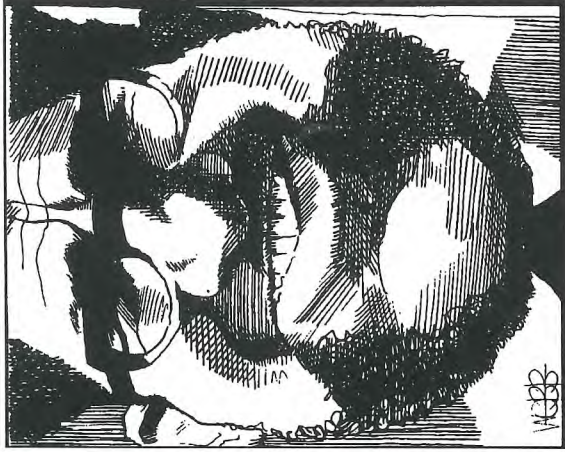


# newsletter

## How good are New Zealand's statistics?

*This essay by Brian Easton recently appeared in the New Zealand Herald and the Press (Christchurch).*



In December 1840, the British Colonial Secretary, Lord John Russell, instructed Governor Hobson that every public servant who failed in his (sic) statistical responsibilities was to receive no salary. If the Order is still in force, its application could well result in a substantial reduction in public spending.

It may seem extraordinary that within a year of the foundation of the government of New Zealand provision was being made for a quantitative description of the country. However the importance of statistics in the administration had long been acknowledged. As the poet Goethe commented two centuries ago, "it has been said that figures rule the world. Maybe. I am quite sure that it is figures which show whether the world is being ruled well or badly".

Thus the rulers are torn between needing statistics as a part of their management, and fearing statistics which may be judge the quality of their management. Jammed between the pressures is the Government Statistician and his department (Statistics New Zealand), which is required to collect the data, but undersupplied with the resources to do so. The 1994 annual report of the department makes gloomy reading, remarking that "New Zealand now operates a limited statistical programme relative to current needs"

*Continued on page 6*

## Foundation members of the new Department of Statistics University of Auckland



Front row (kneeling) from left: Steve Butt, Andrew Balemi, Werner Schmidt  
Second row: Leanne Wood, Edith Sharpe, Lovina McMurchy, Peter Mullins, Alastair Scott, Jiti Gao, Kerry Short  
Third row: Ilze Ziedins, Constance Brown, Siew Choo Soo, Lynne Gilmore, Chris Triggs  
Fourth row: Karina Sheath, Karla Ballman, Wiremu Solomon, George Seber, Matt Regan, Chris Wild, David Smith, Alan Lee, Arden Miller, James Curran, Robert Chan, Robert Gentleman  
Back row: Gita Mishra, Roland Thomas, Ross Ihaka

## A.C. Aitken Centenary Conference 1995 NZSA Conference Dunedin 28 August - 1 September 1995

Registration form is enclosed with this Newsletter.

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## The NZSA Exec visit the Christchurch Casino

Here is a brief overview of the financial activities of the NZSA. It includes budget rationale and decisions. I am relatively new to the treasurer's job (just over a year) and I still have anxiety attacks.

The NZSA is a small incorporated society. We do not claim GST; this saves a lot of work. As treasurer I am responsible for getting the subscriptions out and collected and the general financial running of the society (writing cheques etc). Each year I prepare a financial statement which is audited and presented to the Justice Department and the NZSA members (via the AGM and the *NZ Statistician*).

The AGM is the main forum in which the members are given the opportunity to participate in financial decisions. The AGM approves the budget for the following year including subscriptions, inescapable and highly desirable expenditure. That is, the 1995 AGM approves the 1996 budget.

The basic annual inescapable costs are roughly:

NZ Statistician	4,000
Newsletter	3,000
Royal Society Levy	1,200
Liability Cover	750
Executive (mail, teleconf etc)	1,500
Portfolios (mail etc)	750
Total	11,200

This \$11,200 expenditure is balanced by subscriptions.

In the 1994 AGM "President's Report" Harold reported that "The executive has put some effort into more clearly identifying the inescapable costs of running the Association. These include journal and newsletter publication, RS levy, liability insurance for those representing the Association, and minimal office expenses. We have adopted a policy of covering the inescapable costs with subscription income and funding other highly desirable initiatives from existing reserves and sponsorship. The exact nature of the highly desirable list should be discussed at the AGM. It is highly desirable that a clear annual budget be established."

At the AGM the following motions were accepted:

1. NZSA should fund inescapable expenditure from membership subscriptions.
2. Current reserves should be reduced to about \$15,000 (in 1994 dollars) over about 4 years. The association should seek to maintain this level. Reserves over \$15,000 will be referred to as surplus. \$15,000 will cover the liability excess for the SAPQC.
3. Surplus reserves should be applied to highly desirable expenditure.

4. Sponsorship should also be sought to help fund highly desirable expenditure, especially science fairs and support for young statisticians.

5. In the event of an agreement with the Australian society re journals, any consequential increased expenditure would join the inescapable category and need to therefore be funded by subscriptions. Since the AGM the identified highly desirable expenditure is:

1. Student grants to NZSA Conference \$2,000 (already spent);
2. Science Fairs: \$1,000 (only partly spent due to Statistics NZ sponsorship);
3. Investigating closer cooperation with the Statistical Society of Australia: \$1,000 (partly spent);
4. Publication of the Suffrage Book: up to \$7,500 in seeding finance (there is scope for this to be returned to the association).

So how do projects get some of the "highly desirable expenditure?" The identification of the "highly desirable expenditure" is a new process and the Exec are feeling their way, but the process is as follows. Submit a proposal through a member of the Exec. To assist the Exec it is helpful to prepare a full briefing paper including budget, timetable etc. We meet monthly so this will hopefully provide a quick indication if the request is successful. In the case of strategic directions (e.g., assisting young statisticians) the proposal may be deferred to the AGM.

If you have any suggestions (or requests) then please make these known to the Exec.

*Gary R Dunnet, NZSA Treasurer*

## Exec Newsflash Suffrage Centennial Project

Readers may have noticed a Listener article suggesting that this NZSA project fell in the category of funded but not completed. In fact the excellent exhibit, *Opportunities: Living Numbers*, and brochure largely funded by a Suffrage Centennial Trust grant has been a great asset to those promoting careers involving maths and statistics, especially for female students. It was launched in April 1993 and is currently touring schools in the Waikato.

## Women with Maths: Making a Difference

The production of a book with the working title, *Women with Maths: Making a Difference*, on the same theme which should also be a valuable resource for secondary schools, has required much additional work and extra funding. At the December meeting the exec was pleased to be able to approve sufficient seeding funds, in addition to anticipated support from elsewhere, to enable a projected release in early 1995. Many thanks are due to Jean Thompson and Helen Stott for finishing off this project.

*Ray Littler, Minute Secretary*

## Editorial



Picture me some years ago as a recently-ex pure mathematician three weeks into a job as an applied statistician who had just been flown halfway down the country at government expense to attend a crop trial design meeting. Can you imagine my terror at having to answer a

technical question flung at me by a seasoned and cynical crop scientist? I think that any consulting statistician finds the first time with a new client or in a new area of application to be a most stressful business.

I think that it is particularly hard for mathematicians, being used to a logical and largely context-free set of structures to have to teach, consult in, and otherwise grapple with the design of experiments. There is something else that makes it difficult as well: it takes both money and authority to carry out an experiment. To participate in the design process is to attempt to exercise power, something that can be very stressful to a person whose experience may be concentrated in solitary study and preparation.

And yet more than anything else this can be seen as the centre of our subject, and it is something moreover that thoughtful statisticians want to see reflected in the school curriculum, as the quoted comments on pages 10 and 11 make clear.

It's not easy, then, to bring this sort of material into the secondary school mathematics class, or even into university teaching, but the rewards will be great if we can build up in New Zealand society an appreciation of the way in which controlled experimentation can lead to understanding and some feeling for what the principles behind it are. Have a look at the education committee's suggestions for a teaching block on the Design of Experiments on pages 10 and 11. In fact I have not had the space to include all of the education committee and the President's fine work on statistics curriculum changes but you can obtain more information off the NZSA server. Email [mailserv@invermay.cri.nz](mailto:mailserv@invermay.cri.nz) the one-line message directory [[nzsa](#)]F7\_stats\_clipons.txt files; send [[nzsa](#)]F7\_stats\_clipons.txt will return Mike Camden's full report and send [[nzsa](#)]F7\_stats\_clipons\_letter.txt retrieves related correspondence from Harold. Help returns the help file. The education committee welcomes your feedback on this.

Statistics has been in the news lately with the SAPQC's criticism of the adequacy of means for monitoring the effects of changes in benefit levels. I have included an extract from this report and also an article by Brian Easton about the adequacy of New Zealand statistical information in general. Brian is an effective advocate and I'm sure that his example will help us be more outspoken on resources for statistics, even beyond the area of official statistics that is his concern.

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Subcommittee convenors: Stephen Haslett (SAPQC), Mike Camden (Education), John Waller (Publications), Vince Galvin (Science Fairs), Garry Dickinson (Standards), Greg Arnold (History), Helen Stott (Women's Suffrage Project), Katrina Sharples (Public Relations)

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### President's Card



Harold Henderson is interested in your views on Association activities.

phone: (07) 838 5151 direct dial

or call AgResearch

(09) 307 0784 Auckland

(06) 356 8019 Palmerston North

(04) 528 6089 Wellington

(03) 325 3011 Christchurch

and ask for Ruakura extension 5151

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Statistics, AgResearch Ruakura, Private Bag 3123, Hamilton

## Letters to the Editor

### Bill Warren

You mention in the September 94 issue that Bill Warren was the first editor of the NZ Statistician. He was in fact a great deal more than this. He put forward the idea of a journal for a couple of years running to the AGMs before having it accepted. There was a lot of opposition at the time:- "Why waste money on a journal?", "No one's going to read it anyway", and "Where will we get sufficient articles of good quality to make it worthwhile?", were some of the remarks passed at the meetings. Many members felt that there were a sufficient number of statistical journals already being published, and that any worthwhile research done here could be published in an overseas journal, and that therefore anything we published would probably be rather trivial. Nevertheless, Bill kept on pushing his idea, and it finally began to be published, mainly because Bill agreed to do all the necessary foundation work and to become the first editor, in 1966.

*Stan Roberts, Wellington*

Congratulations to Bill Warren on being named "Distinguished Statistical Ecologist" at the International Ecology Congress in Manchester in August, along with Bryan Manly as reported in the September *Newsletter* - that makes two "New Zealanders" so honoured. Incidentally, Bill and Bryan are both associate editors of the new *Journal of Agriculture, Biological and Environmental Statistics (JABES)*. -Ed

### Tribute to Prof Campbell

Kit Withers thoughtfully sent me a copy of your NZ Statistical Association Newsletter with its special mention of tributes paid to Dr Jim Campbell who I greatly admired. What I learnt from Dr Campbell enabled me some years later to invent a very specialised piece of equipment while at the University of California. It was used to evaluate the quality of plastic concrete and has been used all over the world. Particulars of the invention were published in an Australian professional journal and about the same time an article appeared in an American Magazine covering a similar invention by an American living in the State of Washington. Then a very prominent engineering authority (Stanton Walker by name) living in Washington DC decided that he would need to determine who was first with their invention. While he had commenced his investigations he unfortunately died so I have never heard of any result. Dr Campbell would never have learnt of my being able to apply his teachings in this field but it is another example of how his work has impinged on industrial development.

*M A Craven, Wellington*

## Young Statisticians Get Organised



Marianne Vignaux, a scientist at MAF Fisheries Research in Wellington, has recently been appointed coordinator of a sub-committee of the NZSA Executive charged with identifying services that NZSA could usefully provide for "Young Statisticians". The term "young statistician", Marianne says, is being interpreted fairly broadly: "We include mature students in that, of course, as well as anyone new to a career in statistics". Marianne wants to hear from anyone who would put themselves in that category. "We are here to help you", she says, "and we want ideas, wishes, as crazy as you like". Ideas that have already been discussed include mini-conferences, seminars, and other forms of information exchange. "People need an opportunity to meet others in similar situations, to exchange ideas, talk about their work, and network".

It has also been suggested that NZSA could organise seminars covering career related topics such as "What organisations employ statisticians?" and "How can I get myself a job as a statistician?"

"As someone very new to the business myself", says Marianne "I know I would have appreciated courses in topics like "How do you do statistical consultancy?" or "How do I explain statistics to non-statisticians in my organisation?"

Marianne also feels that just making information available like, who employs statisticians, what do they do, who can I contact, would be extremely useful for someone trying to start a career as a statistician. "I sure wish it had been available for me" she says. She is keen to hear from anyone who would like to comment, or to tell her about their ideas. She can be contacted at MAF Fisheries, PO Box 297, Wellington vignauxm@frc.maf.govt.nz  
Phone (04) 386 1029 Fax (04) 386 0574

## Desperately Seeking Comments

In the September *Newsletter* Harold Henderson devoted much of the President's Page to the proposed Code of Conduct. Specific questions derived from the August AGM were raised and the membership was invited to respond. The response rate achieved has been only just above zero. PLEASE give the topic some thought and let me know how you feel as soon as possible.

*Garry Dickinson*

*gdickinson@stats.govt.nz*

*Fax (04) 472 9135*

## W Edwards Deming 1900 - 1993

W Edwards Deming died in December last year, at the age of 93. Deming was best known for his work on quality; and particularly his work on quality in Japan. This work led to much of what is known today as *Total Quality Management*. Although well-known in Japan, he remained largely unknown in the West until 1980 when his Japanese work was presented on the television documentary *If Japan can, why can't we*.

The Japanese recognised his contribution by setting up the Deming Prize for Quality. And in 1960, the Japanese Emperor awarded him the *Second Order of the Sacred Treasure*, an award normally reserved for Japanese.

He has been honoured by both the applied and theoretical statistical societies in the USA as well as numerous universities. In 1987, US President Reagan awarded him the National Medal of Technology. Nevertheless, he was frustrated at the way much of American business, with a number of notable exceptions, ignored the quality message and the need for urgent change. He renamed the 1986 edition of his book *Quality, Productivity and Competitive Position as Out of the Crisis*.

Deming had extraordinary vitality and maintained a schedule that his much younger associates found difficult to follow. Even in his last year he led 30 four day seminars, the last being in California in early December.

Despite the honours and eventual recognition, Deming maintained a simple lifestyle, an interest in people, and listened as much as he talked. He described his *14 points* as aiming to make it possible for people to work with joy.

Deming's background was statistics. He received his Ph.D in physics from Yale University in 1928 but then turned to statistics in agriculture. He spent a year in London studying under R.A.Fisher. He contributed to the early development of statistical methods. Particularly important for Deming was his friendship and association with Walter Shewart, the quality control pioneer. In 1938 he joined the U.S. Bureau of the Census and helped develop perhaps the first application of quality procedures to a non-manufacturing problem: the U.S. census. During the war he set up training courses on statistical quality methods for those involved in wartime production. His first visit to Japan was at the invitation of General MacArthur to work on the first post-war census. This gave him the contacts with Japanese business that led to the Japanese work on quality.

After the war, the quality lessons in the USA disappeared; the emphasis was on quantity, not quality.

*There was nothing - not even smoke.* The problem was that it was the technical people who had been educated in the quality methods, not the management. So in Japan, he was determined to train management as well as the technical people

Deming made two visits to New Zealand, in 1984 and 1986. He gave one 4 day seminar in Auckland in 1984 and 4 day seminars at several centres in 1986. These were the turning point for a number of senior managers in New Zealand. Fisher and Paykel, a particularly keen supporter of quality methods in New Zealand, sent 50 of their staff to the 1984 seminar.

Deming's message is summarised in his *14 points, the seven deadly diseases* and the *PDCA-Deming-Shewart* cycle. The version of the fourteen points given in the March 1994 *Quality Progress* are reprinted here on page 16. Surprisingly there is little about statistics in the 14 points. Yet there is the theme of avoiding the misuse of unreliable data and setting up the atmosphere where reliable data can be obtained and used. Particularly offensive to Deming was the use of poor data or simplistic analyses to grade staff or set goals or generally put people down. On the other hand the effective use of data is an essential part of his programme.

Peter Drucker (of M.B.O. fame) describes the greatest gains arising from *statistical quality control* as arising from the social gains that it brings about. I don't think Deming would be unhappy with this judgement.

Robert B Davies, Consulting Statistician  
Robert.Davies@vuw.ac.nz

## Mathematical and Information Sciences

The Royal Society of New Zealand's Committee on Mathematical and Information Sciences (MISCNZ) was launched on September 29. There is a good chance that this will become a strong, effective and broadly-based lobby group for the mathematical and information sciences. Jeff Hunter and Jean Thompson represented the NZSA at the inaugural meeting.



Some of those gathered at the launch of MISCNZ

*Continued from page 1.*

and describes the most significant deficiencies in official statistics. It is easy enough to say that the department is always demanding more resources than the country can afford. Of course professional pride is important, but it is also that which generates the worth (or otherwise) of the data.

Take the consumer price index (CPI), probably the highest quality data series produced by the department. The CPI is used in legal documents because of its reliability, while the country almost comes to a breathless hush each quarter when the index is to be announced, such is its importance in our assessing of the economy. (The agreement between the Governor of the Reserve Bank and the Minister of Finance designates a modified version of the CPI as the measure by which inflation is to be assessed and so how monetary policy and interest rates are to be regulated.) The CPI's quality and public trust has been built up over the years because of the constant pressures to improve it. The Government Statistician has said that he is worried about the CPI, not because it lacks reliability, but because the processing system is inefficient. Sure, we can continue with the current system for a while longer, but ultimately can the public continue to trust a series which, whatever the quality of its methodology and the diligence to which that is applied, is compiled on an increasingly obsolete system?

The CPI may be our highest quality series, but there are many others which are much more problematic, and can even be misleading. It could be said that the "Rogernomics" reforms were in part precipitated by a faulty GDP series, which gave a false impression of how the economy had been performing previously. But at least we have some macro-economic statistics, which with care - rarely seen in public - can be used to assess what is happening to the economy. Other areas of public concern are almost opaque as far as statistical measures are concerned, and public discussion frequently falls back on data which every expert will tell you is wrong and deceptive.

The problem does not stop at the inadequacy of the funding of New Zealand statistics. Where there is data, policy makers can be very unwilling to use it. A report recently prepared by the New Zealand Statistical Association (NZSA), for the New Zealand Council of Christian Social Services, lambasted the government for the inadequacy of its monitoring of the effects of social policy on children. As the Council executive officer, Bonnie Robinson, said "current mechanisms for setting benefit levels for families with children provide no guarantee that the basic needs of children in such families for food, clothing, and shelter will be adequately met." This may well be

the single most important statement made about children in this International Year of the Family, but do not expect a prompt response. (Recall that when the Treasury was thinking about these issues, they set their food requirements for poor adults at below that which we feed prisoners, and squeezed children even more.)

Much of the data which could be used for a proper assessment already exists, built up over the years by Statistics New Zealand and voluntary researchers. But there is a notable lack of willingness to use the data to investigate family incomes, probably because the indications are that it would demonstrate current income levels for children are woefully inadequate.

It is a good thing it is not also international year for employment, personal safety, housing, social justice, the environment, or voluntary work, because the NZSA would have to say largely the same thing about deficiencies in each of these areas. Given the choice between systematic analysis and an anecdote our politicians and policy makers will plump for the latter, no matter how misleading.

This reflects a lacuna in public understanding about the nature of the statistical method. The statistician becomes inured to the howlers which the media solemnly reports, the journalists reflecting the wider public innocence. Much of the population thinks that statistics is a branch of mathematics, and is therefore impenetrable. Most of the rest seem also to think it is about mathematics, unaware that statistics is an interface of abstract thought and the real world. We teach the subject badly at schools, with little attempt to get across the few simple ideas which would reduce the daily diet of statistical nonsense.

The cynic might say that the rulers have it right. Realizing the ability of a statistically literate and informed population to judge the quality of their governance, they have ruthlessly discouraged such attributes. But Russell had it right. Governing a modern state involves a sound data base, and the skills to use it. When we look at the actuality it is almost as if the country's ambitions are now set on being a second rate, third world, nation. We are in danger of having a statistical base of a corresponding lack of quality.

Brian Easton

*Although known better as an economist, Brian Easton is also a social statistician, a Fellow of the Royal Statistical Society, and a member of the macro-economics advisory committee of Statistics New Zealand.*

**Good News:** After extensive negotiations the Government has agreed to provide an extensive capital injection to upgrade the IT facilities at Statistics New Zealand. Perhaps this is a significant turning point in the commitment of government to provide good statistical information. -Ed

## **SAPQC report on the statistical adequacy of current monitoring of social welfare benefit levels**

*This is the summary section of the Survey Appraisals and Public Questions Committee Report referred to by Brian Easton in his article.*

### **1. Government responsibilities**

A. While current legal requirements to monitor policy exist under the Public Finance Act these requirements monitor how efficiently money is being spent, not whether the area on which money is being spent is appropriate for solving any underlying social problem.

B. The Department of Social Welfare is under a legal obligation to monitor the effects of its policies under the Children and Young Persons Act, but whether monitoring the effects of changes in benefit levels falls under this umbrella is a legal rather than a statistical question. Current monitoring of the social effects of benefit levels is however not statistically adequate for a matter of major social consequence. The Social Policy Agency of the Department of Social Welfare in seeing its role as providing 'accurate assessment of the impact of policy changes on the people of New Zealand' needs improvements to the Statistics New Zealand Household Economic Survey (HES), formerly the Household Income and Expenditure Survey (HEIS), to meet its objectives.

### **2. General points on data**

A. The currently available information on which decisions on Social Welfare benefit levels are based is not statistically adequate to assess the effects of policy changes on benefit levels, nor is it adequate for Treasury and IRD to monitor the social effects of general tax policy. In carrying out its brief the SAPQC was made aware that other sources of information were used for setting benefit levels. Both the Treasury and Social Welfare indicated that information other than HEIS was used, but neither was able to explain these sources in any detail or to convince the SAPQC of their statistical adequacy. In the professional opinion of the SAPQC current monitoring of the social effects on children of families receiving benefits is not adequate, and the current mechanisms for setting benefit levels do not provide a guarantee that the basic needs of children in such families for food, clothing, and shelter, are adequately met.

B. The importance of adequate information in planning economic policy is reflected in the use that Treasury make of HEIS information. Major decisions affecting New Zealand's economic and social future are currently being made using inadequate data. Better publicly available information would provide a sounder basis for adequate action and intervention.

### **3. Comments from Government Departments**

A. The best available source of statistical information has been the Household Expenditure and Income Survey (HEIS) implemented by Statistics New Zealand. The HEIS

is methodologically sound but has a sample size too small to provide adequate information for benefit level decisions. In the view of both Statistics New Zealand and the SAPQC, current sample sizes do not allow accurate information to be available for families with one, two, or three children. Use of equivalence scales to combine information is at best an interim solution to the data inadequacy issue. These problems will remain after the current redesign of the survey unless additional funding is made available to allow a substantial increase in the sample size for the redesigned survey. In conjunction with the redesign, this survey has been renamed the Household Economic Survey (HES) from April 1 1994.

B. Information from the HEIS is currently used by the Department of Social Welfare, the Treasury, and the Office of the Commissioner for Children, among other agencies, to make decisions or recommendations with financial consequences considerably in excess of the costs of improving the HEIS/HES to the level of statistical accuracy necessary to make those decisions.

### **4. SAPQC Comments**

A. All of the government departments and non-government agencies consulted that make use of HES/HEIS information, want the sample size for the HES/HEIS increased to a statistically acceptable level. None however believe they have sufficient current funding to make a substantial contribution to these costs, which are likely to be in the range one to two million dollars per annum.

B. Government estimates within the Department of Social Welfare indicate that in 1993-94 the comparative emphasis was on detecting fraud rather than on monitoring. The monitoring allocation includes salary and overhead costs, and work necessary by law under the Public Finance Act. There is evidence that further funding is necessary to statistically assess social impact and adequacy of benefit levels. As an illustration of this phenomenon, the 1995 estimates of appropriations for the New Zealand Government indicate that in the 1993-94 financial year \$33,710,000 and \$27,966,000 respectively was spent on reduction of fraud and abuse, and on debt collection, while the total spending of the Social Policy Agency was \$9,025,000.

C. The SAPQC would suggest that the current level of funding for sound research to assess the social effect of government policies in the area of benefit payment relating to families with children is currently inadequate, and that current Official Statistics collections in this area are not sufficient. Either amendments to HES, or a separate survey more focused on questions relating to poverty, is required.

D. The cost of improving data collection in the area of monitoring of benefit levels to an adequate level is likely to be small in comparison with the risk of making inadequate decisions in the absence of reliable information.

E. Current work on poverty issues has shown considerable ingenuity in making use of data collected from various

sources, under what are often very serious financial constraints to such research. The efforts of those involved ought not to be denigrated; indeed it is remarkable in the circumstances. The question that the SAPQC has addressed however is not whether the best use is currently being made of the available resources to monitor the effects of social policy in these areas, but whether those resources are adequate.

F. The Office of the Commissioner for Children has stated that: '... it is highly desirable to have improved:

- Income data: more detailed analysis of census income data by family structure
- Costs of children: specific research taking the family budget standards approach to the costs of children
- Expenditure data: larger surveys from time to time on expenditure to enable reliable estimates of expenditure patterns by family structure
- Equivalence scales: specific research to provide a basis for equivalence scales based on NZ standards
- Poverty standards: the development of standards of adequacy of income for different family structures in New Zealand'

The SAPQC would support the view that this information is necessary, in conjunction with macro-economic data, for setting of adequate and sustainable benefit levels for families with children.

*If you wish to obtain the full report email the 1 line message send [NZSA]WELFARE\_SAPQC\_OCT94.TXT to mailserv@INVERMAY.CRI.NZ*

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## All others must bring data.

*A personal view from John Maimdonald.*

### Financial data

Legislative changes since 1989 have ensured that the New Zealand ship of state is awash in financial data. There remains scope for improvement in its collection and use. Is data collected for reasons of control likely to provide an accurate and unbiased assessment of the use of time and dollars? Would judicious aggregation, before entry into the computer and while those who know the background can deal with anomalies, provide data that is more usable and relevant? Do those who record the data find it possible to use the categories in a clear and consistent manner? For example, the definition of 'overhead' may vary widely.

The focus on financial management has perhaps worked well enough in changes to electricity supply, postal services and telecommunications. Any hiccup brings immediate and publicly obvious effects, giving a form of public accountability that is absent in many other areas of change.

### Changes to health and science

In health, most hiccups are sporadic in their effects. The potential indicators of effective functioning are diverse. An informed judgement of the effect of changes demands a careful and systematic assessment of relevant data. Surgical waiting lists are one measure. It has been left to the lobby group Coalition for Public Health to publish the

figures (*N. Z. Herald*, Nov. 17). We may wish, in vain, for wider-ranging data. It may be that Government prefers to focus its attention on 'selling' the changes.

Official assessments of the impact of science changes have used very limited and biased data. Official sources have been the bidding process and the views presented by managers. Both these sources present a highly filtered view. Surveys conducted by the N.Z. Association of Scientists (NZAS) indicate disturbing trends (*Listener*, Oct. 22, p.54), for example a perceived lowering in the quality of science. The responses of science bureaucrats have mixed thinly disguised annoyance that scientists should try to collect such data with criticism (some of it well-founded) of surveys that have inevitably cut corners. The NZAS attempted, not altogether successfully, a task which their bureaucratic critics had totally neglected.

### Decision-makers and voters

Questions of the quality of existing data for decision making extend to many areas of Government, as the Government Statistician made clear in his annual report (*N.Z. Herald*, Oct. 18). Statisticians have not just a right, but a duty, to make their voice heard. Until both decision makers and voters have access to the data-based information that will allow informed decisions, we cannot claim to function as a modern enlightened society.

I once heard Brian Joiner quip: "In God we trust. All others must bring data". Who else but gods would one appoint to rule Godzone? Being gods, well of course they have no need to bring data! Is that really what we believe?

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

### Draft programme and registration form enclosed

The Programme Committee for the A.C. Aitken conference is keen that all of the targeted subject areas (Actuarial Mathematics, Linear Algebra, Numerical Methods, and Statistics) have good and interesting talks. As the person chairing the committee I obviously completely share this aim. But as a statistician I am particularly concerned that the statistics sessions are first rate, and that the conference will be remembered for years to come as an important event for our subject. This is especially the case because the conference includes the Annual Conference of our Association and the Third Pacific Statistical Congress.

In order for the statistics component to be a success we must have a large number of talks from members of the Statistical Association. I am confident that these will be forthcoming, but it will help enormously with organizational matters if we know as soon as possible what these papers are likely to be about, and have some idea about numbers. Therefore, if you have in mind giving a paper please send me an



email or letter to let me know the approximate title. There are four particular types of session that you might like to aim for with a paper:

(a) A workshop on **Matrix Methods in Statistics** is scheduled for **Monday 28 August**, possibly with some sessions later in the week as well. George Styant is in charge of this, and has probably contacted many potential speakers already.

(b) I am organizing a **workshop on environmental and ecological statistics on Tuesday 29 August**. I am pleased to say that Brian McArdle (Auckland University) and Graham McBride (NIWA) have agreed to contribute here - but there is still plenty of space for papers on ecological sampling, population ecology, environmental monitoring, water quality, etc.

(c) The **annual meeting of the NZSA** will be held from **Wednesday 30 August until Friday 1 September**. For this, **papers on any aspects of statistics** are welcome, and sessions will be set up according to what is received. There is a reduced fee for just attending these sessions (see the registration form).

(d) On **Friday 1 September** there will be a seminar on **Financial Time Series**. This idea has not yet been developed far but papers are definitely required.

PLEASE, send me that email or letter NOW, offering your paper or making any other suggestions that will help make this conference a great success!

*Bryan Manly* (P.O. Box 56, Dunedin;  
bmanly@maths.otago.ac.nz)

### Literary Corner

*Dickens, C. (1854), Hard Times, Penguin, p 158*

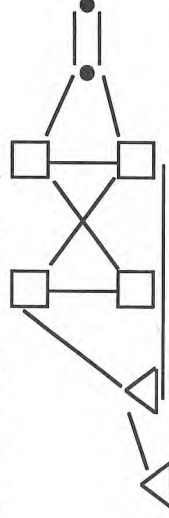
Now, this gentleman had a younger brother of still better appearance than himself, who had tried life as a Cornet of Dragoons, and found it a bore; and had afterwards tried it in the train of an English minister abroad, and found it a bore, and had then strolled to Jerusalem, and got bored there, and had then gone yachting about the world, and got bored everywhere. To whom this honourable and jocular member fraternally said one day, "Jem, there's a good opening among the hard Fact fellows, and they want men. I wonder you don't go in for statistics." Jem, rather taken by the novelty of the idea, and very hard up for a change, was as ready to "go in" for statistics as for anything else. So, he went in. He coached himself up with a blue book or two; and his brother put it about among the hard Fact fellows, and said, "If you want to bring in, for any place, a handsome dog who can make you a devilish good speech, look after my brother Jem, for he's your man."

*with thanks to Mick Roberts*

*Self, W. (1991), The Quantity Theory of Insanity, Penguin, p121.*

The trial was conducted over a period of six months in four distinct 'trial periods'. The results were monitored by me purely in the form of computer data. I never had any direct access to either the mechanics of the trial itself, or even to the intermediate collection of data. Naturally a double-blind trial involves not only the technician who is directly monitoring the trial to be unaware of whether he is administering a placebo or not, but also the overall administrator of the trial - be he psychologist or statistician - to be unaware of whether he is really administering a trial, or just carefully collating and analysing figures, totals and percentages, completely at random. Thus, two of the groups of data that Zack Busner fed through to me comprised respectively: the number of snail trails he had counted, smearing across the fissured concrete apron, wreathed in bindweed, that lay in the dead centre of the waste ground behind the Concept House; and, a random selection of handicapping weights from the pages of a back number of the *Sporting Life*.

On the other two occasions the data was, of course, 'real' - although in a very restricted sense. The two real trials contained an obvious reversal. In one, the mental patients were given an economic placebo and the Concept House inhabitants, money. In the other this was reversed. The butchers [controls] were given, arbitrarily, either money or virtually useless discount vouchers for household cleaning products. Thus, the overall form of the trial could be depicted by a schematic diagram:



To my mind this expressed with absolute clarity the limiting conditions necessary for a cost-benefit analysis of sanity variables. Of course the informed reader will have already detected the lineaments of Quantity Theory in the structure of the trial diagram.



*1994 NZSA/ORSNZ conference*

## Education Committee



*Some members of the education committee (from the left) Caroline Smith, Peter Fleming, Sharleen Forbes, Irene Cassidy, Mike Camden and Paul Ackerley*

We are delighted to have some more contacts around the country and would welcome further contacts. We are also delighted to add two Wellington people to the committee, Irene Cassidy of CIT and Pip Arnold of Sacred Heart College, Lower Hutt.

Some recent decisions by NZQA led the Ministry to set up a group to investigate further topics for the 7th form level (level 8) of Maths in the New Zealand curriculum. This group met 14-16 November. The President and Executive and other interested members of NZSA put considerable effort into sending a letter to the Minister about this process. The Education Committee, with support from other interested members, concocted a six page paper of input for the group. We recommended three further blocks of work, namely Designing of Experiments, Investigating Pairs of Variables and Time Series. Feedback suggests that the group altered the structure somewhat. Some extracts from this paper follow this report.

NZQA's plans for Unit Standards in Maths (which includes Statistics) are as follows :-

The Units for Level 1 - Preliminary, Level 1, Level 2 and Level 3 (which approximately correspond with Form 4 and below, forms 5, 6, and 7) are in "confidential draft". Double-sided the document is 10mm thick.

The release for general consultation will be about April 1995 and it will come together with details of the moderation system and some exemplars arising from trials.

Interested members can contact Mike Camden, Wellington Polytechnic [CAMDEN@eng.wnp.ac.nz].

The Unit Standards will be trialled in perhaps 30 schools from early in 1995. Our usual concern arises, namely that Statistics curriculum material is very hard to get right. We are concerned that the exemplars that come from the trials are in fact appropriate. Along with the document, Maths in the New Zealand Curriculum, a parallel document has now been published - Tauaki Marautanga Pangarau. Maori Language Maths Unit Standards are currently being compiled in draft.

Another topic of extreme interest to the Education Committee is the content of the two conferences in August/September 1995 - The NZ Association of Maths Teachers Conference in Auckland titled the *Many Faces of Maths*

(several of which contain statistics) and the A.C. Aitken Conference in Dunedin.

By August next year the situation with curriculum Unit Standards and examination prescriptions will be more vivid, if not clearer.

Another issue which needs debate and very careful thinking through to its consequences is how Maths and Statistics at 7th form should be arranged. Currently there are two bursary subjects called Maths with Statistics and Maths with Calculus and they have some overlap. The Ministry's group mentioned above will have added further content to this overlap. The question of how it is arranged into bursary subjects is a matter requiring debate.

The real question for us probably is this very dramatic one. How can we get a good deal for Maths and Statistics from the torrent of change which has been roaring along? The debate needs a good process and lots of interchange between practitioners and teachers at both secondary and tertiary level.

The Education Committee wish you a robust summer.  
*Mike Camden*

*[But I hope that the committee's influence knows no bounds - Ed.]*

## Some Extracts from Mike Camden's Report on Statistics at NZ Curriculum Level 8.

*[I have included only part of this report, the full text of which can be retrieved from the server mailserv@invermay.cri.nz. In particular there are two other blocks proposed, Block 2: Time Series and Block 3: Investigations involving Pairs of Variables. - Editor]*

The following quotes from four practitioners should give the direction we would like to see:

Sharleen Forbes:

*Getting a good grasp of basic concepts, and being able to do some EDA in all these areas, is more important than formal hypothesis testing.*

John Maindonald:

*So, far from being important, the teaching of hypothesis testing at this level, unless handled with unusual delicacy, is a recipe for giving pupils a wrong steer.*

John Waller:

*The one aspect that always stands out (in Science Fairs) is the number of students who make a mess of designing experiments... What is needed is a decent course on designing experiments... Better use of graphs for presentation could be a part of this.*

Jean Thompson:

Students could be introduced to designed experiments, just as far as fully randomised designs. In this context the idea of hypothesis testing can be introduced, but with all the "health warnings" about what it really signifies.

## Block 1: Design of Experiments

While consulting on Unit Standards and this Curriculum add-on, and in 1991 on making input to MINZC, we have heard persistent requests from applied statisticians,

speaking without consulting one another, for this topic. Similarly, there's a prevailing and spontaneous view that hypothesis testing should be learnt in context, with delicacy, only at the end of "extensive meditative exercises", and with "health warnings". We have conflicting views on whether it should be present or absent; and if present, what amount. One option is to include the simplest non-parametric tests (Sign and maybe Signed-Rank tests and maybe Chi-Squared). This by-passes problems with distributions (Student t), relates to probability work, and may make the underlying concepts of testing more obvious. There is a need for this topic for both groups of F7 students: those exiting education for the workforce (and life-force!), and those continuing in education.

[... text omitted ...]

### **Achievement Objectives**

Design and perform an experiment so as to take account of potential confounding factors.

Analyse and report on an experiment using exploratory and simple confirmatory methods (appropriately) giving regard to their roles.

Recognise and explain situations as being appropriate for exploratory and confirmatory analysis (formal inference; confidence interval estimation and statistical hypothesis testing) (and demonstrate various alternative informal approaches to examining data).

(Note: I'm not sure whether Confirmatory means Inference or just Testing).

Recognise and explain the differences between observational studies and experimental studies.

### **Suggested Learning Experiences**

Discussing the potential environmental confounding factors for an experiment, and designing the experiment so that the effects of these are minimised.

Formulating questions about situations so as to focus and direct a search, and designing experiments which will answer the questions.

Seeking out previous knowledge and data about an issue before designing an experiment on that issue.

Using the terminology and concepts of experimental design so as to communicate clearly:

- experimental units or subjects, factors, levels, treatments
- response and explanatory variables
- design, confounding
- control, randomisation, replication

Using graphs (e.g. "clustered bar charts") and tables of means (and other statistics) for both exploration and communication (important).

(Note: "Analysis of Means" produces averages over all sources of variability that are not relevant to the comparisons of interest.)

Using the tools of statistical inference to analyse an experiment;

- standard errors, confidence intervals; simple statistical hypothesis tests

Discussing the validity of the inference methods in terms of:

- the distribution of the data as shown in graphs
- assumptions about distributions and sampling methods
- possible confounding factors and sources of bias
- causability

[causation? Ed.]

Discussing formal confirmatory techniques as techniques for use when something quite central to the investigation is at stake.

Discussing situations which involve causation, common response and confounding (Moore & McCabe, p. 236).

Discussing the importance for decision making of experimental design, data structure, data collection, data analysis, data interpretation and data presentation.

Designing experiments using randomisation and replication for the case of a simple completely randomised experiment (i.e. one factor with replications).

(Note: I know this sounds enormous, but the technical stuff is: one factor designs [eg: 12 lettuce, with 2 sorts of fertilizer]; and the simplest of hypothesis tests. The rest is actually the common sense "critical-thinking" stuff which is about processes.)

## **Fourth International Conference on Teaching Statistics, (ICOTS 4) Marrakech, Morocco (25-30 July, 1994)**

This conference was held in a setting of quite remarkable splendour in the Congress Palace of Marrakech. Apparently the venue was decreed in a strategic move by the Moroccan government who wanted to get as many of our tourist dollars as possible. From their point of view this worked splendidly. With "guides" placed at the hotel doors, the medina full of local Berber markets within walking distances, and a bevy of locals harassing us with wares wherever we ventured I doubt if even the poorest of us didn't come home with trinkets and/or treasures. After a sufficient number of cups of hot mint tea (surprisingly refreshing in 50 degree heat) one felt obliged to buy something.

The location did present some problems for the local organisers who were from Rabat (about as far away as the distance between Auckland and Wellington) who would have preferred the control of being in their own University. In the circumstances they did a splendid job and managed to service almost all the whims and desires of participants. I did, however, quickly realise that there was a "Moroccan" solution to every problem which was often very lateral and certainly not on Western timeframes.

The conference seemed much smaller than ICOTSIII but had some 400 participants from 62 countries. The program suffered somewhat from not having plenary speakers and choice was sometimes very restricted. For example, an entire afternoon (with an additional one-and-a-half hour report back) was devoted to language specific (Arabic, French, English, or Spanish) workshops all on the topic of 'The Statistics Curriculum: Towards the Year 2000'. Another three hours were devoted (with no alternatives) to the 'Activities of Professional Societies in education and public awareness of statistics'.

The latter session was one of a number of sessions where we (NZ) were referred to often but had no official representative speaking. NZSA actively (and financially) supported the bid to have ICOTSIII in Otago. Surely the Association therefore had an obligation to ensure there was adequate NZ support for ICOTS IV. Although the 10

or so NZ participants there represented us well and all gave well-received presentations a number of people expressed their disappointment at not seeing some of our more well-known names (for example: David Vere-Jones, Bryan Manly, Len Cook, etc). Individually, people have excellent reasons for not attending but maybe the association should have asserted collective responsibility and sent a "titled" person (say, President or Convener of the Education Committee).

The last negative issue I wish to raise is that some of the women presenters were upset at what they viewed as sexist comments and behaviour of some men (No, not Moroccans who went out of their way to accommodate us but apparently a few Americans and South Americans). It might have been isolated behaviour (and certainly I personally didn't get any) but on at least one occasion was of a sufficient magnitude to reduce someone to tears. The atmosphere didn't have the "woman-friendly" feel of ICOTSIII and I believe this was in part because there were few primary or secondary teachers present whereas ICOTSIII was very successful in attracting this group. [continued on p. 13]

## Visitors

Dr David Robinson of the Department of Mathematics and Statistics at the University of Canterbury is the N.Z. Mathematical Society Visitors' Co-ordinator. He operates a register of visitors to New Zealand in Mathematics and Statistics, and the following information on statistical visitors has been extracted from this register. If you are expecting a visitor please let David have the details as soon as possible. He can be contacted by email: d.robinson@math.canterbury.ac.nz fax: (03) 364 2587, or ordinary mail.

The information for each item is arranged as follows: Name of visitor; home institution; whether accompanied; principal field of interest; dates of visit; principal host institution; principal contact person; comments.

One of the main purposes of this list is to enable other institutions to invite visitors to spend time with them. Anyone wishing to issue such an invitation should do so through the principal contact person.

**Professor Jim Berger**; Purdue University; accompanied by wife (Ann); Bayesian statistics; September to October 1995; University of Canterbury; Prof. JJ Deely; Erskine Fellow.  
**Dr Jim Filliben**, Senior statistician, US National Institute of Standards & Technology; statistical package DATAPLOT; August 1995; Applied Mathematics Group, Institute of Industrial Research, P.O. Box 31-310, Lower Hutt; Dr Kit Withers (email: c.withers@irl.cri.nz)

**Dr Jiti Gao**; University of Science and Technology of China; unaccompanied; statistics; 1 February 1994 to 31 January 1995; Auckland University; Prof George Seber.  
**Dr Jim Hartman**; The College of Wooster, Ohio, USA; applied statistics; May 1995 to May 1996; University of Otago; Prof. Bryan Manly.

**Dr Garry Newsam**; Defence Science and Technology Organisation, Salisbury, South Australia and Research Centre for Sensor Signal and Information Processing; accompanied by wife; radial basis functions and applications to image processing; September 1995 (?); University of Canterbury; Dr. R K Beatson.

## Conference Diary

**Workshop on Environmental and Ecological Sampling and the Estimation of Biological Population Sizes** University of Otago, 13-17 February 1995. Taught by Lyman McDonald and Bryan Manly. Email casm@maths.otago.ac.nz

### Workshop on Clinical Trials Research Methods

Auckland, 16-17 February, 1995  
(features Tom Fleming, Biostats, University of Washington)  
email katrina@otago.ac.nz

### Third International Applied Statistics in Industry Conference

Dallas-Ft Worth, Texas, USA. 5-7 June 1995.  
(features George Box and Douglas Montgomery as 'Special Speakers')  
email tracy@acginc.com

### Sixth International Meeting on Statistical Climatology

Galway, Ireland. 19-23 June 1995.  
Contact I.G. O'Muirheartagh, University College, Galway, Ireland.

**Australasian Biometrics Conference**, September 25-27, 1995 Coolangatta (Gold Coast, Queensland), Australia.

Themes for the conference are agricultural statistics (particularly field variety trials), medical and health statistics, and the practical application of Markov Chain Monte Carlo and environmental statistics.

Information: Kaye Basford, Department of Agriculture, The University of Queensland, Brisbane Qld 4072, Australia. Phone +61-7-3652810, Fax +61-7-3651177, E-mail k.e.basford@mailbox.uq.oz.au

### Royal Statistical Society 1995 International Theme Conference Communicating Statistics

University of Wolverhampton, Shropshire Campus, Telford, Shropshire, U.K., 12-14 July 1995  
email rss@scitsc.wlv.ac.uk [David Goda]

### 50th session of the ISI

Beijing, Peoples Republic of China. 21-29 August 1995.  
email wangj@bepc2.ihep.ac.cn

### Sixth International Conference on Statistical Methods and Statistical Computing for Quality and Productivity Improvement

Seoul, Korea. 17-19 August, 1995.  
email parksh@krsnucci.bitnet [Prof. Sung H. Park]

### A.C. Aitken Centenary Conference

University of Otago, Dunedin.

28 August-1 September 1995

email casm@maths.otago.ac.nz

See insert and pp. 8-9 in this issue.

### Statistics in Public Resources, Utilities, and in Care of the Environment SPRUCE III: Statistical Aspects of

Pollution - Assessment and Control

Merida, Yucatan, Mexico. 11-15 December 1995

email spruce@mailier.main.conacyt.mx

### Sydney International Statistical Congress

Sheraton-Wentworth Hotel, Sydney. 8-12 July 1996  
email sydney96@syd.dms.csiro.au

## MASSEY UNIVERSITY Faculty of Information and Mathematical Sciences

### LECTURESHIP IN STATISTICS Department of Statistics Palmerston North Campus

The Department of Statistics is seeking a Lecturer to assume responsibilities as the Coordinator of the Department's first year teaching programme and to contribute to the Department's wide range of teaching in Statistics. The Department is a major service provider to the University with commitments to internal, extramural and conjoint programmes. Applicants should possess a higher degree in Statistics or Mathematics and have experience in and a commitment to teaching Statistics. A research interest in statistical education would be an advantage.

Further information can be obtained from

Professor Jeffrey J Hunter, Head of Department,  
telephone (06) 350 5082, fax (06) 350 5611,  
email [j.hunter@massey.ac.nz](mailto:j.hunter@massey.ac.nz).

Reference number: NZSA 112/94 must be quoted.  
Closing date: 30 January 1995

*As a condition of application the University reserves the right to make enquiries of any person regarding any candidate's suitability for appointment, not to make an appointment or to appoint by invitation.* An information package containing Conditions of Appointment are obtained by telephoning (06) 356-9099, extension 7318.

Applications, including a full curriculum vitae and the names, addresses and fax numbers of three referees should be sent to Mrs V B Bredherston, Personnel Section before the closing date specified.

## ICOTS 4 [continued]

However, it wasn't all bad. In fact it was great! My favourite sessions all had female co-ordinators (am I showing a gender bias here?). They were Joan Garfield's "Research on teaching and learning statistics and probabilistic concepts", Flavia Joliffe's "Statistics for Social Scientists" and Anne Hawkin's "Teacher Training". While I didn't attend any, apparently the sessions on computation, computers and computer software in statistics education were excellent. I made some good international contacts that I've since been in touch with on Internet (how did I ever live without it), and Joan Garfield in particular used the opportunity to broaden the international network and get papers for a publication on statistics education research. Interestingly not all the New Zealanders working in this area had meet each other previously.

We were entertained spectacularly by our Moroccan hosts, the scenery was superb and (even though accompanied by a relatively demanding eleven year old I came home feeling I'd had a holiday and stimulated to do some more research. Isn't that what conferences are about!

*Sharleen Forbes [sdforbes@stats.govt.nz](mailto:sdforbes@stats.govt.nz)*

## Local News

### University of Auckland

It has been a hectic first year of existence for the new Department of Statistics (see the picture on page 1). Four new members of the academic staff, Vera & Brian Eastwood, Lakhdar Aggoun and Renate Meyer, have arrived since our last news item appeared. Vera received her undergraduate training in Germany and did her PhD at Carleton in Ottawa. Her interests include stochastic processes and limit theory. Brian did his undergraduate work at Waterloo and has a PhD from North Carolina State. His interests are nonparametric regression and medical statistics. Lakhdar is originally from Algeria and has recently completed his PhD in filtering and control of partially observed stochastic processes at the University of Alberta. Renate has also recently completed her PhD (at Aachen) and her interests include multivariate analysis and medical statistics. We also have a new PhD student, Mohammad Salehi, who has been teaching at Arak University in Iran for several years.

We have a number of visitors this year. John Petkau from the University of British Columbia has arrived since the last newsletter and will be visiting for most of the northern academic year. Jiu Gao continues his stay until March. Murray Jorgensen was here for a brief visit between newsletters. Keith Worsley will be visiting from McGill next month. David Brillinger from Berkeley in January and J.N.K. Rao from Carleton and Josef Stenebach from Marburg will both be here in February.

George Seber is back from North America but remains officially on leave until February.

It has been a busy winter for conferences. Among those that I can remember, Alan Lee, Ross Ihaka, Robert Gentleman, Chris Triggs, Lovina McMurchy and I attended the SSA conference in Melbourne in July; George Seber, Gita Mishra and Brian McArdle were at the IBC in Hamilton, Ontario, in August; Arden Miller attended the ASA meetings in Toronto in August; Constance Brown was at ICOTS in Marrakech in July; Ilze Ziedins, Vera & Brian Eastwood, Renate Meyer, Ivan Reilly, Robert Gentleman, Lovina McMurchy, James Curran and I were at the joint ORSNZ/NZSA meeting at Massey in August and I went to the annual meeting of the Statistical Society of Canada at Banff in May.

*Alastair Scott*

## Hort Research at Mount Albert

Staff have been assigned to separate sections for administrative purposes: Melissa Miller to Postharvest Science, John Maindonald to Postharvest Insect Control and Rearing, and Rod Ball and Anne Gunson to Sensory Science. By no means is our work restricted to these areas. Rod Ball now has substantial ongoing work in Molecular Genetics.

John Maindonald's visit in April to the USDA Tropical Fruit & Vegetable Research Laboratory in Hilo (Hawaii) has led to ongoing co-operation in work on insect and fruit response to heat, and on handling the analysis of disinfection data.

*John Maindonald*

## Massey University

At the time of writing academic matters are taking second place to genuinely important events, with three babies being produced in almost as many weeks. The direct departmental involvement extends to the fathers only: congratulations to Richard and Lynn Barker, John and Antoinette Koolaard and Doug and Michelle Timmer. This was also the year of our first grandfather: congratulations to Dick Brook. We must shamefacedly admit to being a male dominated group, but the congratulations list includes Megan Smith, who has just married Tom Pledger.

Early in December Steve Haslett will join the Palmerston North campus as Director of the Applied Statistics Consulting Centre. He will be warmly welcomed, but his most difficult task will be to avoid becoming the Centre.

At Palmerston North next year the main academic preoccupation will be coping with semesters. Will a typical first year student cope with statistics arriving at the rate of four lectures a week? How do we ensure that a business studies student, a science student and a social science student are all equally well prepared for a second year course when their faculties insist that they receive two and two thirds, three and a third and four lectures a week, respectively, in their first year?

More positively, in 1995 we introduce new third year courses in quality improvement, in stochastic operations research and in risk theory. The risk theory paper will be a preparation for Actuarial Institute examinations.

Student numbers at Albany are growing rapidly. The three statisticians have been largely involved in service teaching for other faculties this year, but being the resident statisticians on a small campus has made this more varied and challenging than the teaching of multiple streams of introductory statistics to uninterested first year students. In particular, a concentrated 12 week course on research methodology (aka "How to use SAS without really understanding it" - just kidding!) was requested and offered to postgraduate Business Studies students. A full second year program will be taught next year, and they will also supervise graduate and diploma projects along with the rest of us.

The overall policy of Massey University is consolidation and rationalisation. Perhaps we will get on to that in 1996.

Since the beginning of August we have had several visitors at Palmerston North. Tom Hassard, once at Massey,

now at the University of Manitoba, is visiting until Christmas. He heads a small service unit in the medical school at Manitoba, and is interested in service quality. Prof J Templeton, from the University of Toronto, stayed a few days and gave a talk 'On the relations among the distributions at different epochs for the discrete-time GI/Geom/1 queue'

Neville Davies, Nottingham-Trent University, popped over from Brisbane for the weekend. He shares Doug Stirling's interest in computer learning of statistics.

David Eaves, from Simon Fraser University, stopped briefly on his way to Sydney and gave a talk on 'Measurement of inter-occasion agreement frequency'



Bill Henderson (pictured giving a keynote address at the annual conference) from the University of Adelaide stayed a while after the conference and told us about 'Networks of queues with signals'

*Greg Arnold*

## Waikato

From my position in exile it hasn't always been easy to catch up on developments on my home ground, but I do know a thing or two.

The Dale family have settled into a new home. Lyn Hunt held a temporary lectureship for the second semester of 1994. Fay Sharples retires at the end of January and we all trust that her health will improve so that she can get more enjoyment from her new freedom. Nye John visited the Universities of NSW and Queensland and attended the Genstat conference in Wagga Wagga in November.

Hans Hockey is visiting WCAS for 6 weeks en route to Nepal, where he will take up a position similar to that he had in Cameroon, working for the Overseas Development Administration of the UK. He will be going to Pakhribas Agricultural Centre, one of two funded by the ODA as part of Gurkha resettlement schemes. While the Centre is 5 km from the nearest dirt road it does have satellite TV!

The first steps have been taken in a process which should see the establishment of a Department of Statistics bringing together statisticians in the Department of Mathematics and Statistics with those in the Waikato Centre for Applied Statistics.

John Neider will probably be visiting WCAS in April 1995 and will give a workshop.

Waikato Centre for Applied Statistics Seminars: Chris Wild (Auckland), "Vector generalised additive models" Simo Puntanen (Tampere), "Matrix tricks for regression diagnostics"

Russell Boyles (IRL, Wellington), "Case studies in applied statistics from an investment casting operation".

Harold Henderson (Ruakura), "Dynamic statistical graphics and statistical practice"

*Murray Jorgensen*

## AgResearch

John Waller, Martin Upsdell, Stephen Eichler and Harold Henderson attended the NZSA/ORSNZ conference at Massey in August. Peter Johnstone and Harold Henderson attended the International Biometric Conference in Hamilton, Ontario, in August. Peter presented a paper on "Effective statistical consulting in agricultural research institutes". Harold also visited the University of Wisconsin, Madison, and Cornell University.

Simon Woodward gave a seminar at Waikato University entitled "Dynamical Systems Modelling of Soil Processes for Fertiliser Planning" in which he described the formulation and analysis of a soil nutrient cycling model and showed how the dynamical state equations could be used to calculate maximum profit fertiliser schedules under a constraint on fertiliser expenditure. This optimisation procedure has been coded into AgResearch Software's new fertiliser planning software called "Outlook".

Ken Louie attended the IVth International Workshop on Modelling Nutrient Utilization in Farm Animals, held at the National Institute of Animal Science, Foulum Research Centre, Denmark from Oct. 3-5. He reports that apart from one or two of the (all invited) talks, the general approach taken was that which gives modelling a bad reputation: i.e. vast systems of differential equations as complex as the original system (usually a lactating cow or some part thereof), or some empirical rule-of-thumb elevated to model status. A small group argued for the merit of research models but had a tough time of it. From there he visited the Institute of Grassland and Environmental Research in North Wyke, Devon.

Mick Roberts gave a seminar at Massey University entitled "The Mathematics of Parasite Communities". This was later presented in a modified form at the Australian Society for Parasitology Meeting at Nelson Bay, NSW, Australia.

David Baird, Dave Saville, Roger Littlejohn and Peter Johnstone attended the Australasian Genstat Conference at Wagga Wagga. Roger talked on analysing repeated measures and Peter spoke on genotype by environment interactions. Craig Wright has recently started working on gene mapping at Invermay - he has a graduate diploma in Statistics from Otago. Robert McDonald is a summer student working with us on pedigree modelling. He has a BA (Hons) in English (so he should get to write this note!), but has the pedigree for the job - his father lectures in Computer Science.

*Mick Roberts and Roger Littlejohn*

## Industrial Research Limited, Applied Maths

Russell Boyles had yet another excuse for showing off his anatomical studies of jet engines to a captive audience when he spoke at the Waikato Centre for Applied Statistics on "Case studies in applied statistics from an investment casting operation". Fortunately, Russell was prevented from going on for too long because of exhaustion. It seems Ray Littler had cunningly made Russell run several miles before giving his talk.

And then there was FRST bidding... This year we had to do a major rewrite of our core programme to fit into a new area, "Industrial Technology and Manufacturing". The new programme focuses on statistics for quality improvement and has both applied and theoretical research objectives. Moreover, now that our ISO9001 Quality Manual is up and running (literally, on XMosiac), we'll be able to practice what our on-site ISO9000 consultant preaches. And, to keep us on our toes, a review instigated by FRST will have established, by Christmas 1994, both the quality and relevance of what we do all day.

A visit from Bryan Manly proved an invaluable shot in the arm for jaded FRST bidders. Bryan gave us a talk on his recent work on randomisation tests and the Behrens-Fisher problem. It was inspiring to see just how much could be done even with very small samples.

Most recently, we're happy to welcome Nancy November, one of our summer students who will be working with David Rhoades and Kit Withers. Nancy is a double major in music and mathematics from VUW. In between musical interludes, Nancy will be working with David on climate statistics and with Kit on a number of projects including density estimation, L-moments and M-estimates in nonlinear regression.

*Donal Krouse*

## Statistics New Zealand

Since our last report David Fitzgerald has left us to pursue teaching English as a second language. Barry Wells is off to Thailand to do similar work. Karen Wong has returned after a couple of years working in England and travelling widely. As a welcome home present we found a project she had started on before she left.

Statistics New Zealand is developing a large internal project to upgrade our IT facilities. After extensive negotiations the Government has agreed to provide an extensive capital injection to enable this. Perhaps this is a significant turning point in the commitment of government to provide good statistical information. (See the articles by Brian Easton and John Maindonald in this *Newsletter*.) Vince Galvin and Gary Dunnet are working on this project full-time. Judith Archibald is doing Vince's job while he is on this project.

Who needs the Auckland Warriors! Sweeping all (or at least some) before them The Standard Deviants touch rugby team has earned promotion to the Championship Mixed grade of the Mirimar Central Competition. Sponsorship deals, interviews with the stars, Tee-shirts and fan-letters can all be arranged through your correspondent.

*Vince Galvin*

## Deming's Fourteen points

1. Create constancy of purpose for the improvement of product and service, with the aim to become competitive, stay in business, and provide jobs.
2. Adopt the new philosophy of co-operation (win-win) in which everybody wins. Put it into practice and teach it to employees, customers, and suppliers.
3. Cease dependence on mass inspection to achieve quality. Improve the process and build quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag alone. Instead, minimise total cost in the long run. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.
5. Improve constantly and forever the system of production, service, planning or any activity. This will improve quality and productivity and thus decrease costs.
6. Institute training for skills.
7. Adopt and institute leadership for the management of people, recognising their different abilities, capabilities, and aspirations. The aim of leadership should be to help people, machines, and gadgets do a better job. Leadership of management is in need of overhaul, as well as leadership of production workers.
8. Drive out fear and build trust so that everyone can work effectively.
9. Break down barriers between departments. Abolish competition and build a win-win system of co-operation within the organisation. People in research, design, sales and production must work as a team to foresee problems of production and in use that might be encountered with the product or service.
10. Eliminate slogans, exhortations, and targets asking for zero defects or new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.
11. Eliminate numerical goals, numerical quotas, and management by objectives. Substitute leadership.
12. Remove barriers that rob people of joy in their work. This will mean abolishing the annual rating or merit system that ranks people and creates competition and conflict.
13. Institute a vigorous program of education and self-improvement.
14. Put everyone in the company to work to accomplish the transformation. The transformation is everybody's job.

*Robert Davies gives an account of Deming's life and work on page 5*

## Some Web Addresses

Listed below are some addresses of interest on the World Wide Web. If I got through using the Mosaic browser I have added a [y], if I tried and failed, I've added a [n]. Do you know any interesting addresses? If so please tell me so that I may display them in the next issue.

**Royal Society of NZ "Gateway to NZ Science"**

<http://www.rsnz.govt.nz/> [y]

**A Guide to Statistical Computing Resources on the Internet**

[gopher://una.hh.lib.umich.edu/00/inetdirsstacks/statistics%3avarnweise](http://www.lib.umich.edu/00/inetdirsstacks/statistics%3avarnweise)

<http://asa.ugl.lib.umich.edu/chdocs/statistics%3avarnweise.html> [n]

**University of Washington Statistics Department**

**Home Page:** <http://www.stat.washington.edu:80/> [y]

**SAS User Group Gopher: University of Georgia**

[gopher://gopher.uga.edu:8999/11/UGA%20Departments/sug](http://gopher.uga.edu:8999/11/UGA%20Departments/sug) [n]

**Using the SAS System (documentation)**

[gopher://gopher.vt.edu:10010/02/5/126](http://gopher.vt.edu:10010/02/5/126) [y]

**Tony Rossini's Guide to Biostatistics Information Sources**

<http://wishart.biostats.hmc.psu.edu:2000/~arossini/stat-services/index.html> [y]

**Statlib Index**

<http://lib.stat.cmu.edu/> [y]

**UCLA Statistics Home Page**

<http://www.stat.ucla.edu/> [y]

**Journal of Statistics Education Information Service**

[gopher://jse.stat.ncsu.edu](http://jse.stat.ncsu.edu)

**List of Stats E-Mail Lists**

[gopher://www.cc.utexas.edu:80/hGET%20/psycgrad/statsresources.html](http://www.cc.utexas.edu:80/hGET%20/psycgrad/statsresources.html)

Murray Jorgensen

## Application to join NZSA

I wish to join the New Zealand Statistical Association

Name:.....

Address:.....

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Phone:..... Fax:.....

Email:.....

Occupation:.....

Employer:.....

Areas of Interest:.....

Please circle membership category and enclose cheque for the annual fee 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 )

**Post to PO Box 1731 Wellington**