New Zealand Statistical Association (Inc.)

newsletter

ISSN 0112-2649

August 1985

Number 7

WELLINGTON REGIONAL MEETING—CANCELLED

The executive committee has been trying to arrange a one-day seminar in Wellington for late August. The 1984 AGM asked for such a meeting to provide a forum for Wellington members in a year in which the main activity was the Pacific Statistical Congress in Auckland. With the success of the evening session on consulting arranged by Ray Littler at Auckland it was thought that a continuation on this theme giving more scope for audience participation would be popular. Regrettably there has been only a limited response to calls for contributors, both through the newsletter and by personal contact.

The August meeting has thus had to be cancelled.

Undeterred by this initial setback, which may simply reflect a temporary surfeit of good things at the PSC-85, it is proposed to try again if support is forthcoming. The object of this note is to gauge the extent of such support.

It is proposed to hold a one-day workshop session looking at consulting from both inside and outside the profession. From inside, statisticians involved in this area, and most of us are one way or another involved, would discuss in small groups specific topics, some of them taken from the Auckland session. A degree of unanimity within a group on perceived problems and possible solutions in consulting would lead to a presentation of findings to the combined workshop.

From outside, and this is more tentative, we hope to get people who work with statistical consultants to comment on the utility of such arrangements.

The timing of the workshop is not fixed yet. It could possibly be in late November but more likely in February next year. It is possible that participants may have to pay a small charge, say $10.

To gauge interest and to aid planning would those readers who are interested please return the coupon at the end of this newsletter by 31st August 1985.

Garry E. Dickinson,
President.

A PUBLICATION POLICY FOR THIS ASSOCIATION

The last newsletter included a call, which was admittedly buried in a report on the AGM, for readers to respond to a Statistical Society of Australia proposal to share the editing and costs of their revised journal—such a sharing of responsibilities would possibly result in the extinction of *The New Zealand Statistician.* Not a sausage has been received. The newsletter also published a letter from Professor David Vere-Jones outlining his ideas for enlarging the scope of *The New Zealand Statistician.* This well-written letter generated no sausages either.

The time has probably come for this association to do a bit of navel-gazing with respect to a publications policy. What sort of journal and newsletter to the membership want? Do members wish *The New Zealand Statistician* to be preserved pretty much as it is or do they wish it to go truly international and become a sort of South Pacific Journal of Applied Statistics? What sort of articles does the membership expect and want to see in the journal? As an aside, the "Notes for Authors" in the journal hasn't been revised in seven years and we apparently still publish appraisals of calculators. Hands up all those who still use a calculator?

At present, the journal and newsletter is received by:

31—local Corporate Members (2 copies each)
2—overseas Corporate Members (2 copies each)
3—local Exchange Members
7—overseas Exchange Members
3—local Honorary Life Members
244—local Ordinary Members
14—overseas Ordinary Members
4—local Student Members
14—local Libraries
7—overseas Libraries

Any attempt to evolve into a truly international journal would probably place some financial strains on the local membership until the level of overseas subscriptions built up. And many more papers would need to be submitted to the journal.

However, three aspects of the local membership figures are disappointing. The first is the very low number of student members. Students pay half the ordinary subscription fee and get access to a journal and newsletter which seem to be carrying more and more job advertisements. Perhaps we should ask university teachers to proselytise a bit for us. Secondly, it appears that very few secondary school and technical institute teachers belong to the association. Perhaps we have not catered for these potential members, in terms of published material, apart from the casebook "Statistics at Work", very well in the past. Yet members of this association have played high-profile roles in the establishment and revision of syllabi for these institutions. The third aspect is the low number of library subscriptions—only four of the country's seven university libraries subscribe to our publications and only one of the country's technical institute libraries subscribes.

The success of the casebook, "Statistics at Work", also raises the question of other publications. Should we be sponsoring the production of other textbooks and resource books for secondary schools and technical institutes? The New Zealand Mathematical Society appears to have been very successful at this. Should we be

Published by the New Zealand Statistical Association (Inc.), P.O. Box 1731, Wellington, New Zealand. Printed by Bayleys Allprint Services Ltd., Wellington.

producing brochures for lay and media persons on, say, "Understanding and Reporting Survey Results"? Should we even be contemplating publishing handbooks for practising statisticians (e.g. a "GENSTAT Companion" full of lots of sage advice on, say, how to use pseudo-factors and avoid the dreaded "AN 1")?

The executive committee would like to hear your views and suggestions on all of these matters. You can either write privately to the committee or write a letter to the editor of the newsletter. And while you are in the writing mood you may also like to compose an item for the newsletter or an article for the journal.

SOME ASPECTS OF STATISTICAL CONSULTING—DIVISION OF RESPONSIBILITIES, TRAINING AND THE UTILITY OF CURRENT STATISTICAL RESEARCH

by John Reynolds

The recent Pacific Statistical Congress (PSC) included an evening panel discussion, organised by Ray Littler (Biometrics Section, MAF, Ruakura) on Statistical Consulting and a planned Wellington Regional Meeting of our association is likely to be devoted to this topic also. This article presents some opinions on aspects of statistical consulting with government scientist clientele and partly summarises some of the points raised at the PSC forum. It is to be hoped that readers will contribute some of their own thoughts on consulting either to the newsletter or at the planned workshop.

Division of Labour between Consultant and Client

The division of responsibilities between statistician and client varies, of course, from client to client. A few clients can do almost everything themselves and merely need to checkout the finer points of their analyses with their statistics (e.g. The statistician is asked to check that the client has got the appropriate 'BLOCKS' statement in his or her GENSTAT ANOVA program). Such clients have generally taken a course based on the almost-classical textbooks by Snedecor and Cochran or Steel and Torrie.

If a statistician is privileged enough to be involved in the design stage of a project he or she should supply the randomisation plans and offer assistance during the execution of the study. The client should arrange for the inputting and checking of the data and the statistician completes the analysis. Numerate clients should be encouraged to do the analyses themselves using MINITAB or GENSTAT if the study is a straightforward one (e.g. a CRD or RCB design). There is however a body of opinion that clients should be allowed to remain a statistically-naive "native tribe" (Tukey, 1982).

An idealised division of client and consultant responsibilities is displayed in Table 1. Readers are requested to send the newsletter editor any ommissions or amendments. The list of consultant responsibilities is purloined from Marquardt (1979) and the list of client responsibilities is plundered from various sources.

Table 1. Ideal Statistician and Scientist-Client Responsibilities

Statistician Responsibilities	Client Responsibilities
* Meet clients on their home ground * Learn the client's subject matter and jargon * Understand the problem from the client's point of view * Devise a statistically sound plan of action (The plan includes a protocol for data gathering and recording and randomisation plans) * Obtain agreement on the plan from all those involved (who is to do what and when) * Monitor and expedite the execution of the plan (Visit the scene of the experiment, assist in the briefing of enumerators etc) * Analyse the data as simply as possible * Write a clear report and be timely * Follow up to see the report is interpreted correctly	* Establish basic goals for a project before consulting the statistician * Give the statistician some idea of the importance of the project (crucial versus incidental) and the level of resources available * If possible have some idea of measurement variation and what constitutes a real, or actionable treatment difference (This helps sample size determination) * Follow the agreed plan and contact the statistician before any changes have to be made * Data authenticity and accuracy * Creation of computer readable data files * Pester statistician if results are slow * Clear up any misunderstandings or ambiguities in the statistician's report * Allow the statistician to check any report before it is circulated or submitted for publication

Some of the client responsibilities in Table 1 deserve some extra comment. We have probably all been in situations where we have pulled the stops out to complete a fairly sophisticated analysis on what we though was a vitally important problem in the client's substantive field only to find that the project was of minor importance or the client's view of the problem according to his or her peers or superiors was unsound. Consultants should be able to expect an honest assessment from clients of the importance and urgency of a project. In the absence of this, the level of pestering is a good measure of importance. Embarrassing situations can occur when clients complete extra analyses without the consultant's knowledge and include them in published reports along with an acknowledgement of the consultant's valuable help. Clients do need to be told the rules of the game. Once we have agreed on the definitive version of Table 1 we may wish to hang it up in our waiting rooms, just above the shelf containing the *Time* magazines and *Woman's Weeklies.*

Training

A fourth year of statistics courses (i.e. a non-thesis masters or a post-graduate diploma) is probably a minimal qualification for a statistical consultant. Several lists of core fourth-year courses abound (see, for example, Marquardt (1979) and the selection of papers on Graduate Programs in Statistics in Rustagi and Wolfe (1982)).

But at least one eminent statistician ranks academic statistical training below general science training, attitude, and experience (Daniel, 1969). Briefly you can't have too many mathematics, statistics, computing and science (or social science) courses.

Internships and "Stat.D." degrees (analogues of "M.D." degrees) have been suggested by various statisticians as alternatives to dissertation writing.

Given mastery of statistical theory and a repertoire of basic techniques, then other skills become the sole determinant of effective statistical consulting. Consultants need to be able to express mathematical and statistical arguments in words (e.g. Not "Consider theta-sub-zero-hat which is A.N. with mean theta-sub-zero and V.C.V.M. cap-omega-sub-zero" but "these statistics have derivable means and variances".) This habit or skill can be learned. One way to have students acquire this skill is to compel them (in their fourth year) to tutor first and second year statistical methods courses (the tutors are, of course, paid). This allows budding statisticians to build a repertoire of verbal descriptions of important statistical concepts—power, test size, confidence etc. It also encourages math/stat majors, who typically work alone during their university studies, to brush up on their "people skills" or "dataside manner" as Boen and Zahn (1982) put it. Tutors who have had to counsel students with failing grades will be well prepared to perform the last rites (i.e. a "rescue-job") on a client's poorly planned study.

Other consulting skills can be learned by observation of consultants. Fourth year students can be assigned to and rotated around staff who will invite them to sit-in on their consultations. The students will see various consulting modes and styles. As an aside, compulsory consulting case studies courses, taken at the expense of a theory course, are probably not a good use of the student's all too short time at university. The problems presented in such courses are at best well-rounded and at worst contrived and students are not unaware of this. Of course, practical tips and anecdotes should always be inserted into applied statistics courses (Sample Survey Design courses should always include accounts of frame construction and enumerator briefings, and, Experimental Design courses should always include anecdotes about sadly missed plots and missing plot techniques, and the translation of a randomisation plan into a schedule or protocol for technicians to follow).

The need for other skills will become apparent on the job. Courses on effective time management, oral and written presentation skills, and interpersonal skills may be useful. Supportive employers will ensure that such courses are available as of right rather than bestowed as rewards for good behaviour.

The Utility of Current Statistical Research

We all moan about how hard it is to keep up with the current literature (if we ever were up with it) and about how, if we only had the time, we'd write the definitive treatise on, say, "Multiple comparison procedures in the presence of heterogeneity" or "The Definition of Interaction in Higher Order Contingency Tables". Supportive employers should ensure that consultants are able to attend conferences, refresher courses and workshops, and are allowed some "downtime" to explore the current literature and develop a research interest in at least one area of statistics. Sabbaticals, extended leave-without-pay provisions and job-swap systems should be available so that consultants can acquire new skills.

Keeping up-to-date though, begs the question of what to keep up to date with. I am no longer, and was probably never, qualified to answer this. Someone who is qualified to answer this is Professor Oscar Kempthorne and in a recent letter to the editor of *The IMS Bulletin* (1985, Vol. 14, No. 1) he wrote:

> "Will IMS become a 'corner' in the field of statistics that is recognised as a significant portion of the whole statistical effort but as a 'little corner' that is out of touch with 'real' statistics, and is pursuing some spectrum of arcane mathematics with exposition that is entirely inaccessible to the minds of most statisticians? ('arcane' means 'what I do not understand'). . . . My personal bottom line is that I wish I had the mathematical background and the time and emotional energy to study our two Annals."

Some of us have probably always thought that many writers in the *Annals of Statistics* agonised excessively over what was happening to their pride-and-joy on sets of measure zero without telling us what their pride-and-joy was really supposed to be doing. I think a rule of thumb for those of us without the background, time or emotional energy is that if a technique gets mentioned more than twice in one's favourite second-level statistical journal, like, say, *The American Statistician* or *Applied Statistics* (JRSS C) or *The Statistician* then it deserves to be checked out. Bootstrapping has made it into this category in the last year or so. Generalised linear models made it into this category about five or six years ago, unless one lives in North America and has never heard of the Royal Statistical Society. Lowess hasn't quite made it yet. Of course, if journals in the client's substantive field mention techniques that you've only vaguely heard of they deserve to be checked out. Chances are you learnt about them ten years ago when they had a more sensible name.

Perhaps one way to dam the paper flood is for practitioners to encourage statistical theorists to adhere to the following general principle: "What statistical consultants don't need is another new, sophisticated-but-approximate tool, but a good comparative study of existing approximate tools and a 'chart' showing which tool is to be preferred under various circumstances (regions of the parameter space)." A collection of such charts would be somewhat akin to the "Datapeia" proposed by Tukey (1982) and would possibly be a skeleton for a "Statistical Expert System". Theorists should also be encouraged to investigate some of the practitioner folklore (e.g. the "airline ticket sales" model almost always works for monthly data—you never need to consider anything else; principal components analysis only works when there is strong and patently obvious clustering in the data; excessive splitting of covariances into components—i.e. MANOVA—is only illuminating when you have an underlying putative causal path model as in quantitative genetics).

Epilogue

There are many good books and papers which describe the rewards and hazards of statistical consulting and which address the abovementioned topics in great detail. However, books and papers are probably no substitute for observation of and conversations with exceptional and enthusiastic consultants. Some of my favourite books and papers include:

Boen and Zahn (1982) "The Human Side of Statistical Consulting." (Very American but full of amusing anecdotes.)

Box (1984) "The Importance of Practice in the Development of Statistics." (Reminds the reader that almost all the really important advances in statistical

theory came from consultants.)
Finney (1982) "The Questioning Statistician." (Warns the reader not to lapse into the role of a "computer with ears and vocal cords".)
Joiner and Pollack (1982) "Practising Statistics or What They Forgot to Say in the Classroom." (From the pen of a very successful consultant who used to remind his students to brush their teeth.)
Sindermann (1982) "Winning the Games Scientists Play" (Warns us to avoid "The Gopher Syndrome" and contains lots of sound advice on choosing a first job. The rest should be read with a grain of salt.)

The major adjustment required in the transition from statistics student to statistical consultant is the move from a world of rigour and instant assessment of answers by a higher authority to a world of compromise and delayed, and often garbled and inconsistent, peer review. Almost all "professionals" have to make similar adjustments to the "real world"—the adjustment can be a little harder after a prolonged adolescence (PhD programme).

References

Boen, J. R. and Zahn, D. A. (1982) *The Human Side of Statistical Consulting.* Lifetime Learning Publications, Belmont, California.
Box, G. E. P. (1984) The Importance of Practice in the Development of Statistics. *Technometrics,* Vol. 26, 1-8.
Daniel, C. (1969) Some General Remarks on Consulting in Statistics. *Technometrics,* Vol. 11, 241-245.
Finney, D. J. (1982) The Questioning Statistician. *Statistics in Medicine,* Vol. 1, 5-13.
Joiner, B. L. and Pollack, A. K. (1982) Practicing Statistics or What They Forgot to Say in the Classroom. In J. S. Rustagi and D. A. Wolfe (eds), "Teaching of Statistics and Statistical Consulting", Academic Press, New York.
Marquardt, D. W. (1979) Statistical Consulting in Industry. *The American Statistician,* Vol. 33, 102-107.
Rustagi, J. S. and Wolfe, D. A. (1982) *Teaching of Statistics and Statistical Consulting.* Academic Press, New York.
Sindermann, C. J. (1982) *Winning the Games Scientists Play.* Plenum Press, New York.
Tukey, J. W. (1982) Discussion. In J. S. Rustagi and D. A. Wolfe (eds), "Teaching of Statistics and Statistical Consulting", Academic Press, New York.

SOCIO-ECONOMIC DATABANKS NETWORK FOR ASIA AND THE PACIFIC (SEDNAP)

Participants at the UNESCO-sponsored Regional Workshop on Databanks for Socio-Economic Statistics and Analysis (held at the University of Melbourne in January, 1984) agreed to form a network to maintain links and information transfer. The network, SEDNAP, produces a newsletter which is distributed to network members. The newsletter is edited by John Gallacher, NZIER, and the first issue appeared in June 1985. This first issue included news items concerning the UNCTAD Economic Time Series Databank, STS Software for Accessing International Data, the Australian National University Social Science Data Archive (SSDA), and, News from the Economic Planning Agency, Japan.

Anyone interested in joining the network by having their name and address added to the SEDNAP mailing list should contact . . .

John Gallacher,
New Zealand Institute of Economic Research,
Private Bag,
Wellington. Telephone (04) 721-880

CANCELLATION
Wellington Regional Meeting
of the
New Zealand Statistical Association

The meeting scheduled for Wednesday, 28th August, 1985 has been cancelled. The organisers regret any inconvenience which may have been caused.

OBE AWARDED TO PROFESSOR J. T. CAMPBELL

The founding president of the New Zealand Statistical Association, Professor James T. Campbell was awarded an OBE for his services to education in the Queen's Birthday Honours. Professor Campbell was appointed to the staff of Victoria University of Wellington in 1935 and appointed to the Chair of Mathematics in 1952. A profile of Professor Campbell appeared in the December 1983 issue of *The New Zealand Statistician* and an earlier biographical essay appeared in the April 1982 issue of *The New Zealand Mathematical Society Newsletter.*

Professor Campbell is an honorary life member of this association and recently made another generous donation to the association. His two most recent donations are likely to be used, together with profits from "Statistics at Work", to produce a handbook on sample survey design and analysis. The casebook "Statistics at Work" was also initiated with a donation of seeding finance from Professor Campbell.

NEWS FROM THE STATISTICS SECTIONS AT APPLIED MATHS DIVISION (AMD), DSIR

Two of AMD's Auckland statisticians go stateside next month. Tony Aldridge is to visit Madison, Wisconsin for 12 months to work with Dr W. G. Hunter at the University of Wisconsin and with Dr Brian L. Joiner of Joiner Associates Incorporated. Tony Cooper has been awarded an NRAC scholarship for doctoral study at Stanford University.

And two Wellington AMD statisticians are travelling abroad, Jean Thompson is currently at the Open University, Milton Keynes, UK and will be consulting there until October, taking time off to attend the GENSTAT conference at the University of York and to visit Rothamsted. David Rhoades is speaking on Earthquake Prediction at the IASPEI conference in Tokyo, Japan and at the "Fuzzy Mathematics in Earthquake Researches" conference in China.

David Whitaker, who also has interests in Applied Statistics, has been appointed to the Operational Research position in Auckland. David is the author of a recent Wiley book "OR on the Micro". The vacancy for an Applied Statistician in the Industrial Statistics Section is still unfilled. Details can be found on page 6 of newsletter No. 6.

AMD has survived the recent "Thatchet Job" delivered to DSIR by Treasury and is gearing up to recover a quarter of its annual budget (in 1987) by completing charge-out work (AMD currently recovers 12% of its budget in this way). Some of this chargeable work which AMD and other DSIR divisions complete has been described as "very mundane, taking in the washing for a lot of government departments that don't have scientific facilities" (*Nature,* Vol. 316, p. 204, 18

July 1985). The statisticians at AMD wish to make it generally known that they do not routinely launder results from scientific experiments.

NEWS FROM THE INSTITUTE OF STATISTICS AND OR (ISOR), VUW

The institute lost Ken Russell to the Department of Mathematics at the University of Wollongong, New South Wales in June, and, Peter Thomson returned in July, via Greece, from 12 months sabbatical variously spent at ANU, Canberra, ISM, Tokyo and the Department of Economics at the London School of Economics.

A recent visitor to ISOR was Dr Richard L. Tweedie, President of the Statistical Society of Australia and Managing Director of SIROMATH. Dr Tweedie gave a seminar at the institute on "Estimating Parameters Through Laplace Transforms" and was apparently also "headhunting" for an industrial statistician for SIROMATH at Wollongong. Dr Masahiro Tanemura of the Institute of Statistical Mathematics in Tokyo was a Visiting Fellow at ISOR for the two weeks following the PSC-85. He gave a series of seminars on Spatial Processes.

Professor David Vere-Jones has recently attended the Bernoulli Society Fifteenth Conference on Stochastic Processes and Their Applications (which he also helped to organise) in Nagoya, Japan. Whilst in Japan, he also attended a meeting on Statistics Education in Upper Secondary Schools and reported on developments in New Zealand, and, sold copies of the NZSA casebook "Statistics at Work"—Peter Thomson has also been a successful promoter of the casebook in his recent travels.

NEWS FROM THE DEPARTMENT OF MATHEMATICS AND STATISTICS, MASSEY UNIVERSITY

A textbook entitled "Applied Regression Analysis and Experimental Design" written by Dick Brook and Greg Arnold has recently been published by Marcel Dekker, Inc. The 256 page text retails for about $US40 and is pitched at upper-level undergraduate and graduate students. Another Marcel Dekker book pitched at a more popular audience has been edited by Dick Brook, Greg Arnold, Tom Hassard and Rob Pringle. Entitled "Fascination of Statistics", the 424 page book is to appear in February, 1986 and should retail for about $US24.

Tom Hassard has left for the Department of Social and Preventative Medicine, University of Manitoba, Canada and his old job is currently under offer. The department has also been having a number of meetings to consider the appointment of a new Professor in Mathematics.

A number of staff are playing with two new Apricots plus a printer which are used by secretaries for Math/Stat typing. These machines were chosen for the following reasons: (i) What you see on the screen is what you get (ii) Overprintings (e.g. hats) show on the screen (as hats)! (iii) Three sets of fancy characters are available and more can be created (iv) Typists like the facility of menus on the keyboard (dynamic keyboard labelling). The department hopes to get a third Apricot next year.

MOVING

Members are requested to notify the Treasurer, NZSA, P.O. Box 1731, Wellington of any change of address in order that newsletters and journals (and subscription reminders) can continue to be despatched to them.

THE UNIVERSITY OF AUCKLAND

LECTURESHIP IN STATISTICS

Closing date: 15 September 1985

Applicants with research interests in most branches of Statistics and Probability are welcome to apply. Applicants should have postgraduate qualifications and proven research ability, and will be expected to play a full part in the Department's consulting activities. Careful consideration will be given to the applicant's potential as a Teacher.

Commencing salaries will be established within the range $NZ23,622-$27,928.

Conditions of Appointment and Method of Application are available from the Assistant Registrar (Academic Appointments) University of Auckland. Application in accordance with the Method of Application should be forwarded as soon as possible, but not later than the closing dates stated.

W. B. Nicoll
Registrar
University of Auckland
Private Bag
Auckland

COMMONWEALTH FUND FOR TECHNICAL COOPERATION—VACANT POSTS

The Commonwealth Fund for Technical Cooperation, the technical assistance arm of the Commonwealth Secretariat, is seeking candidates for the following positions:

(1) Agricultural Statistician, Ministry of Agriculture, Entebbe, Uganda. The duration is two years. Duties include the training of field staff in the techniques of agricultural and livestock surveys and censuses, and some data analysis for sample surveys. Remuneration includes an Inducement Allowance plus a Service Gratuity. Job reference is CFTC/UGA/35/1.

(2) Statistician, Central Statistics Office, Port of Spain, Trinidad. The duration is six weeks and duties include the specification of a Social Accounting Matrix and the production of a timetable for the construction of the SAM. Job reference is CFTC/TRI/34.

(3) Senior Statistician, Indices and Price Analysis, The Statistical Institute of Jamaica. The duration is two years. Duties include staff training, index

DEADLINE FOR NEXT ISSUE

The deadline for submitted material for the October, 1985 issue of this newsletter is September 27. Please send all notices of seminars, news items, letters-to-the-editor, etc to . . .

John Reynolds
Newsletter Editor
AMD/DSIR
P.O. Box 1335
Wellington.

The deadline for "News and Announcements" for the November, 1985 issue of *The New Zealand Statistician* is October 31.

construction and analyses of income and price elasticities. Remuneration includes an Inducement Allowance plus a Service Gratuity. Job reference is CFTC/JAM/38.

(4) Consultant, Ministry of Social Security, Kingston, Jamaica. The duration is one year. Duties include the evaluation of the present Statistics and Research Unit, staff training and advice on computerisation of data. Remuneration includes an Inducement Allowance plus a Service Gratuity. Job reference is CFTC/JAM/45.

Recently retired persons are encouraged to apply. For further information contact the newsletter editor or write directly to:

The Managing Director,
Commonwealth Fund for Technical Cooperation
COMMONWEALTH SECRETARIAT
Marlborough House,
Pall Mall,
London, SW1Y 5HX.

OVERSEAS CONFERENCES

18th Symposium on the Interface of Computer Science and Statistics

To be held at Colorado State University, Fort Collins, Colorado, USA, March 20-21, 1986. For further information write to The Symposium Chair, Dept. of Statistics, Colorado State University, Fort Collins, CO 80523, USA.

XIIIth International Biometric Conference

To be held in Seattle, Washington, USA, July 27 to August 1, 1986. For further information write to Dr Gerald van Belle, Dept of Biostatistics, University of Washington, Seattle, Washington 98135, USA.

The Second International Conference on Teaching Statistics (ICOTS II)

This conference will be held in Victoria, British Columbia, Canada, August 11-15, 1986. The conference aims to improve the quality of statistics teaching on a world-wide basis. Sessions will take place on teaching statistics at all levels, from school to university and in government, business and industry. Opportunities will be provided to see and experiment with the latest in computer hardware and software for statistical work.

The New Zealand coordinator for ICOTS II is . . .
John C. Turner
Department of Mathematics
University of Waikato
Private Bag,
Hamilton, New Zealand

American Statistical Association/Biometric Society

The 1986 joint meeting is to be held from August 18-21 in Chicago, Illinois. For further information write to ASA, 806 15th Street, N.W., Washington DC, 20005, USA.

International Association for Statistical Computing, COMPSTAT '86

This meeting is to be held in Rome, Italy, September 1-5, 1986. For further information write to COMPSTAT'86, Dipartemento di Statistica Probabilitie e Statistica Applicata, Universita degli studi di Roma, 'La Sapienza', I-00185 Rome, Italy.

Bernoulli Society—First World Congress

This meeting is to be held in Tashkent, USSR, September 8-14, 1986. For further information contact S.Kh. Sirajdinov, Institute of Mathematics of the Uzbek SSR Academy of Sciences, Hodjaev F., 29 Tashkent, 700143, USSR.

International Symposium on Probability and Bayesian Statistics

To be held in Innsbruck, Austria from September 23-26, 1986, this symposium is in honour of Bruno de Finetti's 80th birthday. For further information write to Professor R. Viertl, Institut fur Statistik und Wahrscheinlichkeitstheorie, Technische Universitat Wien, A-1040 Wien, Austria.

Third Annual Conference on Criminal Justice Statistics

To be held from December 1-2, 1986 in New York. Contact Lily E. Christ, Criminal Justice Centre, John Jay College of Criminal Justice, CUNY, 444 W 56th Street, New York, NY 10019, USA.

42nd Annual Conference on Applied Statistics

Newark, New Jersey from December 3-5, 1986. Contact Walter R. Young, Medical Research Div., American Cyanamid Co., Bldg. 60, Rm. 203, Pearl River, NY 10965, USA.

SEMINAR

Energy/Economic Growth and Dynamic Equilibrium

Professor George B. Dantzig
Stanford University, California

Where:
Lecture Theatre 2, McLaurin Lecture Block,
Victoria University of Wellington

When:
Wednesday, September 4, 1985,
9.00-11.30 a.m.

Contact:
Andrew Smith, Ministry of Energy, Wellington
Telephone (04) 727-044, ext 706

WORKSHOP ON STATISTICAL CONSULTING

I am interested in taking part in a one-day workshop.

I would prefer it to be held in . . .

November 1985/February 1986 (delete one)

Name .....

Address .....

.....

WORKSHOP ON STATISTICAL CONSULTING

To gauge interest and to aid in planning would those interested in the proposed workshop on statistical consulting please return the following coupon, or a photocopy of it, by 31st August 1985 to . . .

Colin Cryer,
P.O. Box 1731,
Wellington.