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n e w s l e t t e r

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XVth INTERNATIONAL BIOMETRIC CONFERENCE

Having waved goodbye to my family and inched my way through customs, I found my seat on the plane and introduced myself to the person next to me. How would I explain to him, without reference to regression, robustness or Rothamsted, what a biometric conference was? It would surely be easier to talk first about his destination. Rotorua? The South Island? On route to L.A.? No, somewhere far more exciting - he was on his way to the University of Waikato at Hamilton, for 'a conference'. So my first IBC had, in a sense, already begun.

At Auckland airport, we were greeted warmly by local organisers congregated around a sign set up for delegates who might be a little lost. Any annoyance at having to wait an extra hour for a few Canadians to arrive, quickly disappeared on hearing of the 15 hours delay they had to endure in Hawaii. Anyway, it gave me time to call a friend in Auckland, and try out New Zealand's wonderful privatised telephone system. After less than a minute, I was cut off. My friend, who is partially sighted, must have pulled out the plug. I obtained some more change at McDonald's (one of the few shops still open) and tried again. I just had time to apologise in case the disconnection had been my fault, when we were cut off again. At this point I gave up on the exercise and cornered the first New Zealander I could identify. He explained that local calls were free from home, but metered (obviously at a fast rate) from public phones. After all that it was a relief to board the bus and begin the 2-hour drive to Hamilton.

Waikato University has an attractive campus, its spacious lawns and leafy enclaves reminding me a little of the

Botanic Gardens in Melbourne. The only problem I experienced was in buying a stamp - the equivalent of our Post Office was closed on a Monday for unfathomable reasons. The accommodation at the university college was comfortable, with staff going out of their way to be helpful. The conference venue was also comfortable, and only 5 minutes brisk walk from either the college or the university shops. The weather was pretty good too - a bit muggy, but free from the extremes more characteristic of summer in Australia.



(from left to right) Harold Henderson, Secretary, XVI IBC, Hamilton, NZ; Peter Macdonald, Chairman, XVII IBC, Hamilton, Canada; Neils Keiding, President, Biometrics Society; Roger Mead, Secretary, Biometrics Society.

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And what about the main event? It was truly international, with 461 delegates representing 36 countries. By region, the number of registrants was: New Zealand 128, North America 100, Europe 98, Australia 95, Asia 28, Africa 7 and elsewhere 5. The programme began with a grand opening ceremony and a not-so-grand lunch at one of the university's food outlets. The conference was opened by Len Cook, the NZ Government Statistician, who in both content and style would have been just as much at home with a television audience. Niels Keiding (Denmark) gave a presidential address entitled 'The Biometric Society: Diversity and Unity', in which he drew attention to the benefits arising from different disciplines meeting under the umbrella of the society.

The scientific programme consisted of 20 invited papers, 263 contributed papers and 23 posters. Four sessions ran concurrently, which gave a fair degree of choice for the average biometrician. I often found myself having to choose between two equally useful or interesting sessions - not a bad problem, I guess. Of the invited papers I attended, the most enjoyable were Desmond Patterson's talk on REML, and David Hand's presentation on statistical consultancy. This partly reflected my own statistical interests, and many delegates would no doubt have found other talks more helpful.

The presentation of papers, as usual, ranged from appalling to excellent, with a normal distribution about 'OK' being a fair summary. I didn't observe any degeneration in quality as the conference wore on - in fact, some of the best talks I attended were at difficult times for the speaker (like 8.30 the morning after the conference dinner). Surprisingly, most people managed to cram their presentations into the allowed 15 minutes - if they didn't, the chairperson usually did a good job of hounding them off the stage.

The informal aspects of the conference were even more valuable than the formal ones. To establish contact with people who were doing work related to mine, and to swap notes, was immensely worthwhile. To suddenly meet, for the first time, someone whose 1980 paper I'd used extensively, was another unexpected pleasure. And it's nice to put faces on all those E-mail addresses. Meeting with a broad mix of nationalities and cultures broadens your view of statistics and the world in general. I was impressed at the excellent English so many people spoke, and realised how easy we English-speakers have it these days.

I couldn't report on this conference without mentioning the mid-conference tours - they were unforgettable. The one I attended began at dawn with a 3-hour bus trip, during which I chatted to a Polish biometrician whose employer had had to raise US\$2000 to get him there. The main part of the tour was a 7 hour walk through the volcanic mountains of Tongariro National Park. We began in T-shirts and sunscreen, before being suddenly overcome by freezing winds and alpine mist. The scenery was rugged but breath-taking, a bit like the moon (not that I've ever been there). Our exhausted limbs were later soothed by a swim in a hot thermal pool, followed by another long bus trip during which some Australians made a fruitless attempt to get everyone singing *Waltzing Matilda*. The

soreness we felt for days afterwards didn't diminish the excitement of the trip. The other tours received similar rave reviews.

Another extra-curricular activity was a visit to a local marae (meeting ground), with a traditional dinner and presentation of Maori dance and song by high school students. Then there was the conference dinner, which was unforgettable in its own way. The food was fabulous, but it took an hour and a half for people at the back of the queue to reach the counter. The hospitality was warm, but the host's self-aggrandisement must have been a bit embarrassing for the organisers. The event wasn't cheap either, though most people didn't seem too worried, having been paid for by their employers. The band wasn't bad, once they realised we weren't a bunch of 90's teenyboppers and started to play Beatles songs. A few brief speeches were given, encouraging delegates to come to IBC '94 in Hamilton (!), Canada. Most of us won't need much encouragement - it'll be our employing organisations (some of whom are debt-ridden governments) who will need persuading.



The Barbershop quartet, "Science of Sound", with scientists from Ruakura Agricultural Centre at the University of Waikato, is joined by Roger Mead.

Overall, IBC was great, and will go down as a highlight of my year. The conference was a credit to the organisers, who remained approachable and helpful throughout the week. The programme appeared to run smoothly, with sufficient variety in it to keep most people interested, and enough time set aside for informal interaction. Having a whole day's break in the middle seemed extravagant at first, but actually helped in maintaining one's concentration till the end. This was of particular benefit for me, as my contributed paper was in the last session on Friday afternoon - every conference delegate's dream!

Graham Hepworth
Victorian Department
of Agriculture

BRANCH REPORTS

Victoria

Annual Belz Lecture - Issues in Wittenoom Mesothelioma Case

The October Meeting was the annual Belz lecture. Prof. Tim Brown talked about some of the issues involved in the Wittenoom, asbestos and lung cancer issue. Cox regression for log odds is used to model mesothelioma. The main variables are duration of exposure, cumulative exposure, nature of work, sex, age at start of employment. The data is censored at death, age 85, departure overseas or 31 Dec 86. When lung cancer is being studied an important additional variable is smoking. If independence is assumed and a multiplicative model used the log odds becomes a linear model. Alternatively conditional logistic regression can be used on the relative risk. When damages claims are taken to court the criterion used is 'on the balance of probabilities'. Problems arise because of doubts about independence between smoking and exposure, heterogeneity of risk and causality without a link having been established biologically.

Statisticians scrutinizing questionable experimental techniques

The November Meeting was addressed by Jane Matthews who looked at instances where questionable experimental techniques have been used and ways in which a Statistician might pick that something was wrong. The McBride and Brigg cases are recent gross deceptions which have come to light, but historically doubts have been cast on some of the work of several scientists including Newton and Mendall. One medical investigator, D'Arcy was found to have made claims of laboratory tests which were not done, to have reused controls and to have data which was too good to be true.

Harvard has drawn up a set of guidelines which define the role of investigators, sponsors, study monitors, Statisticians, etc. In the protocol for an experiment Statisticians have a responsibility to be involved in assessing whether the experimental design is appropriate, the sample size is large enough, randomized procedures are to be used, reasons and procedures for interim analysis, statistical models and methods, criteria for removing subject from analysis.

Gareth Clayton

South Australia

Honours Scholarship Award

The South Australian Branch has awarded the 1993 Statistical Society of Australia Honours Scholarship to David Hirst, an Honours student at the University of Adelaide.

Commemorative Dinner to honour Alan James as 1992 Pitman Medallist

A Commemorative Dinner to honour ALAN JAMES (Pitman Medallist 1992) was held in the Adelaide University Union on 11 November.

Alan James, former Professor of Statistics at the University of Adelaide, was awarded the Pitman Medal of the Statistical Society of Australia in 1992, in recognition of his outstanding contributions to Statistics.

Thirty seven colleagues and friends joined Alan and Cynthia in a celebratory dinner. John Darroch (Professor at Flinders University), Richard Jarrett (Professor at Adelaide University) and Graham Wilkinson (now retired, but formerly of the CSIRO Division of Mathematics and Statistics) spoke of Alan's work.

Fiducial Probability 1930 - 1990

Dr A.W.F. Edwards, Reader in Biometry at the University of Cambridge, gave a talk on fiducial probability to the Branch meeting on 25 November.

Fiducial probability, R.A. Fisher's attempt at probabilistic inductive inference, is the key to an understanding of the controversies of modern statistics. Poised between the unconditional behaviourist approach of Neyman and the fully-conditioned Bayesian approach, it illuminates both without condoning either.

Group Replacement Policies for Stochastically Failing Parallel Machines

John Wilson of the Department of Operations Research at Case Western University, Cleveland, Ohio presented a talk following the February Branch meeting.

Assume that n machines with independent, identically distributed failure times are operating in parallel. This research explores a number of issues related to the maintenance and/or replacement of the machines.

In most of the literature, the objective is to choose a policy that minimises cost per unit time. However, the variability of costs would also be of interest to most managers. It will be shown that the variance of the cost per unit time associated with any given group replacement policy can be readily calculated. Knowledge of this variance can often lead to the selection of a policy other than the one that minimises cost per unit time.

Two new classes of policy together with algorithms to compute the associated cost per unit time were introduced.

In most of the literature (and the material discussed above), the parameters of the failure time distribution are assumed to be known. In practice, this is rarely the case. Instead, the engineer might estimate parameters from prior information or data gathered while operating the machines. The problem of integrating the statistical estimation problem with the cost minimisation one has not been adequately addressed in the literature. In this seminar, a Bayesian group replacement policy was introduced. Two

forms of statistical input are allowed: prior distributions and information obtained during the operation of the machines. The prior need not be in conjugate form. Statistical information that is provided by the actual failure times of the machines is incorporated into the decision rule via the sufficient statistics for the problem. The resulting policies are intuitively attractive, easy to implement and mathematically tractable.

John Wilson is visiting CSIRO from the Department of Operations Research at Case Western University, Cleveland, Ohio. He has an MSc from University College, Dublin, and MStat and PhD degrees in Statistics from Carnegie-Mellon. John has research interests in the application of statistical and operations research techniques to problems in manufacturing and management science. Recent research has been in the areas of reliability growth modelling and equipment replacement and repair modelling.

Canberra

A Bayesian Analysis of the Impact of Logging on Rain Forest Fauna

Dr Mervyn Thomas, from CSIRO Biometrics Unit, Institute of Plant Production and Processing, addressed the October meeting of the Branch on the above topic. Mervyn presented a case study on the analysis of experiments to investigate the effects of logging on rain forest fauna. A Bayesian approach to the problem was adopted, and a model involving extra Poisson variability formulated. Mervyn presented a number of different approaches to obtaining marginal posterior moments and densities, and inferences were made under a range of prior densities, representing the diversity of opinion about this contentious issue. Mervyn compared this Bayesian approach to a classical analysis of the problem.

SAS Institute Australia Presents...

Multivariate Statistical Methods: Practical Applications course

21 - 23 June, 1993 SYDNEY

Audience:

This three day course is designed for new researchers who need to apply multivariate statistical methods to research data in academic, commercial and industrial situations.

Benefits:

- * perform multivariate analysis of variance (MANOVA), including one-way designs, factorial designs, and blocked designs, with contrasts and post-hoc comparisons;
- * analyse repeated measures designs using the traditional univariate split-plot-type approach and a multivariate approach;
- * perform multivariate analysis of covariance and fit multivariate general linear models and complex slope structures;
- * perform multivariate multiple regression and canonical correlation;
- * perform discriminant analysis, including stepwise discriminant analysis and classification methodology;
- * perform cluster analysis, including hierarchical and direct methods, with disjoint and overlapping clusters;
- * perform and interpret principal components, factor analyses and multidimensional scaling.

Overseas Instructor:

The course instructor is Dr Robert M. Hamer. Dr Hamer is a freelance statistical consultant and the author of this course, he teaches statistical courses for "SAS Institute Inc." in the US.

For further information or booking details, please contact Christine Price or Handan Tunçdoruk at:

SAS Institute Australia
Telephone: (02)428 0428
Fax: (02)428 4759



1992 KNIBBS LECTURE

In November Alan Gleeson, General Manager, Information and Biometric Services, NSW Agriculture gave the Knibbs lecture in Canberra. The Knibbs lecture is named after the first Commonwealth Statistician and is given in November or December each year. There are invited discussants and the after dinner meeting is a little more formal than for the other meetings of the year.

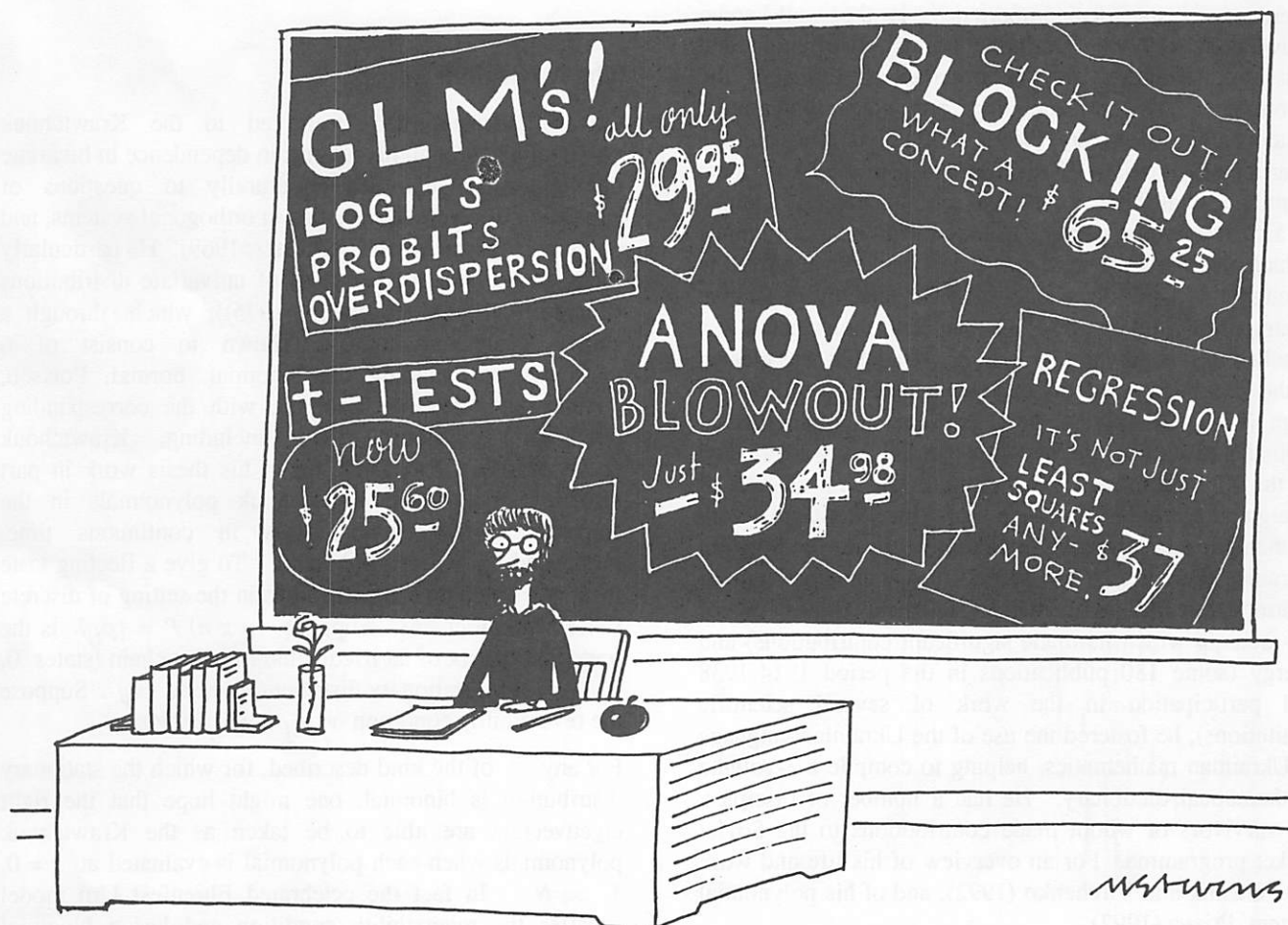
Alan's title was "The Changing Role of Biometricians in NSW Agriculture". He described how the Biometrics section had grown from twelve staff all located in Sydney in 1970 to the current level of 24 staff spread across nine locations. Improvements in computing facilities had made this practicable. As a result, contact between biometricians and clients had improved, but interaction between biometricians had become more difficult. This particularly affected the training of new staff. Alan also talked about the increased level of education of staff, and the change from a primarily service role to one which involved education of scientists and substantial direct involvement in research projects. Alan used a wheat variety trial project to exemplify these changes.

John Reynolds of the Victorian Department of Agriculture and Jeff Wood of the CSIRO Biometrics Unit in Canberra

were invited discussants. With the aid of some pertinent cartoons John compared the Victorian and NSW situations. Victoria had a much worse ratio of biometricians to scientists than NSW. Biometrical work was sorted into seven priorities of which only the first three got done. Jeff commented that there were several issues in the provision of biometrical consulting which had been argued about for the last sixty years and that they were unlikely to be ever finally resolved. Alan had talked about how they were currently handled in NSW. One issue which was relatively new was the provision of statistical education for clients.

Several people contributed to the discussion. Joe Perry from Rothamsted Experimental Station had had the opportunity of seeing an advance copy of the paper and commented at length. He questioned the value of appointing Ph. D. graduates. He emphasised the need to "ring fence" a certain amount of time for statistical research. It was clear from the meeting that there was a fair degree of unanimity on the current major issues in biometrical consulting, and in the way in which they should be handled.

Jeff Wood



KRAWTCHOUK POLYNOMIALS AND AUSTRALIAN STATISTICIANS

Background

The year 1992 marked the 100th anniversary of the birth of the Ukrainian mathematician Mikhailo Pilipovich Kravchuk [1892-1942] as well as the 50th anniversary of his death in one of Stalin's labour camps in the Kolyma river region of Siberia. Kravchuk's name became known in Australian statistics through the use of "Krawtchouk" polynomials by H.O. Lancaster and his students, especially G.K. Eagleson, at the University of Sydney. (I shall use the English transliteration "Kravchuk" of the surname - coincident with that of the Ukrainian president - except when referring to the celebrated paper, or to Krawtchouk polynomials. "Krawtchouk" is a French transliteration.)

The Krawtchouk polynomials, a set of polynomials orthonormal to the binomial distribution, were first exhibited by Kravchuk (1929).

This paper, in the proceedings of the Kiev agricultural institute where from 1921-1929 he worked as professor in charge of mathematics and variational statistics, also contains a preliminary discussion of the discrete Chebyshev polynomials (orthonormal with respect to the discrete uniform distribution), proofs, and the remark that the binomial case has special significance in mathematical statistics. (The discrete Chebyshev polynomials are well known in linear regression theory). An abbreviated version of the material, without proofs and with no reference to statistical importance, is the well-known Krawtchouk (1929). Both the normal distribution and Poisson distribution may be obtained as limits of the binomial. The corresponding orthogonal polynomial systems are, respectively, the Hermite polynomials and the Charlier polynomials. Kravchuk notes in the two papers mentioned that these polynomial systems can be obtained by a corresponding passage to the limit in his polynomials (which can therefore be regarded as a generalization). It is through the paper Krawtchouk (1929) and the definitive treatment of it in Szegö (1939) that Kravchuk's name was attached to this polynomial system. Kravchuk was elected to the Ukrainian Academy of Science on 29 June 1929 and from 1934-1938 headed the Department of Mathematical Statistics of its Institute of Mathematics. He was arrested on the 23 September 1938 in connection with charges of foreign espionage because of his contacts with mathematicians abroad, particularly those in Western Ukraine, then a part of Poland. A mathematician of enormous breadth (mathematical statistics was only one of the areas in which he made significant contributions) and energy (some 180 publications in the period 1914-1938 and participation in the work of several scientific institutions), he fostered the use of the Ukrainian language in Ukrainian mathematics, helping to compile a 3-volume mathematical dictionary. He had a number of disciples, the survivors of whom made contributions to the Soviet rocket programme. For an overview of his life and work see Parasiuk and Virchenko (1992); and of his polynomial system, Prizva (1992).

Kravchuk's papers on mathematical statistics and probability begin in 1925, are written in Ukrainian, and relate to the theory of correlation and regression, the bivariate normal, and the method of moments in mathematical statistics, as well as to orthogonal polynomial systems. A number of these virtually inaccessible papers was obtained for me in 1992 by Dr L. Kuks.



M.P. Kravchuk 1892 - 1942

The Australian Scene

Oliver Lancaster had been led to the Krawtchouk polynomials through his interest in dependence in bivariate distributions, which leads naturally to questions of expansion of bivariate densities in orthogonal systems, and of canonical correlation (Lancaster, 1969). He particularly focussed on the Meixner class of univariate distributions (Eagleson (1964), Lancaster (1975)), which, through a simple characterization, is shown to consist of 6 distributions, including the binomial, normal, Poisson, gamma, and negative binomial, with the corresponding polynomial systems thus including Krawtchouk polynomials. Geoff Eagleson in his thesis work in part also investigated the Krawtchouk polynomials in the context of Markov processes in continuous time, influenced by work of Sarmanov. To give a fleeting taste for this work, here are a few lines in the setting of discrete finite Markov chains. Suppose $(n \times n) P = \{p_{ij}\}$ is the transition matrix of an irreducible Markov chain (states $0, 1, \dots, N$) with stationary distribution vector $\{v_j\}$. Suppose the reversibility condition $v_j p_{ij} = v_i p_{ji}$ holds.

For any P of the kind described, for which the stationary distribution is binomial, one might hope that the right eigenvectors are able to be taken as the Krawtchouk polynomials when each polynomial is evaluated at $x = 0, 1, \dots, N$. In fact the celebrated Ehrenfest Urn model satisfies the reversibility condition and has a binomial stationary distribution. In a prize-winning paper of many years ago Kac (1947) had found all the eigenvalues (which

are distinct although the chain has period 2), and had, with some difficulty, found all the corresponding eigenvectors directly, without making the connection with Krawtchouk polynomials.

The reason I was thinking about these things in 1992 was because in February I received a first announcement of a Conference dedicated to the memory of Mikhailo Kravchuk, to be held in Kiev (the capital city of Ukraine), and then in Lutsk, in September. There were to be Sections on mathematical statistics.

Before 1992 Kravchuk had been little more than a name attached to the polynomials popularized in the west by Szegő's book. Since his arrest he had been a non-person in the Soviet Union. The announcement gave me some of the biographical detail, and led me to dig for more. The Conference intended to rehabilitate him in the mathematical community.

The Conference

I had not been to Ukraine since I left it at the age of 4 or 5 just after World War II; now it was an independent state, and the Conference was a good excuse to go. Apart from this, one had, first, to show the Australian flag in the context of Kravchuk's mathematical statistics. Secondly, I would be able to present my contributions, as was appropriate, in Kravchuk's native language, Ukrainian. Contact with the Conference organizers about details was difficult. The Australian Post Office was still sending letters for Ukraine to Moscow (where much mail for the former non-Russian Republics of the Soviet Union was being scrapped) in spite of the fact that there were direct Lufthansa flights between Frankfurt and Kiev. I was never quite sure whether my faxes had arrived, though I received some from Kiev; and remained uncertain of details until establishing some email contact, through a tip from Peter Jagers (Sweden), a few weeks before the departure date from Sydney. My sister, born in Australia but also speaking Ukrainian, accompanied me.

We landed at Kiev's Borispol airport on September 21, to be met by the main Conference organizer Prof. M.L. Horbachuk (Gorbachuk) (who looked after us personally for the duration of the Conference) and were driven to the sanatorium "Feofania" on the outskirts of Kiev where most Conference participants were to be accommodated. The opening ceremony of the Conference was in the main auditorium of the Institute of Mathematics in the centre of Kiev, under the gaze of newly-positioned portraits of Voronoi, Ostrogradsky and Kravchuk, with a presidium of eminent living Ukrainian mathematicians, including several probabilists, such as V.S. Koroliuk, Yu. O. Mitropolsky, A.V. Skorokhod, and M.I. Yadrenko. I was asked to read from the podium the letter of greeting from the President of the Australian Academy of Science, Prof. David Craig, in English original and Ukrainian translation. The talks on that day were of a general nature, relating to Kravchuk's life, work and death.

The mathematical part of the Conference got under way on 24 September partly at "Feofania", but mostly at the nearby Institute of Theoretical Physics, a 15 minute walk

away through the woods. The mornings were dedicated to plenary sessions, the afternoons to contributed papers. Apart from speakers from outside of Ukraine (for example, from Russia), most papers were presented in Ukrainian. I was asked to chair a contributed paper session of 8 papers of which one (by a Russian) was in English, and two were in Russian. I held the speakers (including myself) to the 20 minutes allocated to their presentation, which surprised them (but pleased some!). At a plenary session I also spoke briefly for another 20 minutes on Krawtchouk polynomials in the work of Australian researchers, including a transparency picturing Oliver Lancaster. A particularly interesting talk preceding mine, by A.U. Klimik, placed the Krawtchouk polynomials within the hierarchy of polynomial systems described by the generalized hypergeometric function.

On the night of September 26-27 the participants of the Conference moved by night trains from Kiev to Lutsk in the Volhyn region of Western Ukraine, where Kravchuk had attended high school. My sister and I hurriedly occupied the lower bunks of a 4-berth sleeper, leaving the upper bunks to Prof. Horbachuk and his student, since there seemed to be no means other than parallel-bar acrobatics of getting into those. There was also a mystery: our train which had been the later of the two to leave, arrived in Lutsk first.

The morning began with ceremonies of welcome by city officials in the Lutsk Pedagogical Institute (soon to become a university) and appropriate responses by Conference officials and foreign guests, and a rather technical talk by one of the eminent visitors (originating from Lutsk) to the bemused general audience. There was then an unveiling of another commemorative plaque of Kravchuk at the former high school, where I was again interviewed by the media (this interview was in fact heard in my "home" town of Stary Sambor, quite some distance away). In the afternoon buses took us to the village where Kravchuk was born, Chovnitsia, where villagers were formed in a half-circle across the main street, next to the school, waiting for us. We were greeted with bread-and-salt, in the Ukrainian tradition, and then the small school children, in national dress, came amongst us to give us each a bunch of flowers — a moving gesture. These we laid at the base of Kravchuk's statue before entering the two school-rooms set aside as a Kravchuk museum. This contained photographs of some of his papers, of his mentors, and individual correspondents such as Hilbert, and group photographs from international conferences (such as the International Congress of Mathematicians in Bologna in 1928) which he had attended. Following speeches (again, in Slavic tradition) in the village club hall, there was a concert of folk-song and dance of a very high standard, clearly drawing on the resources of a substantial geographic region containing Chovnitsia.

The Conference ended that night, at a Civic reception given by the City of Lutsk, where as the evening wore on and the vodka and cognac took effect, in typically Slavic fashion there was much singing and many patriotic speeches and toasts.

It was a well-organized conference under very difficult conditions (incredible inflation and almost no petrol), and

a very memorable experience. My impression of Ukrainian mathematical statistics is that it is at a very high theoretical level. The absence of computers (remarked upon several times at the Conference) is, however, increasing the distance from theoretical developments, heavily influenced by computer capability, in the Western countries.

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Eugene Seneta

S-PLUS Version 3.1

Version 3.1 of S-PLUS, the successful data analysis and graphical software package is now available for UNIX workstations.

Important improvements and enhancements in S-PLUS 3.1 include:

- * Faster performance when analysing and computing data sets,
- * Additional mathematical computing functions,
- * Quality control (QC) charting,
- * Support of colour PostScript, and
- * Compatibility with S+INTERFACE, StatSci's new software tool kit for building custom applications with S-PLUS.

An exciting new development is the new PC version which will use the Windows operating system - ready for release soon.

Free Trial - A 30-day trial program of the complete product, as well as a free instructional video showing how to use S-PLUS for advanced modern data analysis is available. Pricing and upgrade information is available from Sue Clancy.

Phone (02) 352 3175

Fax (02) 312 3200.

CONFERENCE REPORTS

Repeated Measurements Workshop 3 & 4 December, 1992 Hamilton, New Zealand

This Workshop was held the week before IBC, and the IBC organisers used it as an opportunity to fine-tune their registration procedures (and the weather). The Workshop was led by Mike Kenward (Univ. of Reading), who provided a comprehensive set of notes. Mike was supported by David Fletcher (Otago), who was careful to make clear that any hard questions were to go to Mike.

The Chapter headings from the notes give an idea of the coverage: Introduction, Summary Statistics, Split-plot-in-time ANOVA, MANOVA and ante-dependence analysis, Likelihood methods for continuous data, Models for binary and categorical repeated measurements, and Missing Values. The audience ranged from occasional dabblers in repeated measurements to experts in the field. As one closer to the first group, I came away with a much greater armoury of weapons with which to attack repeated measurements problems, but unsure how to wean my clients from their simpler but less appropriate methods of analysis.

The Workshop concluded with talks from six registrants (Edgar Brunner (Germany), Leigh Callinan (Aust), Brian Cullis (Aust), Chuck Davis (USA), Yoel Haitovsky (Israel) and Philip McCloud (Aust)) on their use of repeated measurement techniques.

Thank you to David Fletcher and the IBC organisers for bringing the Workshop to fruition, and to Mike Kenward for making it so informative.

A couple of limericks:

A Meeting on Repeated Measures
Reveals a vast bundle of treasures.
But to learn all this stuff
Is a task very tough -
These workshops are business, not pleasures.

A lim'rick on measurements repeated
Requires rhyming that would have defeated
A less able poet.
But - wouldn't you know it?
It tends to make one quite conceited.

Ken Russell

Bootstrap Workshop

The Workshop on Practical Applications of the Bootstrap was held at ANU (CMA) from December 2-4, 1992 and was supported by grants from DITAC and CMA. There were forty-three registered participants but the actual number exceeded fifty. Participants came from all over Australia, the US, Sweden, Canada, New Zealand, Korea, Germany, and Italy. Twenty-one invited and contributed

talks were presented which covered application of the bootstrap methodology to a wide range of topics such as regression models, finite populations and survey data, discriminant analysis and factor analysis, forecasting, autoregressions, rank regression, model selection, LOESS curves, mixture models, kernel density estimation, predicting high-risk cholesterol levels, gait analysis, robust ANOVA, predictive tests for logistic models, and tilting methods. The talks were informative and sometimes quite intense followed by very informal and pleasant breaks for tea/coffee and lunches. The invited speakers were Peter Hall, Rudy Beran, Richard Olshen, Nick Fisher, and Tom Louis who all presented very interesting talks. One of the contributed speakers came down with measles on the last day whereupon Peter Hall covered for him with an impromptu talk at a half hour's notice, we were all very impressed! Congratulations to David Chant and Jonathan Dwyer for their perseverance in application of the bootstrap method under adverse circumstances. Judging by the comments made to the Organiser during and after the workshop by both invited speakers and participants, the workshop proved very stimulating and worthwhile for all concerned. The end-of-workshop lunch/wine tasting sent everyone stumbling off in a happy mood.

Finally, thanks to all participants who have made the workshop such a resounding success.

Kim-Anh Do

2nd Australasian Genstat Conference, Rotorua

The second Australasian Genstat Conference was held in Rotorua, New Zealand from 14-16 December, 1992. Participants came from Australia, New Zealand and United Kingdom, as well as Papua New Guinea, Canada and Thailand.

Sessions, which were invariably lively, covered a range of topics, all of vital interest and relevance to the practising statisticians present. The participants from Rothamsted previewed exciting new methodologies soon to be included in Genstat. These included such topics as extensions to REML, generalized additive models, the combination of information in the analysis of covariance of generally balanced designs and spatial analysis. A particularly exciting development is procedures for fitting generalized linear mixed models.

Other sessions covered systematic methods for data collection, linked to Genstat either through a Genstat menu-driven interface or as specialized output from another program, eg, Datachain. There were discussions on statistical practice with examples from the participants' experience and demonstrations of new Genstat procedures for the examination of alternative links and construction of generalized biplots.

As always at these workshop-style conferences, much was to be gained by discussions among participants between

the formal sessions. There was opportunity to discuss and solve 'pet' problems; the exchange of ideas has given rise to the Genstat discussion list as an easily accessible (via email) forum for the exchange of ideas, procedures, macros and solutions to problems.

The conference proved to be a worthwhile experience where much was gained by all participants. The exchange of ideas, concepts of statistical practice and general insight into the direction of Genstat development was invaluable, exciting and stimulating. Thanks to those who came, particularly those from afar, and to the organisers of the Conference. We look forward to the third Australasian Genstat Conference.

Christine Donnelly

IMS-ILAS Matrix Workshop: An Overview

Co-sponsored by the Institute of Mathematical Statistics (IMS) and the International Linear Algebra Society (ILAS), an International Workshop on Matrix Methods for Statistics was held at the University of Auckland in Auckland, New Zealand, Friday-Saturday 4-5 December 1992. This Workshop was organized by Harold V. Henderson, Jeffrey J. Hunter, Bryan F. J. Manly, Simo Puntanen, Alastair J. Scott, and George P. H. Styan. Participants came from Australia, Austria, Canada, Denmark, Finland, Germany, New Zealand, the United Kingdom, and the United States.

The Workshop began with a talk by John S. Chipman (University of Minnesota) on the 'Generalized matrix Schwarz inequality and its application to biased estimation in linear regression.' This was followed by George P. H. Styan (McGill University, Montreal) speaking 'On the efficiency of a linear unbiased estimator and on a matrix version of the Cauchy-Schwarz inequality'; it was observed that Styan's results complemented those published by Chipman (1976) in *Generalized Inverses and Applications* (M. Z. Nashed, ed., Academic Press, 549-769). This first session ended with the presentation by Simo Puntanen (University of Tampere) on 'Matrix tricks related to deleting an observation in the general linear model'.

The afternoon sessions on the Friday started with Garry J. Tee (University of Auckland) on 'Alexander Craig Aitken: 1895-1967'; Garry's plans for publication of Aitken's Collected Papers were also discussed. Richard William Farebrother (University of Manchester) spoke about 'Statistical contributions to matrix methods' in an historical context, while Peter Clifford (Oxford University) spoke 'On the distribution of Pearson's correlation coefficient in the presence of spatial autocorrelation' and David J. Vere-Jones (Victoria University of Wellington) on 'Generalized permanents and their applications to multivariate negative binomial distributions'.

These talks were followed by a reception featuring Bluff oysters (courtesy Peter Mullins) and an excellent dinner in "Berlin" (organized by Alan Lee).

The sessions on the Saturday started with Graham R. Wood (University of Canterbury, Christchurch) telling us

'How not to use matrices when teaching statistics' (joint work with David J. Saville, New Zealand Pastoral Agriculture Research Institute Ltd., Lincoln). This was followed by Thomas Mathew (University of Maryland, Baltimore-County) speaking on 'Combining independent tests for a common mean: an application of the parallel sum of matrices' and by an in-depth study by Renate Meyer (Technical University of Aachen) on 'Invariant preorderings of matrices and approximation problems in multivariate statistics and multidimensional scaling'. Shayle R. Searle (Cornell University, Ithaca, New York) presented 'Further results and proofs for the singular linear model,' while Michael G. Schimek (University of Graz Medical Schools) told us about 'Problems with direct solutions of the normal equations for nonparametric models'.

The Saturday afternoon session started with a tour de force by Chris C. Paige (McGill University, Montreal) on 'The full CS-decomposition of a partitioned orthogonal matrix' (joint work with Musheng Wei, East China Normal University, Shanghai). The CS (cosine/sine)-decomposition (CSD) of a 2-block by 2-block partitioned unitary matrix reveals the relationships between the singular-value decompositions of each of its 4 sub-blocks. The CSD was originally proposed by C. Davis and W. Kahan, and is important in finding the principal angles between subspaces (Davis and Kahan, Björck and Golub), such as in computing canonical correlations between two sets of variates. It also arises in, for example, the Total Least Squares problem.

The Workshop ended with talks by Jeffrey J. Hunter (Massey University, Palmerston North) on the 'Stationary distributions and mean first passage times in Markov chains using generalized inverses' and by Alastair J. Scott (University of Auckland) 'Characterizing invariant convex functions of matrices' (joint work with James V. Bondar, Carleton University, Ottawa).

George Styan

Miniconference on Stochastics and Finance

In the last couple of decades probabilistic and statistical methods have become essential tools in finance. There is an obvious need for interdisciplinary cooperation between practitioners from the finance industry and academics at universities. The main problems correspond to an improved mathematical modelling of financial markets, the development of correspondingly efficient stochastic numerical methods and the adequate statistical on-line analysis of relevant market data.

These topics were discussed by 15 invited talks at a two-day conference on stochastics and finance in February 1993 at the Australian National University in Canberra organised by Eckhard Platen supported by the School of Mathematical Sciences and the Faculty of Economics and Commerce. More than 45 participants attended the conference; a third representing experts in research and development from private sector financial institutions,

another third coming from commerce and finance departments of different Australasian universities and the remaining third consisting of specialists from various fields of applied probability and statistics. This mixture created a stimulating atmosphere.

The lectures focussed on topics such as interest rate options, option research and development, option pay-off structures, stochastic PDEs and term structure modelling, stochastic numerics in finance, inflation rate modelling, bond pricing and anticipative calculus, statistics of stochastic processes in finance, stochastic maximum principle in finance.

The first day contained talks by Glen Kentwell (Bankers Trust, Sydney), Dieter Sondermann (University of Bonn, Germany), Carl Chiarella (University of Technology,

Sydney), Chris Heyde (ANU, Canberra), Thomas Mikosch (Victoria University, Wellington), Marek Musiela (University of New South Wales, Sydney), John van der Hoek (University of Adelaide), Daryl Daley (ANU, Canberra). The programme of the second day included talks by Alan Brace (Citicorp, Sydney), Kim Sawyer (RMIT, Melbourne), Eckhard Platen (ANU, Canberra/IAAS, Berlin), Rolando Rebolledo (Universidad Católica de Chile, Santiago), Peter Kloeden (Deakin University, Geelong), David Heath (University of Canberra), Mohammad Tahir (ANU, Canberra).

The majority of the participants expressed their interest in continuing this type of concentrated interdisciplinary meeting focussed on applications in finance.

Eckhard Platen

YOUNG STATISTICIANS' PROFESSIONAL DEVELOPMENT WORKSHOP

The third in a series of annual Young Statisticians' Professional Development Workshops will be held in Canberra, at the Brasseley Hotel in Barton, from 29 September to 1 October 1993. Sponsorship will be provided primarily by the Science and Technology Awareness Program administered by the Department of Industry, Technology and Commerce. Further financial support will be furnished by the Statistical Society of Australia, and by the Centre For Mathematics and its Applications at the Australian National University.

The previous Workshops in this series have been organised on a regional basis, by the ACT and NSW Branches of the Statistical Society. However, the next Workshop will have a clear National focus, and expressions of interest from all young statisticians are welcome.

The Workshop provides an opportunity for young (interpreted loosely) statisticians to meet and talk about their work, in a non-threatening environment. The Workshop is aimed at Honours year statistics students, postgraduate students, or statisticians in the first few years of their careers. There were about 40 participants at the 1992 Workshop, the majority of whom gave talks about their current work or research.

In particular, the Workshop will provide young statistical scientists with opportunities to consider career paths in

applied areas such as commerce and industry, to gain confidence in communicating their work to a general audience, to develop peer group networks, and to consider career paths leading to senior levels. It will emphasise the participation of women in statistical science, particularly at senior levels — at least half the participants in the 1992 Workshop were women. Three of the six invited speakers at the 1993 Workshop are women.

At this stage we seek only expressions of interest. A registration form will appear in the May issue of the Newsletter. Although the size of the Workshop will be greater than it was last year, the organisers have had to limit the number of participants to 50, so that attendance may have to be determined on a first come, first served basis. Expressions of interest should be sent to:

Ann Cowling
 ABARE
 PO Box 1563, Canberra ACT 2601
 email: annc@abare.gov.au
 Phone (06) 272 2191
 Fax: (06) 272 2001

Ann Cowling

Peter Hall

NEWS ABOUT MEMBERS

The American Statistical Association announced the election of 37 of its members as Fellows of the Association, a recognition of outstanding professional leadership in the field of statistical Science. The naming of the 1992 Fellows was made immediately prior to the Presidential Address on Tuesday, August 11, at the Joint Statistical Meetings in Boston, Massachusetts. One of the

newly elected Fellows was (Charles) Clyde A. McGilchrist, Associate Professor, Department of Statistics, University of New South Wales, for significant contributions to statistical methodology as applied to different subject matter disciplines, for outstanding and dedicated teaching, and for editorial service to the profession.

OBITUARY — Veronica Gai Thomas

Veronica Gai Thomas was born in Sydney on 7 August 1969 and died in a car accident on the Princes Highway, just outside Nowra, on 4 December 1992.

She was a gifted student from childhood. Her secondary education was gained at Hurlstone Agricultural High School, one of the Sydney's selective schools, after which she entered the Arts course at the University of Sydney in 1988. In her first year, apart from taking Mathematics 1, she encountered the terminating first-year course in Arts, General Statistical Methods (GSM), created by Howard D'Abrera, which motivated her to pursue the normal statistics major of Mathematical Statistics 2 and 3. The first GSM student to proceed to 4th year Honours in Mathematical Statistics, Veronica shared the Tim Brown Prize for the top student in Mathematical Statistics 2, and gained First Class Honours in her 4th year, sharing the Statistical Society of Australia (NSW) Prize and the Australian Federation of University Women (NSW) Prize. Her 4th year project, supervised by the undersigned, was entitled *Probability Inequalities and Simultaneous Inference*. In her final years in Mathematical Statistics, she was one of a close-knit group of especially talented female students.

During her 4th year Veronica held a Cadetship with the Australian Bureau of Statistics (ABS). She entered the Statistical Services Branch of ABS, Canberra, immediately on completion of her Honours year. Initially in the Statistical Consultancy Section, she worked on two projects: Rates of Pathology Services for the Health Insurance Commission; and Sample Design for a Staff Perception Survey for the Australian Taxation Office. Subsequently in the Statistical Support Section, she assisted with the Monthly Population Survey. At the time of her death she had just been promoted and was considered one of the best recruits from 1992, being remembered as being very efficient and conscientious, and always providing feedback.

At the beginning of 1992 she had also enrolled part-time for the Master of Statistics (Coursework) degree in the

Department of Statistics, Faculty of Economics and Commerce, Australian National University (ANU), completing three courses in exemplary fashion. By the end of the year she had done considerable background reading on her chosen project topic (*Modelling Flows in Longitudinal Data Subject to Attrition Bias*), and at the Young Statisticians' Professional Development Workshop (Newcastle, 30 September - 2 October 1992) presented a paper entitled *Estimating Non-Response Bias in Longitudinal Survey Data*.

Veronica was a sincere and committed Christian, who involved herself intensely with other people. As a full-time student she worked with Sunday School and children's Church clubs; and even at this time gave regularly and generously to charities such as Barnardo's Australia, and sponsored a girl in Africa and a boy in India through the Christian Children's Fund. Between the end of her third and beginning of her fourth years at Sydney University, she spent two months in India as a short-term missionary. In Canberra, many young people find themselves living away from home for the first time, and Veronica was active in Church outreach programmes designed to welcome them.

In addition to all this, in the last few years of her life she found time and enthusiasm for things such as navigators' courses, theological courses, bread-baking, deaf-signing, tennis and aerobics.

Yet she was essentially a quiet, caring and sharing person, enjoying a loving family life and a wide circle of friends.

Her death at the very blossoming of her potential as a statistician is a sad loss to the Australian statistical community where she might have achieved much. These lines are written so that a record remains. My thanks with help in preparing them are due to Paul Sutcliffe (ABS), Ray Chambers (ANU) and Veronica's parents, Alice and Richard Thomas.

Eugene Seneta

AUSTRALASIAN CONFERENCES

CONFERENCE SUMMARY

Australasian Meeting of the Econometric Society, 7-9 July 1993, Sydney.

Information: Denzil G. Fiebig, Department of Econometrics, University of Sydney, Sydney NSW 2006.

Behaviour Genetics Association 23rd Annual Meeting, 13-16 July 1993, "The Earth Exchange", Sydney.

Information: Dr Nick Martin, Queensland Institute of Medical Research, 300 Herston Road, BRISBANE QLD 4029, tel. (07) 362 0278, fax (07) 362 0111. Full details this issue.)

IVth Australasian Economic Modelling Conference on Asia-Pacific Economic Modelling, 24-28 August 1993, Port Douglas, North Queensland, Australia.

Information: Colin Hargreaves, Director, Economic Modelling Bureau of Australia, GPO Box 1363, Canberra ACT 2601, Australia.

STATCOMP93, 27 September - 1 October 1993, University of Wollongong.

Information: Statistics '93 Conference Secretary, Mathematics Department, University of Wollongong, Northfields Avenue, WOLLONGONG NSW 2522; fax: (042) 21-4845; email: statconf@uow.edu.au. (Details this issue.)

Young Statisticians' Professional Development Workshop, 29 September - 1 October 1993, Brassey Hotel, Barton, Canberra, Australia.

Information: Ann Cowling, ABARE, PO Box 1563, Canberra ACT 2601; tel: (06) 272 2191; fax: (06) 272 2001; email: annc@abare.gov.au. (Full details this issue.)

Second International Conference on Financial Econometrics, 13-14 December 1993, Queenstown, New Zealand

Information: David Giles, Economics, University of Canterbury, Christchurch, New Zealand.

Statistics In Ecology and Environmental Monitoring, 13-17 December 1993, University of Otago, Dunedin, New Zealand

Information: Centre for Applications of Statistics and Mathematics, University of Otago, PO Box 56, Dunedin, New Zealand, tel: +64 3 479 7774, fax: +64 3 479 8427, email: CASM@math.otago.ac.nz. (Details this issue.)

Twelfth Australian Statistical Society Conference, 1994, Monash University, Victoria.

Information: R.C. Griffiths, Mathematics Department, Monash University, Clayton VIC 3168, email: apm466b@vaxc.cc.monash.edu.au. (Details this issue.)

Behaviour Genetics Association 23rd Annual Meeting, 13-16 July 1993

The Behaviour Genetics Association 23rd Annual Meeting will be held in Sydney from 13 - 16 July 1993. Statistical designs and methods used in the study of twin and family data will be covered in the conference and those interested in this area are encouraged to attend. The venue will be "The Earth Exchange", a semiprivate geology museum situated in the historic Rocks area with stunning views to the harbour and Opera House.

For further information contact:

Dr Nick Martin
Queensland Institute of Medical Research
300 Herston Road
BRISBANE QLD 4029
Tel: (07) 362 0278
Fax: (07) 362 0111.

Some news about STATCOMP93, 27 September - 1 October 1993

Trevor Hastie (AT&T, New Jersey) has accepted an invitation to speak about statistical modelling.

Organised sessions

We are in the process of organising the following sessions:

- . Experimental design

- . Medical imaging
- . Developments in S
- . Government statistical computing
- . Educational Software
- . Optimisation in statistics.

Statistics in Ecology and Environmental Monitoring, 13-17 December 1993

This is the first announcement of a 5-day conference on the use of statistics in ecology and environmental monitoring. One of the primary aims of the conference is to bring together all interested in these topics, whether they be statisticians, ecologists or managers. As well as invited and contributed papers, there will be a number of workshop-style sessions within the 5 days, during which emphasis will be placed on two themes:

1. Modelling Ecological Populations, particularly in the areas of:

- . Endangered species
- . Pest populations
- . Parameter estimation (eg. capture-recapture models)

2. Environmental Monitoring, particularly with reference to:

- . Design of sampling schemes

- . Analysis to detect change
- . Use of remote sensing

There will be a number of invited participants. Of these, both Richard Cormack (Scotland) and Roger Green (Canada) have already agreed to speak at the conference.

For further information, please contact:

Centre for Applications of
Statistics and Mathematics
University of Otago
PO Box 56
Dunedin, New Zealand
telephone: +64 3 479 7774, Fax: +64 3 479 8427
email: CASM@math.otago.ac.nz

Twelfth Australian Statistical Society Conference 1994

The programme committee is soliciting suggestions for major speakers, subject areas, and special interest areas at this conference. We are particularly interested in talks of a review nature, interesting statistical case studies, and talks about major methodology (for example GLIM or REML).

We would like to make the conference attractive to all members and welcome suggestions for changes in programme format. The conference venue is Monash University, Victoria.

Please reply to: R.C. Griffiths
Mathematics Department
Monash University
CLAYTON VIC 3168
email:
apm466b@vaxc.cc.monash.edu.au

OVERSEAS CONFERENCES

The Second International Symposium on Uncertainty Modelling and Analysis, 25-28 April 1993, College Park, MD, USA.

Information: Bilal M. Ayyub, Department of Civil Engineering, University of Maryland, College Park, MD 20742, USA.

XXVèmes Journées de Statistique, 24-28 May 1993, Vannes, France.

Information: XXVèmes Journées de Statistique, Institut Universitaire de Technologie, 8 rue Montaigne, 56014 Vannes, France, tel. (33) 97 46 06 00, fax (33) 97 46 04 40, email VANASU93@CERBERE.CICB.FR

Thirteenth International Symposium on Forecasting (ISF '93), 9-12 June 1993, Pittsburgh, PA, USA.

Information: Anne B. Koehler, Department of Decision Sciences, Miami University, Oxford, OH 45056, USA.

International Conference on Establishment Surveys, 27-30 June 1993, Buffalo, NY, USA.

Information: Brenda G. Cox, National Agricultural Statistics Service, USDA, 14th Street & Independence Avenue, S.W. Room 4835, South Building, Washington, DC 20250-2000, USA.

8th International Workshop on Statistical Modelling, 5-9 July 1993, Leuven, Belgium.

Information: Emmanuel Lesaffre, Biostatistical Centre, Department of Epidemiology, U.Z. St. Rafael, Kapucijnenvoer 35, B-3000 Leuven, Belgium.

1993 Joint Statistical Meetings, 8-12 August 1993, San Francisco, CA, USA.

Information: ASA, 1429 Duke St., Alexandria, VA 22314-3402, USA.

10th International Conference on the New Quality Philosophy in Statistical Research and Statistical Education, 10-12 August 1993, San Francisco, CA, USA.

Information: Prof. V. Shvyrkov, IS-SSE, 536 Oasis Dr., Santa Rosa, CA 95407, USA.

International Symposium on Statistics with Non-precise Data, 17-20 August 1993, Innsbruck, Austria.

Information: Prof. R. Viertl, Institut f. Statistik U. Wahrscheinlichkeitstheorie, Technische Universität Wien, A-1040 Wien, Austria.

Chemometrics and Environmetrics — CHESM-93, ISI Satellite Meeting, Bologna, Italy, 21-24 August 1993.

The aim is to stimulate communication between practitioners and researchers concerning significant problems arising in these two important areas. Presentation of significant practical problems will be emphasised.

Information: Prof. Daniela Cocchi, Dipartimento di Scienze Statistiche, "Paolo Fortunati", Università di Bologna, Via Belle Arti 41, 40126 Bologna, Italia, tel. +39 51 258234, fax +39 51 232153, email cocchi%statbo.cineca.it@icnucevm.cnuce.cnr.it.

49th Biennial Session of the International Statistical Institute, 25 August-3 September 1993, Firenze, Italy.

Information: ISI Permanent Office, 428 Prinses Beatrixlaan, PO Box 950, 2270 AZ Voorburg, The Netherlands.

IFCS '93 - 4th Conference of the International Federation of Classification Societies, 31 August-4 September 1993, Paris, France.

Information: INRIA Secretariat, INRIA - Rocquencourt, Bureau des Colloques, Domaine de Voluceau-BP 105, 78153 LE Chesnay, Cedex-France.

11th International Conference on the New Quality Philosophy in Statistical Research and Statistical Education, 1-3 September 1993, Firenze, Italy.

Information: Prof. V. Shvyrkov, IS-SSE, 536 Oasis Dr., Santa Rosa, CA 95407, USA.

SPRUCE II (Statistics in Public Resources, Utilities, and in Care of the Environment), Rothamsted Experimental Station, 13-15 September 1993.

Following the very successful first SPRUCE International Conference in Lisbon in Spring, 1991, a second will be held at Rothamsted Experimental Station, Harpenden, UK. This will be in conjunction with the 150 year celebrations of the Station, where so many major contributions to the development of statistics have been made from the time of R.A. Fisher and F. Yates.

The Conference theme will be "Statistics of Water" covering the crucial areas of quality and pollution; water as energy; water supply, management, irrigation and drainage; rainfall and climate; sea-levels and coastal protection; and hydrological modelling.

Information: Vic Barnett, SPRUCE Chairman, or Roger Payne, Local Organiser, both at Department of Statistics, Rothamsted Experimental Station, Harpenden, Herts., AL4 2JQ, UK, tel. +44 582 763133, ext. 2376, fax +44 582 467116, email SPRUCE@UK.AC.AFRC.RESA.

14th Meeting of International Society for Clinical Biostatistics, 21-24 September 1993, Cambridge, United Kingdom.

Information: Meeting Secretariat, ISCB14, 42 Devonshire Road, Cambridge, CB1 2B1, United Kingdom.

International Conference on Statistics and the Quality of Life: A Third World Perspective, 9-12 January 1994, Luxor, Egypt.

Information: P.K. Sen, Department of Biostatistics, University of North Carolina, Chapel Hill, NC 27599, USA.

Fifth Valencia International Meeting on Bayesian Statistics, 5-10 June 1993, Alicante, Spain.

Information: Prof. Jose M. Bernardo, Centro de Documentacion y Analisis, Presidencia de la Generalidad, Caballeros 9, 46001 - Valencia, Spain.

Fourth International Conference on Teaching Statistics, Marrakesh, Morocco, 25-30 July 1994.

Information: Mr EL GHAZALI Abdelaziz, Chairman of the Local Organizing Committee, I.N.S.E.A., PO Box 6217, Rabat-Instituts, Rabat, Morocco.

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