

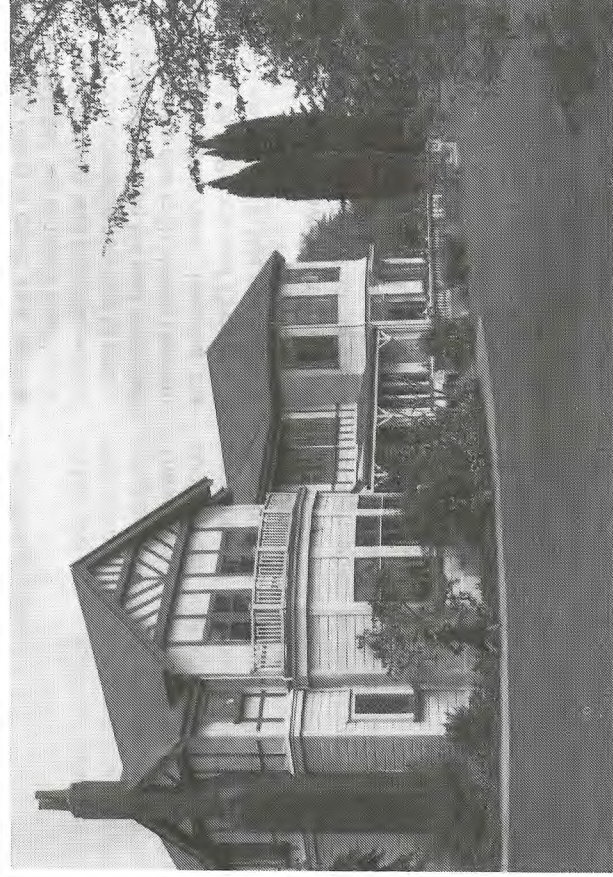
DR H P EDWARDS
DEPT OF MATHS AND STATS
MASSEY UNIVERSITY
PRIVATE BAG PALMERSTON NORTH

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APRIL 1988
Number 17

ANNUAL CONFERENCE NEW ZEALAND STATISTICAL ASSOCIATION

**AUGUST 14 - 17 1988
MASSEY UNIVERSITY, PALMERSTON NORTH**



The conference will be held in the gracious and peaceful setting of Wharerata, the original homestead which has now been converted into the Staff Club for Massey University.

The conference will begin on Sunday evening with registration and a welcoming social event; Monday and Tuesday will have a full program of invited and contributed papers; an exciting Conference Dinner is planned for Monday evening; Wednesday will be given over to workshops on statistical software. During the course of the conference, there will be a book display and computer software displays.

Being centrally located in New Zealand, Palmerston North has become a popular conference location with considerable motel accommodation. Inexpensive and convenient accommodation will also be available in the university hostels.

Renew acquaintances, make new friends, have a great and an informative time.

In this issue:

- * Statistics: At what price?
- * Statistical evidence in litigation
- * NZSA Annual Conference Details
- * News from members

President's Column



This is the first issue of the *NZSA Newsletter* for 1988. I hope that you all had an enjoyable and relaxing Christmas break and arrived back at work refreshed, rejuvenated and ready to face the new year. State Sector Bills, reports from Royal Commissions and other committees, yet more deregulation and reorganisation promise to make 1988 a demanding and stressful year for many if not all of us.

Despite this, 1988 looks like being a good year for the NZSA. Since the last *Newsletter* an eminent member of the Association, Dr Hamish Thomson, was invested with an MBE for his significant and considerable services to statistics and DSIR. We congratulate him on his well deserved honour. Congratulations are also due to Dr Harold Henderson who, in the latter part of last year, became the Association's third recipient of a Prince and Princess of Wales award. (See article elsewhere in this newsletter.)

Turning to other matters, you will all have been impressed with the 'new look' *Statistician* which arrived on our desks late last year. Thanks are due to our new editor, Jocelyn Dale, for this welcome initiative - she has done a marvellous job. While on the subject of publications, an excellent review of *StatLab* is due out in the next issue of *The American Statistician*. Moreover, we are now in a position to take orders for the surveys booklet, *Understanding Surveys*, edited by Vic Duoba and John Maindonald. This booklet is based on a document prepared by members of the Section on Survey Research Methods of the American Statistical Association. *Understanding Surveys* is advertised elsewhere in this newsletter together with two books by John Bibby entitled *Notes towards a History of Teaching Statistics and Quotes, Damned Quotes, and...*. The Association has entered into an exchange agreement with John whereby he will, in the first instance, market 100 copies of *Statistics at Work* within the UK (mainly to UK schools) and we will market an equivalent number of his two books within New Zealand. So be in and purchase these reasonably priced books while stocks last!

You will be pleased to hear that an enthusiastic group headed by our Newsletter Editor Dick Brook has offered to organise the 1988 NZSA Annual Conference. The Wellington dominated Executive Committee accepted this generous offer with alacrity! The conference will be held at Massey University in Wharerau, the beautiful old home that houses the Massey Staff Club, from August 15-17. A detailed report of the highly successful 1987 NZSA Conference written by Richard Penny and Graham Wood has been passed on to the Massey team; it will form the basis of an 'NZSA Conference Manual' which will help with the smooth-running of future NZSA conferences. The Association has also agreed to sponsor the Fourth International Meeting on Statistical Climatology to be held in Rotorua

from March 27-31, 1989. Further details on these conferences are given elsewhere in the newsletter.

Alistair Gray is organising a membership drive principally targeted at graduate statistics students. A membership brochure and a poster have been created and these will shortly be sent out to key people for distribution etc. The contents of the brochure plus a membership form are reproduced in this newsletter. Note the introductory offer for first-time members. Why not photocopy off a few copies and distribute them to people who you feel would benefit from membership. If every member introduced at least one new member to the Association, then our membership would at least double (I always was good at arithmetic!) thus increasing our penetration into the community and advancing the aims of the Association and NZ statistical education in general.

In his new role as External Relations Officer, David Harte has been writing to the national statistical associations of neighbouring countries to encourage links with the NZSA. These might involve the exchange of information about conferences, visiting statisticians etc together with the exchange of newsletters and other publications. The neighbouring countries written to come from Asia, North and South America, and all Pacific basin countries. This is an important initiative which will provide a natural medium through which to encourage regional activities such as ICOTS, the Pacific Statistical Congress etc as well as other activities.

We welcome John Revfeim as the new convener of the History Project, John Rayner as the new convener and Fred Lam as a member of the Publications Committee. We are grateful to them for taking on these roles. In particular we thank Sharleen Forbes, the previous convener of the History Project, and John Maindonald, the previous Publications Committee convener, for their considerable contributions. Both were instrumental in promoting and setting up these initiatives which have significantly added to the life and vitality of the Association.

The activities of our enthusiastic and hardworking Education Committee continue unabated and are reported elsewhere in this newsletter. The Royal Society of New Zealand has agreed to sponsor ICOTS 3 and has made available a grant of \$2000 which will be put towards the costs of the Local Organising Committee in the period leading up to the conference in 1990. Mr Lange, as Minister of Education, has written a letter of support for ICOTS 3 and the Director-General of Education has also written indicating ways in which the Department will support this conference.

Any further suggestions for topics of projects for ICOTS 3 (see President's Column Newsletter No. 16)?

Warm regards

Peter Thomson

Statistician Receives MBE

Former President of the NZSA, Hamish Thompson, was invested with the MBE in November, 1987, for services to New Zealand science. Hamish has recently retired after 40 years with the DSIR.

Hamish joined the Applied Mathematics Laboratory of the DSIR in 1947 and was stationed at Plant Diseases Division in Auckland. In 1951, he went to Manchester University and studied for his PhD with M S Bartlett, returning to Auckland in 1953, where he became a leading authority in the application of mathematical and statistical methods for improving agricultural and horticultural experiments. He also successfully pioneered the DSIR's role as an advisor on statistical and quantitative methods in industry.

In 1963 Hamish was appointed Director of Applied Mathematics Division at the comparatively young age of 36. During his administration AMD evolved from a small group of about 7 mathematicians to 40 mathematicians and about 20 support staff. He oversaw many major developments including the

move of the divisional headquarters from a small suite of rooms above a billiard parlour in Courtenay Place, Wellington, to the Rankine Brown Building at Victoria University of Wellington. The new location enabled the development of the present close relationship AMD mathematicians have with their VUW counterparts. Other developments included the start of Operations research and the introduction of electronic computing facilities, which brought New Zealand's first scientific computer onto the VUW campus. Hamish anticipated the need for expanded and improved consulting, particularly to the commercial and industrial sector, but also recognised that a strong base in excellent research was crucial to the long term vitality of AMD.

In 1982 Hamish was appointed a Chief Director of the DSIR with responsibility for the Resources Group of Divisions, the position he held at his retirement. He still maintains a keen interest in the work of AMD and the application of statistical ideas to all facets of decision making.



The citation read:

Dr Thompson has given 40 years service in the DSIR. 1947-1963 he was improving design in agricultural experiments through the application of statistical methods. He became a leading authority in this area and was frequently asked to contribute his ideas to other organisations and was a visiting professor at overseas universities. 1963-1982 he was DSIR's Director of Applied Mathematics, guiding its application to New Zealand's agricultural and industrial development. From 1982 to May 1987 he was the Chief Director of DSIR, Head Office, with oversight of all the Divisions of DSIR concerned with increasing knowledge of New Zealand's resources.

Jean Thomson

A NEW STATISTICS JOURNAL

David Harte passed on this letter from the SINGAPORE INSTITUTE OF STATISTICS

Thank you for your letter of 12th February 1988 inviting us to exchange information on a regular basis. We would, of course, be most happy to do so and I would raise your proposal at our next Council meeting.

With regard to your proposal to exchange newsletters, I am afraid that we do not presently publish newsletters on a regular basis. However, we are in the process of launching our journal, the Singapore Journal of Statistics (SJS), the first issue is targeted to be published in November this year. This issue on the theme "Statistics: The Practitioner's Viewpoint, Problems and Issues" will be oriented towards the statistics profession. We would appreciate your conveying this to your members and would welcome papers on a subject relevant to them.

Soon Teck Wong

STATISTICS: AT WHAT PRICE?

Evening Talk by L.W.Cook, at NZ Statistical Association Conference, Christchurch, August 1987

1. INTRODUCTION

In this talk about some current issues of relevance in official statistics in New Zealand, I will address:

- (a) revenue generating constraints and considerations;
- (b) what the true costs of statistics are;
- (c) how deregulation has changed those costs;
- (d) new funding arrangements for the Department of Statistics;

2. REVENUE GENERATING CONSTRAINTS AND CONSIDERATIONS

2.1 HOW CAN YOU EARN MONEY FROM STATISTICS

Economists divide products into public goods and market goods. Public goods are those for which: supply cannot be restricted; and use by one consumer does not diminish use of another. Obvious examples are radio broadcasts, street lighting, or defence.

It is simply impossible to extract a fee from a user of such services related to the extent of their use or benefit from the service. Payment is usually by community taxation, and occasionally by regulation (for example television license fees).

Many statistics have these properties, and thus have no real revenue earning capacity. Indeed their value is enhanced by their widespread acceptance and use.

What can be charged for is the market value of the means of delivery and the right to equal "first access" with all other users.

Any user is in fact a competitive supplier in their own right.

2.2 WHAT STATISTICS ARE MARKET GOODS?

Customer specific services can be rationed. What is at issue here is the extent to which the private interest of the user approximates the total benefit to society. Of course, there is an even more fundamental problem in that statistics are not an end in themselves, but are an intermediate product. Hence, relating benefits to costs requires an informed agent to act for the beneficiary of the efficiency gained from using the information. In some situations, this is a simple issue, and data is traded at a price acceptable to buyer and seller.

2.3 HOW IS THE PRICE SET?

There are several options for setting the price of statistics:

- a) Near the opportunity cost the customer could pay to go elsewhere - usually not an option.
- b) At a price which still leaves a profit from the improved decision making - usually not possible to quantify.
- c) At a price comparable to that paid overseas - international practice varies but may become more consistent.
- d) At a price comparable to information of a similar value supplied by market research, etc.
- e) To recover the supplier's costs of meeting the request.
- f) To cover marginal costs plus an unknown amount.

Ultimately, the end effect of charging for statistics is not to set a market price - the market does not function.

Statistics charges are taxes, levied arbitrarily, on users. It is only the mode of delivery which is marketed.

In my view, information is too scarce, too political, and too valuable to be treated as you would ice-cream.

Neither are the economics of ice-cream sales relevant to those of statistics.

I certainly hope that as our understanding and experience with market economics improves, lessons will be learned, before our official statistical system is damaged by the process of learning.

3. THE TRUE COSTS OF STATISTICS

Costs of statistics are borne by:

- a) the suppliers who provide answers for questionnaires - households, businesses, government departments;
- b) the taxpayer based funding of the Department of Statistics (somewhat over \$30 million per annum in non-Census years);
- c) the charges on users of some services.

Only the latter two are known.

The cost to suppliers of compliance varies with the nature of the data collected. It was estimated that it would require 8 minutes to complete the personal questionnaire for the 1986 Population Census, and 3.5 minutes for the dwelling questionnaire. On the other hand, a local authority with many activities will need up to 3 person-weeks to complete the annual schedule for local absence statistics.

Could we pay suppliers for their work?

Perhaps the question is parallel to that for blood donations. In those countries where blood donations are paid for, the small fees, easily earned, attract repetitive contributions by unhealthy down and outs, creating for example a high

incidence of serum hepatitis, compared to countries with a voluntary system.

The night shelters of New Zealand would be population boom areas!

While this comparison may not be perfect, the lesson it supplies should not be ignored.

How is free compliance assured?

It is legally a result of the compulsory acquisition powers of the official statistician. These powers are balanced by statutory responsibilities of the statistician.

4. HOW DEREGULATION HAS CHANGED THESE COSTS

Statistical information is generally accepted as a government function, akin to the provision of courts for example, where the purpose is:

- a) to facilitate the efficient exercise of their choices by informed voters in a democracy;
- b) the efficient operation of markets.

Two points can be made about a controlled society, one where human or commercial behaviour is regulated. Firstly, the fewer choices decision makers have, the less effort is required to monitor outcomes. Secondly, regulatory processes provide monitoring information from their administrative control points. Obvious examples of this are:

- a) wealth versus income: wealth not taxed - no information; income taxed - some information
- b) imports versus exports, duty - GST now
- c) overseas borrowing - previously restricted, now not
- d) overseas exchange controls - now none
- e) regional economic differences

With deregulation, decision makers have more choices, and yet information sources reduce. Without more statistical surveys, the knowledge we have about society is diminished, and as a consequence the quality of public and private decision making will fall, and markets will be less efficient than they should. Hence, one of the prices we must pay for deregulation and its manifold benefits is a more extensive information gathering system. This we have not yet achieved.

I can give two examples of deregulation's effects on statistical requirements.

In the area of consumer prices, we have seen the removal of national pricing and scale fees for: petrol, real estate agent fees, valuation fees, solicitors fees, milk, and overseas air fares. To maintain the same quality of official statistics, the Department of Statistics has had to mount extensive nationwide surveys to replace previously simple pricing procedures.

In the balance of payments area, the removal of overseas exchange transactions regulations and the obligation to gain approval for obtaining foreign exchange, has:

- a) reduced the capacity to record such activity;
- b) expanded the range of activities taking place;
- c) increased the number of participants in the foreign exchange area;
- d) increased the volume and volatility of foreign exchange activity.

To maintain balance of payments statistics at the quality historically provided by the Department of Statistics, and expected by those that hold the 40-odd billion dollars of our overseas debt, much more resource is required of government.

Indeed in the absence of appropriate increased funding for the Department of Statistics to meet this essential requirement, other statistics, which some may regard as equally important, will be cut out, or reduced in quality, to maintain the integrity of our balance of payments statistics.

5. NEW FUNDING ARRANGEMENTS FOR THE DEPARTMENT OF STATISTICS

Given that revenue shortfalls result in reductions in appropriated expenditure in the following year, without major gains in efficiency, or reductions in services, the Department of Statistics will reduce by around ten percent of its 1986 level under current policies, every year, after 1990. To prevent that happening, efficiency gains expected over a 4-5 year period must be achieved in less than half that time. To this end, the Department is currently reviewing the extent of its existing operations and their size, to meet the funding limitations now imposed.

We will meet this challenge, given our past efficiencies (14.8% cost reduction from 1978/79 to 1984/85; 19% reduction in 1986 Census cost over that of 1981).

The real price the government and the community will be paying over this time, will be the incapacity to adapt to emerging needs for more extended statistical services - there can be none.

Given earlier comments about deregulation, the full impact of this is obvious.

For example:

- a) Health funds by population based formula, giving increased local control, leads to increase in population data (internal migration estimates limited);
- b) Tax estimates lead to government deficit measure, which affects the borrowing requirement, which affects interest rates. These estimates were \$1.3 billion out in 1986/87 - \$10 per head for official statistics is light compared to the household mortgage interest bill.
- c) Market sentiment (hard instinct) one over-reaction to statistics - for example June 1907 Consumers Price Index - dropped around \$70 million off the value of the bond market. This indicates the need for more frequent statistics.

The efficient operation of the market place requires a lot of accurate up to date information, to stop excessive volatility and instability from spurious events.

STATISTICAL EVIDENCE IN LITIGATION

Over the past year several New Zealand statisticians have found themselves giving evidence, generally for the first time, in High Court litigations. The major one, of course, was the **maxicrop** case, a marathon case that saw evidence from no less than six New Zealand statisticians.

I, and I am sure the others, learnt a lot from the experiences in court. I hope the others will also share their experiences. I do think it is appropriate that we, as a profession, look at some of the lessons from these experiences and those of our colleagues overseas. There are many hazards facing expert witnesses and the reputation of some professions, such as psychiatry, has undoubtedly suffered through the apparent ready availability of experts to support totally contradictory views; the dangers to our profession are also very real.

There are five issues that I wish to discuss very briefly in this article.

1. Legal vs Statistical Reasoning

In the maxicrop case, many of us had a difficult time getting our counsel to understand some basic statistical principles; it is easy to forget the difficulties we had all those years ago. A major sticking point was with the null hypothesis. The legal profession seem to think, quite reasonably, in terms of accumulating evidence for and against alternative hypotheses so that, in the final analysis, the weight of evidence points, on the balance of probabilities (or even beyond reasonable doubt) towards one of those alternatives.

If this approach is applied to the null (maxicrop has no effect) and alternative (maxicrop has some effect) hypotheses, there are some real difficulties because, technically, the null hypothesis has no probability of being true. Hence I had my own counsel asking me: "If the result of each individual trial is consistent with zero and there are a number of trials, although all together they still cannot prove that the result necessarily is zero, do those consistent trials make it more probable that the answer is zero?"

How would you answer that? A more difficult one to answer came from the judge; he asked me what I thought about the two propositions:

"1. On the balance of probabilities, maxicrop does not work.

2. On the balance of probabilities, maxicrop might work."

We cannot altogether blame the legal people for

having difficulty understanding our view of hypothesis testing where we consider a point hypothesis which has zero probability of being true no matter what evidence is produced. The better approach is via point and interval estimation where we describe what the accumulated evidence is telling us rather than considering alternative hypotheses.

2. Maintaining Professional Integrity

In his paper, "Damned liars and expert witnesses", Meier looks at the many corrupting influences exerted upon the expert witness and comments that to remain neutral "he should pray for strength when he does this, for he will need it".

The court situation is an adversarial one where each side is out to make the most of any and every bit of evidence that they think will help their case. Counsel have the responsibility of ensuring that the evidence is presented to the court in a way that the court will best understand and so will discuss with each witness the evidence he will present. I found that counsel wanted me to be more definite and less cautious in my statements, and to present issues as more black and white than is my natural inclination. But, at the end of the day, I had the responsibility of ensuring that what I put in my written brief of evidence and what I said in court was fair and balanced.

Although we have been called to support the "cause" of one side, it is essential that we maintain our independent judgement and be aware of the difficulties (see Meier's paper) in doing that. In our work, especially in the interpretation of the results of our analyses, we have to exercise a good deal of judgement and that judgement must be maintained.

3. In The Witness Box

I found the experience of a week in the witness box to be quite stressful; I do not know anyone who found it easy. The situation is extremely artificial and I do not think that the adversarial environment is conducive to getting to the truth in an essentially scientific argument nor is it helpful to the expert witness.

What the counsel lacked in statistical understanding, they certainly made up for in skill at cross-examination; they seem fond of trying to trip people up on any point, no matter how trivial that point may be. I suspect this is done to get the witness flustered and therefore more likely to get things a bit wrong or confused on matters of more importance.

I noticed on several occasions that the line of questioning seemed to be leading up through some minor questions towards a particular conclusion. But just

when I was expecting the questions of real substance on the issue to be asked, the line of questioning was suddenly switched, leaving me feeling frustrated that the real issue had not been dealt with.

4. Combining Results from Many Trials

In the maxicrop case, the results from many trials run by MAF and later from hundreds of overseas trials were presented to the court. We were given the challenge of saying, and trying to demonstrate, what the combined evidence really meant. We all know the difficulties inherent in the formal analysis of data from many trials with differing treatments, replication and conditions. These problems are exacerbated in the court situation where it is difficult to get those involved to understand the problems and complexities while keeping our presentations simple and clear.

the judge and the counsel, however, seemed to relate well to the pictures I produced of the confidence intervals from all the MAF trials. John Reynolds tackled the more difficult task of presenting the results from all the maxicrop trials world-wide. His solution was to present the results graphically in the form of an empirical distribution function; I think this was an excellent solution and I hope he will present his ideas to us all soon.

5. Data Accuracy

It is vital that when we present results of analyses in

court that we know our data well, we can be sure of its accuracy and we have the raw data we used with the material we present to the court. I had to check the data from the experiments I examined right back to the field recording sheets. This was done as a result of the embarrassing discovery of errors in the data from another experiment. At another high court litigation I was involved with last year, there was some embarrassment caused when the judge questioned whether the data used by the statistician was the same as that presented earlier in the case by another witness; because he did not have the data with him he could not confirm they were the same. The lawyers on my "side" had ensured I would not suffer such embarrassment but clearly we cannot rely on this.

I hope others will continue this discussion and that eventually we will come up with some positive guidelines or codes of ethical behaviour that will ensure that we can maintain our own and our profession's integrity.

Reference:

Meier, P. (1986) Damned liars and expert witnesses. JASA 81, 269-276.

Neil Cox
MAFTech
Ruakura Agricultural Centre

INTERNATIONAL DIRECTORY OF WORKERS IN STATISTICAL EDUCATION PRINCIPALLY AT SCHOOL LEVEL

As N.Z. Coordinator for the ISI Statistical Education Committee I recently received one copy of the above directory.

The New Zealand entry is reproduced below. If you feel you would like to be added to that entry in future up-dates, or if you have corrections to this one, please contact me. Also if you require information about the entries from other countries (from Argentina to Zambia) let me know. As I've said, only one copy was sent to me; I'd rather not photocopy the entire directory too many times.

Dr A. Begg
Wellington

Dr J.L. McWhirter
Hamilton

Prof. J.C. Turner
Hamilton

Dr R.J. Brook
Palmerston North

Dr M. Camden
Wellington

Prof. D. Vere-Jones
Wellington

Dr D.J. Saville
Lincoln

Dr R. Dear
Invercargill

Prof. G.R. Wood
Christchurch

John Rayner
Otago University

News from Members...

DEPARTMENT OF STATISTICS

Alastair Gray is about to leave for the US Bureau of the Census where he will attend their fourth annual research conference and also discuss recent advances in seasonal adjustment to time series as well as aspects of sample design methodology. The other item is the commencement of planning for the 1991 Census, including the calling for comments on the questionnaire contents.

Garry Dickinson

MINISTRY OF AGRICULTURE AND FISHERIES

Nothing noteworthy has been happening at MAF Biometrics in Wellington. Oh, one thing, we are buying two more PC's. They are both WYSE PC 386, Model 3216 with math coprocessors. Compared to the IBM AT, they are very fast. We will only be getting monochrome VDU's though.

David Harte

APPLIED MATHEMATICS DIVISION - MT ALBERT SUBSTATION

Sue Cammell started work as an industrial operational research consultant at the end of January. She had been working with Fletcher Steel for the previous year. Jocelyn Dale returned at the beginning of January to work on a half-time basis as an industrial statistician. Thomas Yee, started with us on a half-time basis in mid-February, just before the last of our three vacation students returned to University study. He will assist with consulting work for other Mount Albert Research Centre Divisions. Chris Triggs, Jocelyn and Thomas will all be giving courses of lectures at University this year.

We are enjoying having John and Mary Nash as visitors. Mary's speciality is bibliographic database techniques. John is from the Faculty of Administration at the University of Ottawa - he is author of a recent Dekker book 'Non-linear Parameter Estimation.' One of his tasks while here is to prepare a second edition of his earlier book 'Compact Numerical Methods for Computers.' He has been concerned to provide software that can be used widely on micro-computers - as a result he has written much of his code in BASIC. He was a contributing editor (scientific computing) for Byte during 1984-86, and has been a chairman of the Canadian Standards Association working group on BASIC.

John Maindonald

DSIR, AMD, WELLINGTON

Peter Walley is set to return to the fold after close to a decade in the US. Much of his time has been spent at Cornell University, with stints at places such as Bell Labs. Sarah Harper is another addition to the Wellington staff. Peter will be in the Statistics section while Sarah is with Industrial Statistics.

Kelly Mara attended the International Conference on Quality Control in Tokyo late last Year. This was followed by visits to a variety of plants to observe Japanese QA first hand. Andrew Wallace is currently visiting NIAB and Rothamsted. A small contingent are about to depart to Caberria for the 9th Australian Statistical Conference - Bicentennial edition!

Alex Neil

NEWS FROM MASSEY

The Statistics Section's request for the formulation of a separate department of Statistics has been turned down by the university. The review panel concluded that increased activities on the part of the statisticians (i.e. us) would do more for the profile of Statistics than a separate department could. So, we are pleased to report that planning for the 39th annual conference of the NZSA to be held at Massey 14-17 August 1988 is well in hand under the guidance of a committee chaired by Dick Brook.

The extramural Diploma in Applied Statistics is off to a good start with many enquiries from individuals and organizations.

Our congratulations to Howard Edwards, whose paper "The ranking and selection computer package RANKSEL" has won the 1987 Thomas L. Saaty prize for the best applied paper appearing in the American Journal of Mathematical and Management Sciences.

A new arrival at Massey is Hugo Valera-Alvarez. Hugo is a consultant in the Computer Centre and his role is to assist users with Mathematics/Statistics/Operations Research software problems. He is Colombian by birth and has post-graduate degrees in Animal Science, Statistics, and Operations Research.

Brian Hayman retires as HOD and Professor of Statistics at the end of the year. We expect his vacancy to be advertised shortly.

Howard Edwards

WAIKATO CENTRE FOR APPLIED STATISTICS

The Centre recently celebrated its first birthday with prayers that it will escape being strangled on its second birthday when its existence is up for review. We, at least, are quite satisfied with the progress of our infant months and look forward to unruly toddlerhood.

Research

We aim to contribute to research in applied statistics by facilitating contacts between members which lead to research collaboration, by holding seminars and study groups, by encouraging visits by applied statisticians, and by involving Ruakura members in graduate education.

A series of well-attended seminars on the EM algorithm were held in association with a graduate course taught by Murray Jorgensen. Ruakura members were particularly interested in the comparisons with minimization methods used in animal breeding work. A number of statisticians paid us brief visits and contributed stimulating seminars on applied topics. They included Richard Alldredge (Washington State), Jock MacKay (Waterloo), Agnes Herzberg (Imperial College) and Katrina Sharples (Univ of Washington). Plans for 1988 include a regular seminar series concentrating on expository talks in a wide range of application areas and a reading group on topics in industrial statistics.

We were pleased to welcome Janet Bodero (School of Australian Environmental Studies, Griffith University) as our first 'visiting member' for two months in late 1987. She undertook some collaborative work on the analysis of a particular crossover design with Isabelle Gravett, shared in some work on the use of large databases in livestock improvement with Harold Henderson, and was able to provide some valuable insights into mathematics education at all levels. We have another visiting member lined up for next summer but would appreciate a flood of further (self-funded!) candidates.

Education in Applied Statistics

The Centre offers a graduate course in statistical consulting, an integral part of which involves students taking partial responsibility for design and analysis of Ruakura projects under the supervision of Ruakura biometricians. A pilot version ran in 1986 and it is being mounted again this year. Ruakura staff are also playing an increasing role in the supervision of graduate student projects.

University Consulting

With the establishment of the Centre, the University has for the first time provided a formal statistical consulting service for staff and research students. The service has been patronised mostly by research-

ers in Biology and Earth Sciences but we expect the net to steadily widen until we hold the whole institution in our thrall.

External Consulting

There has been a reasonable demand for our scarcely advertised services with about 20 jobs in the first year for fees ranging from \$200 to \$7500. The work has fallen into three main categories:

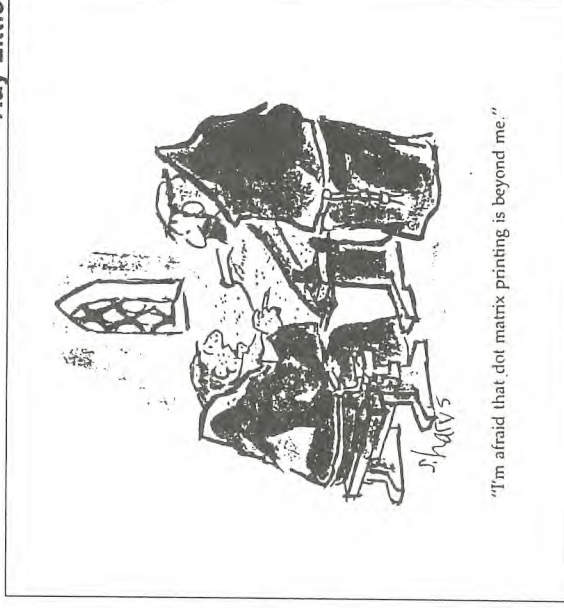
- (i) industrial statistics, especially quality monitoring and experimentation for improvement of quality and productivity in the dairy industry,
- (ii) environmental monitoring, in partnership with such agencies as the Department of Conservation, Coalcorp and the Hamilton Water Quality Centre, and
- (iii) agricultural and related research involving, for example the Meat Industry Research Institute, the Livestock Improvement Division of the Dairy Board, or agricultural chemical companies.

We have been grateful for the informal education given to us, and impressed by the importance of the work undertaken by, statisticians already established in the industrial arena. This must be the area with the greatest potential for statisticians to play an increasingly important role in the near future.

More Rhetoric

The Centre was established with the idea of more fully exploiting the strengths of both university and research centre. At a time when public sector statisticians are sharing a more general anxiety about the future of our working environment, it has helped us feel more positive about our ability to influence our own future.

Ray Littler



"I'm afraid that dot matrix printing is beyond me."

News from the VUW Institute of Statistics and OR

The third term of 1987 saw a visitation from John Bibby (private consultant, Edinburgh, UK) as a temporary replacement for David Vere-Jones, who was still in Italy at that point. John proved to be a lively addition to the group and made quite an impact in the short time that he was here. As far as the Association was concerned, John's visit led to a useful exchange of educational material and copies of *Statistics at Work* were exchanged for some of John's publications: *Notes towards a History of Teaching Statistics and Quotes, Damned Quotes, and ...*

Dr Zheng Xiaogu, our UGC post-doctoral fellow, has been working at ISOR since October 1987 in geographical time series. He is expected to be here for two years, and is temporarily absent in Canada at Carleton University studying contact and percolation processes.

ISOR has been reorganised to take some of the administrative burdens off the Chairperson, and the new system seems to be working reasonably well at the moment. Contract research activities continue to play a significant role in the Institute. Late in 1987 several Institute members were involved in the teaching of a forecasting course to employees of Telecom. This was repeated in February of this year, and a further course will be given in May in Auckland. Through ISOR, Sharleen Forbes was instrumental in organising a large contract with the Department of Education on ethnic and gender differences in performance in mathematics. The work for this project is currently being undertaken by Sharleen, Elizabeth Robinson, Thora Blithe, Jean Thomson and Megan Clark among others.

Earlier this year, we were especially pleased to welcome an old friend, Dr Agnes Herberg (Imperial College) to Wellington and the Institute in particular. Agnes gave three entertaining and interesting talks during her week-long stay.

In March of this year, David Vere-Jones helped organise a New Zealand/Italy workshop on the comparative aspects of earthquake risk. The concomitant overseas visitors included Fabio Musmeci and two of his colleagues (ENEA, Italy), Karen McNally (University of California, Santa Cruz) and the NZ Royal Society Rutherford Lecturer, Professor Dan Mackenzie (Cambridge, UK). We were even more delighted to have Fabio visit the Institute again for the fortnight following this conference.

Dr Ann-lee Wang from the University of Malaya visited the Maths Department to work with Thora Blithe on mathematics education and David Vere-Jones on point processes. We also have Mike Dollinger visiting the Maths Department from the Pacific Lutheran University in Washington State. His

research interests are in functional and numerical analysis with applications to probability and statistics. Amongst other things he has been helping teach the graduate course in probability and burying various ISOR members on squash and tennis courts.

Dr Hatem AbdelAty, an Irish Egyptian, is a temporary replacement for Stephen Haslett, who is on leave at Iowa State University for one year. Megan Clark will be absent on leave at Southampton from May until early next year.

The Institute is currently reeling under a large increase in graduate numbers, with more than 20 doing Diploma, Honours or higher level programmes. There has also been a significant increase in first year numbers, with the service statistics course Math 193 going from 160 to over 300. The Quantitative Group in the Commerce Faculty has also recorded explosive increases.

Mark Bebbington, who is currently doing a MSc on percolation processes, has recently been awarded a Commonwealth Scholarship. This is tenable at Darwin College, Cambridge, for research towards a PhD under Dr Frank Kelly. We are all very pleased for Mark and wish him every success in his future studies.

We continue to develop the ISOR computing facility and this year for the first time we have graduates using S. The opportunity to expose the students to this leading graphics and data analysis package has been greatly assisted by generous support from the University and we are in a much stronger position now than we were last year. We continue to be grateful to AMD for systems support and Olivetti for general support.

Brian Dawkins

SAVE 50% (OR SO) ON BOOKS

We are a new, small publishing house and book distributor specialising in statistics and maths education. We can supply you with any book in print at UK or US prices, which are 50-60% cheaper than in New Zealand.

Postage is free on all orders over \$30, and you can pay with Visa/Mastercard or a cheque in NZ\$.

Please send your wants list with Visa/Mastercard number or cheque for NZ\$20 as deposit to: John Bibby, 29 Liberton Brae, Edinburgh, Scotland, or phone (from New Zealand) 0044-31-6643765.

If cost of books (excluding postage) exceeds \$300 then (New Zealand) GST may be levied.

UNIVERSITY OF CANTERBURY

Prof. Shanti Gupta, Head, Dept of Statistics, Purdue University, will be visiting Canterbury from August 25 to October 25. Anyone interested in more details contact John Deely, Mathematics Department, Canterbury.

Dr. Frank had joined the Statistics group at Canterbury University January of this year. A Bayesian Statistician from USA having taught several years at Utah and New York.

UNIVERSITY OF AUCKLAND

Recent appointments: Patrick Graham as Statistician/Programmer in the Department of Community Health in the Medical School.

Visitors: Currently Peter Phillips from Yale is visiting the Economics Department and Jack Mackay from Waterloo continues his visit in the Department of Mathematics and Statistics. Malcolm Quine, from the

John Deely

University of Sydney, will be visiting for the second term and Keith Worsley, from McGill, will be here during May and June. We also expect shorter visits from T.M.F. (Fred) Smith from Southampton and George Styan from McGill during the second term.

Alastair Scott

FROM THE U.S.A.

I have decided to accept a position at the National Academy of Sciences and to leave the Census Bureau, effective next week. The new position, Director, Board on Mathematical Sciences, offers considerable challenge to improve the state and usefulness of mathematics, statistics and operations research work in the U.S. I will have some time to continue my individual research (especially the controlled rounding for 3D and subtotals work) and will maintain an affiliation with the Census Bureau on confidentiality issues. Unofficially, I can continue as a link between New Zealand and American colleagues in official statistics. Wish me luck!

Lawrence H. Cox

Centre for Computing and Biometrics, Lincoln College

Comings and Goings

Dr Peter Neumann braved bush singlets and cow pats to speak to members of the Centre for Computing and Biometrics at Lincoln College on "Computing in Finite Groups" and "The Memoirs of Evariste Galois". A few of the Biometrics Unit from MAF joined us for the first session, which proved to be a challenge to us who had forgotten all about groups. Dr Neumann's pleasant patience was to lead us through an all-too-brief undergraduate programme of group theory in five minutes and then a graduate programme of the same in ten minutes before presenting the major topic. It was quite a mental stretch for those of us who had yet, as biometricians, to master Kempthorne's chapter on Galois field theory.

Dr Neumann's second talk was pitched at a more general level, and proved to be both entertaining and challenging. Galois, to those who had read E.T. Bell's account of his life, has always been a dramatic figure in the history of mathematics. The story of the young, brilliant, hot-headed genius, years before his time, completely misunderstood and rejected by the conservative, reactionary and stodgy mathematical "establishment" of his time which lead to his embittered revolt against the political establishment appeals to every young undergraduate nursing the wounds of a C+ grade. It wasn't quite like that. Dr Neumann gave us an enlightening account of the interaction between Galois' life, what he stated in the

Memoirs and, more importantly, how well he stated his ideas! Poisson's criticism was fair, if firm. Galois had not been neglected: he had published in a reputable journal, even if, Dr Neumann tells us, it wasn't a really thoroughly prepared paper. A good research supervisor could have changed the course of history here.

If Dr Neumann found it necessary to apologise for pitching his first lecture above his audience, we found it essential to apologise for asking such elementary questions! Nevertheless, we were able to help him in one endeavour: that of finding out more about the maker of a violin in his possession, one Rees who flourished in Christchurch at the turn of the century.

Mostly Goings

The Centre is being thrown into a state of mild panic by the departure of our tutor, Ruth Frampton, who having been awarded her PhD in entomology, is leaving us to join MAFQual at Lincoln, where her expert knowledge of insects will be employed keeping them out of New Zealand. Her efficiency in organising labs, tutorials, tests and exams will be sorely (very sorely) missed.

Bruce Robertson will be away for six months visiting the UK and Europe.

Richard Sedcole

Department of Statistics - A New Look

As the economy becomes more competitive a greater need for complete statistics develops. Until now it was only the forward thinking people who thought it necessary to utilise information on a wide range of topics especially economic indicators. However to use an old cliché "times are changing" and it is becoming more important to understand just what is going on in the environment we operate in.

Businesses need to consider their options and investigate all possibilities to find the best source of information. The most logical place to start is where the bulk of the data originates so why not exploit the most valuable source of data to your own advantage.

BUSINESS DECISIONS

The Department of Statistics provides the basis for a lot of the analysis which is presented to the public and companies. Some examples of how the information can be used are set out below:

- (i) If looking at a new business location you can find an area with a population suitable for your business purposes.
- (ii) By using import statistics you may discover that your market share is different from expected.
- (iii) You can compare your wage rates with others in your industry or on a total New Zealand basis.
- (iv) Unusual economic activity may be uncovered by using available information (both data and documentation).

The Department of Statistics is the largest collector and disseminator of statistical data in New Zealand. Therefore it would be a good idea to make use of this very valuable and to date largely unexploited source.

A large number of surveys are done so therefore the range of data available is expansive. There will certainly be data held which will be of interest and use to your business whether it is general economic or industry specific.

The statistics are presented in a number of ways. Publications, news releases, customised tables or the department's database, INFOS, will provide you with the most appropriate means of receiving your information. Output is available on computer printout, diskettes or magnetic tape.

NEW DEVELOPMENTS

Investigations into existing and future products have already begun and these will make statistics much more accessible to a larger number of people.

Some of the interesting developments which have taken place over the last year have begun to move the department away from the traditional views. More people are becoming aware of the department not for its surveys regularly collected but for the information it readily supplies

to the public.

An example of these developments is a product being designed to carry the Census of Population and Dwellings information in a new medium. The data will be put onto compact disc for use in CD Rom players attached to a PC.

A system called "Supermap", which has been successfully adopted by Australian and American statistical organisations to hold similar data, is the software behind this new product. Such a system will be very useful to those people who are using IBM compatible XT or AT colour PC's and wish to use population statistics with mapping facilities.

The possibilities to extend this system to other areas of data is the next step in the development of such a system. Information on the business areas in New Zealand already available in printout and publications may well be extended to incorporate mapping capabilities.

CURRENT PUBLICITY

The advertisements which have appeared in a number of magazines have been used as a medium to create further awareness of the department in the public eye. You may have already seen some of these. Many people have now realised that the Department of Statistics can produce information vital to their needs and in a form that is convenient to them.

TO FIND OUT MORE

As you are also interested in the ways that the department can help you we are willing and able to guide you to the areas of importance to you. For further information on the availability of data please contact any of the below people and we will be happy to help you with your requests.

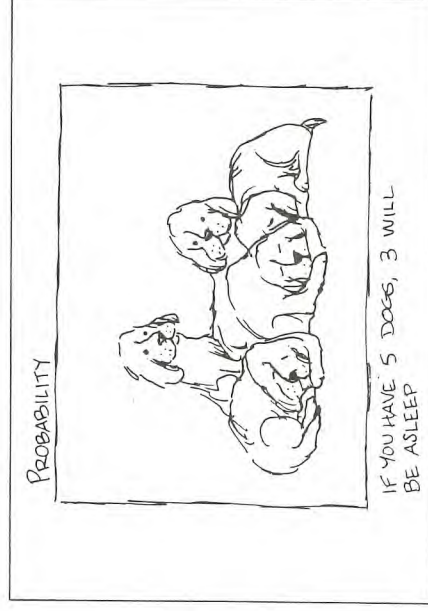
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Prince and Princess of Wales Science Award



Harold Henderson, a statistician at the Ruakura Agricultural Centre, was awarded \$1000 by the Royal Society of New Zealand towards his recent visit to Cornell University. Harold was the third of our members to receive this award, the other two being Peter Thomson and Colin Cryer. In our last issue he wrote about his experiences at the statistical meetings in San Francisco en route to Cornell. He continues:

Research at Cornell

Shayle Searle invited me to spend 6 weeks at Cornell University collaborating with him and Friedrich Pukelsheim who was visiting from Germany. Among other things we completed a paper on *Generalized Dispersion Matrices for Covariance Structural Analysis*.

The Field of Statistics has statisticians from various departments. Funding for research, visitors and students is very healthy as Cornell has the Mathematical Sciences Institute which is funded by the US Army Office of Scientific Research. Cornell seems to have computers all over the place, many donated by IBM from PCs through to its largest supercomputer for the Theory Centre's new \$US 20 million system. The Theory Centre was established in 1985 with a \$US 22 million National Science Foundation Grant and has created interdisciplinary groups based on problems being solved on the supercomputer.

Data Desk

I also pursued my interests in exploratory data analysis, statistical packages and graphical display of data with other Cornell statisticians like Paul Velleman. Paul is leading development of Data Desk, a desktop data analysis and display environment implemented on the Macintosh. With the mouse you can touch datapoints in a plot to ask questions about them or restrict another analysis to a subset of the data. Data Desk plots rotate the point cloud to provide true three-dimensional graphic views of data. Data Desk's windows link together so that several aspects of the same individuals or groups can be seen simultaneously in adjacent windows possibly highlighted by slicing and brushing. The new version is due for release at the end of March.

Macintosh

I bought a Macintosh at Cornell. The price in the US is such that you can pay to fly there, buy a Mac, bring it home, pay GST and still pay less than what it would cost to purchase it in New Zealand (for both academic

and other purchasers)! Price differentials make software purchase from the US also very attractive.

MathWriter, a *wysiwyg* (what you see is what you get) mathematical typesetting package for the Macintosh is also being developed at Cornell. At \$US50 it represents great value. MathWriter can be used to create TeX files.

The Hendersons three

C R Henderson, my academic grandfather, now emeritus professor of animal science at Cornell and I met for discussions with his son, C R Henderson Jr. Charles Jr had an interesting review paper from a recent issue of *Econometric Theory*, by Jan Magnus, which was related to work of mine with Searle on vec operators, Kronecker products and Jacobians. Here, in one office were possibly the only Hendersons interested in this area of matrix algebra applications in statistics!

Libraries

It was great to be able to spend a few days exploring topics of interest in the extensive Cornell libraries. The Biometrics Unit have a 14 page listing of statistical journals held by the various libraries at Cornell. The *New Zealand Statistician* was not held! The Mathematics Department library promised to rectify this. To be able to browse the journals and stacks was marvellous. colleagues and clients for adjusting consulting loads during my absence.

BOOKS AVAILABLE FOR REVIEW

The following books have arrived. If you wish to review any of these books for the journal, please write to the Editor, 'The NZ Statistician', P.O. Box 77-087, Auckland, 3.

Mixture models: Inference and applications to Clustering by G.J. McLachlan and K.E. Basford

Models of Society by F.L. Jones and P. Davis

Randomized Response: Theory and Techniques by A. Chaudhuri and R. Mukerjee

Articles on relevant subjects are also welcome: please follow the Guide to Authors on the inside back cover of Volume 22 No.2.

Jocelyn R. Dale

A suggested caption for the November photo (of serried ranks of important statisticians):

"We wouldn't be where we are today if it wasn't for the wine and cheese after this meeting."

D J Haverkamp

Operational Research Society of New Zealand

24th Annual Conference 1988, August 18-19, Auckland University

Papers are invited on all aspects of the theory and practice of Operational Research. Each paper will be allocated about 30 minutes. Please submit abstracts, before 30th April, to:

ORSNZ Conference Secretary
T.A.M. Department,
University of Auckland,
Private Bag,
Auckland.

Student papers are especially welcome. Student travel grants may be available - for details, contact the Conference Organisers.

Enquiries to: Julie Falkner (09) 737-999 x 8387
Andy Philpott (09) 737-999 x 8394

Report on the First International Conference on Statistical Data Analysis based on the L1-Norm and related methods

Selected Comments

The Conference was held in Neuchatel, Switzerland for the week 31 August - 4 September 1987. About 40 countries were represented. Numbers were fairly large but manageable. The venue was delightful,

right beside a lake where swimming was popular. The overall verdict - a great success.

Summary of PC Software brought back

1. ROBSYS - for robust regression, etc. Writup only. Cost c. \$400 NZ to \$1200 NZ depending on what is bought and if you're an educational institution.
2. BLINWDR - for robust regression, etc. Writup and disc.
3. RLLAV - for robust linear regression (ex IMSL). Writup and disc.
4. VERTEX and REVEX - for robust linear discriminant analysis. Writup and disc.
5. XPLORE - for exploratory regression analysis. Demo' disc and writup only. Needs EGA graphics. Cost DM 2000.
6. STADIA - for spectral functions and harmonic analysis of a univariate random process. Writup only.
7. ENOPA - nonparametric density estimation and regression. Writup only - in French. Needs EGA graphics.

C.S. Withers

INTERNATIONAL CONFERENCES

Ninth Australian Statistical Conference
To be held in conjunction with the Mathematical Science Congress, in Canberra, May 16-20 1988.

International conference on Biomathematics
Xi'an, China, 25-30 June 1988.

Joint Meeting of the Western North American Region (WNAR) of the Biometrics Society and the Institute of Mathematical Statistics (IMS)
15-17 June 1988 in Honolulu, Hawaii.

XIVth International Biometric Conference
Namur, Belgium, 18-23 July 1988.

Fourth International Meeting on Statistical Climatology
March 27-31, 1989, Rotorua, New Zealand.
Enquiries should be addressed to Dr John Revfeim, Meteorological Service, P.O. Box 722, Wellington, New Zealand.

New Zealand Statistical Association Annual Conference
14-17 August, 1988, Massey University, Palmerston North, New Zealand.
Enquiries should be addressed to Dr R.J. Brook, Department of Mathematics and Statistics, at the above address.

Icots III
To be held in Dunedin, New Zealand during August 1990.

NEW ZEALAND STATISTICAL ASSOCIATION ANNUAL CONFERENCE

14 - 17 AUGUST 1988
MASSEY UNIVERSITY, PALMERSTON NORTH

FIRST NOTICE AND CALL FOR PAPERS

The venue for the conference is the elegant and stately old homestead, Whararata, which is set in a pleasant setting of extensive lawns and gardens. Computer software and books related to statistics will be on display in the Social Science Tower which is adjacent to Whararata.

Participants may wish to enrol for the whole conference or on a daily basis. Wednesday 17th will be given over solely to workshops on statistical computer packages while the program for Monday 15th and Tuesday 16th will consist of invited and contributed papers. To assist planning for the conference, we would like an indication from you if you may possibly attend. Indeed, even if you have not made a final decision about your attendance but would like to be kept informed of further details about the conference, please return this form.

Papers are invited on all aspects of statistics but emphasis will be given to the applications of statistics and the interface with computing. Each paper will be allocated about thirty minutes. Please submit abstracts, before **June 15** to:

Dr R J Brook
NZSA Conference Secretary
Department of Mathematics and Statistics
Massey University
Private Bag
Palmerston North
New Zealand

.....

(Either tear off this section, or photocopy the page, complete and send to the above address as soon as possible)

I may/may not (delete the inappropriate response) attend the 1988 NZSA Conference but keep me informed.

I will/may/may not/will not (delete the inappropriate response) give a paper titled

_____ in the statistical area of _____

Name: _____

Address: _____

I am/am not (delete the inappropriate response) a full-time student.
Student travel grants may be available.

New Zealand Statistical Association (Inc)

1988 Publications Catalogue

Statistics at Work (1982; edited by S. Gubbins, D.A. Rhoades and D. Vere-Jones) \$13.50

A handbook of statistical studies for the use of teachers and students. Includes eleven case studies accompanied by exercises, numerous references for further reading together with suggestions for class work and projects. Illustrates the practical importance of statistical ideas in a range of applications in a New Zealand context.

StatLab (1987; by W. Douglas Stirling) (NZ or US) \$99.00

StatLab is a computer program for teaching statistical concepts to students in introductory statistics courses. StatLab runs on the Apple Macintosh and covers most topics in such courses and can be used by students in practical classes or by teachers in classroom demonstrations. It is sold with a 180-page book containing detailed instructions for 16 practical classes and a full manual about the program. Site licenses are available.

Understanding Surveys (1988; edited by V. Duoba and J.H. Maindonald) \$10.00

This booklet provides a non-technical introduction to sample surveys and the many ways in which surveys are used. The focus is on the design of a survey and on the collection of survey data. It has been adapted for New Zealand needs from a document prepared by the American Statistical Association and contains many examples of New Zealand surveys. It includes exercises and can be used in statistics, social science and other courses to give students a brief introduction to sample surveys.

Quotes, Damned Quotes, and ... (2nd edition 1986; compiled by John Bibby) \$ 7.00

An anthology of sayings, epithets, and witticisms - several

of them something to do with statistics!

Notes Towards a History of Teaching Statistics (1986; by John Bibby) \$12.50

This book examines the development of a subject and the evolution of a profession. Three key themes relate to the institutional development of numeracy, continual "identity crises" in statistics, and the agonising emergence of a new profession. These themes are illustrated using a wide variety of episodes including Florence Nightingale's designs for an Oxford professor, Karl Pearson, and many, many more. Useful historical background.

Further information on these publications can be obtained from NZSA Publications, Department of Mathematics and Statistics, Otago University, PO Box 56, Dunedin.

Order Form

Please supply the following:

	No. of Copies
<i>Statistics at Work</i> (\$13.50 each)
<i>StatLab</i> (\$ 99.00 each)
<i>Understanding Surveys</i> (\$10.00 each)
<i>Quotes, Damned Quotes, and ...</i> (\$7.00 each)
<i>Notes Towards a History of Teaching Statistics</i> (\$12.50 each)

Our cheque for \$..... is enclosed. (Note that no GST is payable on NZSA publications except for StatLab)

Name:.....

Address:.....

Return to NZSA Publications,
Department of Mathematics and Statistics,
Otago University,
PO Box 56, Dunedin.

One of the products of David Vere-Jones' recent trip to Italy. While in Rome, David was working with Fabio Musmeci (ENEA) analysing Italian earthquake catalogues and undertaking various simulations etc. Fabio's brother, Mario, drew the above cartoon of Fabio and David at work! (Mario has kindly given his permission for it to appear in the Newsletter.)



by Mario Musmeci (18-1987)

NEW ZEALAND STATISTICS ASSOCIATION

The New Zealand Statistical Association, founded in 1948 is New Zealand's only association for professional statisticians. Its constitutional aims and objectives are the encouragement of theoretical and applied statistics in New Zealand.

The Association's affairs are conducted by its Executive Committee. A number of affiliated local groups are concerned with the promotion of statistics in their region.

Activities

The Association's annual conference is a major event on New Zealand's statistical calendar with statisticians attending from all over the country and also from overseas. This year it will be held at Massey University from the 15th to the 17th August. The conference provides a unique opportunity for meeting other New Zealand and overseas statisticians. The Association also sponsors occasional regional meetings, statistical software displays and workshops.

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.

The *Education Committee* is concerned with the promotion and teaching of statistics at all levels in the New Zealand educational system. It is currently offering assistance in the form of one-day in-service seminars, additional resource material and regional lists of members who are willing to assist with project work and occasional talks to classes. In association with the NZ Department of Statistics, the DSIR Applied Mathematics Division and the Ministry of Agriculture of Fisheries, the Association sponsors prizes for statistical excellence at each of New Zealand's regional Science Fairs.

A project on the *History of Statistics in New Zealand* is concerned with building up an archive, both oral and written, of the early history of New Zealand Statistics as remembered by New Zealand's early and influential statisticians.

The Association supported a successful bid to hold the *Third International Conference on the Teaching of Statistics* (ICOTS 3) in Dunedin, New Zealand, in August 1990. It is actively involved with the preparations for this conference which is concerned with the teaching of statistics in primary schools, secondary schools, technical institutes, universities, government and industry. This will be the first time that an ICOTS conference is held in this part of the world. New Zealand teachers will have an outstanding opportunity at ICOTS 3 to make themselves familiar with international developments in the teaching of statistics and, in turn, will be able to show overseas teachers new and interesting local developments.

Publications

The Association's official journal, *The New Zealand Statistician*, is published twice yearly and contains a wide variety of articles of interest to a diverse membership. A regular *Newsletter* keeps the membership up to date with the

statistical happenings up and down the country and with any interesting overseas developments.

The *Publications Committee* aims to be the first point of contact for authors who wish to submit textbooks, monographs, statistical software etc for publication by the Association to the wider New Zealand statistical community. The Association has published an applied statistics casebook, *Statistics at Work* which many secondary schools have found useful for 7th form classes and is about to publish a booklet entitled *Understanding Surveys* which should also be a useful resource book for secondary school teachers. It has also published (with Massey University) a statistical program called *StatLab* for the Apple Macintosh. *StatLab* demonstrates statistical concepts through practical classes and simulations.

Membership

Applications are invited from any persons, firms or organisations interested in furthering the aims and objectives of the Association.

For further information write to the Secretary, New Zealand Statistical Association (Inc), PO Box 1731, Wellington.

MEMBERSHIP APPLICATION

The Secretary
New Zealand Statistical Association (Inc)
PO Box 1731
WELLINGTON

I wish to join the New Zealand Statistical Association (Inc).

Name:.....

Address:.....

.....

.....

Occupation:.....

Membership category:
(Ordinary, Corporate, Student, Library).....

My membership subscription is enclosed.

Signature:.....

Date:.....

The 1987/88 subscription rates are \$30 (Ordinary), \$60 (Corporate), \$15 (student), \$30 (Library).

First-time members who pay the above subscription before the Annual General Meeting in August 1988 qualify for an introductory offer of 1988/89 membership together with half the 1987/88 membership.

Members! Photocopy this page and give it to a friend!