indicating that there is insufficient new blood coming through. The lack of current Ph.D. students in this area further exacerbates these concerns.

We would like to thank David Vere-Jones for rewriting the historical development section.

References

Moore, M I, Thomson, P J, and Shirtcliffe, T G L. (1988), "Spectral analysis of ocean profiles from unequally spaced data," *J. Geophys. Res.*, **93**, 655-664.

Vere-Jones, D. (1970), "Stochastic models for earthquake occurrence (with discussion)," *J. Roy. Statist. Soc. B*, **32**, 1-62.

Zheng, X-G, and Vere-Jones, D. (1991), "Applications of stress-release models to historical earthquakes from North China," *PAGEOPH*, **135**, 559-576.

J J Hunter
M S Bebbington
August 1996

Faculty of Information and Mathematical Sciences
Massey University
Private Bag 11222
Palmerston North

j.hunter@massey.ac.nz
m.bebbington@massey.ac.nz

Area Profile in Statistics

1. Introduction

In the classification for mathematical sciences that is being used for the MoRST analysis of New Zealand's scientific knowledge base, Statistics is considered to include Statistical Modelling, Sampling Theory, Statistical Inference, Medical Statistics/Biostatistics, and Data Analysis and Statistical Computing. There is therefore a strong overlap with the area that is described as Probability and Stochastic Processes, which covers Probability Theory, Stochastic Processes and Time Series. Time series analysis, in particular, fits equally well in both categories, while statistical modelling is often based on models for stochastic processes.

Applications of statistics span virtually all areas of commerce, humanities, medicine and science. These applications often involve the development of new methodology, and are therefore statistical research. It is, however, very difficult to keep track of them because they are usually published in subject matter journals. For this reason, it must be accepted that there will probably be some important research in applied statistics that has been carried out in New Zealand that is not covered in this profile. Nevertheless, some effort has been made to give an adequate representation of work in applied areas.

Much of the research in statistics in the last 20 years or so has been deeply influenced by the increasing availability of computer power. In 1979 Bradley Efron wrote a prophetic article called 'Computers and Statistics: Thinking the Unthinkable' in which he argued that statistical methods which would have been thought absurd in the 1950s because of the huge number of calculations involved would soon be common place (Efron, 1979). This has indeed occurred. For example, bootstrapping (which involves resampling an initial set of data and repeating an analysis thousands of times) has become a standard tool, and in recent times Bayesian statistics with calculations carried out using Monte Carlo Markov Chain simulation has been attracting increasing interest (Besag et al., 1995). These developments are reflected in pure and applied statistical research in New Zealand, which has become extremely computer-intensive.

2. New Zealand's Knowledge Base

It is fair to say that the statisticians in New Zealand as a group work at the leading edge of the subject. There are many individuals with international reputations in their areas of expertise and the methods used by consultants in universities and crown research institutes generally represent the best in modern practice. An important factor in contributing to this state of affairs has been the regular visits to the country of leading statisticians from other parts of the world, and travel overseas by New Zealand statisticians to attend conferences and to collaborate with colleagues in other universities.

A number of research groups and individual researchers in New Zealand are making important contributions in both pure and applied statistics. Some areas worthy of particular note are included in the following list. Those marked with # have a distinctly New Zealand character, in part at least.

Agricultural Science# Collaborative research in this area is carried out mainly by staff of Crown Research Institutes (AgResearch, Crop & Food and HortResearch) in support of projects on a wide variety of topics. Research in this area is also carried by individuals in several universities.

Archaeology Research on methods for analysing mortuary remains and other types of archaeological data has been carried out at the University of Otago in collaboration with the Department of Anthropology's programme of research on prehistoric Thailand.

Bayesian Inference There are groups of researchers at AgResearch, the University of Auckland and the University of Canterbury working on this topic.

Environmental Statistics# Staff from AgResearch, the National Institute of Water and Atmospheric Research, the University of Auckland, and the University of Otago are developing methods for environmental monitoring, impact assessment based on tests of bioequivalence, computer intensive methods, and graphics. A group in the National Institute of Water and Atmospheric Research also work on climate prediction.

Fisheries# A group at the National Institute of Water and Atmospheric Research are working on problems related to stock assessment and the management of fisheries, while a group at the University of Otago are involved with statistical aspects of the monitoring and control of the bycatch of marine mammals and birds that occurs accidentally during fishing operations.

Forensic Science# Work on statistical methods in this area is carried out at the University of Auckland.

Generalized Linear Models Research in various aspects of the theory and application of these models is carried out in many locations.

Industrial Statistics# Groups are working in this area at Massey University and the University of Waikato. Another group involves staff from Industrial Research Limited and HortResearch.

This research involves the development of statistical methods for quality improvement, including process control, the design of experiments, and improved estimation from non-standard samples. The Industrial Research Limited/HortResearch group is also working on applications to electrical engineering problems.

Marketing# Research on statistics in marketing research has been conducted at the University of Auckland.

Multivariate Analysis Massey University has a group working in this area, particularly on methods for discriminant analysis.

Production of Statistical Software# This activity is carried out at many of the crown research institutes and universities. Massey University staff have developed software for teaching statistics.

Reliability Theory Individuals at Massey University and Victoria University are working on reliability modelling and other aspects of reliability theory.

Samples and Surveys# Staff working for Statistics New Zealand are involved in research related to improved sample designs for surveys, small area estimation, maintaining the confidentiality of records from individuals, and other matters related to government statistics.

Seismology# A group involving staff from Industrial Research Limited, Massey University and Victoria University are working in this area, including the development of models for quantifying earthquake hazards based on precursory information.

Statistical Ecology# Several individual researchers and research groups work on methods for estimating wildlife population parameters and studying community ecology at AgResearch, Landcare, the University of Auckland, Victoria University, the University of Canterbury, and the University of Otago.

Statistical Genetics# AgResearch has an active programme in the development of statistical methods related to animal genetics and linkage studies while some staff at the Universities of Auckland and Otago are involved with similar methods for human genetics. Much of this research has distinctly New Zealand characteristics.

Survey Design and Analysis A research group at the University of Auckland has developed methods for analysing survey data collected with complex sampling designs, and has investigated the properties of adaptive sampling methods.

3. New Zealand's Capability

Table 1 is likely to be incomplete, but it should be a reasonable guide to the employment situation in New Zealand at the present time. It shows that there are about 170 individuals employed in crown research institutes, government departments, and universities who are likely to be involved in research for at least a part of their time. There are also a small number of statisticians who work as private consultants that may do some research at times. It is important to realize in this connection that in statistics it is often difficult to decide whether a particular task is applied 'research' or routine consulting.

Institute	**Researchers**	
Crown Research Institutes		
AgResearch	14	
Crop & Food	4	
Dairying Research Corporation	1	
Dairy Research Institute	2	
Forest Research Institute	5	
HortResearch	8	
IGNS	1	
Industrial Research Limited	3	
Landcare	1	
NIWA	20	
NZ Dairy Board	4	
		63
Government Departments		
Ministry of Agriculture	3	
Statistics New Zealand	25	
		28
Universities		
Auckland	20	
Waikato	8	
Massey	20	
Victoria	11	
Canterbury	5	
Lincoln	5	
Otago	7	
		76
		167

Table 1 *Approximate numbers employed in crown research institutes, government departments, and universities who are (or may be) engaged in statistical research for at least part of their time.*

There are currently about 70 students working on graduate degrees in statistics (including honours degrees) in departments of statistics, or mathematics and statistics, of which about 20 are doing PhD degrees. The number of students working on higher degrees in areas closely related to statistics (e.g. those working for a PhD in econometrics in an economics department) is not known. Although these numbers studying statistics seem quite reasonable, some evidence is accumulating which suggests that there

is a shortage of young New Zealanders with the background that is necessary for either theoretical or applied research in statistics. For instance:

It is generally necessary to recruit university academic staff in statistics from overseas.

At a New Zealand Vice-Chancellors' Subject Conference in Statistics held in June 1996 concern was expressed by delegates about the small number of students who are studying statistics to the level that is necessary as a basis for research. At the same subject conference, a representative from Statistics New Zealand noted that there is a great deal of difficulty in recruiting graduates who have the knowledge and ability to develop new methodology, as is required in the operation of their business from time to time.

Graduates in statistics appear to obtain employment quite easily. Consequently, it seems to be a fair assessment of the present situation that there is some shortage of personnel capable of statistical research, which is being overcome at the highest levels by recruitment from overseas. Of more concern is the lack of students being trained at a level that enables them to carry out research at the operational level that is needed by some businesses and government departments.

4. Opportunities

It is interesting that statistics staff at all New Zealand universities are appreciating the potential for greater interaction in teaching and research with staff in other subjects. Those who have been most involved in collaborative research are particularly well aware of the benefits that can result from joint research projects. Furthermore, these benefits may be greater in non-traditional areas. There is also a realization of the advantages of greater collaboration with crown research institutes, government departments, business, and industry.

There is, however, widespread concern that, because of its interdisciplinary nature, statistical research is not well catered for in terms of public support. The Marsden Fund does, of course, cover statistics within the Mathematical and Information Sciences category. This provides a welcome avenue for grants for 'pure' research. Unfortunately, the categories for the Public Good Science Fund (PGSF) have been set on industry based science outputs which appear both in principle and reality to be biased against bids in the mathematical sciences in general, and statistics in particular, where the benefits are generic rather than specific to one industry. Therefore what might otherwise be an obvious source of funding for applied statistics research does not provide this except to a small extent. Furthermore, statisticians in crown research institutes are usually included in bids in support of outputs that are not in the mathematical sciences area.

5. Conclusion

At present a wide range of high quality pure and applied research in Statistics is being carried out in New Zealand, and the knowledge base must be considered to be quite good for a country of this size. There are, however, two concerns in the statistical community about the situation in future:

- The number of students studying statistics to the level necessary for research may not be sufficient to meet the demand.
- There is a lack of public support for generic statistical research that can be expected to be of benefit in a wide range of applications rather than to a specific industry problem.

Helpful comments on this area profile at various stages of development were received from Dick Brooks (Massey University), Neil Cox (AgResearch), Chris Francis (NIWA), Harold Henderson (AgResearch), Peter Johnstone (AgResearch), David Rhoades (IGNS), Chris Wild (University of Auckland) and Xiaogu Zheng (NIWA).

References

Besag, J., Green, P., Higdon, D. and Mengersen, K. (1995), "Bayesian computation and stochastic systems," *Statistical Science*, **10**, 3-66.

Efron, B. (1979), "Computers and statistics: thinking the unthinkable," *Society for Industrial and Applied Mathematics*, **21**, 460-80.

Professor Bryan F.J. Manly

Department of Mathematics & Statistics
University of Otago, P.O. Box 56, Dunedin
bmanly@maths.otago.ac.nz

1996 Young Statisticians' Employment Workshop

Some of the participants at the workshop held at the annual conference

Conference in Honour of Shayle Searle

Friends and colleagues gathered at Cornell, August 9-10, for this conference to honour Shayle on the occasion of his retirement.

Shayle Searle was born in New Zealand, and gained his M.A. with first class honours in mathematics from the University of New Zealand in 1949. After two years in an actuary's office he went to Cambridge University where he earned the Diploma in Mathematical Statistics. Shayle was at Cambridge in its statistical heyday, studying with early luminaries of statistics including Sir David Cox, Frank Anscombe, John Wishart, and his tutor, Dennis Lindley. On returning to New Zealand in 1953 he was research statistician with the New Zealand Dairy Board for nine years.

While he was at the New Zealand Dairy Board, Professor Charles Henderson from Cornell University came and spent a sabbatical leave in Shayle's office. Following that Shayle won a Fulbright travel award to Cornell where he got a Ph.D. in Animal Breeding under the direction of Henderson. Thus began a lifetime of exchanges between the two which became mutually beneficial to both statistics and Animal Breeding. In 1962, Shayle was invited back to Cornell from New Zealand, first to be in the computing centre and later as a faculty member in the Biometrics Unit. He has remained in the Biometrics Unit ever since as Professor of Biological Statistics, except for being visiting Professor at Texas A&M, Florida State, Augsburg and Auckland.

Shayle's early and continuing interests in translating applied problems into solvable mathematical and statistical ones has been arguably his greatest contribution to the field. This has taken the form of a series of six popular texts (including the seminal Linear Models of 1971 - which still sells numerous copies today), his abundant research articles, and his contributions to the theory of statistical computing in linear and related models. In short, he has made a career out of proving that *applied mathematical statistics* is, in fact, not an oxymoron, but a valuable sub-field of statistics. Shayle must be the only author who can boast Annals of Mathematical Statistics articles with Dairy Board by-lines!

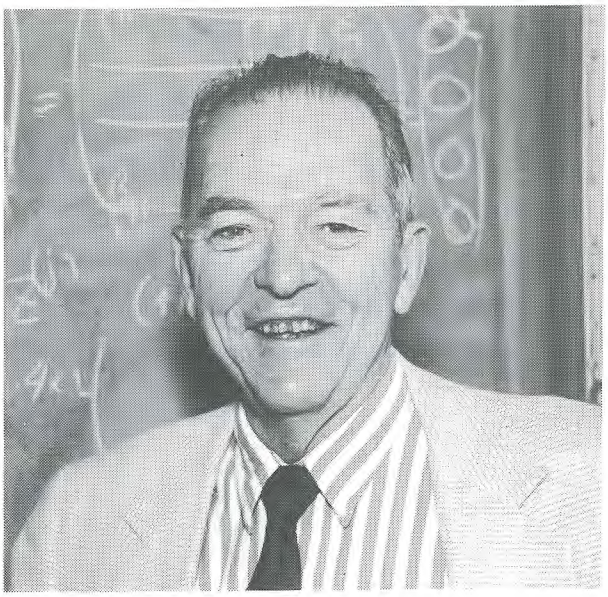
As one of the premier educators and lecturers in the field, Shayle is still in tremendous demand to give talks and seminars. His honours and awards: Fellow of the American Statistical Association, Fellow of the Royal Statistical Society, Elected Member of the International Statistical Institute, and recipient of the Alexander von Humboldt U.S. senior Scientist Award are all testaments to his achievements.

NZMS visiting lecturer, Valerie Isham

Valerie Isham, University College London, toured university and CRI campuses for 3 weeks in October and November as the New Zealand Mathematics Society visiting lecturer. She gave numerous seminars and shared her knowledge of stochastic processes and their application to epidemiology and parasitology. Mick Roberts co-ordinated her very successful visit.

Valerie Isham (left) with Jocelyn Dale and Neil Cox in Hamilton, reminiscing on days at Imperial College, London.

John Deely Accepts Professorship at Purdue



After almost 30 years of service to the statistical community of New Zealand, Professor John Deely is retiring from the University of Canterbury to accept a position as Professor of Statistics at Purdue University beginning 1 January, 1997. Since 1968, his cheerful energy, his wit, and his persistent interest in the foundations of statistical thinking and its application to scientific, commercial, agricultural, industrial, and social matters have had a profound influence on the personal development of myriad students and on the institutional development of standards of statistical practice in Christchurch and throughout the country.

John was awarded his doctoral degree from Purdue in 1965, and worked for three years as a research scientist in the Statistics section at Sandia Corporation in Albuquerque, having worked as an electrical engineer for NASA (at that time NACA) and having lectured in mathematics and statistics at Purdue throughout the 7 years before the award of the Ph.D. He began his career at Canterbury as a Senior Lecturer in 1968, progressing to reader by 1970, and being named Professor of Statistics in 1972.

Throughout John's years at Canterbury his academic interests have been balanced between teaching and research, both theoretical and applied. His concern with formally recognising the role of prior information about any specific applied problem produced insights for which he has been widely known as an eager proponent and practitioner of Bayesian methods. Details of his research results have been published regularly in journals as diverse as the *Annals of Statistics*, *Biometrika*, the *Journal of the American Statistical Association*, the *American Statistician*, *Journal of Statistical Computing and Simulation*, the *New Zealand Statistician*, *Sankhya*, and the *Journal of the Italian Statistical Association*. There is surely more in the pipeline, as John has continued his research activity at a regular rate; the more intrigued it seems, the more he learns.

In New Zealand, the array of his contributions to statistical practice spans major consultations and research with the New Zealand Roads Board, the Christchurch Airport Authority, the NZ Apple and Pear Board, Canterbury Television, the Justice Department, the Christchurch Health Benefits Centre, the Hawkes Bay Farmers Meat Company, Waitaki Freezing Works, and Trust Bank New Zealand, as well as numerous contributions to specific points of statistical evidence as an expert witness in the law courts.

Over the years John has been an extremely popular lecturer, across the spectrum of class sizes from 5 to 400. Not only have students appreciated that "you can come away with a good set of notes" from his lectures, but they have welcomed his ability to address real problems and to analyse them with insight and with rigour, from first year lectures through the honours seminars.

It is through his individual relations with the honours students and with his research students that John Deely will leave his most lasting influence on statistics in New Zealand. Over the years he has personally supervised the completion of 7 Ph.D. theses and 12 Masters theses, and numerous honours projects. Indeed, his students today populate virtually every New Zealand University and Research Institution and Statistics New Zealand as researchers and lecturers.

John's most active years of activity with the New Zealand Statistics Association were the 1970's and 80's when, among other activities, he initiated and developed the role of the Survey Appraisals Committee as a professional committee of the Association, serving as its Chair for two years.

Many of us have had the greatest fortune to know John as a friend, and it is in this way we'll miss his presence among us most. Top class 10-pin bowler, cricket batsman, bridge player, jazz lover, music lover, and dazzling dancer, we could always count on fun times at social events with John. He has known the love of Jesus, and he has long remained devoted to his favourite patrons Saint Luke and Saint Anthony.

Although he is departing these southern isles, answering the call of new sirens, John is not forsaking New Zealand completely, and will be accessible with regularity one is sure. He is a New Zealand citizen and leaves here a fine family of 6 grown children. Come to think of it, how did you find time to fit all this in, John? Farewell mate! Fly higher! We'll miss you, a lot!

Frank Lad

Job Announcements in Australasia

The ANZSTAT mail server, initiated by Rodney Wolff, has been a great vehicle for announcements, job vacancies and the like. However it doesn't in itself provide an archive of recent job vacancies that one can browse.

I have started an archive of job announcements in Australia and New Zealand at "http://www.maths.uq.oz.au/~gks/jobs/index.html", which I hope will be a service for statistical graduates especially. Please help me to keep it up to date by sending me WWW information about your job vacancy as well as posting it to ANZSTAT. You can either:

1. Set up a WWW page for your job and email me the address
2. Send me an HTML file and we'll archive it here at UQ, or
3. Send me a plain text file with the information, and I'll do a simple HTML conversion.

In the longer term I hope to make the jobs archive part of an Australian statistics server including conferences and data sets of Australasian interest suitable for teaching.

Gordon K Smyth
Department of Mathematics
University of Queensland
gks@maths.uq.oz.au

Journal of Statistical Software

The Journal of Statistical Software is published electronically on the UCLA Statistics Webserver. The URL is

http://www.stat.ucla.edu/journals/jss/

Access is free and unlimited. Articles are peer-reviewed.

O Hidden Markov Models

(to the tune of *O Christmas Tree*)

O hidden Markov models show
how processes most likely go.
From starting state to ending state
control does flow at varied rate.
But we don't know what's going on,
we're only guessing, based upon
the probabilities that we
observed so very carefully.

from *Science Carols*
by Lloyd Smith, Computer Science, Waikato

Hoare Research Software

Suppliers of statistical, mathematical and chemistry software to universities, commerce and industry.

http://www.hrs.co.nz/comm/hrs
Email Ray_Hoare@hrs.co.nz
Phone 07-839 9102, Fax 07 839 9103

Hoare Research Software with SPSS Australasia sponsor $1000 each year for the student paper competition (see page 1) at our annual conference.

Ray Hoare at our 1996 conference

Local News

Crop & Food

Statisticians from Crop & Food pictured together at the 1996 conference are Andrew Wallace, Fred Potter, Ruth Butler and John Koolaard. The painting is by Peter Smith.

Waikato

Information on two Masters scholarships in Industrial Statistics , sponsored by NZ Aluminium Smelters, is available from Ray Littler (littler@waikato.ac.nz).

Ken Russell is visiting for three months. Kim Bannon reports that a fabulous time was had by 15 young statisticians from Auckland and Waikato who got together recently for a meal and a tour of the Hamilton night-life. (They made it home in time to see Holmes! - Ed.) A recent graduate, Carole Wright, has reported favourably on her first experience of statistics Victorian-style working for that well-known Australian statistician John Reynolds.

Massey

What changes did I notice on returning to the Department after three months at Wollongong?

First, two visitors, Jenny Brown and Larry Weldon, had become part of the Department. Larry has helped Doug Stirling to finish a new first year textbook ('The Principles and Practice of Statistics - Understanding Data', due for publication in the middle of 1997). Larry also helped mark first year exams, after which he strongly advocated using senior students to do the job. Jenny was able to tell us what the serious problems are in data collection, and she understood the statistics too. Larry is now holidaying before returning to Simon Fraser University, and Jenny is revitalising statistics at Canterbury University.

Second, new capital letters in the vocabulary: KPI and PIA. 'KPIs' are easily obtained data by which Departments' performance will be measured, and 'PIA' means that what you say you are going to do will be used as evidence in the future. A Statistics Department should be good at playing these new games, and Dick Brook does not seem too oppressed by the education seminars for HOD's he has been hit with on his return from Sweden.

Gordon Knight, Associate Dean on the Albany Campus, retires at the end of this year. Gordon joined the Mathematics Department back in the days when mathematics and statistics were combined, and statistics has benefited greatly from his leadership in mathematics education.

The following seminars have been presented since August:

S Ganesalingam 'Comparison of regularised discriminant analysis with standard discrimination methods'

Tom Hassard 'Performance and perception: Using competency assessment tools to explore patients' perceptions of the care they receive'

Siva Ganesh 'Teaching statistics using spreadsheets: A demonstration'

Peter Jones 'Examining the educational potential of computer based technology in statistics'

Kay Lipson 'What do students really understand from computer simulation exercises'

Alasdair Noble 'Teaching and the WWW'

Jennifer Brown 'Is adaptive cluster sampling a useful technique in ecology?'

Larry Weldon 'Who needs the theory of statistics?

K Govindaraju 'Combined continuous lot by lot sampling plan'

Chin Diew Lai 'Continuous sampling plan for Markov dependent production process'

Jennifer Brown 'Sampling butterflies'

Greg Arnold 'Design and analysis experiments: Whither or wither'

Greg Arnold

AgResearch

We were pleased to welcome the NZMS visiting lecturer, Prof. Valerie Isham, to the AgResearch campuses at Whatawhata, Ruakura, Wallaceville and Invermay, where she shared her knowledge of stochastic processes and their application to epidemiology and parasitology. Mick Roberts attended the New Zealand Society for Parasitology Conference at Taupo in August and gave an invited paper on modelling parasite populations in the face of drug resistance.

At Ruakura, Neil Cox continues to explore the use of Excel for dynamic statistical graphics and data summary. Martin Upsdell's Flexi is becoming still more flexible and a new version (2.4) is being released. Martin has developed a module for analysis of assays, in particular RIAs as read by the Microman automated plate reader. It fits a smooth curve through a set of standards and produces estimates of the concentrations and their standard errors. It is being run by the lab personnel at Ruakura. Harold Henderson attended the joint statistical meetings in Chicago in August and spent a week at Cornell in conjunction with the Conference in Honour of Shayle Searle (see p. 18) on the occasion of his retirement.

David Baird, Dave Saville, Roger Littlejohn and Peter Johnstone are participating in the Genstat conference and courses in Adelaide in December. David is speaking on the use of the spreadsheet in Genstat for Windows, Dave on the geometry of the p-value and Roger on spectral analysis for replicated hormone experiments.

Mick Roberts

Canterbury

The students have finished all their exams and are now away on holiday while the lecturers finish off marking and recording the last of the exam papers.

Frank Lad hosted a special party to celebrate the publication of his book which lasted most of the day and was well attended. Frank had some copies of his book circulating for people to look at, the only problem was that with the large crowds of people there, only a limited number were able to have a look at it. The midday meal consisted of turkey with the evening meal being roast lamb, which from accounts from people who tried them was quite delicious. The worry was that as Graham Wood left us when he had completed his book that Frank might do the same. Luckily for us this did not occur. Frank's book is

Operational Subjective Statistical Methods: A Mathematical, Philosophical and Historical Introduction John Wiley ISBN 0-471-14329-0

He has copies available at the low price of NZ$75. If you would like one (or more), he can be contacted at F.Lad@math.canterbury.ac.nz.

Although Frank isn't leaving us, John Deely and Murray Smith are. John Deely is retiring (see p. 19), which will be a great loss to the department. John Deely's research interests included Bayesian methods and inference with emphasis on prior information, applications to sample surveys, quality control reliability and A.O.V. type problems and empirical Bayes decision theory. His speciality being empirical Bayes decision theory for which he was well known internationally. John Deely was known by his students for his sense of humour, his dislike of phone surveys, and his drinking of Coca Cola before lectures.

Murray Smith is leaving us to join his wife at Auckland University where he will be teaching statistics at the department of Engineering Science. This will also be a great loss to the department with his input in the media on lotto and possible outcomes of the election. His other research interests included optimal stopping, heteroscedastic regression, Bayesian statistics and applications of statistics.

A special farewell party to honour our imminently departing colleagues (John Deely, Murray Smith, James Sneyd (biomaths)) is being organised for Thursday, December 12, 7pm till reasonably late.

We have just had interviews for two vacant positions. One was offered to Dr Jennifer Brown who accepted and started work in the department on the 9th of December. The second position has been offered to another of the applicants and we hope to hear back from that candidate by the 13th of December.

One of our PhD students, Andrea Piesse, who submitted her thesis entitled "Coherent Predictive Distributions" a month or two ago has just got back from a relaxing two week holiday, where she somehow managed to find the sun and got a nice suntan. On her return the results of her thesis awaited her, which were high enough that she doesn't need to sit an oral exam. She will be very much missed in the department with her indepth understanding of a variety of topics not to mention her sparkling personality. We wish her well for the future.

Our new building is still progressing nicely and is being much admired by other departments, especially as, unlike all the other construction around campus, the construction of our building is not running behind schedule.

Our introductory SAS booklet was trialled on our stage 3 statistics students, which resulted in fancier projects this year but still the same level of stress among the students. After the projects were all handed in a number of students went out to celebrate with a meal of pizza and a few drinks. The students were helpful in finding not only all the errors in the SAS booklet, but also omissions, which resulted in a revised edition of the booklet being produced which was given out to the class.

The main complaint about SAS was the lack of time in which to learn it. Hopefully next year the students will be introduced to it earlier in the year with minor exercises before the final project. These minor exercises will be included in next years edition.

Julian Visch

Lincoln University

As summer research beckons, exam marking has all the appeal of a burnt sausage on a barbie. Chris Frampton dropped in to mark his share before returning to count either pinhole borer on the West Coast or possums on the Coromandel. He says he's not short of volunteers to carry his surfboard (a statistician on a surfing safari?). Valerie Isham entertained us with her talk of contagion models - very topical, after my first year class was decimated by a mystery virus the day I had my student evaluation. I mean, I do try to bias my sample, but to suggest I organised this is too much.

Jim Young

Contest Number 3

Set by Mr. Ree

Only two entries! The editor is wondering whether he wants to support this endeavour (i.e., provide a prize) if his readers don't appear to be interested. Be that as it may, I've awarded the prize of a copy of *Facts New Zealand* to Ross Leadbetter for ICOUNT, which evidentally is Jeff Hunter's number plate.

The editor has allowed me to set another contest. This time I want a statistical limerick. The prize of *Facts New Zealand* goes to the winner (I think the editor got a discount from SNZ for bulk buying). To add interest a copy of the *1996 New Zealand Yearbook* will be awarded if the winner can use 'heteroscedasticity' or 'kurtosis' as one of the words that rhyme (and it has to rhyme e.g., no 'kurtosis/basis').

The rules: my decision is final, you have to be a NZSA member, you can enter as often as you like, and I don't have to award a prize. Entries to the editor. If e-mailing put "Contest Entry" in the subject line. Contest closes April 1. Results, if any, in the next *Newsletter.*

Education

The Education Committee aims to improve the quality of statistical education for New Zealand students. It participates in advisory groups related to curriculum matters and helps organise conferences and courses for the benefit of those teaching statistics at all levels. With the support of some of our corporate members, the association sponsors prizes for statistical excellence at each of the regional Science Fairs.

Special Projects

The association has pursued a number of special projects in recent years. The focus for 1993, our Suffrage Centennial Year, was on a series of initiatives culminating in a book celebrating the role of women in statistics, and an associated display.

The Australian Journal of Statistics and the New Zealand Statistician are to merge in 1998. Pictured are Murray Jorgensen (Editor NZS), Helen MacGillivray (President SSAI), Ian James (Editor AJS) and Jeff Hunter (President NZSA)

Officers of the New Zealand Statistical Association

President **Jeff Hunter**
Information and Mathematical Sciences, Massey University
Secretary **Siva Ganesh & Greg Arnold**
Dept. of Statistics, Massey University
Treasurer **Gary Dunnet**
Statistics New Zealand, Christchurch
Newsletter Editor **Richard Penny**
Statistics New Zealand, Christchurch
NZ Statistician Editor **Murray Jorgensen**
Dept. of Statistics, University of Waikato

Committee and Convenors

Jennifer Brown
University of Canterbury
Mike Camden
Wellington Polytechnic
Sharleen Forbes, Jenny Mason
Statistics New Zealand, Wellington
S Ganesalingam, Steve Haslett
Dept. of Statistics, Massey University
Harold Henderson, John Waller
Statistics, AgResearch Ruakura
Donal Krouse
Industrial Research Ltd, Lower Hutt
James Reilly
ABG McNair, Auckland
Caryn Thompson
Dept. of Mathematics and Statistics, Otago
Jean Thompson
JAD Associates, Wellington

Young Statistician Employment Workshop in 1996

Application to join NZSA

I wish to join the New Zealand Statistical Association

Name:.....

Address:.....

.....

.....

.....

Phone:.....

Fax:.....

Email:.....

Occupation:.....

Employer:.....

Areas of Interest: eg, Experimental Design, Time Series, Stochastic Processes, Official Statistics, etc

.....

.....

Please circle membership category and enclose cheque made out to NZ Statistical Association.

Ordinary members NZ $30, Overseas $35

Student and Retired $15, Overseas $17.50

(NOTE: First year free for students)

Signature:.....

Date:.....

Post to NZSA, PO Box 1731, Wellington

For more information contact:
Siva Ganesh
Department of Statistics
Massey University
Private Bag 11 222
Palmerston North
Phone (06) 350 4258 Fax (06) 350 2261
Email nzsa@massey.ac.nz

The New Zealand Statistical Association (Inc)

PO Box 1731
Wellington

The NZ Statistical Association, founded in 1948, is New Zealand's only association for professional statisticians. The association has about 400 individual members and is growing strongly. Many of its members are employed by universities, government departments, or research institutes, with growing participation by senior students, who are offered free membership for their first year.

The constitutional aims and objectives of the association are *the encouragement of theoretical and applied statistics in New Zealand.* In 1992 the association agreed on a more comprehensive set of vision and mission statements including the short description:

> *The mission of the NZSA is to lead New Zealand to value and make intelligent use of statistical thinking and good statistical practice.*

(The complete vision and mission statement, which serves to guide the executive and membership in planning and decision-making, is available from the secretary.)

Services to Members

Members receive the official journal *The New Zealand Statistician* twice yearly and are kept up to date on statistical happenings within New Zealand and interesting overseas developments with regular newsletters. A feature of the New Zealand statistical year is the annual three-day conference, normally held in mid-year. In addition to invited and contributed papers on a wide range of topics, there are often special sessions with panel discussion on topics of current concern to the profession.

Ken Jury at the Flexi poster paper with David Wheeler. Martin Upsdell is demonstrating on the PC.

Professional Standards

At the 1995 annual conference the association adopted a 'Code of Ethics'. Particular attention was paid to the positions adopted by kindred organisations in Australia, UK, and USA on the question of formal accreditation of statisticians. No immediate action will be taken on a formal accreditation scheme but work is continuing on the preparation of guidelines of good practice.

Links with other Bodies

The association is an affiliated organisation of the International Statistical Institute and maintains close relations with a number of statistical societies around the world. It is also a member body of the Royal Society of New Zealand and is part of the Mathematical Sciences Council of New Zealand.

Cooperation with related societies sometimes leads to joint conferences such as the International Biometric Conference (IBC) held in Hamilton at the end of 1992.

On the terrace at the IBC

Survey Appraisals and Public Questions

The Survey Appraisals and Public Questions Committee aims to raise the standard of statistical practice and the level of public understanding of statistics in New Zealand by conducting independent appraisals of sample surveys, opinion polls and other statistical statements in relation to the statistical validity of their results. It is regularly called upon to comment on contentious polls and surveys.