THE NEW ZEALAND
MATHEMATICAL SOCIETY (INC.)

NEWSLETTER

CONTENTS

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PUBLISHER'S NOTICE

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The New Zealand Mathematical Society,
C/- The Royal Society of New Zealand,
P O Box 598, Wellington, New Zealand.

However, correspondence should normally be sent directly to the Secretary:

Dr Margaret Morton,
Department of Mathematics,
University of Auckland, Private Bag 92019, Auckland, New Zealand.

NZMS COUNCIL AND OFFICERS

NEWSLETTER CORRESPONDENTS

EDITORIAL

LEST WE FORGET

In this issue you will see a section listing the Masters and Doctoral research students who graduated in our disciplines in New Zealand this year. I hope to make this a regular feature of the August issues in following years. I feel that it is important for a society such as ours to acknowledge the efforts of our own research students, not only to honour them, but also to increase the awareness of the research activities pursued at the different departments and to welcome these graduates into our midst. We hope many of them will become long standing members of our Society and help to maintain a healthy demographic balance. My colleague Dr Mike Carter reminded me of previous lists of research graduates that had been produced as supplements to this Newsletter, those up to 1977 with issue #10, up to 1979 with #18 and up to 1983 with #32. I hope that with the next 2 issues we can record the names of those who have graduated since 1983. I would urge you to check to identify any overlooked graduates so that we might maintain a complete record. Please submit your information to the editor in the format of those in this issue.

Accompanying this issue are inserts advertising professional publications I have judged as being of interest to the membership. The publisher's agents have not only met the additional costs associated with this addition, but are also assisting the Society with the costs of bringing an overseas speaker to New Zealand.

Finally I wish to record my apologies to readers for errors occurring in the previous issue, #60. You may wish to correct two errors in that issue. (They both appeared on the cover!) The date of issue #60 should have been April 1994, and the final four clues of the crossword were inadvertently omitted. (These clues are repeated with the solutions, inside the back cover of this issue.) I am sorry for any inconvenience these errors may have incurred. Personally I find the crossword sufficiently demanding even with all clues provided.

Mike Hendy
e-mail: m.hendy@massey.ac.nz

LOCAL NEWS

AgResearch

AgResearch statisticians held their annual meeting on April 6 at Ruakura, joined by statisticians from other CRIs, MAF and other organisations in the Waikato - about 30 people in all. The following day about 50 participants attended the Waikato Centre for Applied Statistics annual autumn workshop. The guest presenters were Ron Sandland, Chief of the Division of Mathematics and Statistics of CSIRO, and Alan Veevers, who heads a strong group of industrial statisticians in the Victorian section of the DMS. Their brief was to give an account of the current state and future prospects of industrial statistics in Australia. This they did with an interesting collection of DMS case studies augmented by sessions concentrating on strategic issues related to the practical and research challenges of industrial statistics.

Martin Upsdell presented papers at the Fifth Valencia International Meeting on Bayesian Statistics and the 2nd Annual Meeting of the International Society for Bayesian Analysis in June. Harold Henderson is part of the NZ contingent attending the 17th International Biometric Conference in Hamilton, Ontario, in August.

Simon Woodward reports: The Modelling group at Whatawhata Research Centre (near Hamilton) consists of David McCall, Tony Pleasants, Mike Rollo and myself. We are currently working on a number of problems important in agriculture, including pasture dynamics, fertiliser and soil chemistry, and animal growth and intake. These models form the basis for commercial "Decision Support Software" for farmers and farm consultants, which are being developed and marketed by AgResearch Software, also at Whatawhata. Our chief tools are dynamical systems methods and time series analysis. Data analysis and numerical methods are also very important to our work. A number of

joint projects bring in skills from other scientists and mathematicians within AgResearch, other CRIs, and the Universities, particularly Massey. We greatly appreciated the opportunity to attend the very stimulating Colloquium recently held in Hamilton. Simon Woodward presented a seminar at Whatawhata on April 27, exploring the dynamic between a modelling approach and experiment-based research, which was attended by around 20 scientists involved in agricultural science in the Hamilton region.

Ken Louie at Grasslands (Palmerston North) is modelling the spatial velocity field in the wool follicle, using a combined fluid mechanics and cell density conservation approach (treating the cell constituents as a viscous fluid). He would like to know of an easy-to-use PDE solver which will provide graphical output. (Quote: I've been put on to a package called Phoenics, but it looks like needing an inordinate amount of familiarisation.) Ken is also starting on a simple model for the effect of nutrition level on certain characteristics of the wool follicle (in conjunction with Ric Sherlock, a Ph.D student from Massey who's doing the experiments).

Ken Louie, Simon Woodward and Mick Roberts attended the colloquium at Waikato in May.

Mick Roberts

UNIVERSITY OF AUCKLAND

SCHOOL OF MATHEMATICAL & INFORMATION SCIENCES

Ivan Reilly, having been appointed as Director of the SMIS, has been promoted to a personal Chair in the Department of Mathematics, under the title "Professor of Mathematics and Mathematics Education". Deirdre Elliott is the new School Registrar.

A Combinatorics Conference, organized by members of the Departments of Computer Science and of Mathematics, is to be held here from December 5th to 9th.

DEPARTMENT OF COMPUTER SCIENCE

Cristian Calude has been promoted to a Personal Chair in Computer Science.

Bob Doran has been elected a Fellow of the New Zealand Computer Society.

Hans Guesgen has received a DrHabil from the University of Hamburg, on the basis of "a considerable volume of post-doctoral research".

Jennifer Lennon, a Senior Tutor in Computer Science, has been awarded a Distinguished Teaching Award, on the recommendation of the Science Faculty.

Seminars

Solomon Marcus (Bucharest University) "Strange sequences of positive integers: Why 1, 2 and 3 are malign cells in the body of positive integers"
Walter Hower (Universität at Koblenz-Landau) "Aspects of constraint processing"
Doru Stefănescu (Bucharest University) "Randomness and polynomial arithmetic"
Lina Khatib (Florida Institute of Technology) "Exploiting interval ordering for efficient temporal reasoning"
Robert A. Morris (Florida Institute of Technology) "A Domain-independent framework for recurrence"
Peter Fenwick "A new data structure for cumulative frequency tables"
Bob Uzgalis "Factotum, and the representation of facts"
Dr Brian Billard (Australian Defence Science and Technology Organisation) "Practical use of verification technology for critical systems"
Bruce Hutton "Automation of code generation"
Paul Burkimsher "Parallel computing for physics at CERN"
Todd Cochrane (Massey University) "Dimple (DIrect Manipulation Prototyping Language and Environment)"
Judy Mousley (Deakin University) "Multimedia and the observation and analysis of teaching"
Graham Birtwhistle (University of Calgary) "AMM - an asynchronous move machine"
Anthony Maeder (Queensland University of Technology) "Directions in image compression"
Amos Omondi (VUW) "Ideas for the design of multithreaded pipelines"
Xinfeng Ye "A distributed transaction management scheme for multidatabase systems"

DEPARTMENT OF MATHEMATICS

Ken Ashton and Peter Lorimer have both undergone major surgery, and are making good progress in convalescing.

Dr Sergei Fedorov, who accompanied Boris Pavlov here from St Petersburg as a post-doctoral Fellow, has been appointed as a Lecturer on a 3-year contract.

Gaven Martin was awarded the NZMS Research Award, at the 1994 Mathematics Colloquium held at the University of Waikato in May.

Vivien Kirk gave an Invited Address on "Dynamical systems and bifurcation theory" at the 1994 Colloquium. Members of the SMIS presented the following Contributed Talks at the 1994 Colloquium:

Jianbei An, "Multilinear forms and some groups of Lie type",
Paul Bonnington, "Noah's snarks",
Cristian Calude & Douglas Bridges (Waikato), "On recursive bounds for the exceptional values in speed-up",
John Butcher & Philippe Chartier, "Parallel general linear methods for stiff ODEs and DAEs".
John Butcher & Ying Mai, "Adapting ODE software for time-dependent PDEs",
Marston Conder & Brent Everitt, "Regular maps on non-orientable surfaces",
Sergei Fedorov, "The Hilbert Space viewpoint on the properties of Bloch functions of periodic Jacobian matrix",
David Gauld, "How to draw a nice Siefert surface",
Horst Gerlach, "On least Fermat, Euler and strong witnesses",
Paul Hafner, "On generalized Moore graphs",
David McIntyre, "The lattices of topologies and of preorders on a finite set",
Alastair McNaughton, "The fractional differentiation of a polynomial",
Boris Pavlov, "Splitting of acoustic resonances for pair of domains, joined by thin channel",
Arkadii Slinko, "Local finiteness of coalgebraic Lie algebras",
Steve Taylor, "Resonance poles of partial differential operators",
Garry Tee, "Eigenvectors of quasi-Toeplitz band matrices",
M. K. Vamanamurthy, "Quasiconformal distortion in the plane".

Marston Conder and Gaven Martin organized the conference/workshop on "Groups and Geometry", which was held here on May 16th to 20th. Invited and contributed talks were given by Jianbe An (Auckland), Emilio Bujalance (Madrid), Chun Chao (Michigan), Antonio Costa (Madrid), Brent Everitt (Auckland), Fred Gehring (Michigan), Don James (Pennsylvania State University), Gus Lehrer (Sydney), Murray Macbeath (St Andrews), Colin Maclachlan (Aberdeen), Tim Marshall (Auckland), Ernesto Martinez (Madrid), Walter Neumann (Melbourne), Mike Newman (Canberra), Gerhard Rosenberger (Dortmund), Hyam Rubinstein (Melbourne) and Steve Wilson (Arizona).

Ivan Reilly, Arkadii Slinko and Gordon Hookings spent the middle week of the May vacation at Rangiruru Girls' School in Christchurch, running the NZ Mathematical Olympiad training camp for 20 students.

A mathematical retreat, on the subject of Knots and starring Vaughan Jones, is to be held at Huia Camp, from December 10th to 20th.

Seminars

Numerous internal seminars and informal talks have been given by members of the Department of Mathematics, in algebra, analysis numerical analysis, topology etc. Seminars have been given by the following visitors:

Chaun Chao (University of Virginia), "Trace inequalities and chordal norms of Moebius transformations".
Burkhard Polster (Erlangen University), "Integration of 2-dimensional incidence geometries and interpolation of sets of functions".
Robert Gassler (University of Innsbruck), "Tangential vector fields and conormal differential forms".
Urban Cegrell (Umea University, Sweden), "The complex Monge-Ampere operator".
Doru Stefanescu (Bucharest University), "Newton polynomials and Puiseux expansions. Generalized power series".
Philippe Chartier (Rocquencourt, France), Seminar at Tamaki, "Runge-Kutta methods for index 2 Differential-Algebraic Equations".

Yongxing Gu, (Chongqing University), "Recent work in value distribution theory in China".
Glen Anderson (University of Michigan), "Quasiconformal transformations".
Kevin Mansfield (UNSW), "Generalised crossed products".

DEPARTMENT OF STATISTICS

Dr Brian Eastwood and Dr Vera Eastwood (from Acadia University in Nova Scotia) and Dr Lakhdar Aggoun (from the University of Alberta) are now Lecturers here. Dr Steve Butt (from Pennsylvania State University) is now a Lecturer in Mathematics & Statistics at the Tamaki Campus.

Garry Tee

UNIVERSITY OF CANTERBURY

MATHEMATICS AND STATISTICS DEPARTMENT

A feature of the second term this year has been the preparation for the departmental audit. The departmental submission exceeds 150 pages, and presents an interesting picture of its diverse activities. Fortunately for the rest of us Peter Renaud shouldered the lion's share of the work of preparing this document.

Planning for the new building continues. Currently the University has invited several architectural firms to submit designs. The urgent need for more room becomes more obvious each term, as the demand for tutorial, seminar, student, staff, visitor and computer laboratory space grows.

We are fortunate to have some more medium term visitors Professor Mitchell Taibleson of Washington University, St. Louis is here as an Erskine Visitor. Professor Ron Christensen from the University of New Mexico is also currently visiting for an extended period. Professor Arnold Zellner of the University of Chicago is visiting on an Erskine shared between ourselves and the department of Economics. A further Erskine visitor, Prof Will Light of the University of Leicester, will be arriving shortly.

John Hannah is currently away with the Mathematics Olympiad team in Hong Kong. Murray Smith has recently returned from a conference in Spain combined with an extended period of work at Purdue. Peter Renaud has just attended the Australian Mathematical Society meeting in Sydney. Burkhard Polster and Gunter Steinke recently presented talks to a Diffential and Topological Geometry conference at Oberwolfach.

Seminars

Dr Qui Bui, "Calderon Representation Theorem and Characterization of Function Spaces".
Prof. G.R. Chapman (Guelph), "Global Optimization and the Geometry of Chemical and Phase Equilibrium Problems".
Dr Angele Hamel (Waterloo and Canterbury), "Planar decompositions of tableaux and generalizations of the Jacobi-Trudi determinant".
Dr Burkhard Polster, "Integrating interpolating sets of functions and 2-dimensional incidence geometries".
Dr Thomas Forster (Cambridge), "Constructive set theory with a universal set".
Dr Peter Bryant, "Nonlinear standing waves".
Dr David Robinson, "Geometrical constructions with a two-edged ruler".
Dr Colin Maclachlan (Aberdeen), "Fibonacci numbers, groups, manifolds and generalisations"
"Arithmetic kleinian groups".
Dr Peter Waylen, "An overview of some solutions of Einstein's equations".
Prof Mitchell Taibelson (Washington U), "A Hardy space associated with the Green's operator for a random walk on a tree".
Also a series of talks on "Harmonic Analysis on trees".
Prof John Deely, "Optimal allocation in stratified sampling with partial information".
Dr Gunter Steinke, "Going from good to bad in mathematics".
Prof Richard Johnson (Univ of Wisconsin), "A Bayesian approach to monitoring the strength properties of lumber".
Dr Murray Smith, "Bayesian estimation of fuel economy potential due to technology improvements".
Prof Arnold Zellner (Chicago), "Bayesian method of moments and instrumental variable analysis".
Prof Curt Lindner (Auburn), "Every $n \times n$ latin square has at least one partial transversal".

Dr J.W. Dold (Bristol), "Inertial effects in a propagating density jump. The inversion of the 'tulip flames'".

Rick Beatson

MASSEY UNIVERSITY

DEPARTMENT OF MATHEMATICS

The big news is the establishment, on 3 June, of the new Faculty of Information and Mathematical Sciences, the updated version of the previous School of Mathematical and Information Sciences to which the Department of Mathematics belongs. For some, it has been a long hard road of lobbying and other work to reach the status of a Faculty, and the sense of satisfaction and anticipation of the opportunities our new position gives us has been well-earned. Our own Mike Hendy has been appointed as Acting Dean as from 1 July; he will hold this position until no later than May 1995, by which time a permanent Dean will have been appointed.

Mathematics teaching has been going on since the beginning of the year at the Albany campus, where Gordon Knight reports satisfactory results from experiments in semesterisation of our first-year courses; this will be upon us all at Palmerston North from next year.

New staff welcomed into the Department include Dr Robert McLachlan (see last Newsletter), and Dr Marijcke Vlieg, who has just returned to the Department as a lecturer. Post-doctoral fellow Dr Chikashi Miyazaki, from Nagamo National College of Technology in Japan, is working here for a year on algebraic geometry with Wolfgang Vogel.

Visiting scholars have included Dr Daniel Huson, from the University of Bielefeld, Germany, who visited during March to work with Mike Hendy and the molecular phylogenetics group. A former student of Andreas Dress who visited us a year ago, Daniel's major research interest is in geometry and he demonstrated his latest version of RepTile, a graphics program used to construct artistic tilings of surfaces. Dr Peng Feng, a visitor from the University of Agriculture in Malaysia, spent some time working with Kee Teo on chromatic polynomials. Mr Malcolm Hood, from the University of Western Australia, spent two months working with Graeme Wake on pde's in combustion. Malcolm is now completing his sabbatical in Oxford - where it is warmer.

Kee Teo attended a Conference on Chromatic Polynomial Theory held in Shanghai during April. At this first such conference ever held, all participants spoke Chinese, and Kee, as an invited speaker, also presented his paper in that language. A large contingent from the Department took part in the 1994 NZ Mathematics Colloquium at Waikato University. Wolfgang Vogel delivered the NZMS Lecture on "Systems of polynomials and Fermat's Last Theorem" while seven other talks were given by Massey mathematicians.

Graeme Wake has won a Senior Research Fulbright Award and will visit the United States three times as he builds up the required contribution of three months. The first visit, in early June, was to present a paper at the Claremont "International Conference on Applications of Differential Equations to Biology and to Industry". Alex McNabb also presented a paper at that conference, and stayed on to visit other West Coast cities. During July, Wolfgang Vogel visited Göttingen to continue his work on algebraic geometry before attending the ICM in Zürich in early August.

Congratulations to Mike Charleston and Peter Frizzell on earning their PhD's. We had a record crowd of 5 PhD students graduating at this year's ceremonies; joining Mike and Peter were Marijcke Vlieg, Simon Woodward and Mark Byrne.

Another successful Mathematical Physics seminar series, the third so far, has just concluded. A varied and interesting range of topics were presented in this cooperative venture with the Physics Department; some visitors also contributed to the seminar, which is aimed at both new postgraduates as well as staff working in the area of mathematical physics.

Seminars

Ms Rose Gong (IRL Ltd) "Modelling spontaneous combustion of wet lignite".

Dr Daniel Huson (University of Bielefeld) "Regular tilings of the plane".

Mr Nicholas Allsop (Massey) "Primary decompositions", "A combinatorial approach to length-multiplicity", "Set theoretic intersections of monomial ideals".
Prof. Wolfgang Vogel (Massey) "A new approach to Fermat's Last Theorem".
Dr Kee Teo (Massey) "Chromatic polynomials of graphs".
Dr Ian Noell (Production Technology, Massey) "An introduction to the H∞ control problem".
Dr Thomas Forster (University of Cambridge) "The Burali-Forti paradox".
Dr Chikashi Miyazaki (Massey) "Bounds on the Castelnuovo regularity".
Dr Robert McLachlan (Massey) "Symplectic integration of Hamiltonian differential equations".
Dr Colin MacLachlan (University of Aberdeen) "Fibonacci numbers, groups, manifolds and generalisations", "Symmetries of surfaces".
Mr Mike Charleston (Massey) "Landscapes of combinatorial optimisation problems with special reference to phylogeny".
Dr Golala A. Kadir (Massey) "The Steiner system S(5, 8, 24) constructed from dual affine planes".
Mr Chris Palliser (Massey) "A mathematical model of the forced cooling of anodes used in the aluminium industry".
Prof. Harold Bresinsky (University of Maine) "Macauley's definition of a perfect homogeneous ideal".
Y. T. Yeh (University of Auckland) "The existence of E-free objects in E-varieties of regular semigroups".
Dr Hong Wang (Massey) "On cycles in bipartite graphs".

Mathematical Physics

Prof. Paul Callaghan (Physics, Massey) "Use of eigenfunction expansions to solve magnetisation diffusion problems".
Prof. Richard Wilson (Harvard University) "B-mesons - experiment and theory".
Mr Malcolm Hood (University of Western Australia) "Heat, dust and combustion".
Dr Robert McKibbin (Massey) "Finite-amplitude water waves of permanent form".
Assoc. Prof. Rod Lambert (Physics, Massey) "The elastica: large displacement, small strain".
Dr Scott Whineray (Physics, Massey) "Chaotic and periodic motion in impact oscillations".
Mr Chris Reid (Physics, Massey) "Chaos in a 'double-well' oscillation".
Dr Tony Signal (Physics, Massey) "Green functions: a physicist's view".

Robert McKibbin

UNIVERSITY OF OTAGO

MATHEMATICS AND STATISTICS

We have just completed our first semester and the jury is still out on just how things went. The full impact will have to be judged after the second semester.

Apart from brief trips abroad for conferences and workshops (Derek Holton is currently in Bognor Regis at the Maths Centre at the West Sussex Institute for Higher Learning on his way to the Maths Olympiad in Hong Kong, Vernon Squire has just returned from Sabonlinna, Finland where he presented a series of lectures at an Advanced Summer School on the Physics of Ice-Covered Seas (only held once in a dozen years or so), John Clark has recently returned from a conference in Italy and others have been away for short spells in various places), there is no-one on extended leave from the department at the moment. This has caused some space problems as we have had a constant stream of visitors this year.

In March/April, Prof. Mike Plummer from Vanderbilt University, Nashville Tennessee, visited for six weeks to work with Derek Holton and Robert Aldred on Matching extensions in graphs.

In May, two further visitors from Vanderbilt arrived, Prof. Bob Hemminger and Dr. Mark Ellingham, to work with Robert Aldred on various graph theory projects. Mark returned at the end of June and Bob will remain until early August.

The department has also had three seminar series running this year year. As usual we have research seminars, enriched by the stream of visitors. In addition this year we are hosting a series of Mathematics Education seminars and we have introduced a series of talks specifically designed to be within reach of and of interest to the more senior honours students.

Seminars

Prof. John Selfridge, "The problem of the squares."
Prof. John Selfridge, "The least prime factor p of the binomial coefficient $\binom{n}{k}$"
Prof. John Selfridge, "A brief update of the no-3-in-line problem."
Prof. John Selfridge, "On the proof of Fermat's Last Theorem."
Dr. Colin Fox, "Solving inverse problems using inference."
Prof. Bryan Manly, "Old bones and artefacts: analysis of mortuary remains."
Prof. Mike Plummer, "Well-covered graphs."
Prof. Mike Plummer, "Matching extensions in graphs."
Dr. Laimonis Kavalieris, "Nonparametric smoothing using wavelets."
Mrs. Austina Clark, "Upper bound for a two-dimensional neighbour design."
Dr. Peter Fenton, "The Dunedin years of A.C. Aitken."
Prof. Derek Holton, "A survey of talented mathematics students."
Jenny Young Loveridge, "Recent research on the development of children's mathematical thinking."
Coralie Marshall, "Aspects of case studies of ten talented young mathematicians."
Gill Thomas, "Discussions and learning in junior maths."
Derek Holton and Tim Spicer, "Problem Solving."
Dr. David Baird, "Covariate designs - why randomize?"
Dr. Mark Ellingham, "Error-correcting codes."

Robert Aldred.

VICTORIA UNIVERSITY

INSTITUTE OF STATISTICS AND OPERATIONS RESEARCH

We are sad to report the tragic death of Dr Abel Ige who has been visiting ISOR from Ilorin, Nigeria for the last year. Abel had a skin complaint in Nigeria but it was only while he was in New Zealand that this was diagnosed as cancer. Despite the efforts of Wellington Hospital the disease spread rather rapidly towards the end and he died on the morning of April 11. Abel worked closely with Steve Haslett on various aspects of sample survey work and our thanks go to Steve and many others who helped Abel so much. He was universally liked throughout the department and we will miss him.

Since December we have had a steady stream of visitors. Phil Pollett came over briefly from Brisbane to work with Zheng Xiaogu and Mark Bebbington stopped by en-route to Massey to work with David Vere-Jones. Other short term visitors combining visits to ISOR with the IASPEI conference were Yoshi Ogata (Institute of Statistical Mathematics, Tokyo, Japan), Fabio Musmeci (Italian Private Consultant) and Zhura Molchan.

We were delighted to see Andrew Bruce and Deborah Donnell over from STATSCI for a month with their son Aaron. Andrew was working on a mixture of wavelets and FORST contracts when we weren't pestering him for his S-PLUS expertise. Mark Reimers from Memorial University, Newfoundland stayed for 3 months working on pattern formation by random processes. Mark became involved in many departmental activities and claimed to enjoy his stay despite being nearly knocked out in a staff student basketball match! This is the same infamous match which resulted in Alistair Gray having a plaster cast on his leg for 2 months and Peter Smith clutching his ribs for 2 weeks. Ma Li from The Centre for Analysis and Prediction, State Seismological Bureau, Beijing, China is visiting both ISOR and the Geophysics group for 6 months. She is working on earthquake prediction methodology for short term through to long range scenarios.

Also since December we have seen the return of Doug Harvie from Italy and Peter Thomson from FORST work in Washington. Thomas Mikosch visited ETH at Zurich and the ANU. Tony Vignaux is due to go to Oxford for sabbatical leave and Ross Renner is taking his leave in Wellington. Yu Hayakawa is planning a Bayesian summer at the 5th Valencia International Meeting on Bayesian Statistics, Alicante, Spain. Alistair Gray planned to go to Hawkes Bay but was forced back by a blown head gasket at Petone! The only staff change to report is that Thomas Mikosch is leaving for the University of Groningen, Holland in July. We will miss his sense of humour and optimism (?) as well as his stochastic differential equations and mathematical expertise. Good luck Thomas!

There have been some teaching alterations with Brian Dawkins overseeing a revamp of graduate courses and the introduction of some

core material. Undergraduate courses have also expanded and a new Masters degree has been developed in Financial Mathematics. Ross Renner and Megan Clark have also been heavily involved in the establishment of the Pacific Island Development Programme which aims to encourage Pacific Island students in the Mathematical Sciences.

Socially there have been several successes: the Otaki Forks tramp, the Orongorongo tramp, the Kapiti Island trips, the Northern Walkway and the hangi at David Vere-Jones' palatial bach at Otaki. For some reason however the social secretary (that's me) seems to be remembered more for organising the notorious basketball game.

Lastly but most importantly we should record the details of a famous cricketing victory against Statistics New Zealand which puts us 2:1 ahead in the series so far:

ISOR 133 for 7 (25 overs)
Statistics New Zealand 102 all out

Peter Smith

DEPARTMENT OF MATHEMATICS

OBITUARY

Prof. J.T. Campbell, OBE, died on 1 July 1994 in Nelson. Our sympathy goes out to Margaret, his wife. He was Professor of Mathematics at VUW 1952-1968, an Honorary Member of NZMS, and a Life Member of the Wellington Mathematical Association. He was the subject of the NZMS Newsletter Centrefold in No. 23, April 1982. As Wilf Malcolm (a former student and colleague) said there, "Mathematics requires those who are gifted and able to create its concepts and theorems and propagate them through the world-wide network of publications. Equally it requires those with Campbell's gifts to create mathematics as a living experience in the minds of those who seek from it understanding. Those many of us who have benefited from the exercise of that gift record our gratitude. One covets for all students of mathematics the experience of such a teacher." (See also the eulogy for Emeritus Professor Campbell on page 11)

OTHER VUW NEWS

Rob Goldblatt was an invited speaker at a workshop on logic at the University of Cape Town, South Africa, in July. In August he will be presenting a paper at the George Hughes memorial conference of the Australasian Association for Logic at Otago. (George Hughes was for many years Professor of Philosophy at VUW, and he founded the logic group in Philosophy and Mathematics here.)

Lindsay Johnston attended a workshop in wavelets at the National University of Singapore in July.

Vladimir Pestov is at the time of writing at the Australian Mathematical Society conference at the University of New England, giving a paper. No sooner will he return than Irene Pestov will go to the Engineering Mathematics conference in Melbourne to give a paper on her work.

Mike Stob has been visiting us again from Calvin College, USA, mainly to work with Rod Downey, but he also gave an intriguing seminar on first-year calculus reform. John Harper was elected to chair ANZIAM(NZ), the NZ branch of Australian and NZ Industrial and Applied Mathematics, for one year.

John Harper

UNIVERSITY OF WAIKATO

DEPARTMENT OF MATHEMATICS AND STATISTICS

This scribe having just returned from a sojourn in the north the news from Waikato will be appropriately compressed. Ernie Kalnins has also returned from travels mostly in Europe, as has Bill Bolstad. Murray Jorgensen left for Canada (McGill) a short time ago.

Douglas Bridges spent time in Queensland during the intra semester break (yes that's its name!), working on a book. Ian Urch has taken early retirement and finished at the end of the first semester, but will be here until September before going back to Australia. Mark Schroder has started a leave period and will soon be heading for Dijon, Mannheim and Kosice. Andy Begg is in Europe and the US attending conferences and meetings. Graeme Williams is teaching applied mathematics courses, at least until the end of the year. Lynne Hunt is teaching statistics courses.

Wilf Malcolm has been farewelled with a Research Fellowship in the School of Computing and Mathematical Sciences being created in his name.

The 1994 Mathematics Colloquium was held at Waikato in May, sponsors including the Department. The 3 day colloquium was followed by one day devoted to Mathematics Education. There were about 100 participants. The invited speakers and their topics are listed below.

Colloquium invited addresses

Mark Gould, "Quantum Groups".
Vivian Kirk, "Dynamical Systems and Bifurcation Theory".
Judith Mousley, "Building Students' understanding of Mathematics".
Ian Sloan, "Numerical Integration in High Dimensions - the Lattice Way".
Mitchel Taibleson, "Characterizations of Besov Spaces".
Wolfgang Vogel, "Systems of Polynomial Equations and Fermat's Last Theorem".

Seminars

Doru Stefanescu (Bucharest), "Newton polygons and irreducibility".
Roland Thomas (Carlton), "Discriminant functions and measures of variable importance".
Colin Maclachlan (Aberdeen), "Fibonacci numbers, groups, manifolds and generalizations".
Colin Maclachlan (Aberdeen), "Symmetries of surfaces".
Solomon Marcus (Bucharest), "Symmetry and antisymmetry in set theory, real analysis and formal languages".
Ben Goertzel (Waikato), "Genetic algorithms and nonlinear dynamics".

Kevin Broughan

Emeritus Professor James Towers Campbell OBE, PhD 1906-1994

(A recollection of his professional career by R M Williams. Delivered at his funeral, 6 July 1994.)

Jim Campbell arrived in Gisborne from Scotland, aged 6, in 1913. His father found work in his trade as a plumber, Jim enrolled at primary school. For most children in that area, schooling finished at primary school, but we can assume that his father, influenced by that Scottish belief in education which has played such an important part in New Zealand's history, ensured that Jim was one of the three, out of a standard six class of 30, who went to Gisborne High School.

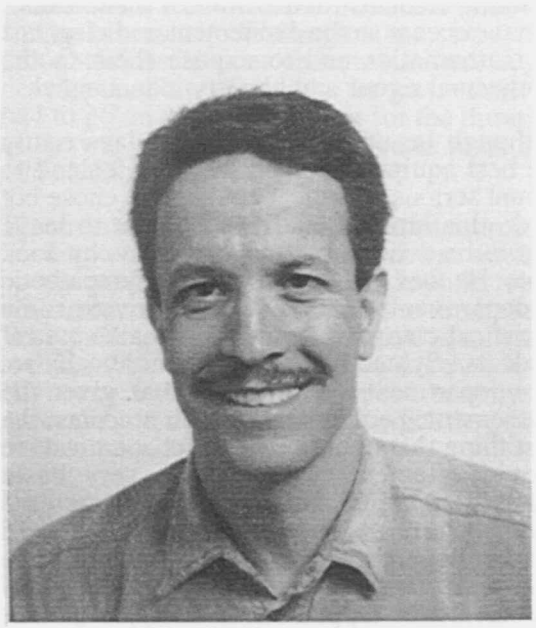
At high school Jim, who had found arithmetic dull and predictable discovered the exciting and mysterious world of algebra the beginning of a life long love affair. But other aspects of the mathematics class were less pleasing. The master divided the class into boys on the right, girls on the left. The girls were told to get on with their knitting, the boys were taught mathematics. This injustice was a lasting memory for him and throughout his life he vehemently challenged the idea that women could not do mathematics. It is no coincidence that an unusually high proportion of young women from his classes pursued successful careers in mathematics helped, no doubt by the quality of his teaching, but far more by his positive confidence in their ability.

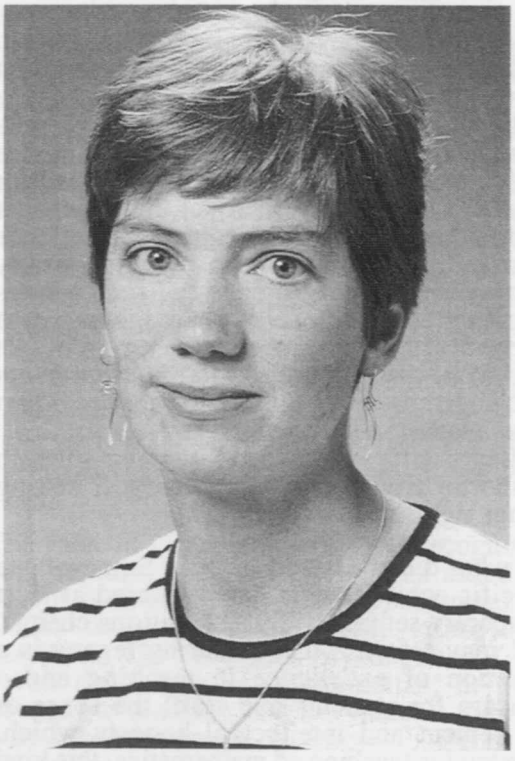
His concern for his students, men and women, manifested itself in a multitude of ways. David Vere-Jones relates how, in his final year, Campbell unexpectedly materialised by his side and suggested that he might slip into a room where they happened to be doing the preliminary selection for Rhodes Scholarships. He brushed aside David's protest that he was not an applicant - the paperwork could be dealt with later! As a result, David studied in Oxford, Moscow and Tashkent before returning to New Zealand and finally to a chair at Victoria. It was this practical regard for the welfare of his students and staff, that enabled Jim to run a department which was remarkable for its warmth and stability, at a time when staffing mathematics departments was a continuing difficulty.

But to return to his career. He won a scholarship to go to the University of Otago where he studied under Professor R J T Bell in Campbell's view, by far his best teacher. He obtained a first class honours degree and was awarded one of the few post-graduate scholarships for overseas study. On Bell's sound advice he rejected the well worn path to Cambridge and went to Edinburgh to do a PhD under the New Zealander, A C Aitken, also one of Bell's students. Two years later, in 1932, he completed and published his thesis on orthogonal polynomials in relation to correlated Poisson variables. David Vere-Jones tells us that many years later, when working on bivariate distribution which had then become fashionable, he chanced on this paper written long before its time. Jim, of course, had not mentioned it.

NEW COLLEAGUES

LAKHDAR AGGOUN has been appointed to a Lectureship in the Department of Statistics at the University of Auckland. He learned much about New Zealand when he was a Visiting Fellow at the Australian National University during the winter of 1993. He received his PhD in Applied Probability from the University of Alberta, Edmonton, Canada. His research interests include nonlinear filtering and control of partially observed stochastic processes.

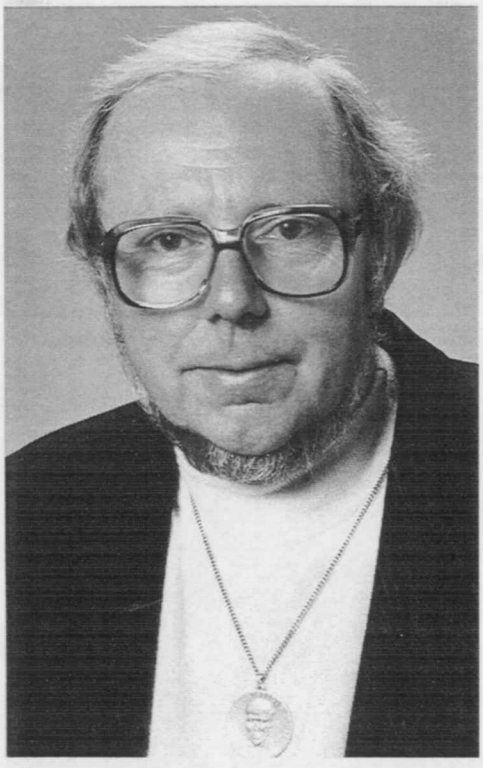




KARLA V. BALLMAN has recently taken up an appointment as a Lecturer in Statistics of the Science and Technology Division at the University of Auckland Tamaki campus.

Born in the United States, Karla has a B.A. degree in Mathematics and Economics from Macalester College (St Paul, Minnesota). She worked as an actuary at a life insurance company for two years before attending graduate school. She received a S.M. and a Ph.D. in Operations Research from MIT. Before coming to New Zealand, she was an Assistant Professor in the Mathematics and Computer Science department at Macalester College. Her research interests are in mathematical modelling, queueing networks and statistical education. She is currently working on an elementary statistics textbook.

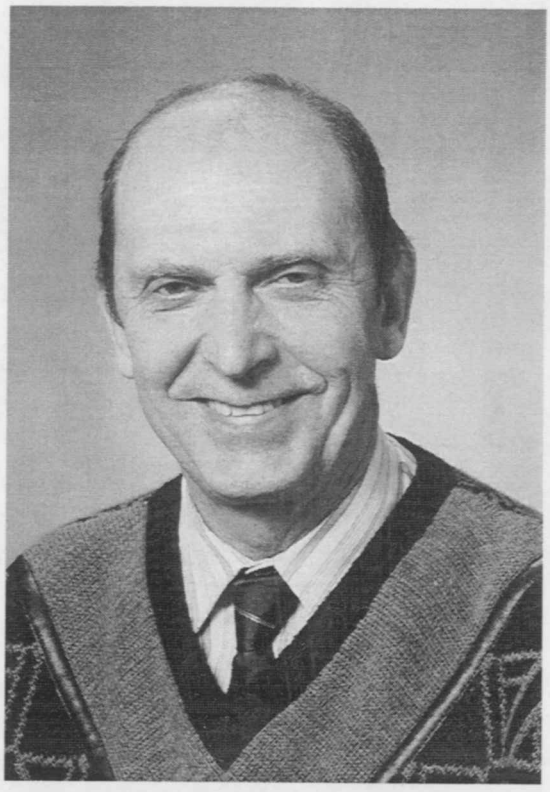
STEVE BUTT has been appointed to a lectureship in Mathematics and Statistics at the University of Auckland - Tamaki Campus. He received a BA degree in mathematics and chemistry from Earlham College, Indiana, and MS and PhD degrees in industrial engineering and operations research from Pennsylvania State University. His current research interests lie in the areas of facility location and vehicle routing. His most recent project involves optimally locating a set of new facilities in the presence of forbidden regions (lakes, forests, parks, etc.) and congested regions (business districts, hospital zones, etc.). The most obvious areas of application seem to be in the transportation industry, but it has been shown that there are also many other areas of study such as routing pipes on ships and designing circuit boards that can use these same optimization techniques.



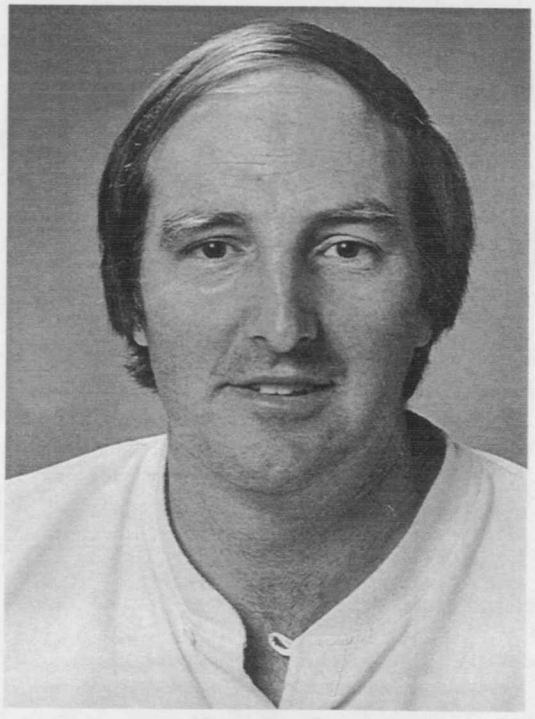
HERMANN MAURER took up a Chair in Computer Science at the University of Auckland at the beginning of 1993. He is an authority on "Hypermedia", an advance on multi-media which integrates text, images, graphics, sound and animation. He is the founding Director of the Hypermedia Unit in the Department of Computer Science.

Born at Vienna, Austria, Hermann gained his Ph.D. in Mathematics from the University of Vienna in 1965. He has been an Assistant and Associate Professor at the University of Calgary and Professor of Computer Science at the University of Karlsruhe, both for 5 years; and Professor of Computer Science and Head of the Research Institute at Graz University of Technology since 1977. He has been Visiting Professor at Dallas, Denver, Waterloo, Brasilia and Patras. He is author of 11 books and over 300 publications. His main interests are: computer networks, computer-assisted instruction, computer-supported new media, hypermedia systems and applications, and social implications of computers.

BORIS PAVLOV has taken up a Personal Chair in Mathematics at the University of Auckland. He was born in 1936 at Leningrad, Russia. He graduated in 1958 from Leningrad University Department of Mathematical Physics, chaired by Academician V.I. Smirnov. He graduated as Ph.D. in 1964 and D.Sc. in 1974, and became a Professor in 1978. He has published more than 100 articles in Russian and international mathematical journals; and has supervised more than 20 Ph.D. students, 4 of whom are now Professors in Russia, France and the USA.



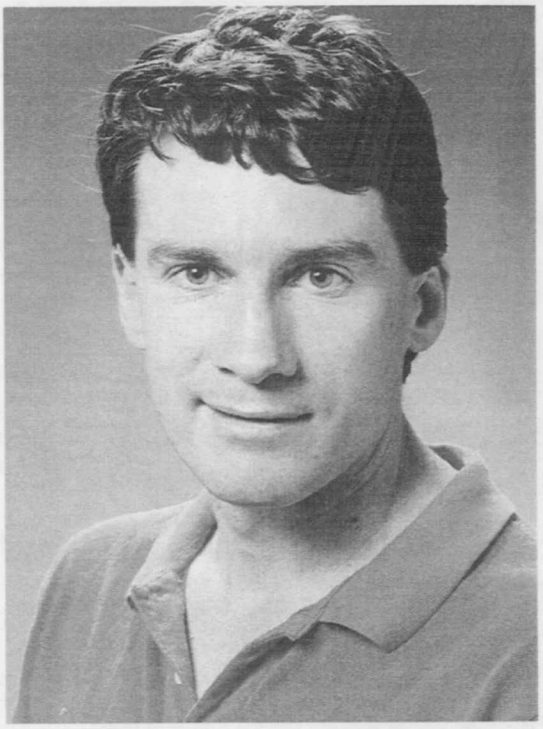
His main field of research is the theory of operators, with applications to mathematical physics. One of his major achievements was to find necessary and sufficient conditions for exponentials $\exp(ik_n x)$ to form a Riesz basis in $L_2(0, 2\pi)$. He has worked in scientific collaboration with L. Faddeev, S. Albeverio, R.S.Phillips and N.K. Nikolskii. From 1989 to 1993 he held positions as Invited Professor in Germany, Sweden and France. At the 1983 ICM he gave a 45-minute Plenary Address. In 1984, Leningrad University awarded him the first University Prize for Research, with referees M. Krein and V. Marchenko. His textbook (co-authored with Professor S. Buldyrev) on Advanced Analysis and Linear Algebra was published by Leningrad University in 1982.



DR PHILIP SHARP, took up a Lectureship in the Department of Mathematics and Statistics at the University of Auckland at the beginning of 1993. Philip graduated Ph.D. from the University of Canterbury in 1983 for his thesis on the numerical simulation of water waves, with Dr Peter Bryant as his supervisor. Several months after graduation, Philip began a one-year post-doctoral position in the Department of Computer Science at the University of Toronto. Once the year was up, he stayed for a further 6 1/3 years. His work at Toronto centred on the development of numerical methods for ordinary differential equations, and the numerical simulation of problems in hydrofracture. In his last three years at Toronto, he also worked as a research associate for the Information Technology Research Centre of Ontario, on the development of numerical software for ordinary differential equations. After Toronto, Philip spent two years in the Department of Mathematics at Queen's University, Kingston, Canada. While there, he became interested in numerical methods for delay-differential equations. He also took advantage of an opportunity not readily available to people living in New Zealand: several times he drove to another country (the United States) for brunch. Since Philip returned from Canada, he has continued with his research interests, as well as collaborating with Prof. John Butcher and Dr Robert Chan on the development of numerical methods for differential-algebraic equations and partial differential equations.

STEPHEN TAYLOR has been appointed to a Lectureship in Mathematics in the Division of Science and Technology at the Tamaki Campus of Auckland University. An Auckland graduate, Stephen gained BSc (Hons) and MSc degrees at the University before undertaking doctoral studies at the University of Minnesota in Minneapolis. He then did post-doctoral work at George Institute of Technology in Atlanta and spent another year as a Visiting Assistant Professor at the University of Minnesota, before becoming an Assistant Professor at Montana State University.

His research interests lie in partial differential equations and control theory, semigroup theory, and general applied mathematics. For leisure activities, he enjoys tennis, tramping, fishing, photography and music.



ILZE ZIEDINS was appointed to a lectureship at the University of Auckland almost two years ago, and is now in the new Department of Statistics there. She did her undergraduate degree in Mathematics and German at the University of Waikato, before going to the University of Cambridge where she completed a Diploma in Mathematical Statistics and PhD in applied probability, and spent a very happy year as a research fellow at Girton College. After several years at Heriot-Watt University in Edinburgh, interspersed with visits to AT&T Bell Labs, she has returned to New Zealand. Her research interests are in stochastic networks and queueing theory, with applications to telecommunication and computer networks.

MATHEMATICS RESEARCH GRADUATES 1994

The information below is set out in the following format: Name; Degree; University; Title; Supervisor(s); date approved; brief description; current position.

Mark Byrne; PhD; Massey University; "Aspects of the vehicle routing problem with pickup and delivery"; March 1993; Dr John Giffin; Constructed and analysed heuristics for the courier distribution problem in deterministic and stochastic environments; Employed as a software engineer in Wellington.

Michael Charleston; PhD; Massey University; "Factors affecting the performance of phylogenetic methods" (Mathematical Biology); February 1994; Prof. Mike Hendy, Prof. David Penny; Analysed many existing methods of constructing phylogenies (evolutionary trees) from DNA sequence data, using both theoretical and simulation studies; Postdoctoral Fellow at University of Texas (Austin), then Postdoctoral Fellow at University of Bielefeld, Germany.

Peter W. Frizzell; PhD; Massey University; "Aspects of the vehicle routing and scheduling problem"; December 1993; Dr John Giffin; Devised heuristics for extensions of the VRP including split deliveries, multiple time periods, time windows, multiple depots, stochastic customer demand and depot relocation; Seeking consulting position in Operations Research.

Liao Kecheng; PhD; University of Auckland; "The AP integral"; 1994; Bruce Calvert, Professor Lee Peng Yee (Singapore University); _; He is now a temporary lecturer in the Department of Mathematics.

Michael Meylan; Ph.D; University of Otago; "The Behaviour of Sea Ice in Ocean Waves"; Submitted 5 December 1993; Prof. V. A. Squire; Michael's thesis developed a novel model for the motion of an ice floe and for the propagation of waves through ice covered seas; Presently he is continuing the same research with a Post Doc. at Otago.

Sannay Mohamad; MSc; Massey University; "Dynamical system of phytoplankton and dissolved nutrient interaction"; February 1994; Prof. Graeme Wake; Investigated simple 2 and 3 component models of plankton-nutrient systems in sea-water; Tutor at University of Brunei, Darussalam.

Catherine Rivers; MSc; Massey University; "Numerical and approximate solutions to problems in spontaneous ignition"; January 1994; Prof. Graeme Wake; An investigation of combustion modelling with wet and dry materials, especially milk-powder; PhD student and Graduate Assistant in the Department of Mathematics, Massey University.

C J Scott; MSc; Victoria University of Wellington; "Real Inflexions of the Four-Bar Coupler Curve"; 1992; P S Donelan; The coupler curves of planar four-bar mechanisms are shown to have at most 12 real inflections, and this bound can be attained; Now an Applications Developer at SCIENZ Softwright Ltd Wellington.

Marijcke Vlieg-Hulstman; PhD; Massey University; "Transformation properties of certain partial differential equations, solutions and integrability"; May 1993; Assoc. Prof. Dean Halford; Connections among certain properties of pde's were obtained and extensively discussed, and an algorithm for finding exact travelling-wave solutions to pde's and systems of pde's was developed; Postdoctoral Fellow (May 1993 - December 1993), Contract Lecturer (January - June 1994) at the Centre for Computing and Biometrics, Lincoln University. Currently Temporary Lecturer in the Department of Mathematics, Massey University.

Simon Woodward; PhD; Massey University; "A dynamical systems model for optimising rotational grazing"; November 1993; Prof. Graeme Wake, Dr Tony Pleasants; Modelling of agricultural systems with the goal of optimising strategies of consumption and conservation; Agricultural scientist at AgResearch Ltd, Whatawhata Research Centre, Hamilton.

Thomas Yee; PhD; University of Auckland; "The analysis of binary data in quantitative plant ecology"; _; 1993; _; He is now working on a statistical project in the Department of Medicine.

BOOK REVIEW

Augustin-Louis Cauchy: A Biography, by Bruno Belhoste, translated from French by Frank Ragland, Springer-Verlag, New York, 1991. xii + 380 pages. ISBN 0-387-97220-X.

Augustin-Louis Cauchy (1789-1857) was a major mathematician, whose volume of published work was exceeded only by Euler. He did very important work in almost every branch of applied and pure mathematics; and many theorems, concepts, methods *et cetera* are named after him.

Cauchy was born in Paris on 1789 August 21, 38 days after the storming of the Bastille. He studied engineering at the *École des Ponts et Chaussées*, and he worked on the construction of canals near Paris and harbour works at Cherbourg. His early mathematical researches on polyhedra attracted the attention of academicians; but in a lecture which he gave at Cherbourg in 1811 he supported the concept (widely held in France's scientific community at that time) that mathematics had essentially been completed, with nothing remaining to be done with it except to find new areas of useful applications (p.28). However, after illness led him to abandon the profession of engineering, his own mathematical researches led to so many new discoveries that he became one of the leading mathematicians of his age.

Cauchy became a professor at the *École Polytechnique* in 1815, and when Gaspard Monge was dismissed from the *Académie des Sciences* on political grounds in 1816, King Louis 18th appointed Cauchy in his place. Cauchy also gained teaching positions at the *Collège de France* and at the *Faculté des Sciences* of the *Université,* and he became a member of various important scientific bodies. His mathematical work was so prolific that, in addition to publishing numerous books and papers in many journals, he published much of his work as the journal *Exercices de Mathématiques*, which published only papers by Cauchy and which appeared in regular instalments from 1826 to 1830.

Cauchy was widely admired as a very distinguished mathematician; but he was not very effective as a teacher. A few students were inspired by Cauchy's lectures to advance themselves in mathematics, but his lectures went far over the heads of most of his students. Several young mathematicians who approached Cauchy about their own mathematical work (including Poncelet, Abel and Galois) expressed severe disappointment (or worse) about Cauchy's response to them. Many of Cauchy's admirers and supporters were puzzled and embarrassed by his extremely reactionary convictions on religion and politics. However, many people who disliked Cauchy as a person and detested his religious and political views acknowledged the sincerity with which Cauchy held his views and emphatically expressed them publicly.

The fatuous King Charles 10th was deposed by the Revolution of 1830, and he fled first to England and then to Bohemia. Cauchy regarded Charles 10th as the divinely appointed ruler of France, and he refused to swear the oaths of loyalty which were required by the successor *régimes* in France. Cauchy thereby forfeited all of his salaried positions, but he remained a member of the *Académie des Sciences*. Cauchy bewildered many of his friends by exiling himself from France in sympathy with his royal master. After Cauchy returned to France in 1838 he continued to refuse to swear oaths of loyalty. (He appears to have been supported financially by his father and brothers, who flourished as high officials serving the very diverse sequence of rulers of France, in the turbulent period from the *ancien régime* until the 1848 Revolution.) After the 1848 Revolution, oaths of loyalty were no longer required, and Cauchy was reinstated at the *Université* in 1849. When Napoleon 3rd seized power in 1852 he required oaths of loyalty from all state functionaries, but he had sufficient sense to exempt Cauchy from that requirement.

Cauchy had gained widespread respect for the sincerity with which he had refused to swear oaths of loyalty to regimes which he did not support. He continued as professor at the *Faculté des Sciences* until he died on 1857 May 23.

Cauchy's major achievements in linear algebra are best expressed in terms of matrices (formalized by Cayley in 1858). He

advanced greatly the theory of determinants and proved that $\det(\mathbf{AB}) = \det(\mathbf{A})\det(\mathbf{B})$, and he proved that every real symmetric matrix has a full basis of real eigenvectors with real eigenvalues.

His theory of substitutions advanced greatly the theory of groups.

His theory of linear elasticity, including stress tensors for anisotropic materials, superseded all previous work and forms the basis of modern elasticity.

Infinite series had previously been used with very little attention being given to convergence, but Cauchy developed carefully the theory of convergence. He defined continuity of functions (in 1823), although much confusion resulted until he eventually introduced (in 1853) the concept of uniform convergence.

The differential and integral calculus had been treated very loosely, with informal reasoning about infinitesimals, which had resulted in many paradoxes and contradictions which plagued mathematics. Cauchy revolutionized analysis by his insistence upon logical rigour. He created the first reasonably logical development of calculus, with differentiation and integration defined in terms of limits, based on "epsilontics". He proved several mean-value theorems, and gave the first proof of the Fundamental Theorem of the Calculus. He proved the existence and uniqueness of solutions of ordinary and partial differential equations satisfying reasonable conditions. He created the theory of characteristics for first-order partial differential equations.

Previous attempts to extend integration from real limits to complex limits had led to various contradictions. Cauchy extended the theory of integration from the real line to contours in the complex plane, and he created the calculus of residues of analytic functions. He began working on complex integration in 1814, and gradually developed the theory through numerous successive versions. But he continued to feel uneasy about the lack of any logical theory of complex numbers, not knowing of Hamilton's definition in 1832 of a complex number as an ordered pair (or "conjugate couple") of real numbers. Cauchy did not give any satisfactory definition of the derivative of a function of a complex variable until 1851; after which he shewed that a complex function which is differentiable throughout a region can be expanded in a Laurent series and its integrals can be found from the calculus of residues.

The translator has sensibly not translated the titles of Cauchy's writings. However, he has not provided any explanatory notes, which results in some passages being very difficult to understand.

Much of the book is devoted to violent disputes between various sects of French Catholics, with Cauchy saving some Jesuits from being lynched by their fellow-Catholics (p.148). The author, writing in French, could safely presume that his readers would know something of those sects and their bloody disputes. But, many readers of the English translation would have welcomed some notes explaining what were the Ultramontanes, the Gallicans, and various other factions with which Cauchy was so passionately involved.

Cauchy explained in a pamphlet published at Prague in 1833 that he had chosen to serve "the child of the miracle" (p.162). Readers of the translation are likely to be puzzled by that term, which is not explained. That term was employed by royalists as a title for the Duke of Bordeaux, on the ground that he had been born after his father (heir to King Charles 10th) had been assassinated in 1820. In telling of the humiliations endured by Cauchy during his self-imposed exile in Prague from 1833 to 1838 as tutor to the young Duke of Bordeaux, the author states (p.165) that: "On the Day of the Feast of the Kings, the Duke of Bordeaux was chosen king by the person who found the bean. The prince then formed his council and bestowed his favors". What is an English-speaking reader to make of this bewildering passage? The reader may suspect that some folk-lorish game was being played – but that Duke lived amidst a bizarre society of men who from time to time proclaimed themselves to be King (and who sometimes persuaded others to accept them as such), and so something much more serious might be intended.

Cauchy made a favourable report to the *Académie* in 1840 on an invention by the Marquis of Jouffroy, who is described as "the inventor of the palmipedes motor" (p.179). It is difficult to imagine what sort of motor could have been described as "web-footed".

The notes are not given as footnotes, but are gathered on pages 241-295; and they are difficult to consult since there are no page-headings identifying the page or chapter to which a note relates.

This translation has some confusing errors. Cauchy first became famous in 1815, for proving Fermat's assertion (in a letter to Mersenne in 1636) on polygonal numbers: "Every number is the sum of three triangular numbers, of four squares, and so on, indefinitely". But the translation consistently states "cubes" instead of "triangular numbers", with nonsensical results (p.46). The Official First-Year Program of the Analysis Course (1816) at the *École Polytechnique* includes "quadrature of surfaces and the cubature of solids of revolution"; but "cubature" gets printed as "curvature" (p.307) . Some lithographed portraits are captioned as photographs (on pages 52, 56 and 124). Several sentences contain redundant definite articles; e.g. "between the light and the matter" (p.200). Some sentences are incomplete (e.g. on pages 185-186), and a few are incomprehensible (e.g. on pages 146 & 183).

Several names get printed without accents, including "Évariste Galois" (p.58 and other pages), "Ménabréa" (pages 156, 276 & 377), and "Göritz" (pages 166 & 170, cf. p.172). Contrariwise, the name of Roger Cotes gets consistently mis-printed as "Côtes" (pages 302, 306, 310, 329 & 373).

There are many other errors , including: "genious" (p.vi), "differences equations" (p.81), "chrystal" (p.105), "ultramontain" for "ultramontane" (p.141, and many other pages), "that the latter" for "than the latter" (p.156), "frivoulous" (p.160), "lead" for "led" (p.160, and elsewhere), "convervative" (p.161), "1830" for "1833" (p.163), "where" for "were" (p.168), "$re^{p\sqrt{-1}}$" for "$re^{q\sqrt{-1}}$" (p.168), "Frauenhofer" for "Fraunhofer" (p.169), "which Charles X and bestowed on him" for "which Charles X had bestowed on him" (p.173), "archbishops's" for "archbishop's" (p.182), "discretely" for "discreetly" (pages 187, 190, 281), "cleaver" for "clever" (p.193), "by dent of" for "by dint of" (p.194), "vibration" for "vibrations" (p.200), "constants coefficients" for "constant coefficients" (p.200), "reasearch" (p.215), "pavillon" (p.218), "sufferage" (p.223), "manuscipt"(p.230), "Norvegian" (p.231), "adaption" (p.232), "Muslems" (p.237), "*Oeuvres*" for "*Œuvres*" (pages 243, 329, 365, 370), "te" for "the" (p.251), "hypocracy" (p.277), "a tiny building from wood" for "a tiny building of wood" (p.294), "heresay" (p.294), "binominals" for "binomials" (p307), "ingenius" (p.321), "less that" for "less than" (p.322), "we have x=0, z=0" for "we have x=0, z=1" (p.322), "as your are" (p.329), "objectives" for "objections" (p.329), "Daguerre's intervention" for "Daguerre's invention" (p.335), "rememberance" (p.363), "*lére Partie*" for "1*ére Partie*" (p.363), "**The Emergence of Science in Western Europa**" (!) (p.366), "Paris, 1828, reed. Paris: Belin, 1977" for "Paris, 1828, re-ed. Paris: Belin, 1977" (?) (p.367).

There are also minor misprints on pages vi, 81, 105, 141, 156, 160, 161, 163, 168, 169, 173, 182, 187, 193, 194, 200, 218, 223, 230, 231, 232, 237, 243, 251, 277, 294, 307, 321, 322, 335, 363, 366 & 367.

Cauchy devoted much time, throughout most of his life, to various "charitable works". Those works included teaching chimney-sweep boys to recite a catechism (p.135), exhorting un-married couples to legalize their marital status and legitimize their offspring (p.188), and petitioning the Pope (which one?) to urge Catholics to provide aid for the starving people of Ireland during the Irish Famine of the 1840s (p.189). No evidence is presented that Cauchy's petition did result in any food reaching the starving Irish. The author declares that "In particular, he was the guiding light behind the work of the *Écoles d'Orient*, which was created in 1856. The Crimean War was concluded by the Treaty of Paris in March 1856. In exchange for a French-British guarantee of the independence and integrity of his empire, the sultan had to grant equal rights to his Christian subjects. The new perspectives which were opened up by the Hatti-i-Humayoun lighted fires of hope in Cauchy's breast; he saw a possibility of a new crusade. ..... Of all the charitable works that Cauchy created, the work of the *Écoles d'Orient*, which still exists today, was by far the most successful" (pages 237-238).

(cont'd on page 24)

CENTREFOLD

John Kalman

It was during my student days 40 years ago that I first heard of the existence of John Kalman. He was referred to with awe amongst mathematics students as being a "Research Fellow". We knew what lecturers were and more or less what they did, but the concept of a career devoted to mathematical research was certainly a revelation to myself and to other students.

Some years later when I was contemplating a return to Auckland I paid a brief interview visit, and it was partly the gracious way John received me and reintroduced me to the Department that made me realise that this was where I wanted to be.

John Kalman was Dux of both King's School and later King's College. He was top of the Entrance Scholarship list and went on to study both law and mathematics at Auckland University College. His father was a lawyer but John decided not to follow this same path but rather to pursue a career in mathematics. After completing his MA degree in 1951, he obtained a scholarship to study at Harvard where he took the AM (1952) and PhD (1955) degrees.

He returned to Auckland in 1955, originally as a Senior Research Fellow. In 1957 he was appointed lecturer and rapidly gained promotion through the various ranks to gain a Professorship in 1964.

He was head of department for a few years in the 60s and has been the senior Professor of Mathematics until his retirement at the end of 1993.

During the time I have had the privilege of being his colleague, I have formed some impressions about John Kalman. Foremost would be his utter lack of pretention and his meticulous care for detail. I need not say more about the first of these but I will on the care for detail. This applied to his teaching, to his administration, and to his research.

As a teacher he offered as close to certainty as anyone can expect in a mathematics class. If he wrote something on the blackboard, students could feel absolute confidence that it was correct mathematics, that there were no flaws in the proofs and that nothing significant was left out. Outside the classroom, his concern for the personal welfare, as well as the mathematical progress of his students, added an extra component to his work as a teacher and a guide to generations of students. Under his influence, many of our ablest students found their ways into first-class graduate schools in other countries. Many of the people whose talents he nurtured have gone on to careers in mathematics, overseas or in New Zealand. The Auckland department alone owes much of its present strength to people John has taught.

During his tenure as head of department his single-minded devotion to the discipline of mathematics and his care for detail ensured that the department ran smoothly. In that time of rapid growth, it became clear to John that Mathematics was relatively poorly treated in terms of resources. He fought hard for better treatment for his department, but his hopes of receiving more equitable treatment were never adequately realised. Eventually he relinquished the headship. Colleagues today take for granted many of the gains he brought about in terms of curricula, in terms of the quality of the mathematics section of the library, and most of all in terms of the quality of the staff appointed to the department. The Mathematical Chronicle owed its existence to John's initiatives and its new identity as the New Zealand Journal of Mathematics gives New Zealand the opportunity to develop a mathematical publication of international standard.

His early research interests included lattice theory, universal algebra and nonclassical logic. In more recent times, he has worked mainly on automated reasoning and has become well-known and highly esteemed by other workers in this field.

Although John has now retired he is still active in mathematical research. His colleagues in Auckland and throughout New Zealand will join me in wishing him well in this new phase of his life.

John Butcher

Neither the author nor the translator has explained which of the many sultans then reigning is meant (presumably the Sultan of the Ottoman Empire), nor what is meant by "the Hatti-i-Humayoun". As for the success of the *Écoles d'Orient* (also known as Work of the Schools of the Orient), an alternative view of that crusade was presented by Eric Temple Bell in his lively chapter on Cauchy in **Men of Mathematics** (Simon & Schuster, New York, 1937). After quoting some over-ripe specimens of imperialistic crusading rhetoric from the *Écoles d'Orient*, Bell explained that "In short the Crimean War had been the customary bayonets preparing the way for the Cross. ..... The Jesuit Council, grateful for Cauchy's expert help, gave him full credit for many of the details ... which were to accomplish "the moral regeneration of peoples enslaved to the law of the Koran, the triumph of the Gospel round the cradle and the sepulchre of Jesus Christ being the sole acceptable compensation for these billows of blood that have been shed" by the Christian French, English, Russians, Sardinians, and the Mohammedan Turks in the Crimean War.

... The net result of the Work was the particularly revolting massacre of May, 1860. Cauchy did not live to see his labors crowned."

G. J. Tee
University of Auckland

CONFERENCES

Because of the ever-increasing length of the conference listing, and the availability of this information in other readily accessible sources, it has been decided that as from this issue, the list will be restricted to meetings in New Zealand, Australia, the South Pacific, the Indonesian region and Singapore.

A comprehensive list of international conferences is given in the IMU Canberra Circular, which is available free of charge on request; contact Professor B H Neumann, School of Mathematical Sciences, Australian National University, ACT 0200, Australia (email: bhn102@phys.anu.edu.au) if you wish to be placed on the mailing list. The Notices of the American Mathematical Society provide similar information.

** 1994 **

September 26-28 (Rockhampton, Queensland) **2nd Australian Complex Systems Conference**
Contact Associate Professor Russel Stonier, Department of Mathematics and Computing, University of Central Queensland, Rockhampton Mail Centre, Queensland 4702, Australia.
e-mail: complex@ucq.edu.au

December 5-9 (Auckland, New Zealand) **Twentieth Australasian Conference on Combinatorial Mathematics and Combinatorial Computing**
Contact Peter Gibbons, Department of Computer Science, University of Auckland, Private Bag 92019, Auckland, New Zealand.
e-mail: p_gibbons@cs.auckland.ac.nz FAX 0064 9 373757

December 10-20 **Knots at Huia.**
Contact Prof David Gauld
email: gauld@mat.auckland.ac.nz

December 12-17 (Singapore) **Pacific Rim Geometry Conference**
Contact Roger Chen, Department of Mathematics, National University of Singapore, Singapore 0511.
e-mail: matchenr@nusunix.nus.sg

** 1995 **

May 29 - June 1 (Brunei Darussalam) **International Conference on Mathematical Modelling (Physical, Biological, Engineering and Social Systems)**
Contact the Organising Secretary, International Conference on Mathematical Modelling 1995, Department of Mathematics, Universiti Brunei Darussalam, Gadong 3186, Brunei Darussalam.

June 19 - 23 (Singapore) **23rd Conference on Stochastic Processes and their Applications**
Contact Louis Chen, Department of Mathematics, National University of Singapore, Lower Kent Ridge Road, Singapore 0511, Republic of Singapore.
e-mail: matspa95@leonis.nus.sg

July 3-7 (Hobart) **39th Annual Meeting of the Australian Mathematical Society**
Contact Dr Barry Gardner, Department of Mathematics, University of Tasmania, Box 252C, GPO, Hobart, Tasmania 7001, Australia.

July 8-9 (Hobart) **Mathematica in Mathematics Research and Education**
Contact D Fearnley-Sander, Department of Mathematics, University of Tasmania, Hobart, Tasmania 7001, Australia.

July 10 - 14 (Melbourne) CTAC-95: **7th Biennial Conference of the Computational Mathematics Group**
Contact Associate Professor Alan Easton, Department of Mathematics, Swinburne University of Technology, Hawthorn, Victoria 3122, Australia.
e-mail: ctac95@swin.edu.au

August 28 - September 1 (Dunedin) **The A C Aitken Centenary Conference (incorporating the 3rd Pacific Statistical Congress and the Annual Meeting of the New Zealand Statistical Association)**
Contact the Aitken Conference Secretary, Department of Mathematics and Statistics, University of Otago, P O Box 56, Dunedin, New Zealand.
e-mail: casm@maths.otago.ac.nz

** 1996 **

July 8 - 10 (Sydney) **IMS Special Topics Meeting on Computer-Intensive Statistical Methods, Australian Statistical Conference and 28th Symposium on the Interface**
e-mail: sydney96@syd.dms.csiro.au

Mike Carter
Massey University

MATHEMATICAL VISITORS TO NEW ZEALAND

List No. 38 : 1 July 1994

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.

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Professor Glen Anderson; Michigan State U; wife and child; complex analysis; January to July 1994; University of Auckland; A/Prof MK Vamanamurthy.

Mrs Dianne Barrows; EQUALS, University of California, Berkeley; educational equity in mathematics and technology; June to August 1994; Auckland University; Dr Margaret Morton; Fulbright Visitor.

Professor Len Bos; University of Calgary; unaccompanied; approximation theory; 26 July to 15 August 1994;Auckland University; Dr Norm Levenberg.

Associate Professor Ugo Bruzzi; University of Genoa and SISSA, Trieste (Italy); unaccompanied; algebraic aspects of Donaldson Theory and geometry of supermanifolds; October 1994; Victoria University of Wellington; Dr V. Pestov.

Professor John Casti; Santa Fe Institute, Santa Fe New Mexico; dynamical systems; 5 September to 10 October 1994; University of Canterbury; Marty Gimpl (Management) and David Wall (Mathematics).

Dr Philippe Chartier; Université de Beaulieu, France; wife and children; numerical analysis; September 1993 to September 1994; Auckland University; Prof. J Butcher.

Dr Sergey Federov; St Petersburg University; functional analysis; February 1994 to February 1996; Auckland University; Prof. B. Pavlov.

Dr Jim Filliben, Senior statistician, US National Institute of Standards & Technology; statistical package DATAPLOT; August 1995; Applied Mathematics Group, Institute of Industrial Research, P.O. Box 31-310, Lower Hutt; Dr Kit Withers (email: c.withers@irl.cri.nz)

Ms Susan Frankenstein; Clarkson University, USA; unaccompanied; polar engineering, oceanography and geophysics; October to December 1994; University of Otago; Professor Vernon Squire.

Dr J Gao; University of Science and Technology of China; unaccompanied; statistics; 1 February 1994 to 31 January 1995; Auckland University; Prof Seber.

Mr Robert Gassler; University of Innsbruck; complex analysis; Auckland University; Prof D Gauld.

Professor Jan Jaworowski; Indiana University; accompanied by Wanda and Eva; topology; December 1994 to June 1995; Auckland University; Prof. David Gauld.

Dr Zorana Lazarevic; USA; theoretical topology; February 1994 to February 1995; Auckland University; Prof. D Gauld.

Professor Roy Leipnik; University of Santa Barbara; wife; September 1994 to January 1995; applied mathematics; quantum mechanics and probability; Massey University; Dr Alex McNabb.

Professor W. Light; University of Leicester; wife (Anita); approximation theory, numerical analysis, wavelets; August to October 1994; University of Canterbury; Dr RK Beatson.

Dr Colin Maclachlan; University of Aberdeen, Scotland; accompanied by wife (Dorothy); group theory and topology; February to August 1994; Auckland University; A/Prof Marston Conder.

Professor Terrence March; Rhodes University, South Africa; mathematics education; July to October 1994; Auckland University; Prof I Reilly.

Professor Robert Molzon; University of Kentucky; unaccompanied; several complex variables and differential geometry; late July to mid August 1994; Auckland University; Dr Norm Levenberg.

Dr Burkard Polster; Universitat Erlangen - Årnberg; incidence geometry; October 1993 to October 1994; University of Canterbury; Dr D. Glynn.

Professor Allan Reid; low-dimensional topology, arithmetic number theory; University of Auckland; Prof G Martin.

Dr Chew Seng; National University of Singapore; wife and 2 children; December 1993 to September 1994; integration theory and dynamical systems; Massey University; Prof. Graeme Wake.

Professor Hayley Shen; Clarkson University USA; polar engineering, oceanography and geophysics; October to December 1994; Prof. Vernon Squire; William Evans Fellow.

Professor M. H. Taibleson; Washington University; Analysis; May to August 1994; University of Canterbury; Dr H-Q Bui; Visiting Erskine Fellow.

Professor Rudolf Vyborny; University of Queensland; wife; PDEs and integration theory; 3 September to 15 October 1994; University of Canterbury: N.A. Watson; Visiting Erskine Fellow.

Professor Arnold Zellner: Graduate School of Business, University of Chicago; statistics; June to August 1994; University of Canterbury; Prof. J.J. Deely; Visiting Erskine Fellow.

Please note: Production of these lists is dependent on me 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
Private Bag 4800
University of Canterbury
Christchurch, New Zealand

email: d.robinson@math.canterbury.ac.nz
(Note new University-standard format)
fax: (03) 364 2587

SECRETARIAL

PRESIDENT'S REPORT 1993/94

I am pleased to report on the activities of the NZ Mathematical Society for the year 1993/94, the twentieth year of the Society's operation.

Visiting Lecturers
The fifth Forder Lecturer will be Professor Elmer Rees, of the University of Edinburgh. Professor Rees is likely to tour NZ in July and August 1995, prior to participating in the Aitken Conference in Dunedin - particularly appropriate as he is the current holder of the Chair previously occupied by Aitken in Edinburgh. We are grateful to Douglas Bridges who will coordinate his visit, and to the British Council for financial support.

The 1994 NZMS Visiting Lecturer has been Dr Colin Maclachlan (University of Aberdeen), who is spending most of the year in Auckland, touring in April and May, and will visit Otago for a longer period in July. Council is in the process of selecting the NZMS Visiting Lecturer for 1995.

Publications

We are about to sign a formal agreement with the University of Auckland on joint publication of the NZ Journal of Mathematics, following a successful three-year trial period. David Gauld will be standing down as Editor in June, and John Butcher has been appointed as his replacement. We are very grateful to David and other members of the Management Committee, the Editorial Board and the production team for the high quality of this international journal.

Mike Hendy has kindly taken over the Editorship of the NZMS Newsletter, from David Smith who completed a 6-year term in December, having published issues 42 to 59, almost one third of the 60 issues to date! Thank you, David, for this substantial contribution.

NZ Mathematics Colloquium
During the period leading up to this year's Colloquium I talked to the organisers and maintained regular contact with them by e-mail. We consulted on the choice of invited speakers, financial and other logistic arrangements, and NZMS grants to students wishing to attend. This arrangement seemed to work well, with NZMS involvement in appropriate areas, but preserving the autonomy of the local organising committee to a large extent.

We have been approached by the NZ Statistical Association concerning the possibility of a joint meeting in the near future, and I hope we can pursue this idea. Also I hope that we will soon be in a position to rekindle joint meetings with our Australian counterparts - this would seem to depend on our universities managing to synchronise between-semester breaks!

Mathematical Sciences Council of NZ
The Mathematical Sciences Council of NZ, set up last year, comprises executive representatives of the NZMS, NZSA, ORSNZ and NZAMT. Discussions are now underway with representatives of the Informatics group of the NZ Computer Society, the Applied Maths/Engineering interface, and mathematical Fellows of the Royal Society of NZ, concerning the formation of a policy/advisory group in the Mathematical & Information Sciences, affiliated with the RSNZ. The prospect of a strong, effective and broadly-based lobby group for the mathematical and information sciences is a development which I see as both exciting and necessary, and I hope it comes to fruition.

Financial Grants
Council has made the following grants between August 1993 and May 1994:

NZ Mathematics Colloquium 1994	$1500
Student travel for 1994 (seven students)	1219
NZ Journal of Mathematics	2000
NZMS Visiting Lecturer 1994	400
Research fund assistance (two members)	1000
Conference support (20th ACCMCC)	500
Donation to EQUALs Network (for Visiting Lecturer)	500
Total	$ 7119

NZMS Research Award
The NZMS Research Award for 1994 goes to Gaven Martin (of the University of Auckland), with the accompanying citation:

"For fundamental contributions in analysis, especially in complex analysis, requiring a careful and inventive blending of algebraic, analytic and topological ideas, with applications in diverse areas ranging from differential equations, through hyperbolic geometry to low-dimensional topology".

Congratulations Gaven, and keep up the good work.

Honorary Memberships
I am pleased to announce that Council has elected John Kalman, John Turner and Brian Woods to Honorary Life Memberships of the Society. Congratulations to Brian, John and John, and thank you all for your many contributions to the mathematical community in NZ over many years.

Personal
Congratulations to Mike Hendy and Ernie Kalnins on their appointment to personal chairs in Mathematical Biology at Massey University and Mathematics at the University of Waikato, and to Derek Holton on his election to a Fellowship of the Royal Society of NZ. We also offer sympathy to Adrian Swift on the loss of his wife Jan Whitwell in a car accident in October last year.

Next I would like to thank Kee Teo for his devoted service as Treasurer from 1989 to 1994, and Mark McGuinness for "volunteering" to take over that position. At the same time I would like to publicly thank John Shanks for all his patience and good work as Membership Secretary (including printing and distribution of the Newsletter), and once again thank David Gauld and David Smith for their contributions as Editors of the Journal and the Newsletter.

Finally I would like to thank members of Council for their advice and support during the year, and particularly Derek Holton (Outgoing Vice-President), Margaret Morton (Secretary) and Graham Weir, who complete their terms on Council this month.

Marston Conder
9 May 1994

MINUTES OF THE THIRTY-FIFTH COUNCIL MEETING

Sunday 8 May, 1994

The meeting was held at the University of Waikato and began at 1.20pm

PRESENT: Rick Beatson, Douglas Bridges (standing in for Ernie Kalnins), Robert Chan, Marston Conder (Chair), Derek Holton, Mike Hendy, Mark McGuinness, Margaret Morton, Graham Weir.

APOLOGIES: Ernie Kalnins

1. MINUTES OF THE THIRTY-FOURTH COUNCIL MEETING
The minutes of the previous meeting (held by teleconference in November 1993) were received and discussed.

Matters arising from the minutes:

(a) NZMS Constitution: The amended constitution has been received by the Justice Department and registration is now complete. In order to keep our registration current the Treasurer must send a copy of the audited accounts to the Justice Department each year.

(b) 1994 NZ Mathematics Colloquium: Grant money totalling $969 was allocated to E. Balakrishnan (Massey, $200), D. Bryant (Canterbury, $123), S. Chapman (Victoria, $200), F. Geiringer (Victoria, $200), C. Stephens (Canterbury, $123) and B. Zhang (Canterbury, $123). The policy of having the colloquium organizers award the grants (in consultation with the NZMS President) worked well and should be continued.

(c) Forder Lecturership: Professor Elmer Rees, from the University of Edinburgh, will be the 1995 Forder Lecturer. He will be here in late July and August 1995, and Douglas Bridges will coordinate his visit. The British Council will contribute towards his travel expenses. Professor Rees will be an invited speaker at the conference to celebrate the centenary of the birth of A.C. Aitken being planned in Otago.

(d) Careers pamphlet: This is not far from completion. The total cost of around $2200 will be split with the NZSA. Hopefully there will soon be a new Publications Convener who will complete this task.

(e) Closer Relations with Australian Mathematical Society: The suggestion of a joint newsletter is to be discussed at the AGM. There is a tentative proposal that a joint 1997 NZMS/AMS meeting be held in Auckland. Possibly the NZSA meeting could be held at the same time. There is a need for an organised cycle of meetings, with a joint meeting with Australia being included on a regular basis.

2. TREASURER'S REPORT

Mark McGuinness (as new Treasurer) presented a report on the state of the Society's finances. These appear to be in good order and there is no need for a subscription increase this year.

3. MEMBERSHIP REPORT

A report from the Membership Secretary, John Shanks, was received. A vote of thanks was made to John for his services. There was some discussion on the guidelines concerning students being offered a year's free membership, continuation of their membership, and the mechanism for obtaining names of new graduate students and staff members.

4. GRANT REQUESTS

The following grants were given:

- David McIntyre ($500) to attend the International Congress of Mathematics in Zurich and the General Topology and Applications conference in Amsterdam.
- Kee Teo ($500) to attend a conference on Chromatic Polynomials in Shanghai
- EQUALS NZ ($500) to assist the Fulbright Foundation in bringing a third visitor to NZ to run workshops throughout the country on equity in mathematics education.

5. NZMS VISITING LECTURER FOR 1995.

A number of people had been suggested, and after discussion it was decided to invite Nancy Kopell from Boston University, whose area of expertise is dynamical systems.

6. NZMS HONORARY MEMBERSHIPS

In recognition of their services to mathematics in New Zealand, John Kalman, John Turner and Brian Woods were elected to honorary memberships of the NZMS. A suitable certificate will be sent to each of them.

7. NZMS RESEARCH AWARD

It was announced the judges had decided to make the 1994 award to Gaven Martin of the University of Auckland. Discussion took place on suitable ways of further publicising the award, encouraging more nominations and applications each year.

8. 1995 NZ MATHEMATICS COLLOQUIUM

Mike Hendy reported that Otago and Massey had agreed to switch the natural Colloquium ordering for the next two years, so that the 1995 Colloquium would be held at Otago in late August (in conjunction with the Aitken conference), and the 1996 Colloquium would be held at Massey.

9. NZ JOURNAL OF MATHEMATICS

A proposed publications agreement from the NZJM committee was discussed, it was agreed to ask Peter Renaud (as NZMS legal advisor) to look over it before it was finally signed. Douglas Bridges and Rob Goldblatt were elected representatives of NZMS on the NZJM committee.

10. COUNCIL NOMINATIONS

Nominations for incoming Council positions were discussed briefly.

11. PUBLICATIONS

Ingrid Rinsma has completed her term as Publications Convener, and a new Publications Convener needs to be sought. Mike Hendy reported that inquiries had been received from commercial organizations about including publicity inserts in the NZMS Newsletter. He offered to obtain financial details on similar arrangements with other organisations. It was felt that for commercial users of this service there should be a contribution to NZMS above the actual cost of adding the insert and extra postage. The Privacy Act precludes selling a membership list to commercial organizations.

12. MATHEMATICAL SCIENCES COUNCIL OF NZ.

Marston Conder and Derek Holton were to take part in a meeting on 10 May, to discuss the possible formation of a policy/advisory group attached to the Royal Society. A report was received from Graeme Wake, the NZMS representative on the RSNZ Board, on the Mathematical and Information Sciences Electoral College. It was felt appropriate that the NZMS and NZSA should alternate in nominating a representative for the Electoral College, and this suggestion would be taken to the AGM.

13. NZQA MATHEMATICS ADVISORY GROUP

Derek Holton, our NZMS representative, gave an update on the introduction of "units of learning", reporting that the Advisory Group is concerned about a number of issues and feels unable to approve the unit standards. Marston Conder agreed to write a letter to NZQA stating that the NZMS supports the stand taken by professional representatives on the Advisory Group.

14. RSNZ FELLOWSHIP NOMINATIONS

This matter was discussed, and it was decided to leave the handling of nominations to the committee of RSNZ fellows in the mathematical sciences.

15. FoRST OUTPUT CLASSES

Concerns were expressed about the lack of funding given to mathematics. A working party consisting of Marston Conder, Douglas Bridges and Vernon Squire was convened to investigate the situation and possible remedies. (Suggestions were to review current experiences, separate the output classes, and to push for mathematics representation on the funding panel.)

16 GENERAL BUSINESS

(a) Minuted approval was given so that any two people holding the positions of President, Secretary and Treasurer could jointly sign cheques on behalf of the NZMS.

(b) A vote a thanks was given to outgoing Council members Kee Teo, Derek Holton, Margaret Morton, and Graham Weir for their respective services as Treasurer, Past Vice President and Council Members. A further vote of thanks was given to David Gauld, David Smith and Ingrid Rinsma for their respective terms as NZJM Editor, Newsletter Editor and Publications Convenor.

(c) Margaret Morton agreed to send the Council's good wishes to Peter Lorimer and Ken Ashton as they recover from cardiac and cranial surgery.

The meeting closed at 4.45pm.

M. Morton

MINUTES OF THE TWENTIETH ANNUAL GENERAL MEETING

Monday 9 May, 1994
The meeting was held at the University of Waikato and began at 5.15pm

PRESENT: Marston Conder (Chair), David Alcorn, Jianbei An, Rick Beatson, Paul Bonnington, Kevin Broughan, Peter Bryant, John Burnell, John Butcher, Cris Calude, Mike Carter, Graham French, David Gauld, Ian Hawthorn, Harold Henderson, Derek Holton, Stephen Joe, Vivien Kirk, Charles Little, Ken Louie, Mark McGuinness, Allan McInnes, David McIntyre, Robert McKibbin, Robert McLachlan, Margaret Morton, Chris Palliser, Ken Pledger, Chris Price, Peter Renaud, Philip Rhodes-Robinson, Catherine Rivers, Mick Roberts, Mark Schroder, Arkadii Slinko, David Smith, Adrian Swift, Garry Tee, Gillian Thornley, John Turner, Mavina Vamanamurthy, Wolfgang Vogel, Graeme Wake, Hong Wang.

APOLOGIES: Ken Ashton, Robert Chan, Mike Hendy, Peter Lorimer

1. MINUTES OF THE NINETEENTH AGM

It was moved from the chair that the minutes be accepted as a true and accurate record. The motion was carried. There were no matters arising from the minutes.

2. PRESIDENT'S REPORT

The President's report was delivered to the meeting and will be published in the NZMS Newsletter.

3. TREASURER'S REPORT

Mark McGuinness (the new NZMS Treasurer) presented the financial report, showing a healthy state of finances and no need for a subscription increase. There was a query about some of the figures associated with the Maths with Calculus texts, and subject to this matter being clarified, the financial statement was accepted by the meeting.

3. MEMBERSHIP REPORT

A report from the Membership Secretary, John Shanks, was received. The guidelines concerning students being offered a year's free membership were discussed. A vote of thanks was given to John Shanks for his excellent work as Membership Secretary.

4. COUNCIL NOMINATIONS

Previously received nominations for the three vacancies on Council were Douglas Bridges for Incoming Vice President, Mick Roberts and Dennis McCaughan as Council Members. There were no further nominations from the floor, and the aforementioned people were duly elected. [Margaret Morton is also to be co-opted as Secretary for one more year.]

5. NZ JOURNAL OF MATHEMATICS

David Gauld is to retire from the editorship of the NZJM in June, after which John Butcher will assume this post. David Gauld presented a report on the current status of the NZJM. There was a query on the financial status of the NZJM, the long term view being that the NZMS may need to continue contributing $1000 per year to the NZJM. In the event of the journal being published electronically there would be a decrease in costs. A financial statement for the NZJM will be tabled at the next meeting.

6. MATHEMATICAL SCIENCES COUNCIL

Marston Conder explained the possibility that the MSCNZ would reform into a policy/advisory group in the Mathematical Information Sciences, attached to the Royal Society of NZ, with additional representation from the NZ Computer Society and the Mathematical Fellowship of the RSNZ. Graeme Wake, the NZMS representative on the RSNZ Board, presented a report on the Mathematical and Information Sciences Electoral College. A current issue under discussion is accreditation for scientists. A suggestion that NZSA be asked to nominate the next representative for the Electoral College was approved by the meeting.

7. 1995 NZ MATHEMATICS COLLOQUIUM

It was announced (following the Colloquium business meeting) that Otago and Massey had agreed to switch the natural Colloquium ordering for the next two years: the 1995 Colloquium would be held at Otago in late August (in conjunction with the Aitken conference), and the 1996 Colloquium would be held at Massey.

8. CLOSER RELATIONS WITH AUSTRALIAN MATHEMATICAL SOCIETY

Marston Conder offered to investigate the possibility of a joint meeting with the AMS in Auckland in 1997, in the hope that such joint meetings will again become part of the regular Colloquium cycle. There have been problems in recent years with universities in both countries being in the process of changing term structures and there not being a common break in teaching.

The suggestion of a joint Newsletter with the AMS had been discussed by Council, possible drawbacks with the suggestion being cost, size and loss of identity. At the meeting it was suggested that the two editors communicate material that might be suitable for publication in both newsletters; two explicit suggestions were the visitor and conference listings.

9. NZQA MATHEMATICS ADVISORY GROUP

Derek Holton (NZMS representative) gave an update on the NZQA "units of learning" discussions. Currently the Advisory Group is concerned about a number of issues and feels unable to approve the unit standards. Marston Conder is writing a letter to NZQA supporting the stand taken by professional representatives of the Advisory Group.

10 GENERAL BUSINESS

(a) MoRST Output Classes: Concerns had been expressed in Council about the lack of FoRST funding given to mathematics. A working party consisting of Marston Conder, Douglas Bridges and Vernon Squire was convened to investigate the situation and possible remedies. This was approved by the meeting.

(b) Kevin Broughan pointed out that this was the 20th anniversary of the Society and that the idea had been initiated by himself, David Vere-Jones and Donald Joyce. This was greeted with acclamation.

(c) A plea was put forth for a Publications Convenor. [Following the meeting David McIntyre volunteered to assume this responsibility.]

(d) David Gauld gave details of a Knots Workshop to be held at Huia near Auckland, in December 1994. Vaughan Jones and Rob Kirby will participate.

(e) A vote of thanks was given to outgoing Council members Kee Teo, Derek Holton, Margaret Morton and Graham Weir, for their respective services as Treasurer, Outgoing Vice President and Council Member. A further vote of thanks was given to David Gauld, David Smith and Ingrid Rinsma for their respective terms as NZJM Editor, Newsletter Editor and Publications Convenor.

The meeting closed at 6.25pm.

GRANTEE REPORT

Conference
The purpose of this trip was to accept the invitation to be an invited speaker at the Conference on Chromatic Polynomial Theory, held at Shanghai Second Polytechnic University, and to discuss research problems in Chromatic Polynomials with Professor Nian-Zu-Li.

This is the first conference on Chromatic Polynomials ever held. There were 25 participants, including one invited speaker from each of USA, Singapore, Malaysia and New Zealand. Most of the participants are researchers in the area or related areas of Chromatic Polynomials. I found this conference most beneficial. I presented the paper "A simple method for determining chromatically equivalent classes of graphs", which was well received. As all participants spoke Chinese, all speakers presented their talks in Chinese.

I had useful discussions with several participants including Professors Nian-zu Li, Khee-Meng Koh, Ru-ying Liu, Lian-Chang Zhao, who promised collaboration. Professors Li, Koh and I plan to write a monograph on Chromatic Polynomials. The non-technical highlight of the conference was to attend, as a VIP, a reception hosted by the Vice-Chancellor (a mathematician) of the University who told us how his training in mathematics helps him in his job.

Shanghai Second Polytechnic [Industrial is a more accurate translation] University has nine campuses scattered around Shanghai, with a student population of over 6000 of which half are involved in continuing education. The Department of Mathematics has 31 teaching staff, seven of whom are professors/assoc professors. The Department offers a wide range of papers with a great amount of face-to-face teaching. For example, there are six time-tabled lectures/week, for 36 weeks/year, for their first year Calculus. Their office space is insufficient. Staff need only be at the University when they have to give lectures or attend a meeting.

Overall I found the trip to be rewarding and stimulating and I would like to thank the NZ Maths Society for granting financial support.

K L Teo
Massey University

STOP PRESS

Mathematics Olympiad

The New Zealand team performed well at the 35th International Mathematics Olympiad held in Hong Kong 12 - 19 July, 1994. The team of 6 earned 4 Bronze medals to score a total of 116 points, putting them in 29th place in the field of 69. The competition was won by the US team (252) followed by China (229), Russia (224), Bulgaria (223), Hungary (221), Vietnam (207), UK (206), and Iran (203) the only teams to exceed 200. Australia was 11th and Canada 24th.

Mike Hendy.

NOTICES

NZMS AWARDS FOR MATHEMATICAL RESEARCH

These awards were instituted in 1990 to foster mathematical research in New Zealand and to recognise excellence in research carried out by New Zealand mathematicians.

The NZMS Research Award for 1994 has been presented to Gaven Martin (of the University of Auckland), with the accompanying citation:

"For fundamental contributions in analysis, especially in complex analysis, requiring a careful and inventive blending of algebraic, analytic and topological ideas, with applications in diverse areas ranging from

differential equations, through hyperbolic geometry to low-dimensional topology".

The other recipients to date have been John Butcher and Rob Goldblatt (1991), Rod Downey and Vernon Squire (1992), and Marston Conder (1993).

Call for nominations: 1994 round

Applications and nominations are invited for the NZMS Research Award for 1995.

This award will be based on mathematical research published in books or recognised journals within the last five calendar years: 1990-94. Candidates must have been residents of New Zealand for the last three years.

Nominations and applications should include the following:

(1) Name and affiliation of candidate

(2) Statement of general area of research

(3) Names of two persons willing to act as referees

(4) A list of books and/or research articles published within the last five calendar years: 1990-94

(5) Two copies of each of the five most significant publications selected from the list in (4)

(6) A clear statement of how much of any joint work is due to the candidate.

A judging panel shall be appointed by the NZMS Council. The judges may call for reports from the nominated referees and/or obtain whatever additional referee reports they feel necessary. The judges may recommend one or more persons for the award, or that no award be made. No person shall receive the award more than once. The award consists of a certificate including an appropriate citation of the awardee's work, and will be presented (if at all possible) around the time of the AGM of the Society in 1995.

All nominations (which should include also the written consent of the candidate) and applications should be sent to the NZMS President, Marston Conder, Department of Mathematics, University of Auckland, Private Bag 92019, Auckland, by 30 September 1994. Please consider nominating any of your colleagues whose recent research contributions you feel deserve recognition!

HONOUR FOR BERNHARD NEUMANN

In the 1994 Australian Queens Birthday Honours List, the highest honour awarded is for Bernhard Neumann (Honorary Member of the NZMS), who has been made a Companion of the Order of Australia.

APPLICATIONS FOR NZMS FINANCIAL ASSISTANCE

The NZMS Council invites applications for financial assistance, in particular for grants from its Student Travel Fund, Research Fund, and South Pacific Fund. Students who wish to apply for financial assistance to attend the NZ Mathematics Colloquium should contact the organisers of the Colloquium, who have been empowered to distribute funds on behalf of the NZMS. Students who wish to attend other conferences should apply to the NZMS Council using the form which is printed in this issue of the NZMS Newsletter.

Ordinary members of the NZMS may apply for financial assistance with the costs of hosting mathematical visitors, organising conferences or workshops, attending conferences, and any other mathematical research-related activity. They too should apply to the NZMS Council using the form which is printed on pages 41-42 of this Newsletter.

A relatively high priority will be given to applications involving contact between the mathematical communities of New Zealand and the islands of the South Pacific.

The Council normally considers applications at its meetings in May and November each year, but applications may be considered at other times in exceptional circumstances. Completed application forms should be sent to the NZMS Secretary, Dr Margaret Morton, Department of Mathematics, University of Auckland, Private Bag 92019, Auckland.

EXCHANGES OF STAFF

At their annual meeting during the 1994 Colloquium, at Waikato, the NZ Mathematics & Statistics HoDs discussed exchanges of staff within New Zealand, along the lines of the exchange between Marston Conder and Rob Goldblatt a few years ago. It was agreed that these exchanges could be of considerable benefit both to the staff exchanging and to their departments. Accordingly, staff interested in exchanging positions (temporarily!) with colleagues in New Zealand are asked to contact their Head of Department in the first instance.

D.Bridges

FACULTY EXCHANGE CENTER
Teaching Exchance Opportunities in Mathematics

We would like to introduce our colleagues in the field of Mathematics to the Faculty Exchange Center and to ask for your support in our effort to reach and serve them. The accompanying literature should answer most of your questions regarding the Center, now in its twenty-first year of operation. Please feel free to use any parts of this material; if your statement must be brief, we have suggested the brief notice below:

FACULTY EXCHANGE CENTER, founded in 1973 to meet the ever increasing competition for fully-funded travel grants, enables college/university faculty interested in teaching exchanges, to contact colleagues in their discipline in countries where the language of instruction is English. Every Fall and Spring the Center publishes a Directory and a Supplement respectively, containing the names of the instructors and their institutions, their rank and areas of specialization, the regions or countries where they prefer to teach, and whether they are willing to exchange their house.

NZMS members will receive a 50% discount off the published fees if they join the Faculty Exchange Center in 1994. Just mark clearly the name of this Society on the form that FEC will provide all respondents. Registrants will receive the rosters of their discipline as these lists appear in the current FEC Directory and Supplement. They will next receive the list that will include their names. The current 1993-94 directory has a total listing of over 300 scholars, representing over 20 disciplines. For details and application forms write to: Faculty Exchange Center, 952 Virginia Avenue, Lancaster, Pennsylvania, USA, 17603.

It would please us to have members of your association as FEC registrants as a result of your personal effort. We are confident that they will voice strong support for your commitment to serve them; you will be making available to them a fringe benefit with inherent goodwill value.

Please note that the rising costs of this academic program are entirely undertaken by subscriber's fees.

American and Foreign Institutions of Higher Learning Represented in Faculty Exchange Center Membership, 1993-94

Included are institutions, printed in italics, that this year have supported the program through their membership.

I American Colleges and Universities:
Austin Peay State University. Averett College. *Bellarmine College. Bentley College.* .Berklee College of Music. *Bryant College. Butler University. California State University, Chico. California State University, Fullerton. Cameron University.* Central Michigan University. Chicago State University. *Clark College. Coker College.* College Misericordia. College of Lake County. *Curry College. Daemen College. Drury College. Eastern Connecticut State University. Eastern Michigan University.* Eastern Oregon State College. *Florida International University. Framingham State College. Franklin and Marshall College. Franklin Pierce College. Georgetown College. Gonzaga University. Hampshire College. Hanover College. Hollins College. Indiana State University. Indiana University of Pennsylvania. Linfield College. Lycoming*

College. Mary Baldwin College. Marywood College. *Miami-Dade Community College. Montana College of Mineral Sciences and Technology. Montreat-Anderson College. Nazareth College of Rochester. Newberry College. Nova University. Point Park College. Quinnipiac College. Randolph-Macon College.* St Ambrose University. *Saint Anselm College. Saint Lawrence University. Saint Norbert College. San Diego State University.* San Francisco State University. *Shippensburg University of PA. Shorter College. Skagit Valley College. South Dakota State University. Southeast Missouri State University, SUNY, Brockport. SUNY College, Fredonia. SUNY, Oswego. SUNY, Potsdam. Stetson University. Texas Southern University. University of Colorado at Colorado Springs. University of Dayton. University of Guam. University of La Verne.* University of Maine. *University of North Carolina, Asheville. University of Pittsburgh, Bradford. University of Pittsburgh Johnstown. University of Portland. University of Richmond. University of South Carolina. University of South Florida.* University of Texas at San Antonio. *The University of the South. Villanova University. Western Carolina University. Western New Mexico University. Western Washington University. Westfield State College. Wilmington* College. *Winona State University. Wright State University.*

II Foreign Colleges and Universities:
Amersham and Wycombe College (UK). *Bedford College of Higher Education* (UK). *Cabot College* (New Foundland). *Champlain Regional College* (Quebec). *Christchurch College of Education* (New Zealand). Derby Tertiary College (UK). *Durham College* (Ontario). Firecroft College (UK). *Grande Prairie Regional College* (Alberta). *Halton College of Higher Education* (UK). *La Trobe University* (Australia). *Lakeland College* (Alberta). Liverpool John Moores University (UK). *Massey University* (New Zealand). *McMaster University* (Ontario). *Memorial University of New Foundland. Monash University College* (Australia). *Mount Royal College* (Alberta). Nizhni Novgorod State University (Russia). *Nottingham Trent University* (UK). *Okanagan University College* (British Columbia). *Saint Francis Xavier University* (Nova Scotia). *Saint Thomas University* (New Brunswick). *Suffolk College of Higher and Further Education*(UK). *Trent University* (Ontario). *University College of the Fraser Valley* (British Columbia). *University of Alberta. University of Keele* (UK). *University of Manitoba. University of Ottowa.* University of Paris. *University of Saint Andrews* (UK). *University of South Australia. Vancouver Community College* (British Columbia). York University (Ontario).

AMERICAN MATHEMATICAL SOCIETY RECIPROCAL MEMBERSHIP

Members of the NZ Mathematical Society may join the American Mathematical Society (AMS) under a reciprocity agreement, at a reduced rate of US$64 per year. Membership of the AMS includes the following privileges:

- 40% discount on most AMS publications
- free subscription to the Notices of the American Mathematical Society (10 issues per year)
- free subscription to the Bulletin of the American Mathematical Society (4 issues per year)
- reduced registration fees at AMS national and sectional meetings.

For further information and membership application forms, contact Carol-Ann Blackwood, Membership and Customer Services Manager, American Mathematical Society, Post Office Box 6248, Providence RI 02940-6248, USA (email: cab@math.ams.org).

NEW CONFERENCE SERIES IN AUSTRALIA

The 1st Biennial Engineering Mathematics Conference was held in Melbourne on 11-13 July. This international event was devoted to the role of mathematics in modern engineering. It was organized by the Engineering Mathematics Group of ANZIAM with Dr Joseph Steiner of Swinburne University of Technology as Conference Chairman.

There were over 130 delegates from Australia and 16 overseas countries. The keynote speakers included such notable overseas scientists as Henk van Tilborg from The Netherlands (Discrete Mathematics in Engineering), Ian Jones from England

(Industrial Computational Fluid Dynamics), Pal Rozsa from Hungary (Block Matrices), Gunther Kurz from Germany (Mathematics for Engineering Education), Jiansheng Pan from China (Mathematical Modelling in Heat Treatment), and leading Australian mathematicians such as Kathy Horadam (Comulative Shift Register Sequences), John Perry (Numerical Modelling of Thermo-Fluid Flows), Noel Barton, Paul Cleary, Mohan Krishnamoorthy and Nick Stokes (Industrial Case Studies). The sessions were extremely interesting and informative with many enlightening discussions between them.

In the best ANZIAM tradition, this conference had quite a large number of students participating and giving talks. It was great for students to have an audience and opportunity to discuss their papers with leading academics and researchers! The Organizing Committee generously supported two students' travel to the conference. I would like to report that I was one of these two students. I am very grateful to the Organizing Committee of the conference and its chairman Dr Steiner. My thanks also go to the Mathematics Department of VUW for financial assistance.

A very nice feature of the conference was its venue, close to all Central Melbourne attractions: the Yarra river, parks, shops and lights.

The only disappointing thing was that New Zealand was under-represented at this conference. Please note that there will be an AEMC96 and do not hesitate to go!

Irene Pestov

ALEXANDER VON HUMBOLDT FELLOWSHIPS

The Alexander von Humboldt Foundation invites applications for its research fellowships, up to 500 of which it awards each year worldwide. These fellowships are awarded to highly qualified scholars holding a doctorate and under the age of 40, enabling them to carry out research projects of their own choice at universities and other research institutes in Germany.

Applications may be submitted at any time by scholars from any academic discipline, and there are no quotas on either discipline or nationality. Selection meetings are held every March, June/July and November.

The initial sponsorship period is usually 6-12 months, but extensions are possible for up to 24 months in total. Also up to six months of this period may be spent at other research institutes in Europe.

The research fellowship monthly rate is generous: between DM3200 and DM4000 tax-free. Additional assistance is also available in the form of travel expenses, grants for married accompanying partners, an initial setting-up allowance, grants for language courses, and so on.

Application requirements include: an academic degree comparable to a doctorate (PhD, DSc, or equivalent), high academic qualification, academic publications, a specific research plan, and a good command of the German language (for scholars in the humanities and social sciences) or at least a good command of the English language (for scientists).

Further information may be obtained from the German Embassy, PO Box 1687, Wellington, or directly from the Alexander von Humboldt Foundation: Jean-Paul-Strasse 12, Bad Godesburg, D-53173 Bonn, Germany.

The Foundation has supported several mathematicians in or from New Zealand, including Marston Conder, David Glynn, Don James, Peter Lorimer, Mike Steel, Paul Turner, Burkard Polster and Gunter Steinke.

THE FERRAN SUNYER I BALAGUER PRIZE 1994

Ferran Sunyer i Balaguer (1912-1967) was a self-taught Catalan mathematician who, in spite of a serious physical disability, was very active in research in classical Mathematical Analysis, an area in which he acquired international recognition.

Each year to honour the memory of Ferran Sunyer i Balaguer, the Institut d'Estudis Catalans awards an international mathematical research prize bearing his name. This prize was awarded for the first time in April 1993. The competition is open to all mathematicians, subject to the following conditions. The prize will be awarded for a mathematical monograph of an expository

nature presenting the latest developments in an active area of research in Mathematics, in which the applicant has made important contributions.

The monograph must be original, written in English, and of at least 150 pages. In exceptional cases, manuscripts in other languages may be considered. The prize, amounting to 12,000 ECU, is provided by the Ferran Sunyer i Balaguer Foundation. The winning monograph will be published in Birkhäuser Verlag's series "Progress in Mathematics", subject to the usual regulations concerning copyright and author's rights.

The winner of the prize will be chosen by a Scientific Committee. Monographs, preferably typeset in TEX should be sent by 15 January 1995 in order to be considered, to Institut d'Estudis Catalans, Carme, 47, 08001 Barcelona, Spain, e-mail: icrm0@cc.uab.es. The name of the prize-winner will be announced in Barcelona in April, 1995.

POSITIONS AVAILABLE

Auckland:

TWO LECTURESHIPS

Department of Mathematics
School of Mathematical & Information Sciences (Vacancy UAC.458)
UNIVERSITY OF AUCKLAND

The Department of Mathematics, one of the three departments (along with Computer Science and Statistics) in the School of Mathematical and Information Sciences, teaches a full range of undergraduate and postgraduate courses. Within the Department there are two units, the Applied and Computational Mathematics Unit and the Mathematics Education Unit, each of which operates with a certain degree of autonomy.

The Department has particular research strength in combinatorics, group theory, functional analysis and operator theory, complex analysis, topology and numerical analysis.

Applicants must have a Doctorate or equivalent and should have a proven record in research and teaching in any branch of Mathematics, but preference may be given to applicants whose field of interest is allied to those of existing staff. One of the lectureships is reserved for Pure Mathematics.

Commencing salary will be established within the range $NZ39,500 - $NZ50,000 per annum. Further information, Conditions of Appointment and Method of Application, should be obtained from the Academic Appointments Office, Telephone 64 9 373-7999, Extn 5097; Fax 64 9 373-7454. Three copies of applications should be forwarded to reach the Registrar by 26 September 1994. Please quote Vacancy Number UAC.458 in all correspondence. The University has an EEO policy and welcomes applications from all qualified persons.

W B Nicoll, REGISTRAR
University of Auckland
Private Bag 92019
Auckland, NEW ZEALAND

VISITING POSITION AVAILABLE FOR 1996

We have a visiting position available in the Computer Science Department at the University of Auckland, New Zealand for part of 1996. Duties would involve the teaching of one graduate-level course for a period of about 12 weeks. We would prefer the course to be in the area of combinatorics with some attention to computational aspects, so as to fit in with research interests of staff here. However exact content can be negotiated, depending on the research interests of the instructor. Remuneration will include a salary and airfare to NZ.

Interested persons are invited to get in touch with me. And if you would like to take a look at the place first, then you would have an ideal opportunity by coming to the 20th Australasian Conference on Combinatorial Mathematics and Combinatorial Computing to be held at Auckland from 5 - 9 December 1994. Registration forms and information will be sent out to you next week.

Peter Gibbons
Department of Computer Science
University of Auckland
Private Bag 92019, Auckland, New Zealand
Email: p_gibbons@cs.auckland.ac.nz
Phone: (64) (9) 373-7599 ext 8260 (Work)
(64) (9) 480-7110 (Home) Fax: (64) (9) 373-7453

Please describe your reasons for making this application and the plans you have for spending the grant if your application is successful:

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Please list any supporting documents or other evidence (attached to your application):

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Supporting statement from supervisor or Head of Department (for student applicants only):

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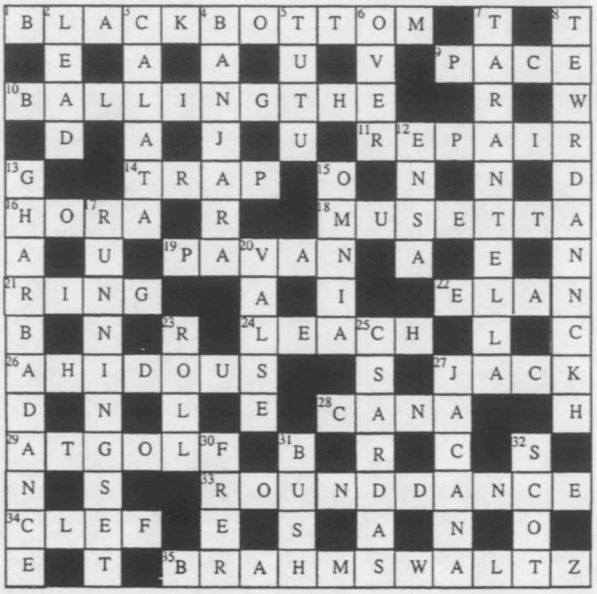
Please send this application (and any supporting documents or other evidence) to:

Dr Margaret Morton, Secretary, N.Z. Mathematical Society,
Department of Mathematics, University of Auckland, Private Bag 92019, Auckland

The NZMS Council normally considers these applications at its meetings in May and November each year, but applications may be considered at other times in exceptional circumstances.

SOLUTIONS TO CROSSWORD NO. 42



Clues to Crossword No 42 (27, 30, 31, 32 down previously omitted)

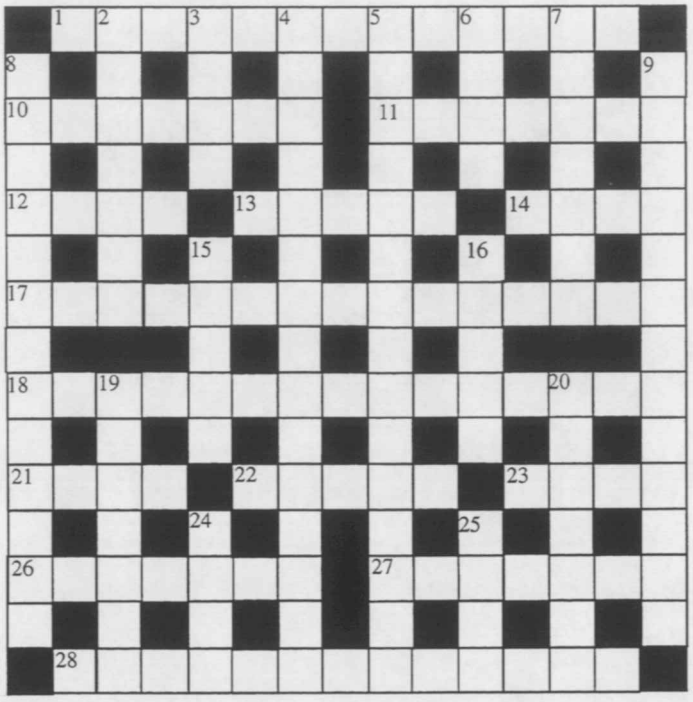
ACROSS

1. Dark base done in the 1920's. (11)
9. Step of peace out east. (4)
10 and 27 ac. The bowler's dance? or naval reprimand? (7, 3, 4)
11. Make good (as in the Progressive Barndance?). (6)
14. Part over is the snare and could be with the drums. (4)
16. Dance of the Roman hour. (4)
18. Her type of song is the last word in 35. (7)
19. A 5 in low dish is slow in 4–4. (5)
21. Call for the arrangement of 33. (4)
22. Sort of lean quality of the Dashing White Sergeant? (4)
24. Lixiviate with 50 apiece. (5)
26. Dance article concealed nothing with us, almost a hideous rearrangemnt. (7)
27. See 10 ac.
28. Wedding picture or dance from the shortened Suez for example. (4)
29. Making steps on the green about to flog a tee before the first. (2, 4)
33. Presumably not for squares. (5, 5)
34. Frolic left with musical sign. (4)
35. Cockney's drunk in 3–4 best known in a flat. (6, 5)

DOWN

2. Metal as do the gentlemen. (4)
3. Lute dance from spreading talc around the AA. (6)
4. From Rajasthan forbid the container before the article. (7)
5. Dance skirt double Caesar's penultimate. (4)
6. Umpire's cry comes after 'The Ball'. (4)
7. Black stuff, insect and girl make an antidote for spider bite? (10)
8. Tops the easy way round done at no northern crowned king's hall to make foreign dance. (11)
12. WWII's entertainers from sane ingredients. (4)
13. Brag raised about an hour the girl follows with the northern anglican making folk movement. (6, 5).
15. Not singular directive could be in a brief moment. (5)
17. Perhaps a jogging group but in Appalachia can have 14 figures. (7, 3)
20. Salve treatment for French version of 35. (5)
23. Edible drum sound is half of a dance. (4)
25. Hungarian dance as on the shuffled cards. (7)
27. Leaf-steeping bird first 3-4 27, last 3-4 28. (6)
30. Short Father hesitation old brother. (4)
31. Dance for the woolshed or the recent White House?. (4)
32. Southern cat's singing style. (4)

No. 43 ***CROSSWORD*** by Matt Varnish



ACROSS

1. Starting price here stepping round the king about space filling (6, 7)
10. Ace made the philosophers' garden (7)
11. Where boney began (7)
12. End ten to two quarters (4)
13. These venues contain an odd number (5)
14. White's? or black trefoil? (4)
17. Where steeplechases are for procedures (sound like applied forces?) (7, 2, 6)
18. Where geometers disagree at the sharp end about war? (5,2,8)
21. Dicey one very loud almost the last (4)
22. Coins that match numbers are about pounds sterling (5)
23. Ruler beginning to start a reign (4)
26. Small staircase for a dance? (3-4)
27. From the start of Archimedes' monster with greek beginning (7)
28. Rich material damaged in end before tips of twelve; every triangle has two (7, 6)

DOWN

2. On the level his problem is extremal (7)
3. Paradise for the Earl of Avon (4)
4. 50/50 yielding before imperial hesitation, disposition needed for the 48? (7, 2, 6)
5. Paper from a bearer of the ass's headgear (1, 4, 2, 8)
6. Meaningless question OK about an answer? (4)
7. Responsible for *The Merry Wives of Windsor* music (7)
8. I, in cattle stop can be connected with 1 and 22 (7, 6)
9. Discretely referring to the arrangement of mathematicians' underwear (13)
15. Pass eats without vowels for surreptitious attention getters (5)
16. Damage the shirt ends, hurt the shoes (5)
19. A florin and nothing more for kind of heating (2-5)
20. Examine point by point since short point shows up (7)
24. Of an organ (with prefix, foreign) (4)
25. Bohemian a thousand and one encored (4)