THE NEW ZEALAND
MATHEMATICAL SOCIETY (INC.)

NEWSLETTER

CONTENTS

PUBLISHER'S NOTICE

NZMS COUNCIL AND OFFICERS

NEWSLETTER CORRESPONDENTS

Sub-Editors

Honorary Correspondents

Harold Henderson   (Ruakura Research Centre, Hamilton)
John Maindonald   (HORTRESEARCH, Auckland)
Robert McKibbin   Mathematics (Massey University)
Donald Nield   Engineering Science (University of Auckland)
Peter Smith   Statistics and Operations Research (Victoria University)
Garry Tee   Mathematics and Statistics (University of Auckland)

LOCAL NEWS

CROWN RESEARCH INSTITUTES
Industrial Research Limited (Wellington)

Our transformation from DSIR to a CRI is now complete. The last part of this process was a change in our location. Our offices are situated at the Gracefield Research Centre, in the Robertson Building. The new phone and fax numbers are 569 0004 and 569 0003 respectively, although the old numbers will continue to operate for a short time. Our e-mail addresses have also changed (once again, the old address should still be valid)—the new address being xxx@maths.grace.cri.nz, where xxx is the users "code". In theory, any staff can be contacted using I.Surname, where I is the person's initial. If you experience and problems then contact me at johnb@maths.grace.cri.nz. The final point to note concerning our move is that our library collection has now been integrated into IFIRAD's library at Gracefield.

The transition to a CRI, and moving to a new site has rather disrupted our work patterns. Consequently there is little news about our mathematical activities. Some points of interest include: John Burnell spent a month in North America from mid-August. During that time he visited the University of Massachusetts, Lowell; and the Earth Sciences Division of the Lawrence Berkeley Laboratory. Stephen White had another trip to Japan, where he attended the International Congress, and visited the Institute of Statistics in Tokyo.

<div align="right">John Burnell</div>

UNIVERSITY OF AUCKLAND
Engineering Science

A former DES student, Andrew J. Mason, has been appointed to a Lecturership (limited term). Andrew has recently been awarded a Ph.D. by the University of Cambridge. His arrival next year will strengthen the OR establishment.

Prof Ramesh Gulrajani, from the Institute of Biomedical Engineering at the University of Montreal, is visiting us for a year to work with Peter Hunter. Short term visitors are Bruce Murtagh from Macquarie and Andrew Stamp from A.N.U. (See below for their current interests.)

Seminars

A/Prof James J. Wright (Psychiatry and Behavioural Science, U.Auck.) "Neural network properties of the cerebral cortex, and the EEG."
Prof Harvey Greenberg (U. Colorado) "Intelligent mathematical programming systems."
Prof Bruce Murtagh (Macquarie U.) "Direct search methods for nonlinear integer programming."
Colin Ives (Eng.Sci.) " Coastal tanker distribution of petroleum oil products in New Zealand."
Andrew Stamp (A.N.U.) "Jupiter's zonal winds."
Prof Ramesh Gulrajani (U. Montreal) "Improving Tikhonov regularization with linearly constrained optimization: Application to the inverse epicardial potential problem."

<div align="right">D.A. Nield</div>

Mathematics and Statistics

Several newly-appointed Lecturers are due to arrive before the next *Newsletter*. Bill Barton (from Auckland College of Education) is joining the Mathematics Education Unit, Dr Robert Gentleman (from the University of Waterloo) and Dr Ilze Ziedins (from Heriot-Watt University) are joining the Statistics Unit, and Dr Philip Sharp (from Queen's University, Kingston) is joining the Applied & Computational Mathematics Unit. Dr Arkadie Slin'ko (from Moscow Lomonosov State University) and Dr David McIntyre (from the University of Reading) are both pure mathematicians, and so they will be joining the complement of the Units.

Dr Hans Guesgen has joined the Department of Computer Science as a Lecturer. He had worked on the development of tools for expert systems at the German National Research Centre for Computer Science, and he is now teaching courses on artificial intelligence.

After many years of discussion of organisational structures for mathematics, statistics, computer science and related subjects in the University of Auckland, the Department of Mathematics & Statistics and the Department of Computer Science are now preparing to collaborate in a School of Mathematical and Information Sciences and on a Board of Studies. An Interim Director is being appointed for the School, and the Board is expected to arrange coordination of relevant courses, in those 2 departments and in others, for 1994.

Ivan Reilly led the 1992 NZ Olympiad Team to Moscow, with Alastair McNaughton escorting the contestants. The team performed very creditably, continuing the steady advances which have been made by the NZ teams over the past few years.

Professor Yuri N. Tyurin, of the Department of Probability at Moscow Lomonosov State University, visited here for the 2nd Term, teaching a graduate course in statistics. Dr Paul Smith studied at Auckland and Canterbury Universities, and he is now based at the University of Washington. He is visiting this Department, with his graduate student Michaela Vancliff, from September until June 1993. Dr Simo Puntanen, a statistician from Tampere University, Finland, is visiting until December. Dr Karel in 't Hout, from Leiden University, is visiting the Applied & Computational Mathematics Unit as a Post-Doctoral Fellow. Dr Rosemary Segedin is a Tutor for the 3rd term, lecturing to the Stage 1 Commerce statistics course 26.188.

Dr Paul Bonnington has departed to Vienna. Patricia Metcalf has completed her thesis for PhD in Statistics, and she is now a Post-Doctoral Fellow at the University of North Carolina (Chapel Hill).

Peter Danaher has returned from leave at the University of Lancaster, and Marston Conder has returned from leave at Waterloo, St. Andrews and Oxford. Gaven Martin is going to Italy until January, Norm Levenberg is going to Indiana until February, Vivien Kirk is at the University of Waterloo until January, Wayne Walker is attending conferences in Australia and England until January. Alan Lee will be going on leave to the University of Southampton, and Chris Triggs will be going on leave to the University of Washington. Colin Fox will be heading off to Antarctica—as soon as the ice conditions there are suitable for his studies.

Our Temporary Tutors have now departed for post-graduate study: Shane Henderson to Washington State University, Ian Painter to the University of Washington (Seattle) and Dale Winter to Stanford.

The University of Auckland Open Day, held on Sunday September 20th, proved to be very popular with the many thousands of visitors. The various displays arranged by this Department aroused much interest from numerous visitors. Mr H. Reynolds Bach came as a guest of the Department, from which he had graduated (as B.Sc.) in 1928. He has had a distinguished career in engineering, becoming President of the NZ Institute of Engineers, City Engineer for Lower Hutt and Chief Engineer for the Hutt Valley Water Supply. He was much impressed by some of the computer displays exhibited in the Department, especially those generating fractal patterns which demonstrated the self-similarity of fractals. When he retired in 1965, engineers in NZ had just begun to make use of computers.

Seminars

Prof. Donald James (Pennsylvania State University), "Integral quadratic forms and Dynkin diagrams".

Dr W. H. Moolman (University of Zululand), "The Wilcoxon-Mann-Whitney test for shift in an ARMA process"

Dr Charles Little (Massey University), "A generalisation of Mac Lane's Theorem to 3-graphs", and "A conjecture of Naddef and Pulleyblank".

Prof. Graeme Wake (Massey), "Steady size distribution for cells in one-dimensional plant tissue".

Prof. Ralph Kopperman (CUNY), "ASYMMETRY and DUALITY in TOPOLOGY".

Prof. Yuri N. Tyurin (Moscow Lomonosov State University), "On the limit distributions of Kolmogorov-Smirnov statistics for composite hypotheses", and "The sign method for general linear models".

Prof. Paul Smith (University of Washington), "Non-commutative algebraic geometry".

Prof. Conrad Blythe (Economics Department), "Bill Phillips from Dannevirke: Pioneer of Hydraulic Computers" (joint seminar with Department of Computer Science).

Britte Basse (MSc Project), "Generation of fractals by iterated function systems, and other algorithms".

Prof. E. F. Krause (University of Michigan), "Taxicab Geometry: a non-Euclidean geometry for high school students", and "Problem solving and connections in a course for elementary teachers".

Dr Vladimir G. Pestov (VUW), "Universal arrows to forgetful functors in topological algebra".

Prof. Murli Gupta (George Washington University, Washington D.C.), "High-order finite-difference schemes for elliptic equations".

Our Temporary Tutors Shane Henderson, Dale Winter and Ian Painter gave a joint seminar telling about their experiences in applying for "Graduate studies in North America".

The Departmental series of seminars on numerical analysis, on algebra, on analysis and on statistics have continued, and some mini-seminars have been given on Fridays.

G. J. Tee

UNIVERSITY OF CANTERBURY
Mathematics

We missed the last newsletter, so this is a double issue of our news! Our regular correspondent, Rick Beatson, is currently on sabbatical in England, working on radial basis functions with Will Light at the University of Leicester. (Will visited us early last year.) While there Rick will be one (of only two!) principal speakers at a numerical analysis day in November.

Roy Kerr has decided to retire at the start of next year. Roy is, of course, famous internationally for his work on relativity, but I suspect that his colleagues here are more likely to cherish his memory because of his achievement in reducing our student-staff ratio to the university's average value during his period as head of the department. We wish him all the best in the years ahead.

From mid-May to early July, Bill Baritompa visited various places in the States, Finland and the Netherlands working on global optimization. On the same topic, Graham Wood attended a global optimization conference on and beside Lake Baikal in Siberia in August. Participants spent three days on the lake (which contains 18% of the world's fresh water!) with a mathematician-cum-entrepreneur on his converted Volga gun boat. Times are very tough in Russia at present, says Graham, and mathematicians are not escaping the difficulties. The Siberian Energy Institute is on 25% of its funding of a year ago, and inflation was 11% in July in Siberia. The head of the Computing Center of the Russian Academy of Sciences now earns $100/month. Despite this the people are wonderful.

In July Professors Jang-Mei Wu and Robert Kaufman visited us from the University of Illinois at Urbana-Champaign (Jang-Mei was an Erskine Fellow and Robert is her husband). They gave seminars (listed below) on various aspects of potential theory.

Kevin O'Meara and I attended a London Mathematical Society Symposium in Durham in July. Eminent noncommunicative, er, sorry, noncommutative ring theorists gave several series of talks about the latest developments in quantum groups and regular algebras. Kevin gave a short talk about our latest work (on "growth curves" for algebras), and the gratifying response resulted in several useful conversations; this looks like being a fruitful area of research in the next few years. On the way back I attended the 7th International Conference on Mathematical Education in Quebec. The academic educationalists managed to give a few incomprehensible talks, but it was good to finally meet, and exchange ideas with, people who are at the forefront of calculus reform in the States. It was interesting to see that many beginning calculus courses overseas are now integrated around the use of graphics calculators, but there didn't seem to be any convincing evidence that students doing such courses could be differentiated from those doing traditional courses.

The department will be offering a new 6-point first year algebra and calculus course next year. A "top-up" 6-point course will start the following year, with the idea that weaker students will be able to take our traditional 12-point first year course over a two year period. This idea was proposed by our steering committee after much consultation with interested parties at the end of last year. More recently, the steering committee has been looking at the problem of giving better service to our students, and it has just released a series of

recommendations covering such matters as improved information about courses and careers, improved teaching, and better staff-student relations.

One of the recent improvements in departmental life has been the institution of a weekly seminar with the emphasis on material accessible to a "general" audience. Frank Lad has done a great job this year of encouraging and cajoling us all to bring our lights out from under their bushels, as you can see from the list below. In a similar vein, your humble servant has been organizing "enrichment" talks once a month for interested secondary school pupils.

Seminars

David Robinson, "The Shape of Panicles in the Daisy Family"

Peter Bryant, "Calculation of forced, nonlinear, water waves in a square container"

Tony O'Hagan (University of Nottingham), "Use of managers' prior information to estimate capital costs and to design sewage pipe sampling procedures for Anglian Water Services Ltd"

John Howie (University of St. Andrews), "Semigroups, rings and products of idempotents"

Michael Steel, "Trees, Abelian (Semi-)Groups and Evolution"

Bob Broughton, "An outline of the computing system in the mathematics department"

John Hannah, "Synchronized flashing by fireflies"

Ian Coope, "Curve interpolation with non-linear splines"

David Wall, "Some ill-posed problems in mathematics"

Zoltan Perjes (Hungarian Academy of Sciences, Central Institute for Physics), "Relativity and the twister picture"

Derrick Breach, "How to profit without being greedy"

Bill Gibson (University of Sydney), "Recent neural network theories of memory storage"

Gerhard Kristensson (Lund Institute of Technology), "Wave propagation problems: a review of direct and inverse methods using time domain techniques"

Frank Lad, "Probabilistic application of the Stieltjes integral: the moments of the Cantor distribution"

David Glynn, "The new algebraic function theory of $PG(n,q)$"

J.V. Baxley (Wake Forest University), "Singular Nonlinear Boundary Value Problems"

Günter Steinke, "What distinguishes the real line from the real plane"

Jang-Mei Wu (University of Illinois at Urbana-Champaign) gave two series of lectures, one on "Level sets and the Green Function", and another on "Doubling Measures, Porous Sets and Sets of Elliptic Harmonic Measure zero".

Robert Kaufman (University of Illinois at Urbana-Champaign) gave two talks: "Introduction to M_0 sets", and "Some examples on removable sets"

John Deely, "Bayes stopping rules for reliability testing with the exponential distribution"

Peter Renaud, "How to sum a series"

Mike Steel, "Trees, Forests, and jungles"

Leigh Roberts (Victoria University, Wellington), "Opportunities for quantitative graduates in the finance and insurance sectors"

Bryan Manly (Otago University), "Using selection functions to describe changes in environmental variables"

John Hannah

MASSEY UNIVERSITY
Mathematics

The first level paper Methods of Mathematics is to be offered extramurally as a summer course from November to February for the first time this year. This is part of a push within the Science Faculty to offer summer courses which can be used as foundations for further tertiary study. Course controller Peter Kelly reports wide interest and strong enrolments in this new venture - his summer will be a busy one!

The Department took part in a hugely successful Science Faculty Open Day at the University on 11 October. The Mathematics exhibits were thronged with visitors of all ages trying out games and puzzles, making kites, being fascinated by fractals, cutting Möbius strips, curve fitting on computers, finding out where mathematicians end up, and, amongst other activities, following Graeme Wake's chemical reaction experiment and model descriptions with awe!

Responsibility for the teaching of mathematics within the School of Aviation has now been moved to the Department of Mathematics. We welcome the tutor in aviation mathematics since last year, Glenda Anthony, as an Assistant Lecturer and also as a PhD student in mathematics.

Associate Professor Gordon Knight was an invited speaker on "Project work across the curriculum" at the International Congress on Mathematics Education in Canada during September, and for the same meeting was convenor of a working group on "Distance education in mathematics".

As part of a new series on staff development, Dr Cedric Hall from the Victoria University Teaching Development Centre presented a well-attended Workshop on Teaching Development; the promotion of student learning through lectures and teaching evaluation considerations were discussed in a most animated way by all present. The Department was reminded of how attentive it must be to teaching, since that is where our funding largely comes from. Visiting Professor Roger Eggleton from the Australia led a discussion meeting on "Priorities for academic mathematicians". The impending semesterisation of Massey in 1994 is also providing fuel for thought about the structure of our papers and courses in the future.

A new seminar series on some aspects of Mathematical Physics was run in the first half of the year, with contributions from the Physics Department and Graeme Wake, Bruce van Brunt and Graham Weir from Mathematics talking on "Bifurcation theory and applications", "Catastrophe theory and geometrical optics" and "Hyperbolic differential equations" respectively. The wide range of material presented drew a good cross-section of post-graduate students and staff from both departments. Graham Weir's contract with the university to contribute to research and teaching activities within Mathematics has been renewed for a year and will include Dr John Burnell, also from Graham's Applied Mathematics Group in the Industrial Research CRI.

The steady stream of successful PhD students continues with the recent award of the degree to Aroon Parshotam for his work on models of biofilm reactors. Aroon now works at Landcare, Upper Hutt. Three other students are also about to submit their PhD theses.

Mike Hendy's application to the Lotteries Health for a year's funding for Dr Mike Steel to return as a Postdoctoral Fellow working in the area of evolutionary trees was successful. Subcontracting for FRST bids by CRIs and a private company has provided some members of the Department with experience which will stand us all in good stead as we enter the new regime of FRST bidding.

Seminars

Dr Geoff Whittle (Victoria) "Invariance in combinatorics"
Professor Xu Xuchang (Tsinghua University, Beijing) "Recent research work on coal combustion in China"
Professor Roger Eggleton (ex University of Brunei Darussalam) "Distance graphs in the Euclidean plane"
Professor Elizabeth Fennema (Wisconsin Centre for Educational Research) "Gender differences in mathematics:
    a problem solved?" and "Integrating research on teaching and learning: cognitively guided instruction"
Mark R. Johnston (Massey) "A temperate maritime algorithm for the vehicle routing problem"
Shaun C. Hendy (Massey) "Strategies for optimising wool growth"
David Bulger (Massey) "An existence and uniqueness theorem for a certain class of functional equations"
Professor Graeme Wake (Massey) "Nutkin's last stand: is he red or gray? The mathematical ecology of squirrel
    populations"
Nicola Jayne (Massey) "Legendre foliations"
Dr Robert McKibbin (Massey) "Mathematical modelling of hydrothermal eruptions"
Dr Peter Donelan (Victoria) "The hierarchy of screw systems"
Dr Alex McNabb (Massey) "The Taupo-Rotorua hot plate"
Dr John Harper (Victoria) "Dirty water and clean mathematics: the leading edge of an oil slick"

<div align="right">Robert McKibbin</div>

OTAGO UNIVERSITY
Mathematics and Statistics

In the runup to the final exams and various associated matters, we have certainly been kept busy. With the introduction of semesters set for 1994, there has been much restructuring of courses to suit the natural breaks in the year as planned. There will be some degree of trial during 1993 as some courses will be taught in a de facto semester model next year. We will be keeping a keen eye on these courses to see what fine tuning needs to be done for the big jump in '94.

Since the last Newsletter some of our more senior members have attended international meetings. In

August, Professor Derek Holton attended ICME 7 in Quebec and the National Council of Teachers of Mathematics in Montréal. Both were useful as was the time he was able to spend at Vanderbilt University in Nashville working on research problems with Professors Mike Plummer and Bob Hemminger.

Also in August, Professor Vernon Squire attended the Third International Conference on Ice Technology held at MIT. The registration for the conference was exorbitant and served to deepen the disappointment felt with the general standard of the meeting. Quite an alarming situation in these times when funds are all too short anyway.

Apart from the more jetsetting exploits mentioned above, we have also maintained an active seminar program, particularly in Statistics.

Well, I guess it's back to the pile of exams.

Robert Aldred.

VICTORIA UNIVERSITY
Mathematics

Congratulations to Philip Rhodes-Robinson, whose Manchester DSc degree has been approved for his many publications on linear water wave theory. (He doesn't need to get a new gown and hood—they're the same as for a Manchester PhD.)

Vladimir Pestov visited the University of Wollongong in August, and Geoff Whittle will be visiting James Oxley at Louisiana State University for two weeks around Thanksgiving, both of them by invitation for research collaborations.

We and Massey University have been enjoying a number of seminars recently in which speakers from one place have been visiting the other. As both are on Tuesdays there has been the opportunity for one person from each place to avoid a particular colleague.

J F Harper

VUWISOR

ISOR recently celebrated a double anniversary - one year as a separate department and one year in the Cotton Building. Despite much wailing and gnashing of teeth both of these changes seem to have been very successful. To mark the occasion an ISOR Quiz Night was held and a few staff headed off to Ruapehu on a ski trip.

As always there is a fair amount of staff movement. We will be sorry to see Rona Bailey and Matthew Hobbs leave at the end of this year. However we are lucky to have two new arrivals. Dr. Yu Hayakawa from Berkeley arrived in September and has already been subjected to a term of lecturing. Her interests are in OR, network and reliability theory. Dr. Thomas Mikosch (ETH, Zürich) timed his arrival superbly to coincide with the end of term. Thomas is partly involved with the Financial Mathematics program and his interests are in time series and asymptotic theory. A third position is currently being advertised.

Other staff news : Professor Richard Lehmann from the US is visiting ISOR for a year. Peter Thomson is still in Europe having suffered the awful hardship of an S Conference in a French chateau. Ray Brownrigg also attended. Tony Vignaux attended the maximum entropy conference in Paris and Peter Smith drew the short straw with a Bayesian Conference in Nottingham !

Back home we have plans to create a second stream for our large first year service course in statistics. The ISOR Computing Laboratory now houses a Sparc 10 which is soon to become a multiprocessor. Various determined individuals have submitted applications to the great FORST funding scheme. I have it on good authority that FORST is Albanian for LOTTO. On the consulting side we are performing large chunks of external consulting largely through the capable support of our graduate students. The Internal Consulting group is plugging SYSTAT as it's preferred PC Package and Sathi has been running SYSTAT courses.

That's all folks

Peter Smith

UNIVERSITY OF WAIKATO

The big news from Waikato is the election of Ernie Kalnins to a Fellowship of the Royal Society of New Zealand. We are all basking in the glory reflected from this well-deserved recognition of Ernie's outstanding contribution to his research areas.

Another important piece of news is that the department has resolved to offer a major in Statistics from 1994. This resolution reflects the view that statistics should no longer be regarded as merely a branch of applied mathematics but as a discipline, albeit heavily based on mathematics, in its own right. At this stage, however, the statisticians have no desire to bifurcate into a separate department.

A number of Waikato mathematicians and statisticians have been abroad in the last few months. John Turner gave a couple of talks at the Fifth International Conference on Fibonacci Numbers and their Applications, at the University St Andrews in July. Graham French attended the International Conference for the Psychology of Mathematics Education (Boston) and ICME (Quebec); this was a postponed part of his study leave from last year! Ernie Kalnins attended a conference on quantum groups in Prague, and then visited his collaborators in North America. Bill Bolstad spoke at the American Statistical Association Joint Statistical Meeting in Boston.

Douglas Bridges spent a week in Malaysia (Penang and KL) visiting five universities in five days. Shortly after that, he went on a School of Computing & Mathematical Sciences visit to China. Both these visits were primarily concerned with the recruitment of doctoral students from among the staff of universities; but in China he also gave some research lectures to audiences whose enthusiasm reflected their starvation of contact with foreign mathematicians.

John Turner has managed to combine theory and practice in a most unusual way: the construction of a piano piece called "Fibonacci Celebration", or "Boogie in F(mod 7)", in which the left-hand boogie rhythm is based on $1,1,2,3,5,8 \equiv 1$ notes in C, F and G. As a result, a Texan mathematician has commissioned John to write a 144-bar Scottish reel in F(mod 7), and John has had the opportunity of publicising mathematics on national Radio University News.

Our statisticians are still gearing up for the big event: the 16th International Biometric Conference, which will be held at Waikato University in December. Anyone requiring information about the Conference and associated satellite meetings should contact the Conference Secretary at Ruakura (email: IBC@Ruakura.maf.govt.nz).

Seminars

Murray Jorgensen "The hazards of binary regression".
Bill Bolstad "Detecting and correcting a shift in the process mean using the EWMA and multiprocess dynamic linear models".
Peter Olver (Maryland) "Equivalence problems in the calculus of variations".
David Ryan (Auckland) "Optimisation methods for scheduling and roster problems".
Simo Puntanen (Tampare University, Finland) "Examples of the use of Survo 84C: regression and graphics".

<div style="text-align: right">Douglas Bridges</div>

NOTICES

AUSTRALIAN MATHEMATICAL SOCIETY
37th Annual Meeting, University of Wollongong, 5th - 9th July 1993

The University, situated at the foot of Mount Keira, an unspoilt natural reserve area, is only 10 minutes by bus from the centre of the city or half an hours drive from the southern suburbs of Sydney.

The Conference. The following speakers have so far (formally or informally) accepted invitations to speak: Robert F. Churchhouse (Cardiff), Jack K. Gray (AMP Sydney), Jack K. Hale (Georgia Tech), S.N. Chow (Georgia Tech), Jennifer Seberry (Wollongong), John N. Crossley (Monash), Henrik Petersen (Odense).

Accommodation has been booked at International House - 10 minutes walk from the University.

A Mini-conference on Analysis will probably be held from 1-3 July 1993, prior to the AMS Conference. It is tentatively entitled "Harmonic Analysis and Partial Differential Equations", and would be organised by S. Morris, R. Nillsen and G. Williams.

The latest AMS-93 information is available on anonymous ftp from ftp.cs.uow.edu.au in the directory /pub/AMS93.

Conference Director: Associate Professor Martin W. Bunder

Conference Secretary: Dr. Graham H. Williams (e-mail: ams93@math.uow.edu.au)
Mathematics Department, University of Wollongong.

The University of Wollongong will also be hosting the conference STATISTICS '93 from 27 September - 1 October, 1993.

1993 PREDOCTORAL THESIS COMPETITION
Advance Notice

The NZMS has decided to continue the predoctoral thesis competition which was last held in 1991; I have been asked, and have agreed to, organise the 1993 competition.

The competition is for Theses submitted for Masterate or Bachelor with Honours degrees, with the proviso that, in the latter case, the thesis is a *significant* part of the degree. Such predoctoral theses must have been submitted *and examined* before 31 March 1993.

The reason for the later closing date is that the 1993 NZ Mathematics Colloquium will be held in *August* (at University of Canterbury) rather than the usual May. Results will be announced at the Colloquium and it is hoped that as many contestants as possible will be able to attend the Colloquium and present a paper.

Chairpersons of departments of Mathematics, Mathematics and Statistics are encouraged to select up to 3 such theses to be entered in the competition. The judges will be asked to consider both mathematical content and style in reaching their decision.

I will communicate with individual chairpersons early in 1993 when logistic details have been worked out.

<div style="text-align: right">

Adrian Swift
Massey University
(a.swift@massey.ac.nz)

</div>

NZMS VISITING LECTURER REPORT
John Loxton

A Circuit of New Zealand

New Zealand's strength, and perhaps its future, lies in the fact that it is an anomaly.
—*The Macquarie Illustrated World Atlas*

In May, I made a whirlwind tour of New Zealand as the 1992 New Zealand Mathematical Society Visiting Lecturer. It was to be my first real experience of the country, but I felt that it would not be too great a shock. After all, I had experienced New Zealand lamb and butter in England and I knew lots of stories about trans-Tasman migration and its paradoxical relation to the second law of thermodynamics. I did not expect to find an anomaly.

1. Runge-Kutta

Auckland provided a period guest-house, a thousand harbourscapes, a woodland stroll to work and glimpses of New Zealand history from the Auckland Museum and Garry Tee. The mathematical enterprise seemed, like the harbour, a little divided, but full of character. The students impressed me, particularly the lucky ones at work in the mathematical computing laboratory. I learnt some interesting mathematics about witnesses for compositeness from Horst Gerlach.

2. Rotorua

Hamilton-Waikato impressed with its new and emerging buildings and the interaction between mathematics and computing departments. Perhaps as a pointer to other thermal wonders, the motels were full of spas. I drove to Rotorua and Lake Taupo and marvelled at the bubbling mud, the rotten smells and cathedral rocks. Unfortunately, the rain seemed to have dampened down the geysers. I learnt about the complexity of arithmetic with continued fractions from John Turner.

3. Wanganui

A funny thing happened on the way to Palmerston North. The early morning flight from Hamilton lined itself up on the mountain range beyond the town and dropped into a mass of cloud. The world turned grey, pulsing to the beat of the engines, as the plane went down, and down, and down, and down. The airport shimmered out of the murk a few feet below just as the plane pulled up again and clawed its way back to the sunshine above. The pilot buzzed the airport twice more, but it had completely disappeared. So we landed at Wanganui and proceeded by bus through the fog. The next flight ended up at Napier. When it appeared, Massey was solid enough and here I found out something of the politics driving the New Zealand University system and how it is responding to the questioning of quality in higher education.

4. As cold as any stone

Dunedin-Otago appeared after a long trek south and inspiring views of the sun playing on the Southern Alps to the west of the flight-path. It was striking for its solid stone and its uncharitable cold. From Derek Holton, I profited from more interesting experiments in mathematical education.

5. Christchurch revisited

Canterbury was the last of my lecture stops. I was intrigued to discover that the mathematicians had just been through a process of redefinition. It may be of interest to note that this quest for the right way to do first-year mathematics has now reappeared at Macquarie.

6. The wilful wind

The grand tour culminated in Wellington with the Annual Meeting of the New Zealand Mathematical Society and the chance to sit back and listen to other people's lectures. The mountains of morn and evening provided good exercise and bracing views between motel and lectures. In keeping with the scenery, the range of input to the Conference and to the Education Day was splendid.

I treasure these and other memories of New Zealand and the special way in which I was made welcome everywhere I went. This is a great tradition. So are the links between Universities and schools and the cooperative spirit in the mathematical community.

It was a pity that my commitments in Sydney kept the trip so short. It really was a four week program. I have nothing but praise for the variety and interest of my audiences. Would it perhaps be practical to use the Visiting Lecturer as an excuse to run a day of lectures, to enrich the fare?

I am pleased to see that the Australian Mathematical Society is to begin a Visiting Lecturer program. We are catching up. However, I think we must try to do more to improve the contacts across the Tasman and the opportunities for joint conferences.

My instructions were to criticise and I have not done so. Perhaps another week would have enabled me to search out the hidden evidence and the anomalies. I am grateful anyway for the opportunity to explore New Zealand and for your generous hospitality. My thanks.

John Loxton
14 September 1992

RSNZ PUBLISHING UNIT
SIR Publishing

On 1 July 1992 the Royal Society of New Zealand took ownership of the DSIR Publishing Unit and thus six scientific journals covering various fields, viz

NZ Journal of Agricultural Research
NZ Journal of Botany
NZ Journal of Crop and Horticultural Science
NZ Journal of Geology and Geophysics
NZ Journal of Marine and Freshwater Research
NZ Journal of Zoology

The *Journal of the Royal Society of NZ* was added to this set and all are now published by SIR Publishing incorporated within the RSNZ. The Cabinet Committee on Education Science and Technology contracted the RSNZ to manage the publishing unit from 1 July 1992 until 30 June 1995, and agreed to a payment of $365,000 to help support the Unit for each of the three years.

The Unit's goal is to be self-sufficient financially at the end of three years, and it will attempt to meet that goal by increasing New Zealand and international researchers' support and submission levels, and to increase international subscriptions.

In 1992/3 SIR is to review all the journals to confirm the future direction for each, particularly in light of the major changes to science structure in New Zealand.

Also, SIR/RSNZ now owns a bulk photocopying machine suitable for large newsletter runs, and a colour photocopier suitable for transparencies and other colour work. Pleas contact SIR to discuss your needs further.

Send enquiries for further information including a free copy of the Publications Catalogue to Brian Balshaw, Executive Officer, RSNZ, c/o SIR Publishing, PO Box 399, Wellington.

MATHS WITH CLASS
NZAMT Biennial Conference
Canterbury University, 29 August - 2 September, 1993

MATHS WITH CLASS is for mathematics teachers of all levels and persuasions. It will actively involve participants in the classroom style and also doing it with class.

- Plenary sessions from world renowned speakers
- Workshops, "hands on" experiences
- Displays, trade exhibits, ordering and purchasing opportunities
- Social events, not to be missed!
- Pre and Post conference tours available

Registration will be between 12:00 noon and 3:30 pm on Sunday 29 August, 1993. Accommodation will be available at budget prices in a nearby Hall of Residence from the Saturday night until the Friday morning.

The organisers request that if you are interested in attending or presenting a contribution you contact them as soon as possible. Contact The Conference Secretary, "MATHS WITH CLASS", Centre for Continuing Education, University of Canterbury, Christchurch, New Zealand

MASSEY UNIVERSITY
New Diploma in Operations Research (DipOpRes)

The Departments of Mathematics, Statistics and Production Technology through a recently formed Operations Research Board of Studies have established a postgraduate Diploma in Operations Research, primarily for students wishing to pursue part-time study extramurally. The diploma is designed to be of interest to students with a reasonably quantitative background. For those involved in management decision making, it provides a means whereby some of the mysteries of common modern problem-solving techniques, models and strategies are unravelled. It also provides an opportunity to update qualifications. Operations Research has planning and problem solving at its heart, with frequent application in areas such as finance and investment analysis, rostering and scheduling, product distribution management, production process optimization, queuing systems design, energy sector modelling, organizational operation effectiveness and efficiency, forecasting, facilities planning and inventory control.

The entry requirements are a bachelors degree, or equivalent, and experience in quantitative work. Course work for the Diploma includes introductory OR papers (if not already credited), a selection from: advanced level papers in deterministic and stochastic OR; applications papers from Production Technology, Economics, Finance and Agricultural Business together with supervised project work in an area of interest of the student. Expected completion time is about three years.

For more information about the DipOpRes, or about internal or extramural Operations Research study at Massey University, contact: Dr John W Giffin, Department of Mathematics, Massey University, Private Bag 11-222, Palmerston North, Telephone: 06-356-9099 extn 8107, FAX: 06-350-5611.

7th INTERNATIONAL CONGRESS ON MATHEMATICAL EDUCATION.

ICME 7 was held at the Université Laval, Quebec, Canada in August this year. It is a very large conference with about 2700 participants from 88 countries. It is certainly the principal mathematics education conference internationally and attracts virtually all the top names in the field.

New Zealand was particularly well represented. The official count was 38 New Zealanders although there were at least 43 with New Zealand addresses in the list of participants. This, I think, placed us second only to Canada, the host country, in number of participants per head of population, except perhaps for a few very small countries with one or two participants.

The New Zealanders had a high profile at the congress. Gordon Knight was Chief Organiser of a Working Group on 'Mathematics in distance education' and Bill Barton Chief Organiser of a Topic Group on 'Indigenous peoples and mathematics education' Bill was supported in his group by seven Maori mathematics teachers, funded by Manatu Maori, who made a very important impact on discussions concerning culture and mathematics education throughout the congress. Many other New Zealanders contributed by being panelists or by presenting papers and posters.

Hopefully, the high international reputation of New Zealand in mathematics education will be maintained at ICME 8 in Seville, Spain in 1996.

Gordon Knight

1993 NZ MATHEMATICS COLLOQUIUM
August 1993

The 1993 Mathematics Colloquium will be held at Canterbury from Monday 23 August to Thursday 26 August. The format will be largely as in previous years except that the Thursday will be devoted to a mini-conference on Mathematical Biology. Speakers on Mathematics Education will be scheduled in the main body of talks. This seems appropriate due to the NZAMT meeting the following week. At present we anticipate that the Colloquium will be followed by the Statistical Association meeting at the end of the first week. So this us gives two solid weeks of Mathematics colloquia.

Calls for contributed papers, invited speakers, etc. will issue later. However, if you know of anyone who will be around at those dates, please let me know. Any information will be useful. All correspondence can be sent to the organizing secretary who is (temporarily) the undersigned.

Peter Renaud

FORDER LECTURER 1993
Professor Roger Penrose

As was announced earlier the Forder Lecturer for 1993 is Professor Roger Penrose, University of Oxford. Professor Penrose is well-known for his work in the area of mathematical cosmology and he recently published a popular book on artificial intelligence called "The Emperor's New Mind".

He is to be in New Zealand from about Saturday 27th March for 5 weeks. He will start in the South Island Centres and cover the North Island Centres after Easter from Wednesday 14th April. It is expected that he will be in each University centre for one-half of a week. Anyone else wishing to suggest visits elsewhere should contact me as soon as possible (Tel (06) 350-5081, Fax (06) 350-5611, E-mail G.Wake@massey.ac.nz). It is hoped that major publicity will ensue for Mathematics from this visit.

Arrangements are being coordinated by myself with financial assistance from The British Council, London Mathematical Society (Forder Bequest) and all six Mathematics Departments in NZ Universities.

Details on his lecture topic will be available in December. Local organisers are:

Otago University - Dr John Shanks
Canterbury University - Dr Graham Wood
Victoria University of Wellington - Dr Geoff Whittle
Massey University, Palmerston North - Professor Graeme Wake
Waikato University - Associate-Professor Ernie Kalnins FRSNZ
Auckland University - Professor Gaven Martin.

Graeme Wake

RSNZ RESTRUCTURING
Call for nominations to Interim Board

The present government is planning to restructure the Royal Society, but this is unlikely to happen during the life of the present Parliament. However, the Royal Society has decided to move in the direction of the probable restructuring Act. Consequently there is to be an Interim Board to steer the new body over the next year or so. This Interim Board will have representatives from various Electoral Colleges, one of which is Mathematical Sciences. Currently the NZ Statistical Association and the NZ Mathematical Society are the only members of this Electoral College. We have been asked by the Royal Society to produce a member to represent this College.

Because a member is needed for the Interim Board for its first meeting in mid-November, I, in consultation with Jean Thompson, have suggested that Jean be the Mathematical Sciences nominee until such time as a member can be elected.

Consequently I am now calling for nominations for a member of the Interim Board who will represent Mathematical Sciences for one year. This member will need to be available to attend Board meetings which will be at most one per month. The business of the Board for the first year will mainly be the establishment of the new structure for an expanded Royal Society.

Nominations for the member of our Electoral College should be sent to me at the address below, by **Friday December 11th** or as soon thereafter as possible. All nominations should include a proposer and seconder and should be signed by them and the nominee. I hope to have ballot papers available early in the New Year so that a postal election can be held by mid-February.

There are a number of less urgent issues relating to the Royal Society that have to be considered in the next year. These include (1) what societies should be members of our Electoral College (should we approach Operations Research, Computer Science people, etc.); (2) how should future members be elected (bear in mind that some societies are always going to be bigger than others); (3) what is mathematical sciences, what are its needs, should it have a policy; (4) is there a need for FOSTS to continue?

I think the new-look Royal Society is an important body for"Mathematical Sciences" in this country. I therefore urge you to consider nominating someone for the Interim Board.

Derek Holton
Department of Mathematics and Statistics
University of Otago
PO Box 56, Dunedin
FAX: 479 8427

XXXIII MATHEMATICAL OLYMPIAD QUESTIONS
Moscow, 1992

1. Find all integers a, b, c with $1 < a < b < c$ such that $(a - 1)(b - 1)(c - 1)$ is a divisor of $abc - 1$.

2. Let $\mathbb{R}$ denote the set of all real numbers. Find all functions $f : \mathbb{R} \to \mathbb{R}$ such that

$$f\left(x^2 + f(y)\right) = y + (f(x))^2 \quad \text{for all } x, y \text{ in } \mathbb{R}.$$

3. Consider nine points in space, no four of which are coplanar. Each pair of points is joined by an edge (that is, a line segment) and each is either coloured blue or red or left uncoloured. Find the smallest value of n such that whenever exactly n edges are coloured the set of coloured edges necessarily contains a triangle all of whose edges have the same colour.

4. In the plane let C be a circle, L a line tangent to the circle C, and M a point on L. Find the locus of all points P with the following property:

   there exist two points Q, R on L such that M is the midpoint of QR and C is the inscribed circle of triangle PQR.

5. Let S be a finite set of points in three-dimensional space. Let Sx, Sy, Sz be sets consisting of the orthogonal projections the points of S onto the yz-plane, zx-plane, xy-plane respectively. Prove that

$$|S|^2 \le |S_x| . |S_y| . |S_z|$$

   where $|A|$ denotes the number of elements in the finite set A. (Note: the orthogonal projection of a point onto a plane is the foot of the perpendicular from that point to the plane).

6. For each positive integer n, $S(n)$ is defined to be the greatest integer such that, for every positive integer $k \le S(n)$, n^2 can be written as the sum of k positive square integers.

   a) Prove that $S(n) \le n^2 - 14$ for each $n \le 4$.

   b) Find an integer n such that $S(n) = n^2 - 14$.

   c) Prove that there are infinitely many integers n such that $S(n) = n^2 - 14$.

BOOK REVIEWS

Models for Smooth Infinitesimal Analysis, by Ieke Moerdijk & Gonzalo E Reyes. Springer-Verlag, 1991, x + 399 pp, DM 148. 3-540-97489-X.

The two approaches to geometry, analytic and synthetic, complement one another and illuminate the subject as a whole. In their efforts to understand Riemann's ideas of geometry, his successors came to work within the paradigm of set theory, developing the modern theory of differential geometry. This foundation provides precision and rigour, at a cost: the arithmetic language of analysis does not accommodate the ideas of *infinitesimal quantities* that once defined and still motivate much of calculus, physics and geometry. In an earlier paper [MR], an accessible introduction to the book under review, the authors comment:
   If we look at the work of geometers like Darboux, Lie and Cartan, as well as those of

contemporary engineers and physicists, we find (at least) two kinds of infinitesimals; the *nilpotent infinitesimals* ... which are used to deal with notions like forms and parallel transport, and the *invertible infinitesimals*, employed in the theory of improper functions of which the δ function of Dirac is the best known example. Furthermore, these invertible infinitesimals come together with *infinitely large natural numbers*, used already by Leibniz and Euler to deal with series, infinite products and the like.

In 1960, A Robinson revived the science of infinitesimals. His non-standard model of arithmetic and calculus vindicated many of the traditional infinitesimal heuristics, but it can not embrace them all, since zero is the only nilpotent infinitesimal number in the non-standard theory.

Some of Riemann's ideas found no place in either modern analytic differential geometry or in non-standard analysis: in particular, he seemed to see function-spaces as manifolds, whereas spaces of C^∞-maps can not form C^∞-manifolds, even if one considers Banach manifolds. In other words, C^∞-manifolds do not form a Cartesian-closed category. Against this background, F W Lawvere emphasised [LS, page 2-3]:

Let me be more specific about the role of the cartesian-closed property of a category ... Let E denote ordinary physical space, T a space which represents the notion of time, and B a space which represents a particular body. Then a particular motion of B may be represented as a map

$$B \times T \to E$$

which is the correct way if we want to compute by composition how particles of the body at various times experience the values of some field defined on space. However, it is also necessary to construe the same motion as a map

$$T \to E^B$$

where the space E^B of (possibly singular) placements of the body is itself independent of T or a particular motion, if we want to compute by composition the temporal variation of quantities like the center of mass $E^B \to E$ of B. Still a third version

$$B \to E^T$$

of the same motion, where the space E^T of paths in space exists independently of B, is a necessary step if we want to compute by composition the velocity field on B induced by the motion. The possibility of passing freely among these three versions of the "same" map is obviously more fundamental for phrasing general axioms or concepts of continuum physics than is the precise determination of the concept of spaces-in-general (of which E, T and B are to be examples), yet these transformations are not possible for the commonest such determinations (for example Banach manifold). The general possiblilty of such transformations within a given category is called cartesian closure ...

Several constructions provide a Cartesian-closed setting for analysis: A Frölicher and A Kriegl devoted their book [FK] to the category of *convenient vector spaces*, while K-T Chen, E Dubuc, P Michor and L Nel described others, and improvements appear regularly. None of these allows for infinitesimals, though.

The apparatus of algebraic geometry (sheaves, varieties and later, schemes) handles infinitesimal structures, but expresses them in its own technical language. The basic ideas originate in the work of C Ehresmann, A Weil and A Grothendieck — see J W Gray's *Fragments on the History of Sheaf Theory* in [FMS]. Then around 1967, Lawvere made two contributions:

(a) he discovered that Grothendieck toposes (such as those built from schemes) resemble the category of sets closely enough to support the language and notation of set theory and part of its logic — the constructive part — complete with nilpotent infinitesimals, and

(b) he suggested building these toposes from rings of smooth functions as well as the rings of polynomials used in algebraic geometry.

These ideas led in turn to axiomatic treatments of synthetic differential geometry, and to concrete models of synthetic differential geometry. In 1981, A Kock's monograph [K] brought these ideas to a wider public. He emphasised the axiomatic approach and even used *naive* style in Part I of it:

all notions, constructions and proofs are presented as if the base category were the category of sets; in particular all constructions on the objects involved are described in terms of "elements" of them.

He did not cover invertible infinitesimals, though. Even though the use of deeply categorial language and ideas later in the book defeated me at the time, Part I made me believe in synthetic differential geometry as a programme.

In the book under review, the authors approach analysis and differential geometry from the other side: they begin with several models of *smooth infinitesimal analysis*. They explain their methods and motivation fully

in the introduction, but [MR] has a shorter account:

> [We] sketch an alternative to the theory of manifolds, by constructing a cartesian closed category L which contains all manifolds ... In addition to this, however — and this distinguishes our approach from all the others — L contains spaces of nilpotent infinitesimals, invertible infinitesimals and infinitely large natural numbers. Moreover, our category L is not just cartesian closed, but is in fact a Grothendieck topos. This implies that we can use set-theoretical language and arguments (provided they are constructive) to describe our structures directly, literally adopting classical definitions and arguments, rather than guessing what the right analogue is for sheaves of a particular kind. In this way, one can carry out arguments using infinitesimals in a mathematically rigorous way. For example, 'synthetic' arguments like the ones used by E Cartan and others can be interpreted literally and word by word in a category like L.

The authors present several models, leading up to the Zariski topos Z and the Basel topos B. These embody successively more of the features needed for analysis and synthetic differential geometry. In addition, they show by largely synthetic methods

(1) that all but the first of these admits a wholly constructive cohomology theory complete with de Rham's theorem, connections and sprays and the Ambrose-Palais-Singer theorem that connects them, and even the Gauss-Bonnet theorem, and

(2) that in the Basel topos B, functions such as Dirac's δ appear as of right.

They conclude with an axiomatic sketch of synthetic differential geometry that extends the one in [K] by providing invertible infinitesimals, and verify that the Basel topos satisfies the axioms.

All this comes at some cost to both the mathematics and the reader. In both the Zariski topos and the Basel topos, the number objects N, Z and R no longer look like their classical counterparts, because as in non-standard analysis, they incorporate infinitely small and infinitely large numbers. This forces the authors

(3) to introduce smooth versions of a great many topological notions (s-finiteness, s-compactness and even s-topology) and of results such as de Rham, and

(4) to devise transfer principles that enable one to interpret these results in classical terms and also to elevate certain results established simply in a lower topos to the Basel topos, in which direct proof can be more difficult.

The authors rely on the reader's acquaintance with categories in general and with Grothendieck toposes in particular. Without this, I had to put myself through a crash course in the latter (after some experiment, I found R I Goldblatt's text [G] on toposes both helpful and a pleasure to read). Nevertheless, I still found the book hard work, but immensely rewarding.

What lies ahead? As many of us may remember, Saunders Mac Lane sees the future in categories and toposes. On the evidence of [K] and this book, I agree. To see why, compare the situation today with that at the beginning of the century. Now, workers in this area search for suitable models and appropriate axioms — just as their predecessors, with great difficulty, found models and axioms for the set theory which we now use almost automatically. Perhaps our successors may use the conceptual edifice now under construction with the same ease (and the same cavalier disregard for foundational detail).

Note — another reviewer, an expert in the area, gave a slightly more technical account of this book in [R].

References

[FMS] M P Fourman, C J Mulvey & D S Scott, editors *Applications of Sheaves* Lecture Notes in Mathematics **753**, Springer-Verlag, 1979.

[FK] A Frölicher & A Kriegl *Linear Spaces and Differentiation Theory* Wiley-Interscience, 1988.

[G] R I Goldblatt *Topoi: the categorial analysis of logic* North-Holland, 1979.

[K] A Kock *Synthetic Differential Geometry* Cambridge University Press, 1981.

[LS] F W Lawvere & S H Schanuel *Categories in Continuum Physics: Buffalo 1982* Lecture Notes in Mathematics **1174**, Springer-Verlag, 1986.

[MR] I Moerdijk & G E Reyes *A Smooth Version of the Zariski Topos* Advances in Math **65**, 229-253, 1987.

[R] K I Rosenthal *Review #18001* Zbl für Math **715**, September 1991, 103-104.

Mark Schroder

University of Waikato

The Apprenticeship of a Mathematician, by André Weil. Birkhäuser, 1991, 197 pp, sFr 58. 3-7643-2650-6.

In this book, André Weil records aspects of his life up to his move to Chicago in 1947. (Shortly before his death, Marshall Stone [S] wrote about the rejuvenation there, and his difficulty in getting Weil appointed on suitable conditions.) The chapters cover Weil's growth and progress:

Growing Up — at school in Paris during World War 1, and the origin of his life-long attraction to the Sanskrit classics;

At the *Ecole Normale* — his fellow students (Jean Delsarte, Henri Cartan ...), Jacques Hadamard's seminar, and other professors that influenced him (Elie Cartan, Henri Lebesgue ... and Sylvain Lévi for Sanskrit);

First Journeys, First Writings — 1926, travels and contacts;

India — about two years in his first academic post and his first real contact with academic intrigue; sightseeing and contact with a very foreign culture;

Strasbourg and Bourbaki — roughly 1934 to 1939;

The War and I —with the subtitle *a comic opera in six acts* and an account of the odyssey caused by Weil's partial attempt to avoid military service;

The Americas; Epilogue — support from the Rockefeller Foundation made up for almost unpaid employment at Haverford and Bethlehem 1941-1944, and two years much more happily in Sao Paulo.

On the whole,Weil keeps deeply personal matters out of this book; he scarcely mentions his — or any — mathematics as such; still less does he discuss the way he thought as a mathematician; but he does deal briefly with the extent and nature of his contact with his colleagues and mathematical elders, explaining the extent of their influence. Possibly the most important aspect of this was Bourbaki: he discusses the formation, motivation, philosophy and activities of this collective — and the influence of Enrique Freymann, their friend and publisher. Henri Cartan [C], Claude Chevalley [G] and Jean Dieudonné [D] have all given rather more detailed and to some extent, more personal, accounts of the origins, aims and successes of Bourbaki; R A Hermann [H] and P D Lax [L] and others assess the work of Bourbaki more critically.

For me, the feature of this book is the portrait of a world wholly different in both time and place ... I can compare Weil's schooling with my own and with Today's Schools; I can contrast the *Ecole Normale* and its élite students and staff with the knowledge factory in which most of us nowadays work (and with the academic ghettos that Weil himself endured in India and in Bethlehem); I can envy the ease with which Weil traveled around Europe (partly thanks to the newly founded Rockefeller Foundation) and the contacts he made on the way with great names such as Vito Volterra, Emmy Noether, Max Dehn and C L Siegel, Mittag-Leffler ... I can understand his frustration with officialdom in the Army, in France, and also in the USA; and I can imagine his pleasure in the music and art that came his way. Overall, the book was a pleasure for me to read, a tribute to Jennifer Gage's easy and fluent translation from the French original, *Souvenirs d'Apprentissage.*

References

[C]   H Cartan, *Nicolas Bourbaki and Contemporary Mathematics* Mathematical Intelligencer, **2.4**, 1980, 23-26.

[D]   J Dieudonné, Notices Amer Math Soc **29**, 1982, 618-623.

[G]   D Guedj, *Nicolas Bourbaki, Collective Mathematician: an interview with Claude Chevalley* Mathematical Intelligencer, **7.2**, 1985, 18-22.

[H]   R A Hermann, *Mathematics and Bourbaki* Mathematical Intelligencer, **8.1**, 1986, 32-33.

[L]   P D Lax, *Mathematics and its Applications* Mathematical Intelligencer, **8.4**, 1986, 14-17

[S]   M H Stone, *Reminiscences of Mathematics at Chicago* Mathematical Intelligencer, **11.3**, 1989, 20-25.

Mark Schroder
University of Waikato

GRANTEE REPORT

PAUL BONNINGTON

Through the generous support of the New Zealand Mathematical Society and the University of Auckland, I was able to attend the 18th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing, held during 6 July to 10 July 1992, at the University of Western Australia and Curtin University, Perth. At this conference, I presented a paper "Relative Imbeddings of Graphs and Permutation-Partition Pairs" that was based on a solution I have found to a problem posed by Saul Stahl.

The conference provided an excellent opportunity to renew old acquaintances and to meet new people. It was especially valuable to have discussions with Prof Cheryl Praeger, Prof Mike Plummer, Prof Bela Bollobas, Dr Warwick DeLauney, Dr Leif Jorgensen, Dr Rao, Prof Jennifer Seberry, Dr Nick Wormald, Dingjun Lou and Sharon Boswell. As a result of these discussions, I have gained considerable insight into some problems I am working on myself.

Perth is a beautiful city, and I enjoyed the riverboat journey to Fremantle, and the tram tour of the sights around Fremantle on the Wednesday afternoon.

I appreciated very much the opportunity to attend this stimulating and enjoyable conference. The experience gained will be invaluable to me in my future work. I am very grateful to the New Zealand Mathematical Society for its assistance towards my expenses.

Paul Bonnington,
University of Auckland.

LETTER TO THE EDITOR

RICHARD BATES AND DNA

Dear Sir,

The tributes to the late Professor Richard Bates (Dec 1990) did not mention some work in applied mathematics for which Bates deserves, and will I believe sooner or later be accorded, considerable credit. I hope your readers will find interesting a sketch of this work.

Assoc.-Prof. (of Chemistry) Gordon Rodley, then Dean of Science at Canterbury (now retired), invented the "side-by-side" (SBS) model for the secondary structure, i.e. short-range folding, of two-strand DNA, which is conventionally stated to be the famous double helix proposed by Watson, Crick and Wilkins. Bates was instrumental in supporting Rodley's qualitative invention by applying—no prizes are offered for guesses—Fourier analysis. Especially important was Bates' demonstration that the pattern of a dozen or so diffracted beams from (the B form of) DNA liquid crystals is if anything more consistent with the SBS model than with the Watson-Crick (W-C) double helix.

Not surprisingly, the Rodley/Bates model shares main features of the W-C: the base-pairing inside, the stacking of the base pairs loosely reminiscent of graphite, and the 34Å repeat distance along the two-stranded structure; and it envisages the strands wrapped around each other - *but only for* short *distances*. The improvement is that each strand, having been helical in the right-handed sense for 5 base pairs, is bent in its phosphate-sugar backbone to become left-handed, and then after only a further 5 base-pairs reverses its helical sense again, and so on. This model obviates the severe (I would argue unsolved) problems of conserving angular momentum whilst unravelling within a couple of minutes a 'rope' structure millions of base-pairs long; the SBS structure can simply 'unzip', as the two strands are not intertwined. Arnott (1980) and Stokes (1982) have attempted to popularise the name 'warped zipper' instead of 'SBS'.

It is not widely enough understood that X-ray scattering was never capable of playing a dominant role in the inference of DNA conformations because DNA liquid crystals in wet fibres give only a dozen or so diffuse X-ray beams rather than the thousands of sharp beams diffracted by highly-ordered crystals. Bates wrote in 1978 "if we have done one useful thing, it is to emphasise that the available X-ray diffraction data for DNA is of such poor quality that it is difficult to have confidence in any quantitative conclusion drawn from it". But, insofar as X-ray analysis is relevant, Bates showed that the SBS model fits the data for DNA better than the W-C does, when

examined by the Patterson method which is unbiased in that it does not assume a helix or any other shape.

The error of reasoning which has been propagated arose from misapplication of a lemma which Crick had produced early in his work on X-ray diffraction by macromolecules. Crick had shown mathematically that a whole-molecule regular helical conformation can scatter X-rays mainly in a characteristic "x" pattern. He overlooked what the SBS originators later proved, namely that other secondary structures also can give such a pattern of scattering.

Of course, the very idea that real DNA has but one form of secondary structure is itself a crudity. All the Canterbury group tried to question is, as they put it in 1980, whether "this important molecule can be said with certainty to possess a single large-scale conformation". They have not suggested that SBS is the whole story - neither could W-C have been - they merely point out that SBS could well be part of the picture.

SBS structures were announced first by G A Rodley, R S Scobie, R H T Bates & R M Lewitt (1976) *Proceedings of the National Academy of Sciences U.S.* 73 2959, and very soon afterwards by V Sasisekharan & N Pattabiraman (1976) *Current Science* 45 779. The Indians developed the SBS concept in more detail, including "upside down" base pairs in one option, with G Gupta (1978) *Proceedings of the National Academy of Sciences U.S.* 75 4092. Bates *et al.* (1977) *Journal of the Royal Society of N.Z.* 7 273 reviewed the unwinding problem and have written more detailed analyses of X-ray data in occasional research reports from the University of Canterbury E.E. department.

<div style="text-align: right">

L R B Mann
Senior Lecturer in Biochemistry
University of Auckland (ret.)
18 September 1992

</div>

MATHEMATICAL VISITORS TO NEW ZEALAND

List No. 33 : 1 November 1992

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

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

###############

Professor C.T.H. Baker; Victoria University of Manchester, U.K.; accompanied by wife Helen; numerical analysis; 14 December 1992 to 9 January 1993; University of Auckland; Prof. John Butcher.

Professor Ugo Bruzzo; University of Genoa, Italy; not accompanied; geometry of gauge theories and supersymmetry; 25 September - 25 October 1993; Victoria University of Wellington; Dr V Pestov; Dr Bruzzo is interested in arranging for his research talks at other universities in Australasia. Possible titles are available from Dr Pestov (vladimir.pestov@vuw.ac.nz) or directly from bruzzo@matgen.ge.chr.it; Possible.

Professor Ernie Cockayne; University of Victoria, British Columbia; unaccompanied; combinatorics; February 23 - March 28, 1993; University of Auckland; Prof. Peter Lorimer.

Professor H.G. Dales; Leeds; 3 - 9 January 1993; University of Waikato; Prof. D. S. Bridges.

Asst. Professor Florin Diacu; University of Victoria, B.C., Canada; not accompanied; celestial mechanics and the qualitative theory of dynamical systems; January 10-16, 1993; Victoria University of Wellington; Dr V. Pestov; Visiting VUW after a conference in Auckland; definite.

Professor Peter Duren; Ann Arbor, Michigan; wife; complex analysis; February 1993; University of Auckland; ˙ C. Martin; Walking Milford track in January?

Professor Aimo Hinkkanen; University of Chicago, Urbana; spouse Porama; complex analysis; March to August 1993; University of Auckland; Dr G Martin; very likely.

Dr Karel In t'Hout; University of Leiden; numerical solution of differential equations; September 1992 - September 1993; University of Auckland; Prof. John Butcher.

Dr Adrian Lewis; University of Waterloo, Canada; accompanied (wife, Heather); nonlinear optimization and analysis; April 1993 Department of Engineering Science, University of Auckland; Dr Andy Philpott

Please note: Production of these lists is dependent on my receiving information. When you know about a visit (whether it be definite, very likely, or possible), would you please forward the details to me at the earliest convenient time. Thank you.

David Robinson
N.Z. Mathematical Society Visitors' Co-ordinator
Department of Mathematics
University of Canterbury
email: dfr@math.canterbury.ac.nz

SECRETARIAL

MINUTES OF THE THIRTY-FIRST COUNCIL MEETING
Sunday 10 May 1992

The meeting was held at Weir House, Wellington and began shortly after 10:30 a.m..

PRESENT: Robert Aldred , John Giffin, Rob Goldblatt, Derek Holton (Chair), Margaret Morton, Ingrid Rinsma, David Robinson, Kee Teo, Gillian Thornley and Graham Weir.

1. MINUTES OF THE THIRTIETH COUNCIL MEETING:

    It was moved from the chair that the minutes of the previous meeting be received and signed as a true and accurate record. The motion was carried without dissent.

2. MATTERS ARISING FROM THE MINUTES:

    (a) It was reported that the AMS/NZMS profile of mathematicians was progressing smoothly.

    (b) It was reported that the formation of the Australian Institute of Mathematics had been delayed. Future developments would be reported.

    (c) Gillian Thornley reported that the problems with the Aitken trust and taxation were still being worked out.
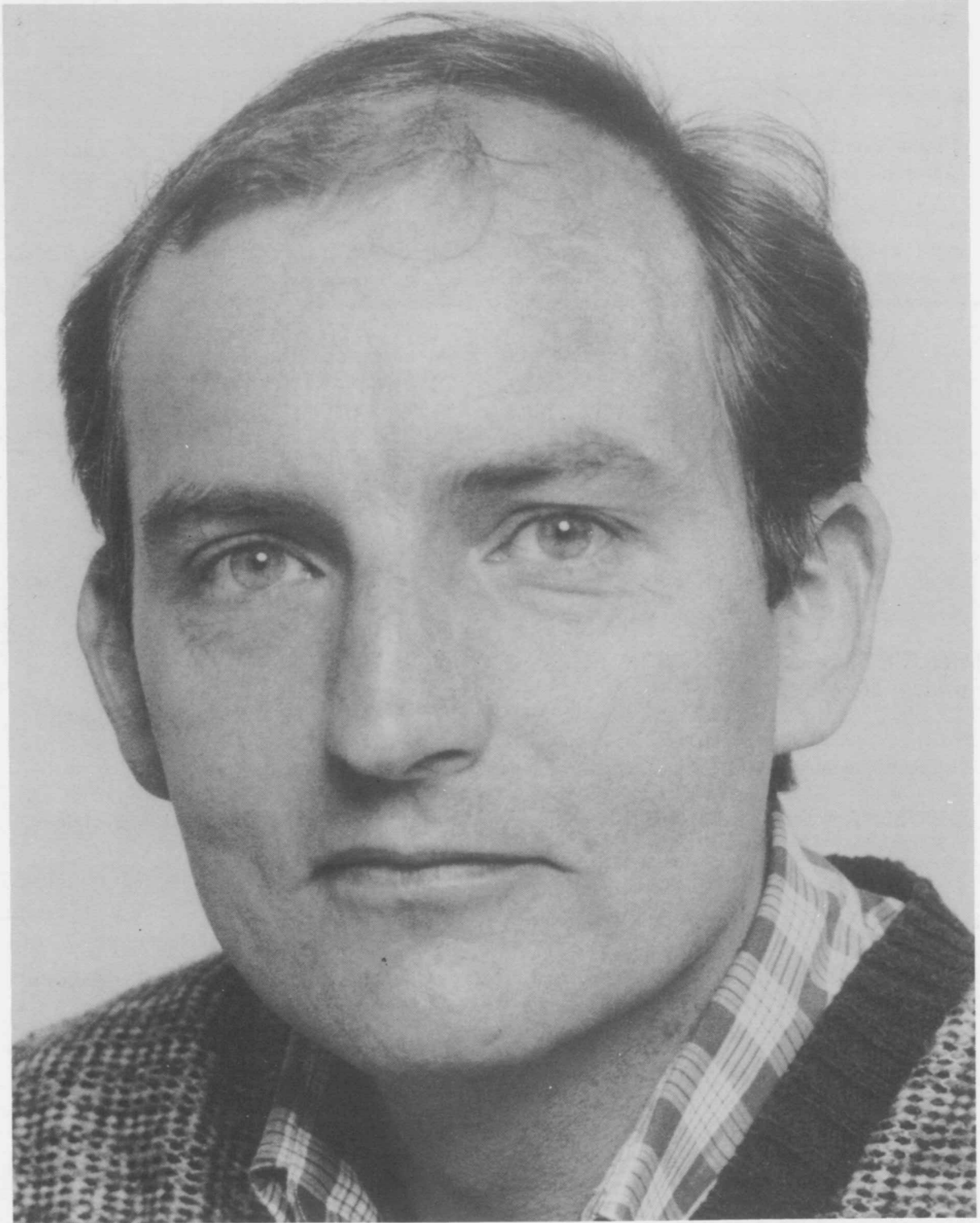
Professor Bryan Manly

BRYAN F.J. MANLY

by J.C.W. Rayner

Bryan Manly is the personable, quiet, hardworking Professor of Statistics at the University of Otago . Born in London, England on May 27, 1944, he is the author of over one hundred papers and five books. These publications are both fundamental statistical research, and applications to several related disciplines. His professorial appointment was to a personal chair, and yet Bryan graduated without a higher degree!

Bryan came to Otago in 1973 by way of Papua-New Guinea, where he had spent three years. Prior to that he worked for about 18 months with Fisons Ltd., a large fertilizer and chemical company in Britain, and another 18 months at the University of Salford. While at Salford, Bryan visited George Barnard at University College for advice in doing a Ph.D., since there was no possibility of supervision in his own department. Bryan was offered a not particularly inspiring PhD topic, and the advice that it was best to just keep publishing articles. During his time at Fisons, Bryan published his first paper (in the Journal of the Royal Statistical Society) on sequential sampling. His early papers continued on this topic until he met Mike Parr from the Biology Department, who had far more interesting problems on mark-recapture sampling. Before this interest could develop into even an MSc thesis, the urge to travel surfaced, and Bryan moved on to Papua-New Guinea.

In 1973 Bryan accepted an appointment as Senior Lecturer at the University of Otago. He was promoted to Associate Professor in 1982, and to a personal chair in 1986. Since the Statistics chair was vacant at that time, he was automatically moved into that position.

Bryan's research interests are, not surprisingly, broad. He lists general applications of statistics, particularly in the life sciences. Special interests include quality control and sequential testing, the construction and analysis of animal life tables, detecting and measuring natural selection, generalized linear models, and the statistics of earth sciences, education, psychology, anthropology and archaeology.

In 1985 Bryan became Acting Director of Otago University's Statistics Unit. He became Director in 1986, and has continued in that capacity since, although the unit became CASM, the Centre for Applications of Mathematics and Statistics, in 1989. Bryan nowadays tries to do less consulting than in the past, especially the more routine problems. However

" ... there are people with real problems where the solutions aren't in the text books. That is the sort of consulting which is of great value to statisticians, because it then gives them some real point for doing their statistics."

Given the value of consulting, and the need many have for advice, it will be difficult for Bryan to avoid. But there is more:

"I just enjoy solving problems. I find a great deal of satisfaction working with someone who has some unusual type of data, and developing new methods of analysis."

Bryan's books have been highly successful. "The Statistics of Natural Selection on Animal Populations" is a summary of research on this topic over many years; a paperback version was published in 1987. "Multivariate Statistical Methods - A Primer" is a teaching text, published in hardback and paperback and reprinted in 1988. "Multistage Populations: Sampling, Analysis and Simulation", "Randomization and Monte Carlo Methods in Biology", and "The Design and Analysis of Research Studies" appeared in consecutive years 1990, 1991 and 1992 . Currently he is working with colleagues on another book on Resource Selection by Animals. As the author of so many articles and books, one would quite correctly find that writing is a significant activity:

"I enjoy writing, that's one of my pleasures in life. I know some people don't. There is nothing more pleasant to me than to have something to write up. I think it's really nice to sit down in the morning and know that I have got the day in front of me, and I am just going to write something up."

The hosting of ICOTS 3, the third International Conference on Teaching Statistics in Dunedin in August 1990, put the New Zealand statistical community on international display. Praise for the organisation was unanimous. It was Bryan's initiative that brought the conference to Dunedin, and his hard work, organizational skills and energy that contributed to its success. But equally important was the team of willing workers that Bryan's interpersonal skills unified and directed so effectively.

Last year Bryan married Liliana Gonzalez of the Department of Finance and Quantitative Analysis. He is a keen tramper, and the father of three adult daughters, and now a grandfather. In researching this article many of his colleagues mentioned his home brewing; especially the ale and elderberry wine. A fine barbecue constructed in the back yard reflects a volume of entertaining that this most generous of hosts enjoys. There are many demands on his time, but the promotion of statistics will always be paramount:

"I have absolute faith in the future of statistics as a subject. So many people need it and will need more of it in future."

3. PRESIDENT'S REPORT:

The President's Report for the AGM was briefly presented and discussed. [The report appeared in the previous issue of this Newsletter. Ed.]

4. REPORTS:

(a) Treasurer. Kee Teo reported on the state of the Society's funds. He noted that the falls in interest rates and book sales would affect the income of the Society. In the light of this, the need to reconsider our current commitments and fund distributions was acknowledged. It was also noted that some restructuring of investments may be advisable to reduce the tax liabilities of the Society.

It was moved that the Treasurer be directed to act on the advice of the auditors in restructuring of the Society's investments. (Rob Goldblatt/John Giffin) The motion was carried without dissent.

It was moved from the chair that the Treasurer consult with the auditors about the method of collection of Journal subscriptions, should the matter arise. The motion was carried without dissent.

It was moved from the chair that the suggested fees for the Society be put at $47 reducible to $45 for prompt payment (G.S.T. exclusive) for the A.G.M.. The motion was carried

It was also moved from the chair that the November Council meeting be held by teleconference in order to reduce costs. The motion was carried.

The distribution of the Society's funds were detailed as in the Treasurer's statement. Among these details it was recorded that the NZMS Visiting Lecturer and the Forder Lecturer should be given appropriate funding by the various Mathematics Departments involved, which should take responsibility for local accommodation matters. The Society should, however, contribute toward the added expenses of weekend entertainment.

(b) MEMBERSHIP: It was reported that the Society's membership was currently difficult to assess due to the fees still being sent in. More accurate figures should be available for the November meeting.

(c) PUBLICATIONS: Nil Report.

(d) NEWSLETTER: Nil report.

5. APPLICATIONS FOR FINANCIAL ASSISTANCE:

Research, conference and travel support applications were received and discussed. Following these discussions it was decided that

Dr. Paul Bonnington of Auckland University be granted $500 towards the cost of travelling to Perth to attend the Australasian Combinatorial Mathematics and Combinatorial Computing conference in July.

Dr. Mike Steel of Canterbury University be granted $500 towards the costs of attending a conference on Trees in California.

Dr. Dingjun Lou of Otago University be granted $500 towards the cost of travelling to Perth to attend the Australasian Combinatorial Mathematics and Combinatorial Computing conference in July.

Dr. Colin Fox be granted $500 toward the cost of organizing a conference at the University of Auckland.

All other applicants were unsuccessful in obtaining funds from the Society.

6. CAREERS PAMPHLETS:

Ingrid Rinsma reported on the options for careers pamphlets being prepared by the Society. Sample formats were presented and their merits discussed as well as the proposed content of the pamphlets. It was suggested that Mathematics associations and various organizations be approached for support and that further developments be reported to the Society.

7. NEW ZEALAND JOURNAL OF MATHEMATICS:

The Editor's report for the Journal was circulated and it was moved from the chair that report be received. the motion was carried.

8. FOSTS:

It was reported that there was not much to report from FOSTS. Things had been fairly quiet there but the Society would be informed of any developments.

9. APPLIED MATHEMATICS GROUP:

Graham Weir reported on the difficulties encountered with the discipline based funding of the CRI system. One of the immediate problems faced was that the AMG library was being moved from its current site at Victoria University to Gracefield. Along with the move the general servicing cutbacks threaten a severe degrading of the resource. Graham Weir will keep the Society informed of any future developments and Derek Holton will write to the Minister to express concern at the situation.

10. RSNZ NATIONAL COMMITTEE FOR MATHEMATICS:

It was reported, from an RSNZ communication that the current membership of the National Committee would be retained for the present.

11. NZMS POLICY:

A final call was made for comments on the Society's statement of policy before its presentation at the A.G.M.

12. COUNCIL NOMINATIONS:

It was noted that there were more nominations for positions on the Council than there were place to fill; thus an election was indicated. David Robinson volunteered to act as returning officer for the election.

13. NZMS VISITING LECTURER:

It was announced that the NZMS Visiting Lecturer for 1993 would be Andreas Dress. Final details of the visit will be made available when they are known.

14. FORDER LECTURER:

There was little news to report on the Forder Lecturer situation.

15. NZMS RESEARCH AWARDS:

It was reported that the reviewing committee had found the five nominees for this year's award were all excellent candidates for the award but felt that making too many awards could set a precedent which might lead to the downgrading of the award. It was suggested that those who were not successful this time might be reconsidered, with updates, in the next round of awards. The two recipients of the awards were:

- Assoc. Professor Rod Downey of Victoria University and
- Professor Vernon Squire of the University of Otago.

It was suggested that handling the nominations for the awards should be the job of the President during the second year of office and retained by that person in their year as Outgoing Vice-president.

16. AITKEN CELEBRATIONS:

Derek Holton reported that there would be a conference held inn 1995 as part of the Aitken celebrations. The exact dates of the conference had not been finalized but would be included in a circular to be sent around in the near future. Edinburgh has been contacted for their suggestions of possible speakers and the A.M.S. has offered $1000 in support.

17. JIM CAMPBELL TEACHERS' AWARD:

It was reported that there have been discussions with and within NZAMT about the nature of the awards. The matter will be considered further by NZAMT and their decision will be passed on. Consequently, there will be no awards made this year.

20. RECIPROCAL MEMBERSHIP OF NZMS AND NZ STAT. ASSOC.:

The reciprocal membership of NZMS and NZ Stat. Assoc. was discussed in the light of the NZ Journal of Mathematics and the likely inclusion of its subscription in the fees for membership. If the editorial policy of the Journal is to rule out the inclusion of statistics papers, then it would seem unfair to include the subscription in reciprocal membership of this type. It was decided to delay any decision until the editorial policy was cleared up.

21. NZ ACADEMY OF HUMANITIES:

Rob Goldblatt expressed interest in keeping in touch with Brian Opie about the New Zealand Academy of Humanities. He will keep the Society informed of any developments.

22. ANY OTHER BUSINESS:

(a) It was noted that the Society should consider arrangements for the predoctoral thesis competition for next year.

(b) Derek Holton reported that Gordon Knight had been working on behalf of the Society in connection with the new Mathematics Curriculum. The curriculum will be set in place next year without trial. A discussion ensued.

(c) David Robinson mentioned that *Acta Mathematica* was still being sent to Canterbury. The matter will be investigated.

The meeting came to a close at 3:00 p.m.

MINUTES OF THE EIGHTEENTH ANNUAL GENERAL MEETING
12 May 1992

The meeting was held on Tuesday 12 May in the Hugh Mackenzie building at Victoria University of Wellington and started at 6:02 p.m.

PRESENT: Derek Holton (in the Chair), David Alcorn, Robert Aldred, Peter Bryant, John Butcher, John Burnell, Mike Carter, Mike Doherty, David Gauld, Rob Goldblatt, Antony Gomez. Dean Halford, Mike Hendy, Mark Hickman, John Kalman, Charles Little, Mark McGuinness, Margaret Morton, Don Nield, Aroon Parshotam, Ken Pledger, Ivan Reilly, David Robinson, Alastair Scott, Garry Tee, Kee Teo, Gillian Thornley (and others who didn't sign)

1. APOLOGIES: Marston Conder, John Harper.

2. MINUTES OF THE SEVENTEENTH AGM:

It was moved from the chair that the minutes be accepted as a true and accurate record. The motion was carried.

3. MATTERS ARISING FROM THE MINUTES:

There were no matters arising from the minutes.

4. CORRESPONDENCE:

All relevant correspondence is dealt with elsewhere in the agenda.

5. PRESIDENT'S REPORT:

The President's report was delivered to the meeting and the following points were made.

(i) Andreas Dress has been named NZMS Visiting Lecturer for 1993. Mike Hendy will act as contact person.

(ii) Roger Penrose will be visiting in May 1993 as Forder Lecturer. Graeme Wake will co ordinate the visit.

(iii) John Shanks and David Smith were thanked for the efforts with the newsletter.

(iv) It was suggested that new texts are being sought to aid the finances of the Society.

(v) It was mentioned that the first issue of the NZ Journal of Mathematics is out and that the Society has committed to support the Journal for the next three years at least.

(vi) The disposal of income from interest etc. was detailed.

(vi) Those who assisted in the adjudication process for the Society's Research Awards were thanked for their efforts.

(vii) The Society's situation in FOSTS was indicated.

(viii) Thanks were given to retiring members John Giffin, Kee Teo and Gillian Thornley.

6. TREASURER'S REPORT:

Kee Teo presented the financial statement and explained the writeoff of secondary school's maths texts and the apparent loss it represented. Details were given of the interest being earned by investments and the expected falloff of income as interest rates fall.

Indications are that the commitment to the Journal could be met from interest income and that the current dues were sufficient to cover the day to day running of the Society.

The current problems of our taxation situation were mentioned.

It was moved by Dean Halford and seconded by David Robinson that the report be accepted. The motion was carried. [The Financial Statements appear in the previous issue of the Newsletter. Ed.]

7. ELECTIONS OF COUNCIL MEMBERS:

As sole nominee for the position, Marston Conder was appointed Incoming Vice-President. An election was held and two new members of council were elected. They are Robert Chan and Mike Hendy. Kee Teo was co opted as Treasurer. Robert Aldred was retained as Secretary.

8. NEW ZEALAND JOURNAL OF MATHEMATICS:

8.1 Editor's Report:

The Editor's report was circulated and it was asked that the report be considered presented. It was moved by John Butcher and seconded by Gillian Thornley that the report be accepted. The motion was carried.

8.2 Committee Report:

David Alcorn presented a report in which it was noted that the subscriptions for the Journal had been set at $50 for institutions and $35 for individuals. It is believed that the cost of production can be covered by a fairly small number of subscriptions. Efforts to advertise the Journal would be made to help this along.

8.3 Subscriptions:

Derek Holton moved from the chair that all full fee paying members receive the Journal, the subscription of $15 for 1993 being collected with annual membership fees. After some discussion, the motion was carried.

It was moved by John Butcher and seconded by Graeme Wake that the editorial policy of the Journal be changed by deleting the words "but not normally statistics" and also "pure and applied". The motion was carried.

It was moved by Gaven Martin and seconded by Gillian Thornley that members of the Society, other than ordinary members, be given the option of subscribing to the Journal at the same rate as ordinary members. The motion was carried.

9. ANNUAL SUBSCRIPTIONS:

It was moved by Kee Teo and seconded by Rob Goldblatt that the annual subscription be set at $47 reducible to $45. The motion was carried.

10. FOSTS:

Graeme Wake reported on the current position with FOSTS. He indicated the worries of funding and reduced representation. He also noted the need to consider instituting a medal in the Mathematical Sciences through the RSNZ. More details were promised for a newsletter article.

11. CHANGES TO THE CONSTITUTION:

In the interest of abolishing exclusive language in the constitution, the following amendments were moved from the chair.

Article III: MEMBERS

The fourth sentence be replaced with: "However, a person who is not normally resident in New Zealand and is a member of a Society with which the New Zealand Mathematical Society maintains a reciprocity agreement shall, upon application to council, be admitted as and remain an ordinary member of the New Zealand Mathematical Society at a reduced subscription."

ARTICLE V: THE COUNCIL Paragraph 4

The fifth sentence be replaced with: "Meetings of the Council shall normally be chaired by the President if present, or by the Vice-President."

In the seventh sentence replace: "Chairman" with "Chairperson"

ARTICLE VI: OFFICERS Paragraph 3,

Combine sentences one and two as follows: "The President shall be ex officio a member of all committees, and shall deliver the Annual Report of the Council at the Annual General Meeting (Article VII)."

The fifth sentence be replaced with: "The Treasurer shall keep the Society's financial records and prepare the necessary financial statements."

ARTICLE VII MEETINGS Paragraph 4,

The first sentence be replaced with: "At every Annual General Meeting or Special General Meeting the Chair shall be taken by the President, if present, or by the Vice-President. If both President and Vice-President are absent, a Chairperson shall be nominated from members of the Council by the persons present at the Meeting."

In the third sentence replace: "Chairman" with "Chairperson".

The motion was carried.

12. NZMS POLICY:

A policy statement was tabled and it was suggested that it appear in the newsletter so that input could be gathered for the formulation of a definitive statement next year.

13. ANY OTHER BUSINESS:

(i) A motion of appreciation and congratulations to the Journal Committee was put by Rob Goldblatt and seconded by Graeme Wake. The motion was carried by acclamation.

(ii) It was moved by Garry Tee and seconded by David Robinson that the abstracts of talks presented at the Colloquium be published in a supplement to the newsletter. After some discussion, the motion was lost.

(iii) It was moved by Kee Teo and seconded by Graeme Wake that Peat Marwick be appointed as auditors. The motion was carried.

The meeting closed at 7:12 p.m.

CONFERENCES

** 1993 **

January 4-8 (Auckland) **International Conference on Scientific Computation and Differential Equations (in honour of Professor John Butcher's 60th birthday)**
Contact Dr Horst Gerlach, Department of Mathematics and Statistics, University of Auckland, Private Bag 92019, Auckland, New Zealand.

January 3-9 (Oberwolfach, Germany) **Grundlagen der Geometrie**
Contact MFOG: see (1) below.

January 3-9 (Oberwolfach, Germany) **Extensions of Buildings and Geometries**
Contact MFOG: see (1) below.

January 4-9 (New Delhi, India) **Advances in Computational Mathematics**
Contact C.A. Micchelli, IBM Research Center, P.O. Box 218, Yorktown Heights, New York 10598, U.S.A.

January 10-13 (Caracas, Venezuela) **First Panamerican Workshop in Applied and Computational Mathematics**
Contact Asociacion Matematica Venezolana, Caracas '93, Apartado 47898, Caracas 1041-A, Venezuela.

January 10-16 (Oberwolfach, Germany) **Computational Methods for Non-Linear Phenomena**
Contact MFOG: see (1) below.

January 12-14 (Kyoto, Japan) **Topology and Field Theory of 3-4 Dimensional Algebras**
Contact RIMS: see (4) below.

January 15-17 (Hong Kong) **International Conference on Complex Analysis and its Applications**
Contact Y.-K. Kwok, Mathematics Dept., Hong Kong University of Science and Technology, Clear Water Bay Road, Hong Kong.

January 17-22 (San Antonio, Texas) **1993 IEEE International Symposium on Information Theory**
   Contact R. Gray, Electrical Engineering Dept., 133 Durand, Stanford University, Stanford, California 94305, U.S.A.

January 17-23 (Oberwolfach, Germany) **Combinatorial Optimisation**
   Contact MFOG: see (1) below.

January 18-21 (Kyoto, Japan) **Numerical Analysis of Partial Differential Equations in Engineering and Related Topics**
   Contact RIMS: see (4) below.

January 19-23 (New Delhi) **Ninth International Congress of Cybernetics and Systems**
   Contact A. Ghosal, Secretary, Society of Management Science and Applied Cybernetics, CSIR Complex, Pusa, New Delhi - 110 012, India.

January 24-30 (Oberwolfach, Germany) **Optimale Steuerung Partielle Differentialgleichungen**
   Contact MFOG: see (1) below.

January 25-26 (Bethesda, Maryland) **NIH Conference on Current Topics in Biostatistics**
   Contact Jonas H. Ellenberg, Biometry and Field Studies Branch, NINDS, NIH, 7550 Wisconsin Ave., Room 7A-12, Bethesda, Maryland 20892, U.S.A.

January 25-27 (Austin, Texas) **Fourth ACM-SIAM Symposium on Discrete Algorithms**
   Contact SIAM: see (6) below.

January 25-29 (Minneapolis, Minnesota) **IMA Workshop on Robotics**
   Contact IMA: see (3) below.

January 26-28 (Kyoto, Japan) **The Development of Algebraic Topology**
   Contact RIMS: see (4) below.

January 31-February 6 (Oberwolfach, Germany) **Asymptotics and Adaptivity in Computational Mechanics**
   Contact MFOG: see (1) below.

February 1-3 (Minneapolis, Minnesota) **IMA Minisymposium on Biological Control of Movement**
   Contact IMA: see (3) below.

February 5-7 (New Brunswick, New Jersey) **Representation Theory and Analysis on Homogeneous Spaces in Memory of Lawrence Corwin**
   Contact R. Goodman, Department of Mathematics, Rutgers University, New Brunswick, New Jersey 08903, U.S.A.

February 7-11 (South Australia) **29th Australian Applied Mathematics Conference**
   Contact Dr A. J. Roberts, Department of Applied Mathematics, University of Adelaide, GPO Box 498, Adelaide, SA 5001, Australia.

February 7-13 (Oberwolfach, Germany) **Partielle Differentialgleichungen**
   Contact MFOG: see (1) below.

February 8-17 (Minneapolis, Minnesota) **IMA Workshop on Non-smooth Analysis and Geometric Methods in Deterministic Optimal Control**
   Contact IMA: see (3) below.

February 14-20 (Oberwolfach, Germany) **Applicable Algebra**
   Contact MFOG: see (1) below.

February 15-19 (Melbourne) **1993 Mathematics-in-Industry Study Group**
   Contact Dr. N. G. Barton, CSIRO Division of Mathematics and Statistics, P.O. Box 218, Lindfield, New South Wales 2070, Australia

February 16-25 (Minneapolis, Minnesota) **IMA Workshop on Nonsmooth Analysis and Geometric Methods in Control**
   Contact IMA: see (3) below.

February 21-27 (Oberwolfach, Germany) **Curves, Images, Massive Computation**
   Contact MFOG: see (1) below.

February 22-28 (Waterloo, Ontario) **Workshop on Pattern Formation and Symmetry Breaking**
   Contact FIRMS: see (10) below.

February 25- March 1 (La Fayette, Louisiana) **Conference on Numerical Analysis with Automatic Result Verification**
   Contact Interval Methods Conference, c/o R. Baker Kearfott, Dept. of Math., Univ. of Southwestern Louisiana, U.S.L. Box 4-1010, La Fayette, Louisiana 70504-1010, U.S.A.

February 28 - March 6 (Oberwolfach, Germany) **Medical Statistics: Statistical Methods for Risk Assessment**
   Contact MFOG: see (1) below.

March 7-13 (Oberwolfach, Germany) **Mathematische Stochastik**
   Contact MFOG: see (1) below.

March 14-18 (Heidelberg, Germany) **7th Conference on the Scientific Use of Statistical Software**
   Contact Soft Stat '93, ZUMA, Postfach 12 21 55, D-6800 Mannheim 1, Germany

March 14-20 (Oberwolfach, Germany) **Gewöhnliche Differentialgleichungen**
   Contact MFOG: see (1) below.

March 15-19 (Minneapolis, Minnesota) **IMA Workshop on Systems and Control Theory for Power Systems**
   Contact IMA: see (3) below.

March 17-20 (Pensacola, Florida) **Pure and Applied Linear Algebra: The New Generation**
   Contact J. R. Weaver, Dept. of Maths. and Stats., 1000 University Parkway, University of West Florida, Pensacola, Florida 32514-5751, U.S.A.

March 21-24 (Norfolk, Virginia) **Sixth SIAM Conference on Parallel Processing for Scientific Computing**
   Contact SIAM: see (6) below.

March 21-27 (Oberwolfach, Germany) **Analysis auf Lokalsymmetrischen Räumen**
   Contact MFOG: see (1) below.

March 22-28 (Waterloo, Ontario) **Workshop on Pattern Formation in Earth Sciences and Biology**
   Contact FIRMS: see (10) below.

March 28-April 3 (Oberwolfach, Germany) **Combinatorial Convexity and Algebraic Geometry**
   Contact MFOG: see (1) below.

March 28-April 8 (Edinburgh) **Workshop on Geometric and Combinatorial Methods in Group Theory**
   Contact A. Duncan, Department of Mathematics, Heriot-Watt University, Edinburgh EH14 4AS, Scotland.

March 29-31 (Cambridge, England) **Multiscale Stochastic Processes Analysed using Multifractals and Wavelets**
   Contact IMA: see (7) below.

March 29-April 2 (Berkeley, California) **Workshop on Diophantine Geometry**
   Contact MSRI: see (2) below.

April 4-7 (Barcelona) **First International Conference on Mathematical Linguistics**
Contact C. Martin-Vide, Universitat de Barcelona, Facultat de Filologia, Secció de Lingüística, Gran Via de les Carts Catalanes 585, E-08007 Barcelona, Spain.

April 4-10 (Oberwolfach, Germany) **Topics in Pseudo-Differential Operators**
Contact MFOG: see (1) below.

April 5-8 (Glasgow) **British Applied Mathematics Colloquium**
Contact Dr. Jan Murdoch, Colloquium Secretary, British Applied Mathematics Colloquium, Department of Mathematics, University of Strathclyde, Glasgow G1 1XH, Scotland.

April 5-9 (Minneapolis, Minnesota) **IMA Tutorial: Design and Analysis of Adaptive Systems**
Contact IMA: see (3) below.

April 12-16 (Minneapolis, Minnesota) **IMA Workshop on Adaptive Control, Filtering and Signal Processing**
Contact IMA: see (3) below.

April 13-23 (Kruger National Park, South Africa) **International Conference in Abstract Analysis**
Contact Professor J. Swart, Department of Mathematics and Applied Mathematics, University of Pretoria, 0002 Pretoria, Republic of South Africa.

April 14-16 (Belfast, Northern Ireland) **Modelling for Food Safety**
Contact IMA: see (7) below.

April 14-16 (Eindhoven, The Netherlands) **Seventh SEFI European Seminar on Mathematics in Engineering Education**
Contact F. Simons, Dept. of Math. and Comp. Sci., Eindhoven University of Technology, P.O. Box 513, NL 5600 MB Eindhoven, The Netherlands.

April 15-22 (Coventry, England) **Symposium on Analytic and Geometric Aspects of Hyperbolic Geometry: Research Level Workshop**
Contact E. Shiels, Mathematics Institute, University of Warwick, Coventry CV4 7AL, U.K.

April 18-24 (Oberwolfach, Germany) **The Arithmetic of Fields**
Contact MFOG: see (1) below.

April 18-24 (Oberwolfach, Germany) **Mathematische Grundlagen und Numerische Verfahren bei Transsonischen Strömungen**
Contact MFOG: see (1) below.

April 19-20 (Minneapolis, Minnesota) **IMA Minisymposium on Fuzzy Control**
Contact IMA: see (3) below.

April 19-21 (Houston, Texas) **SIAM Conference on Mathematical and Computational Issues in the Geosciences**
Contact SIAM: see (6) below.

April 25-27 (Manhattan, Kansas) **Conference on Applied Statistics in Agriculture**
Contact James R. Schwenke, Kansas State University, Department of Statistics, Dickens Hall, Manhattan, Kansas 66506-0802, U.S.A.

April 26-29 (Uxbridge, England) **The Mathematics of Finite Elements and Applications VIII**
Contact The Secretary, MAFELAP 1993, The Brunel Institute of Computational Mathematics, Brunel University, Uxbridge UB8 3PH, U.K.

April 29-May 1 (Oberwolfach, Germany) **Low Dimensional Dynamics**
Contact MFOG: see (1) below.

May 3-7 (Minneapolis, Minnesota) **IMA Tutorial: Verification Issues in Discrete Event Systems**
Contact IMA: see (3) below.

May 3-9 (Waterloo, Ontario) **Workshop on Ecological Systems**
Contact FIRMS: see (10) below.

May 6-12 (Paseky, Czechoslovakia) **Spring School on Potential Theory and Analysis**
Contact Jiri Kottas, Department of Mathematical Analysis, Sokolovska 83, 186 00 Praha 8 - Karlin,
Czechoslovakia.

May 9-15 (Oberwolfach, Germany) **Reelle Algebraische Geometrie**
Contact MFOG: see (1) below.

May 9-17 (Jerusalem) **Jerusalem Combinatorics '93**
Contact G. Kalai, Institute of Mathematics, Hebrew University, Jerusalem, Israel.

May 10-12 (Montréal) **IMACS Symposium on Signal Processing and Neural Networks -
SPANN '93**
Contact Z. Jacyno, Chair of IMACS SPANN '93, Dept. of Physics, Univ. of Quebec at Montréal, P.O.
Box 8888, Station A, Montréal, PQ, Canada H3C 3P8.

May 10-14 (Minneapolis, Minnesota) **IMA Workshop on Discrete Event Systems, Manufacturing
Systems and Communication Networks**
Contact IMA: see (3) below.

May 16-22 (Oberwolfach, Germany) **Mathematical Problems in Viscoelastic Flows**
Contact MFOG: see (1) below.

May 20-23 (Santa Barbara, California) **International Conference on Approximation Probability
and Related Fields**
Contact S.T. Rachev, Dept. of Statistics and Applied Probability, University of California, Santa Barbara,
California 93106, U.S.A.

May 23-29 (Oberwolfach, Germany) **Differentialgeometrie im Grossen**
Contact MFOG: see (1) below.

May 30-June 1 (Ottawa, Canada) **Canadian Society for the History and Philosophy of
Mathematics**
Contact G. R. van Brummelen, The King's College, 10776 9th Street, Edmonton, Alberta T5H 2M1,
Canada.

May 30-June 5 (Oberwolfach, Germany) **Funktionalanalysis und Nichtlineare Partielle
Differentialgleichungen**
Contact MFOG: see (1) below.

June (Cambridge, England) **Fourth IMACS International Symposium on Computational
Acoustics**
Contact D. Lee, Code 3122, Naval Underwater Systems Center, New London, CT 06320, U.S.A.

June (Lyon, France) **Geometrical and Topological Methods in Theoretical Physics**
Contact P. Sorba, Laboratoire de Physique Théorique, Ecole Normale Supérieure de Lyon, 46 allee d'Italie,
F-69364 Lyon Cedex 07, France.

June 6-9 (Wolfville, Nova Scotia) **Annual Meeting of the Statistical Society of Canada**
Contact P. Cabilio, Department of Mathematics and Statistics, Acadia University, Wolfville, Novia Scotia,
BOP IX0, Canada.

June 6-12 (Oberwolfach, Germany) **Analysis auf Kompakten Varietäten**
Contact MFOG: see (1) below.

June 7-10 (Newark, Delaware) **SIAM Conference on Mathematical and Numerical Aspects of
Wave Propagation Phenomena**
Contact SIAM: see (6) below.

June 7-11 (Minneapolis, Minnesota) **IMA Tutorial: Mathematical Theory which has become an Integral Part of Modern Financial Economics**
Contact IMA: see (3) below.

June 7-13 (Waterloo, Ontario) **Workshop on Pattern Formation and Cellular Automata**
Contact FIRMS: see (10) below.

June 13-19 (Oberwolfach, Germany) **Differential-Algebraic Equations: Theory and Applications in Technical Simulation**
Contact MFOG: see (1) below.

June 14-17 (Singapore) **the Fifth Asian Logic Conference**
Contact Fifth Asian Logic Conference, Department of Mathematics, National University of Singapore, Singapore 0511.

June 14-18 (Ithaca, New York) **Linear Logic Workshop**
Contact J. Chiment, Mathematical Sciences Institute, 409 College Avenue, Ithaca, New York 141850, U.S.A.

June 14-18 (Minneapolis, Minnesota) **IMA Workshop on Mathematical Finance**
Contact IMA: see (3) below.

June 15-18 (Barcelona) **Third IMACS International Workshop on Qualitative Reasoning and Decision Technologies - QR & DT-3**
Contact N. Piera, Univ. Politecnica de Catalunya, Dept. di Matematica Aplicada II, c/o Pau Gargallo 6, E-08028 Barcelona, Spain.

June 20-26 (Oberwolfach, Germany) **Konvexgeometrie**
Contact MFOG: see (1) below.

June 21-25 (Amsterdam) **22nd Conference on Stochastic Processes and their Applications**
Contact SPA '93, c/o CWI, P.O. Box 4079, 1009 AB Amsterdam, The Netherlands.

June 21-26 (Lillafured, Hungary) **Colloquium on Analytical Number Theory**
Contact The Bolyai Mathematical Society, Budapest, Fo u. 68 II. 224, H-1027, Hungary.

June 23-26 (Columbus, Ohio) **Conference in Ergodic Theory and Probability**
Contact J. Rosenblatt, Mathematics Department, Ohio State University, 100 Mathematics Building, 231 West 18th Ave, Columbus, Ohio 43210-1174, U.S.A.

June 27-July 3 (Oberwolfach, Germany) **Algebraische K-Theorie**
Contact MFOG: see (1) below.

June 28-July 3 (Vilnius, Lithuania) **6th International Vilnius Conference on Probability Theory and Mathematical Statistics**
Contact V. Statulevicius, Institute of Mathematics and Informatics, Akademijos 4, 2600 Vilnius, Lithuania.

July 4-9 (Seoul, Korea) **Fifth International Fuzzy Systems Association World Congress**
Contact Congress Secretary, c/o K.C. Min, Dept. of Mathematics, Yonsei University, Seoul 120-749, Korea.

July 4-10 (Oberwolfach, Germany) **Freie Randwertprobleme**
Contact MFOG: see (1) below.

July 5-9 (Wollongong, New South Wales) **37th Annual Meeting of the Australian Mathematical Society**
Contact Associate Professor M. W. Bunder, Department of Mathematics, University of Wollongong, NSW 2500, Australia.

July 6-9 (Amsterdam) **European Multigrid Conference '93**
Contact EMG '93, c/o CWI, Simone van der Wolff, P.O. Box 4079, 1009 AB Amsterdam, The Netherlands.

July 11-17 (Oberwolfach, Germany) **Nonlinear Evolution Equations, Solutions and the Inverse Scattering Transform**
Contact MFOG: see (1) below.

July 12-16 (Adelaide) **19th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing**
Contact Dr C. M. O'Keefe, Dept. of Pure Mathematics, University of Adelaide, GPO Box 498, Adelaide, SA 5001, Australia.

July 12-16 (Geelong, Victoria) **CHAOTIC NUMERICS: An International Workshop on the Approximation and Computation of Complicated Dynamical Behaviour**
Contact Professor P. E. Kloeden, Department of Computing and Mathematics, Deakin University, Geelong, Victoria 3217, Australia.

July 12-16 (Edinburgh) **Workshop on Algebraic Graph Theory**
Contact Dr. P Rowlinson, Department of Mathematics and Statistics, University of Stirling, FK9 4LA, Scotland.

July 12-23 (Berkeley, California) **Conference on Universal Algebra and Category Theory**
Contact MSRI: see (2) below.

July 18-24 (Keszthely, Hungary) **Combinatorics Colloquium**
Contact The Bolyai Mathematical Society, Budapest, Fo u. 68 II. 224, H-1027, Hungary.

July 18-24 (Oberwolfach, Germany) **Dynamische Systeme**
Contact MFOG: see (1) below.

July 21-25 (Amsterdam) **Twenty-second Conference on Stochastic Processes and their Applications**
Contact SPA '93, c/o CWI, P.O. Box 4079, NL-1009 AB Amsterdam, The Netherlands.

July 25-31 (Oberwolfach, Germany) **Geometric Methods in Theoretical and Computational Mechanics**
Contact MFOG: see (1) below.

July 26-30 (Edinburgh) **Workshop on Randomness and Computation**
Contact "Randomness and Computation", Department of Computer Science, University of Edinburgh, James Clerk Maxwell Building, The King's Buildings, Edinburgh EH9 3J2, Scotland.

August (Colchester, England) **Semigroups of Transformations**
Contact Dr. Peter M. Higgins, Department of Mathematics, University of Essex, Wivenhoe Park, Colchester C04 3SQ, England.

August 1-7 (Oberwolfach, Germany) **Abelsche Gruppen**
Contact MFOG: see (1) below.

August 1-14 (Galway, Ireland) **Groups 93 Galway/St Andrews**
Contact James Ward, Department of Mathematics, University College, Galway, Ireland.

August 2-6 (München, Germany) **Second Gauss Symposium**
Contact Rudolf Fritsch, Mathematisches Institut, Universität München, Theresienstrasse 39, W-8000 München 2, Germany.

August 2-13 (Athens, Georgia) **Georgia International Topology Conference**
Contact W. Kazez, Mathematics Department, University of Georgia, Athens, Georgia 30602, U.S.A.

August 4-6 (San Francisco, California) **SIAM Conference on Simulation and Computational Probability**
Contact SIAM: see (6) below.

August 7-21 (York, England) **Monoids and their Applications**
Contact Dr John Fountain, Department of Mathematics, University of York, Heslington, York YO1 5DD, England.

August 8-14 (Oberwolfach, Germany) **Konstruktive Approximationstheorie**
Contact MFOG: see (1) below.

August 9-13 (Szeged, Hungary) **Analysis Colloqium**
Contact The Bolyai Mathematical Society, Budapest, Fo u. 68 II. 224, H-1027, Hungary.

August 13-17 (Plovdiv, Bulgaria) **Second International Colloquium on Numerical Analysis**
Contact Ass. S. Zlatev, Mathematical Faculty of the Plovdiv University, Tsar Assen Str. 24, Plovdiv 4000, Bulgaria.

August 15-21 (Oberwolfach, Germany) **Noncommutative Algebra and Representation Theory**
Contact MFOG: see (1) below.

August 16-19 (Seattle, Washington) **Third SIAM Conference on Linear Algebra in Signals, Systems and Control**
Contact SIAM: see (6) below.

August 17-20 (Innsbruck, Austria) **International Symposium on Statistics with Non-Precise Data**
Contact Professor R. Viertl, Institut f. Statistik u. Wahrscheinlichkeitstheorie, Technische Universität Wien, A-1040 Wien, Austria.

August 17-20 (Dublin) **The Mathematical Heritage of Sir William Rowan Hamilton**
Contact B. Goldsmith, Department of Mathematics, Statistics and Computer Science, Dublin Institute of Technology, Kevin Street, Dublin 8, Ireland.

August 18-22 (Plovdiv, Bulgaria) **Fourth International Colloquium on Differential Equations**
Contact Ass. S. Slatev, Mathematical Faculty of the Plovdiv University, Tsar Assen Str. 24, Plovdiv 4000, Bulgaria.

August 22-27 (Lillafured, Hungary) **Topology Colloquium**
Contact The Bolyai Mathematical Society, Budapest, Fo u. 68 II. 224, H-1027, Hungary.

August 22-28 (Oberwolfach, Germany) **Special Complex Varieties**
Contact MFOG: see (1) below.

August 22-29 (Zaragoza, Spain) **Twenty-ninth International Congress of History of Science**
Contact XXIX International Congress of History of Science, Faculdad de Ciencias (Matematicas), Ciudad Universitania, 50009 Zaragoza, Spain.

August 23-27 (Szeged, Hungary) **16th Algebraic Conference: Lattices, Ordered Sets and Universal Algebra**
Contact Gabor Czedli, JATE Bolyai Institute, Szeged, Aradi vertanuk terc 1., H-6720, Hungary.

August 23-28 (Krasnoyarsk, Russia) **International Conference on Algebra Dedicated to the Memory of M. I. Kargapolov**
Contact Organising Committee of the International Conference on Algebra, Institute of Mathematics, Novosibirsk, 630090, Russia.

August 25 - September 3 (Firenze, Italy) **49th Biennial Session of the International Statistical Institute**
Contact ISI Permanent Office, 428 Prinses Beatrixloan, P.O. Box 950, 2270 AZ Voorburg, Netherlands.

August 29-September 4 (Oberwolfach, Germany) **Random Graphs and Combinatorial Structures**
Contact MFOG: see (1) below.

September 5-11 (Oberwolfach, Germany) **Novikov Conjectures, Index Theorems and Rigidity**
Contact MFOG: see (1) below.

September 5-12 (Varna, Bulgaria) **First World Conference on Branching Processes**
Contact N. M. Yanev, Dept. of Probability and Statistics, Institute of Mathematics, Bulgarian Academy of Sciences, 8 G. Bontchev str., Sofia 1113, Bulgaria.

September 12-18 (Oberwolfach, Germany) **Topologie**
Contact MFOG: see (1) below.

September 13-18 (Warsaw) **Different Aspects of Differentiability**
Contact Conference D-A-D, Institute of Mathematics, Polish Academy of Sciences, Katowice Branch, Staromiejska 8/6, 40-013 Katowice, Poland.

September 19-25 (Oberwolfach, Germany) **Mathematical Game Theory**
Contact MFOG: see (1) below.

September 20-22 (Leeds) **Complex Stochastic Systems and Engineering**
Contact IMA: see (7) below.

September 26-October 2 (Oberwolfach, Germany) **Diophantische Approximationen**
Contact MFOG: see (1) below.

October 17-23 (Oberwolfach, Germany) **Geometrie**
Contact MFOG: see (1) below.

October 25-29 (Seattle, Washington) **Third SIAM Conference on Geometric Design**
Contact SIAM: see (6) below.

October 31-November 6 (Oberwolfach, Germany) **Algorithmische Methoden der Diskreten Mathematik**
Contact MFOG: see (1) below.

November 21-27 (Oberwolfach, Germany) **Mathematische Modelle in der Biologie**
Contact MFOG: see (1) below.

November 28-December 4 (Oberwolfach, Germany) **Nonlinear Equations in Many-Particle Systems**
Contact MFOG: see (1) below.

December 6-10 (Perth, Western Australia) **International Congress on Modelling and Simulation**
Contact Michael McAleer, Department of Economics, University of Western Australia, Nedlands, WA 6009, Australia.

December 13-17 (Raleigh, North Carolina) **International Cornelius Lanczos Centenary Conference**
Contact Robert J. Plemmons, Department of Mathematics and Computer Science, Box 7388, Wake Forest University, Winston-Salem, North Carolina 27109, U.S.A.

** **1994** **

January 1-7 (Calcutta) **International Symposium on Mathematical Physics with Special Sessions on Bose's Works**
Contact Professor B. N. Mandal, S. N. Bose School of Mathematics and Mathematical Sciences, Calcutta Mathematical Society, AE-374, Sector 1, Salt Lake City, Calcutta - 700 064, India.

April 24-26 (Manhattan, Kansas) **Conference on Applied Statistics in Agriculture**
Contact James R. Schwenke, Kansas State University, Department of Statistics, Dickens Hall, Manhattan, Kansas 66506-0802, U.S.A.

June 13-17 (Stony Brook, New York) **5th International Conference on Hyperbolic Problems Theory, Numerical Methods and Applications**
Contact T. Mills, Dept. of Applied Mathematics, University at Stony Brook, Stony Brook, New York 11794-3600, U.S.A.

July 4-8 (Armidale, New South Wales) **38th Annual Meeting of the Australian Mathematical Society**
Contact Dr C. Radford, Department of Mathematics, Statistics and Computing Science, University of New England, Armidale, NSW 2351, Australia.

August 1-5 (Chiba, Japan) **3rd World Congress on Computational Mechanics**
Contact T. Kawai, WCCM III Office, Dept. of Electrical Engineering, Science University of Tokyo, 1-3 Kagurazaka, Shijukuku, Tokyo 162, Japan.

August 3-11 (Zürich, Switzerland) **The International Congress of Mathematicians 1994**
Contact R. Jeltsch, Seminar für Angewandte Mathematik, ETH, CH-8092 Zürich, Switzerland.

** 1995 **

(Italy) **Second International Conference on Numerical Methods for Volterra and Delay Equations (A conference to celebrate the 100th anniversary of Volterra's birth.)**
Contact A. Feldstein, Dept. of Math., Arizona State University, Tempe, Arizona 85287, U.S.A.

April 23-25 (Manhattan, Kansas) **Conference on Applied Statistics in Agriculture**
Contact James R. Schwenke, Kansas State University, Department of Statistics, Dickens Hall, Manhattan, Kansas 66506-0802, U.S.A.

** 1996 **

April 28-30 (Manhattan, Kansas) **Conference on Applied Statistics in Agriculture**
Contact James R. Schwenke, Kansas State University, Department of Statistics, Dickens Hall, Manhattan, Kansas 66506-0802, U.S.A.

Special Contact Addresses:

(1) **MFOG:** Mathematisches Forschungsinstitut Oberwolfach Geschäftstelle, Alberstrasse 24, D-7800 Freiburg in Breisgau, Germany.

(2) **MSRI:** I. Kaplansky, Director, MSRI, 1000 Centennial Drive, Berkeley, California 94720, U.S.A.

(3) **IMA:** Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church Street S.E., Minneapolis, Minnesota 55455, U.S.A.

(4) **RIMS:** Research Institute for Mathematical Sciences, Kyoto University, Kitashirakawa, Sakyo-ku, Kyoto 606, Japan.

(5) **ICTP:** International Centre for Theoretical Physics, P.O. Box 586, 34100 Trieste, Italy.

(6) **SIAM:** SIAM Conference Coordinator, 3600 University City Science Center, Philadelphia, Pennsylvania 19104-2688, U.S.A.

(7) **IMA:** Miss Pamela Irving, Conference Officer, The Institute of Mathematics and its Applications, 16 Nelson Street, Southend-on-Sea, Essex SS1 1EF, England.

(8) **CIRM:** A. Zeller-Meier, CIRM, Luminy, Case 916, F-13288 Marseille, Cedex 9, France.

(9) **CRM:** S. Chenevert, Centre de Recherches Mathématiques, Université de Montréal, CP 6128-A, Montréal, Quebec H3C 3J7, Canada.

(10) **FIRMS:** E. Reidt, The Fields Institute for Research in Mathematical Sciences, 185 Columbia St. West, Waterloo, Ontario N2L 5Z5, Canada.

M.R. Carter

MEMBERS OF NZMS AT 11/92

O = Ordinary, R = Reciprocal, S = Student, F = Free one-year, FS = Free student one-year, L = Life, H = Honorary

Mr D P Alcorn	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr R Aldred	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr Jianbei An	F	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Ms J A Anderson	O	57 Bedford Street, Wilton, Wellington 5
Prof G D Anderson	R	Dept of Mathematics, Michigan State University, East Lansing, Michigan 48824, U.S.A.
Prof G Andrews	R	Dept of Math McAllister Bldg, Penn State Univ, Univ Park Pennsylvania 16802, U.S.A.
Prof J H Ansell	O	Institute of Geophysics, Victoria University, P.O. Box 600, Wellington
Mrs G Anthony	S	73 Waterloo Crescent, Palmerston North
Mr G C Arnold	O	Dept of Statistics, Massey University, Private Bag 11-222, Palmerston North
Dr C J Atkin	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Dr Colin Bailey	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
David Baird	FS	M A F, P.O. Box 24, Lincoln
Dr R D Ball	O	Biometrics, Hort. & Food Research Inst., Private Bag, Auckland
Dr R K Beatson	O	Dept of Mathematics, University of Canterbury, Christchurch
Mark Billinghurst	S	245 Frankley Road, New Plymouth
Dr C Paul Bonnington	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr E W Bowen	R	200 Erskine Street, Armidale, NSW 2350, Australia
Dr D R Breach	O	Dept of Mathematics, University of Canterbury, Christchurch
Prof D S Bridges	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Dr K A Broughan	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Mr R L Broughton	O	Dept of Mathematics, University of Canterbury, Christchurch
Dr Constance Brown	F	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Ms Marian E Bruns	O	94 Sandringham Road, Mt Albert, Auckland 3
Dr P J Bryant	O	Dept of Mathematics, University of Canterbury, Christchurch
Dr H-Q Bui	O	Dept of Mathematics, University of Canterbury, Christchurch
Dr David Bullivant	O	Dept Engineering Science, University of Auckland, Private Bag 92019, Auckland
John Burnell	O	15 Flers St, Karori, Wellington 5
Prof J C Butcher	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr S J Byrne	O	Dept Engineering Science, University of Auckland, Private Bag 92019, Auckland
Mr M Byrne	S	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Dr B Calvert	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Mr B K Campbell	O	P.O. Box 17-402, Wellington
Prof J T Campbell	H	579 Rocks Road, Nelson
Dr M R Carter	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Dr Robert Chan	F	Tamaki Campus, University of Auckland, Private Bag 92019, Auckland
Dr C P Chang	L	18 Lilford Pl, Bucklands Beach, Auckland
Michael Charleston	S	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
G H L Cheang	S	Dept of Statistics, Yale University, Box 2179, Yale Station, New Haven, CT 06520, U.S.A.
Dr D B Christianson	R	Computer Science Division, Hatfield Polytechnic, College Lane Hatfield Herts, AL10 9AB England
Dr J Clark	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Megan J Clark	O	Inst of Stats & Oper Research, Victoria University, P.O. Box 600, Wellington
Austina Clark	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Prof I F Collins	O	Dept Engineering Science, University of Auckland, Private Bag 92019, Auckland
Assoc Prof M D E Conder	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dale D Copeland	S	Punibo Retreat, RD 37, Okato
N R Cox	O	Pastoral Agric Research Inst, Ruakura Research Centre, Private Bag 3132, Hamilton
Dr John Curran	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr Peter Danaher	F	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Prof W Davidson	H	80 West Close, Fernhurst Nr Haslemere, West Sussex GU27 3JT, England
Mr R B Davies	O	16 Gloucester Street, Wellington
Dr G D Dixit	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
G J Dobson	O	Open Polytechnic of New Zealand, P.O. Box 30-335, Lower Hutt
Mr M J Doherty	O	Dept of Statistics, P.O. Box 2922, Wellington
Dr Peter Donelan	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Dr R G Downey	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Gary R Dunnet	O	T/F 39 Brougham St, Mt Victoria, Wellington
Mr Shane Dye	FS	37 Amberley Avenue, Palmerston North
H P Edwards	O	Dept of Statistics, Massey University, Private Bag 11-222, Palmerston North
Dr R L Enlow	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
J C Falkner	O	Dept Combinatorics & Optimisation, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1

Mary D Fama	O	41 Yarawa St, Kenmore, Queensland 4069, Australia
Dr Simon Fitzpatrick	O	Dept of Mathematics, University of Melbourne, Parkville, Victoria, Australia
Ms Sharleen D Forbes	O	R D 1, Featherston
Dr Colin Fox	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Mr A G French	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Peter Frizzell	S	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
F C Gair	O	Dept of Mathematics, University of Canterbury, Christchurch
Dr S Ganesalingam	O	Dept of Statistics, Massey University, Private Bag 11-222, Palmerston North
Prof J Gani	R	Statistics Research Section, School of Mathematical Sciences, ANU, GPO Box 4, Canberra, A.C.T. 2601 Australia
Mr R A Garden	O	Research & Stats Div, Ministry of Education, P.O. Box 1666, Wellington
Prof D B Gauld	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr John W Giffin	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Ms L L Gilmore	O	Tamaki Campus, University of Auckland, Private Bag 92019, Auckland
Dr Stephen P Glasby	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Prof R I Goldblatt	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Mr A J Gomez	O	Nuclear Sciences Group, Industrial Research Ltd, P.O. Box 31-312, Gracefield, Lower Hutt
Mr A G Gray	O	Mathematical Statistics Branch, Dept of Statistics, P.O. Box 2922, Wellington
Ms Sina Greenwood	S	24 Seaside Avenue, Waterview, Auckland 7
Mr J Ha	O	Division of Maths and Stats, CSIRO Private Bag 10, Clayton Vic 3168, Australia
Dr P R Hafner	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr W D Halford	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Mr A Hall	O	DSIR Fruit and Trees, DSIR, Private Bag, Palmerston North
Dr J Hannah	O	Dept of Mathematics, University of Canterbury, Christchurch
Dr J F Harper	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Dr J A Harraway	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr J H Harris	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Mr D C Harvie	O	Inst of Stats & Oper Research, Victoria University, P.O. Box 600, Wellington
Head of Dept	O	Mathematics Dept, Parkway College, Wainuiomata
Gareth Hegarty	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr Harold V Henderson	O	Pastoral Agric Research Inst, Ruakura Research Centre, Private Bag 3132, Hamilton
Brent Henderson	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Assoc Prof M D Hendy	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Dr M S Hickman	O	Dept of Mathematics, University of Canterbury, Christchurch
Prof D A Holton	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
B S Jacobsen	S	86 Manuka Road, Glenfield, Auckland 10
Nicola Jayne	S	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Chen Jian	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr Stephen Joe	F	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Prof Vaughan F R Jones	H	Dept of Mathematics, University of California, Berkeley CA 9472, U.S.A.
Brian Jordan	O	Open Polytechnic of New Zealand, Private Bag, Lower Hutt
Dr M A Jorgensen	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Prof D Joyce	O	c/- Huia Post Office, Auckland 7
Prof J A Kalman	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr E G Kalnins	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Dr Grant Keady	R	Dept of Mathematics, University of Western Australia, Nedlands WA 6009, Australia
Daniel Kelly	S	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Mr A P Kelly	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Dr Vivien Kirk	F	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Assoc Prof G H Knight	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Mr J P Koolaard	S	Dept of Statistics, Massey University, Private Bag 11-222, Palmerston North
Dr F R Lad	O	Dept of Mathematics, University of Canterbury, Christchurch
Dr P Laird	R	Dept of Mathematics, University of Wollongong, Wollongong NSW 2500, Australia
Prof Lee Peng Yee	R	Dept of Maths, National University of Singapore, Singapore,
Dr R Jonathan Lermit	O	Electricorp, P.O. Box 930, Wellington
Dr Henry Levy	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr G F Liddell	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr C H C Little	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Mr R S Long	O	Dept of Mathematics, University of Canterbury, Christchurch
Prof P J Lorimer	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dingjun Lou	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Mr A I MacFarlane	O	6 / 151 Ladies Mile, Ellerslie, Auckland 6
Mr J H Maindonald	O	AMD Biometrics, Hort. & Food Research Inst, Private Bag, Auckland
Dr W G Malcolm	O	Vice Chancellor, University of Waikato, Private Bag 3105, Hamilton
Prof Gaven Martin	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
G B McBride	O	Water Quality Centre, P.O. Box 11-115, Hillcrest, Hamilton
Dr D J McCaughan	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Peter N McGavin	O	86 Totara Cres, Lower Hutt
Dr Mark McGuinness	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington

Dr A W McInnes	O	Dept of Mathematics, University of Canterbury, Christchurch
Dr Robert McKibbin	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Dr A McNabb	O	29 Cavendish Crescent, Awapuni, Palmerston North
Ms J L McWhirter	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Patricia Metcalf	S	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Michael Meylan	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Prof S A Morris	O	Dean, Faculty of Informatics, Univ of Wollongong, Wollongong NSW 2500, Australia
Dr M J Morton	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Prof Mila Mrsevic	O	Faculty of Mathematics, University of Belgrade, Belgrade, Yugoslavia
Prof B H Neumann	H	School of Math Sciences, ANU GPO Box 4, Canberra ACT 2601, Australia
Assoc Prof D A Nield	O	Dept Engineering Science, University of Auckland, Private Bag 92019, Auckland
Dr F M Nolan	O	Maths Stats Section, Dept of Statistics, Private Bag, Christchurch
M A Nyman	R	Dept Math & Comp Sci., Alma College, Alma Michigan, U.S.A 48801
Dr A J O'Connor	O	School of Science, Griffith University, Nathan Queensland 4111, Australia
Des O'Dea	O	21 Karepa Street, Wellington
Dr Kevin C O'Meara	O	Dept of Mathematics, University of Canterbury, Christchurch
Assoc Prof M J O'Sullivan	O	Dept Engineering Science, University of Auckland, Private Bag 92019, Auckland
Dr G Olive	H	c/- Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr A Parshotam	S	Landcare, Upper Hutt
Dr Michael Paulin	O	Dept of Zoology, University of Otago, P.O. Box 56, Dunedin
Dr Vladimir G Pestov	F	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Prof G M Petersen	H	2 Bannister Street, Christchurch 5
Dr Andy Philpott	O	Dept Engineering Science, University of Auckland, Private Bag 92019, Auckland
Dr K E Pledger	O	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Mrs S A Pledger	O	Inst of Stats & Oper Research, Victoria University, P.O. Box 600, Wellington
Graham Price	FS	Computing Services Centre, University of Otago, P.O. Box 56, Dunedin
Dr Andrew Pullan	O	Dept Engineering Science, University of Auckland, Private Bag 92019, Auckland
Ms H J Rae	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Glen Rayner	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr Charles Rees	R	Dept of Mathematics, University of New Orleans, New Orleans Louisiana, U.S.A. 70148
Assoc Prof I L Reilly	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr P F Renaud	O	Dept of Mathematics, University of Canterbury, Christchurch
D A Rhoades	O	Industrial Research Ltd, P.O. Box 31-310, Lower Hutt
Dr I Rinsma-Melchert	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Dr M G Roberts	O	Wallaceville Animal Research Centre, Private Bag, Upper Hutt
H S Roberts	H	54 Balfour St, Vogeltown, Wellington 2
Dr D F Robinson	O	Dept of Mathematics, University of Canterbury, Christchurch
Dr D L Roper	O	54 King Street, Penrith, NSW 2750, Australia
Assoc Prof M S Rosser	O	447 Hillsborough Rd, Mt Roskill, Auckland
Dr K G Russell	O	Dept Mathematics, University of Wollongong, P.O. Box 1144 Wollongong, NSW 2500 Australia
Prof D M Ryan	O	Dept Engineering Science, University of Auckland, Private Bag 92019, Auckland
Prof D B Sawyer	H	131 Tenby Street, Wanaka
Dr J L Schiff	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr M Schroder	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Mr C P Scott	S	13 King Crescent, Porirua, Wellington
Prof A J Scott	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Prof G A F Seber	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Prof C M Segedin	H	16A Landscape Rd, Mt Eden, Auckland
Dr Seung-Jin Bang	R	1033-33 Doksan Dong, Guro Gu, Seoul 152-012, Korea
Dr John Shanks	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr R K Sharma	R	Dept of Maths, Indian Inst of Technology, Kharagpur, West Bengal, 721302 India
Fay Sharples	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Deidre Shea	O	26 Volcanic Street, Mt Eden, Auckland 4
Siew Choo Soo	S	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Marie Sleeman	S	20 South Street, Palmerston North
P N Smale	S	46 Montague Street, N.E.V., Dunedin
Dr D J Smith	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Mr Cecil Smith	S	26 Marua Road, Ellerslie, Auckland 1105
Dr A D Sneyd	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Dr Wiremu Solomon	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Niels Somerville	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Mr Soon Kian Ngee	O	1A Pine Grove #16-03, Singapore 2159
Dr Hamish G Spencer	O	Dept of Zoology, University of Otago, P.O. Box 56, Dunedin
Prof V A Squire	O	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr M A Steel	O	c/- FC & DC Steel, 28 Memorial Avenue, Fendalton, Christchurch
Mr B R Stokes	O	13A Tomin Road, Glenview, Hamilton
Joachim Suck	O	Rahmstr 140, D 4300 Essen 12, Germany
Mr A Swift	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North

Dr Stephen W Taylor	O	Dept of Mathematical Sciences, Montana State University, Bozeman, MT 59717-0240, U.S.A.
Mr Garry J Tee	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr K L Teo	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Dr Gillian M Thornley	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Dr Ting On To	O	58 Creyke Road, Christchurch 4
Dr Chris Triggs	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr J C Turner	O	Dept of Maths & Stats, University of Waikato, Private Bag 3105, Hamilton
Dr R W Urwin	O	11800 SW 104 Avenue, Miami, Florida 33176, U.S.A.
A-Prof M K Vamanamurthy	O	Dept of Maths & Stats, University of Auckland, Private Bag 92019, Auckland
Dr Bruce van Brunt	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Prof D Vere-Jones	O	Inst of Stats & Oper Research, Victoria University, P.O. Box 600, Wellington
Mrs M Vlieg	S	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Dr Jose Felipe Voloch	R	Dept of Mathematics, University of Texas at Austin, Austin, TX 78712, U.S.A.
Prof G C Wake	O	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
D J N Wall	O	Dept of Mathematics, University of Canterbury, Christchurch
David Wallace	F	Dept of Mathematics, Victoria University, P.O. Box 600, Wellington
Dong Qian Wang	F	Dept of Statistics, Massey University, Private Bag 11-222, Palmerston North
Roy Ward	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Paul Watson	S	20 Maxine Place, Tauranga
Dr Neil A Watson	O	Dept of Mathematics, University of Canterbury, Christchurch
Stephen B Watt	O	P.O. Box 1977, Palmerston North
Dr P C Waylen	O	Dept of Mathematics, University of Canterbury, Christchurch
Raymond Webster	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Dr Graham Weir	O	Industrial Research Ltd, P.O. Box 31-310, Lower Hutt
Prof John A Wenzel	R	Dept of Maths & Stats, Albion College, Albion, Michigan 49224, U.S.A.
Dr C S Withers	O	Industrial Research Ltd, P.O. Box 31-310, Lower Hutt
Dr Graham Wood	O	Dept of Mathematics, University of Canterbury, Christchurch
Prof B A Woods	O	Dept of Mathematics, University of Canterbury, Christchurch
Simon Woodward	S	Dept of Mathematics, Massey University, Private Bag 11-222, Palmerston North
Craig Wright	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Xie Zhao	FS	Dept of Maths & Stats, University of Otago, P.O. Box 56, Dunedin
Prof A Zulauf	H	25 Hooker Avenue, Hamilton

Solution to Crossword No 37
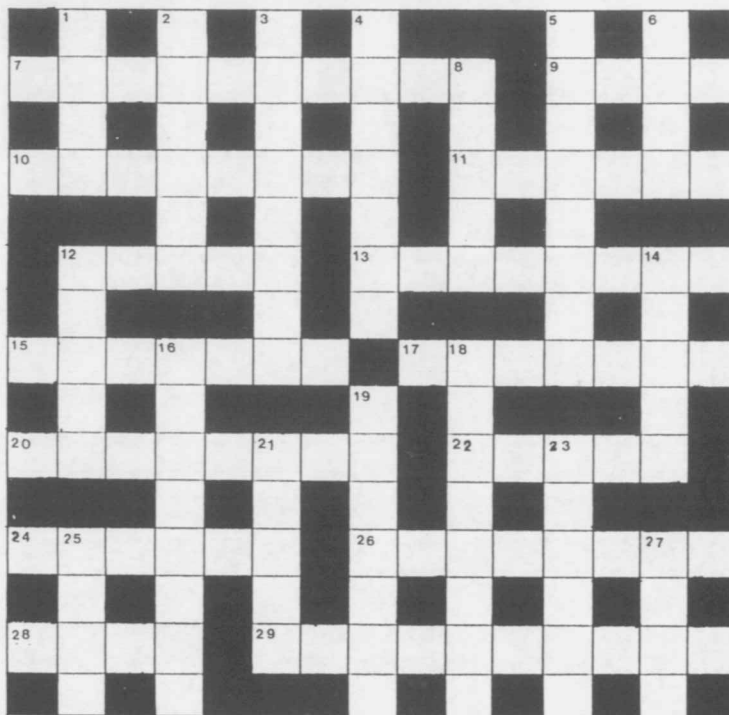
CROSSWORD

No 38   Many Named   by Matt Varnish

With one exception, the answers are all proper names linked together by a certian noun. Solvers should provide this noun.

Across

7. I was the chief BC (10)
9. He also had no beginnings (4)
10. I take story (a foot?) again (8)
11. Honour me and split 50/50 (6)
12. He goes about the last said pudding (5)
13. Joint-maker is all one wants (5-3)
15. I am the loner of the east (7)
17. Was I an ex-miner? (7)
20. I am beyond the familiar Prince of Wales (8)
22. I reversed French way about wrong article to sound the smoother (5)
24. Me Esau? No! (6)
26. I come from the foreign war (8)
28. I was an Eric (in the Moulmein Pagoda?) (4)
29. I had begun eager though confused (10)

Down

1. Came to the top (4)
2. Calmly noble but not royal (6)
3. The last devil's takings (8)
4. Dangers from Mad Hatters (7)
5. Hot in the tail-gated camion to the unknown place in France (8)
6. Implement for gambler's card that could come from his old socks (4)
8. No elf could be wrongdoer (5)
12. She thus begins with a bar in series (5)
14. A mere mixed-up leader (sounds like it!) (5)
16. To cut off lying without end in a brown way (8)
18. Met Green coming out (8)
19. One function in attempt is threefold production (7)
21. Good for cakes bad for planes (5)
23. The drift of Bruce's manner can be made up (3-3)
25. One of the first four did not complete a 28 (4)
27. Rocky knot (4)

A prize of $20 is offered for the first correct solution opened on March 1st, 1993. Solutions should be addressed to: CROSSWORD, Department of Mathematics, University of Canterbury, Private Bag 4800, CHRISTCHURCH, N.Z.

44