**THE NEW ZEALAND**
**MATHEMATICAL SOCIETY (INC.)**

# NEWSLETTER

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### NZMS COUNCIL AND OFFICERS



### NEWSLETTER CORRESPONDENTS

**Sub-Editors**
*Book Reviews* Mr David Alcorn (University of Auckland)
*Conferences* Dr Michael Carter (Massey University)
*Visitors to New Zealand* Dr David Robinson (University of Canterbury)

**Honorary Correspondents**

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# EDITORIAL

One of the responsibilities (and usually pleasures) of being a Council Member of the Society is attending Council Meetings several times each year. In the first 3 years of my membership, meetings were held by teleconferencing (phone only), except for one meeting just prior to the colloquium each year. However this February 1, we returned to the "face to face" meeting. (The minutes of this meeting are elsewhere in this issue.)

Although such a meeting requires greater financial and time costs, it is probably more constructive than talking into a telephone. That Thursday was a brilliant summer's day, a day when Wellington is at it's best. The commuter train from Palmerston North arrives about 8.30am, so I had about 90 minutes to kill before we were scheduled to begin. I took the opportunity to stroll through the Bolton Street cemetery and Botanical gardens. Rather unexpectedly I encountered two other Council members also enjoying the gardens before we settled down to business.

The formal report of the meeting is elsewhere, but I do want to highlight two issues that I hope Society members will consider seriously. The first is the issue of professional accreditation, a process mirroring that undertaken by similar societies, whereby we can offer a public meaning to the concept of "professional mathematician". An amendment to the constitution is required, the notice of this amendment is also given in this issue. This is a topic that you should all consider seriously, do examine the proposal before coming to the Annual General Meeting in July.

The other issue is more pertinent to the academic members of the society, and that relates to the category A classification that mathematical sciences have for university funding. Although from the providers a reclassification is likely to be a "zero sum" exercise, and that universities are bulk funded anyway, it appears that these funding categories are indicative of the relatively lower levels of internal redistribution at some institutions in comparison to disciplines that require similar levels of support. As we must embrace the new technologies that are giving mathematics powerful new techniques, we must be able to expose our students to these so that we can continue to produce graduates who will be able to continue to apply modern mathematics in their future employment. A coordinated campaign with Statistics is being planned.

However, if reclassification is to succeed, it will require support from all departments.

I had another 90 minutes to enjoy the beautiful Wellington day before catching my train home. I took the chance of wandering through my old student haunts of Kelburn, the suburb above the university. As it would be several hours before I would be home, I bought a light meal from the delicatessen there. That was a bad mistake!

I discovered a few weeks later that I was one of the 35 known victims of a Hepatitis A contamination from that shop. Having spent most of the last 5 weeks off work, laid low by this virus, and still not fully recovered as yet, I offer my apologies to Society members for the consequent delay in putting this issue together. However, once again the sterling efforts of our typist, Gail Tyson, have ensured that most of the material was ready for production on my return this week.

In 1980 the first of our regular crosswords appeared; a contribution from a member using the pseudonym Matt Varnish. Very few of us knew the identity of Matt Varnish, perhaps only the editors and Matt himself. However, it now seems appropriate to acknowledge the 48th and final crossword by Matt, alias Derrick Breach. I received a message from Canterbury that Derrick passed away on Saturday April 28. At this proof reading stage I just wish to acknowledge the major contribution that Matt Varnish has made to this newsletter, and I trust a fuller article will be prepared for the next issue. Matt's crosswords have challenged, teased and entertained us for 17 years and he is probably irreplaceable. His contribution will be sadly missed. I wish too, to convey to his family and friends my condolences on behalf of the readership of this newsletter.

Mike Hendy

# LOCAL NEWS

**AGRESEARCH**

Major activity centred around the ANZIAM'96 conference at Masterton in February. AgResearch sponsored a plenary speaker, Odo Diekmann, who is Professor of Applied Mathematics at the University of Utrecht. Odo's paper entitled "Physiologically structured populations: modelling and analysis" showed how useful results could be obtained from integral equations. He remarked later that biologists appear to have less difficulty than applied mathematicians when he talks about measures! Other AgResearch contributions to ANZIAM'96 were:

Kao & Smith: "A new approach to modelling cell receptor aggregation phenomena through Gibbs and reaction ensemble simulations".

Kopetschny, Lambert, Louie, Springett & Wake: "Dynamical systems model of earthworms and litter".

Louie: "A continuum mechanics approach to determining the cellular velocity field within a wool follicle".

Metherell, Woodward & McCall: "Modelling phosphorus fertiliser requirements for grazed pastures".

Pleasants, McCall & Wake: "Modelling pasture mass through time with stochastic differential equations".

Roberts: "Possums, parasites and population dynamics".

Saha & Sarbadhikar: "Immune system functions - a simple mathematical approach".

Vetharaniam, McCall & Garrick: "Growth theory for an animal".

Woodward: "Dynamical systems modelling of grass pasture and grazing".

Following ANZIAM'96 Odo Diekmann visited AgResearch at Wallaceville and Whatawhata, as well as Auckland University. The Dutch invasion at Wallaceville continued with a two-week visit in March from Hans Heesterbeek from the Agricultural Mathematics Group at Wageningen, a visit made possible by a Prince and Princess of Wales Science Award. Hans spent the time on joint work with Mick Roberts, and gave a seminar "The Mystical Significance of Arnold" which detailed the history, current state and outstanding problems in mathematical epidemiology.

**UNIVERSITY OF AUCKLAND**

**SCHOOL OF MATHEMATICAL & INFORMATION SCIENCES**

The SMIS has survived the transition to semesters, despite significant hiccups in the implementation of the computer-based enrolment process.

No reliable counts of student enrolments are yet available.

A cricket match was held between the Departments of Mathematics and of Computer Science. The outcome was: 1 bruised nose, 1 broken spectacles and 1 fractured forearm, all scored by Ivan Reilly.

A Forum for Ideas on Teaching was held, chaired by Ivan Reilly, with contributions by Marston Conder, Chris Wild, Jill Ellis, Bill Barton, Greg Oates and Philip Sharp.

The Centre for Discrete Mathematics and Theoretical Computer Science was founded in 1995 as a joint venture of the Universities of Auckland and of Waikato, with Cris Calude and Douglas Bridges as co-directors. It will host its first conference at the University of Auckland on 1996 December 9-13.

**DEPARTMENT OF COMPUTER SCIENCE**

John Hosking has been promoted over the bar in the Senior Lecturer scale. Peter Fenwick has returned from a year's leave, which he spent at several universities in California, Minnesota and Perth.

Professor Charlie Colbourne is visiting from the University of Waterloo (Ontario) until the end of June.

Robert Sheehan has won a Distinguished Teaching Award from the Faculty of Science for 1996. Paul Qualtrough has been awarded one of 14 travel grants under the Young Scientists' Fund of the Royal Society of NZ.

Thirteen students are now enrolled for PhD

**Seminars**

Dr T. Ahrndt, Dr R. Riederer & Dr J.Teiwes (Universität der Bundeswehr Munich), "Computer systems for diagnosis and therapy of speech disorders".

John Cleary (Waikato University), "Deductive programming: a pure approach to logic programming".

Professor Lindsay Groves (VUW), "Deriving programs by combining and adapting refinement scripts".

Dr Mark Titchener (Tamaki campus), "Seeding trees from a coded message".

Dr Alan Creak & Robert Sheehan (University of Auckland), "An operating systems course".

Dr Xiaosong Li (University of Auckland), "Extensions to the PUIST User Interface Specification Tool".

Nickee Sanders (University of Auckland), "Automated testing using executable formal specifications".

Dr Jeremy Gibbons (University of Auckland), "Tracing lazy functional languages".

Howard Wong-Toi (Cadence Berkeley Labs), "HyTech: a symbolic model checker for hybrid systems".

Dr Dale Miller (University of Pennsylvania), "Observations about using logic as a specification language".

Professor Karl Svozil (Technical University of Vienna) "Recent developments in quantum mechanics: `Mindboggling' experiments, quantum information theory and quantum computing".

Dr Rick Mugridge (University of Auckland), "Java and the Web".

Professor Cristian Calude (University of Auckland), "Is computer science a science?".

Dr John Hamer (University of Auckland), "The tyranny of names".

**DEPARTMENT OF ENGINEERING SCIENCE**

Mike O'Sullivan has handed over the reins of HOD to David Ryan. Andrew Mason and Mikael Ronnquist, previously holding limited-term Lectureships, have now been appointed to permanent positions. Andy Philpott has been promoted to Associate Professor. Ian Collins has returned from leave. We are deeply saddened by the loss of his wife, Annette. Peter Hunter has departed on leave, to UCSD and later to Europe.

Recent seminars have included the following:

Dr Gerd Infanger (Stanford University) "Planning under uncertainty - solving large scale stochastic linear programs".

Professor Klaus Neumann (U. Karslruhe) "Heuristics and applications for resource-constrained project scheduling with minimal and maximal time lags".

Professor Ian Clucki (U. Salford) "Real time control of urban drainage using weather radar"

Professor Bruce Bare (University of Washington) "Personal experiences in the development of O.R. techniques to forestry in the Pacific Northwest of the U.S.A."

Professor C.A. Knox Lovell (U. Georgia) "The cost of air pollution abatement in Thailand".

Dr Lawrence Hogben "50 years of Operational Research".

Dr J. Tennant-Smith (formerly at UMIST) "Probability fallacies in DNA-profile evidence at criminal trials".

Professor Goerge Nemhauser (Georgia Inst. Tech.) "Optimization problems in airline scheduling", and "Branch and price: solving huge integer programs by column generation".

Professor Andres Weintraub (U. Chile) "Operational research techniques in forest management".

Andrew Goldie (D.E.S.) "Generation of airline pilot tours of duty using optimization".

Dr Rod Lambert (Massey University) "Using elastica theory to study a biological membrane".

Dr Andrew Pullan (D.E.S.) "The forward and inverse problems of electrocardiology".

Dr Andrew Mason (D.E.S) "Staff planning at Auckland International Airport".

A/Professor Don Nield (D.E.S) "Modelling fluid flow in a porous medium".

Michael O'Sullivan (Jr.) (D.E.S.) "Scheduling and loading of a transportation fleet".

A/Professor Mike O'Sullivan (D.E.S.) "Is Mururoa Atoll leaking?".

Professor A. Antamoshkin (Siberian Aerospace Academy, Krasnoyarsk) "Modelling of the control systems design".

Don Nield

**DEPARTMENT OF MATHEMATICS**

Marston Conder has become the Head of Department, from 1995 December 1. He took up a Claude McCarthy Fellowship in December 1995, to travel to Spain for joint research with colleagues at the UNED in Madrid; and to Singapore, where he was a plenary speaker at the First Asian Technology Conference in Mathematics.

Mavina Vamanamurthy had been Acting Head of Department for 18 months. On his last night as HoD, most members of the Department attended a banquet in his honour, held at Freiya's Restaurant in Ponsonby. After that, Vaman took 2 months holiday in India.

John Butcher and Marston Conder have been appointed to the Marsden Fund advisory panel for the Mathematical & Information Sciences. Marston Conder is convenor of that panel, and is a member of the Marsden Fund Committee for 1996.

Both Lynne Gilmore and Alastair, at Tamaki Campus, have been promoted within the Senior Tutor scale.

Mark Wilson has been awarded a New Zealand Science & Technology Postdoctoral Fellowship, for 2 years.

Colin Fox went to Scott Base in November, to continue his research on ice shelves in the Ross Sea. After that he visited Clarkson University (Potsdam, New York), to continue research with John Dempsey.

John Butcher is on leave, at several universities in Europe and North America. Norm Levenberg is on leave for 18 months. Bruce Calvert is on leave at Rutgers University, and Vivien Kirk is on leave. Peter Lorimer is on leave without pay, until the end of the first semester.

Professor Bob Russell, from Simon Fraser University in Canada, is visiting the Applied & Computational Mathematics Unit, for the first semester. He is teaching a Masters paper 445.770 on Advanced Numerical Analysis.

Professor Dan Archdeacon from the University of Vermont (USA) is visiting the Mathematics Department until April 6. He is based at the Tamaki Campus but will be involved in teaching part of 445.225 Discrete Mathematics on the City Campus. Dr Aisling McCluskey (University College Galway) is visiting Ivan Reilly and other topologists until April.

The book "The Foundations of Topological Graph Theory" by Paul Bonnington and Charles Little, published by Springer-Verlag, was launched at a ceremony at Tamaki Campus in October 1995.

The Department now has more than 25 students currently enrolled for PhDs. Chris Heath, Rowan Killip, John MacCormick and Rachel Weir have been awarded University of Auckland Doctoral Scholarships; and Emily Lane has been awarded a University of Auckland Masters Scholarship.

Graeme Wake organized ANZIAM `96, the 32nd Australasian Applied Mathematics Conference, which was held at Masterton on February 4th to 8th. Over 170 mathematicians came to Masterton from Australia, New Zealand, Fiji, Brunei, Japan, USA, Canada, Sweden, Netherlands and England.

The papers presented by members of this Department were:

Kumar Vetharaniam (with D G McCall & D J Garrick), "Growth theory for an animal".

Graeme Wake, "Predation thresholds for survival of endangered species: the New Zealand kiwi", and

Simon Watt & Graeme Wake on "Uncertainty in epidemic models".

**Seminars**

Professor Ron Dunkley (University of Waterloo), "Good output requires good input".

Liz Stone (Auckland College of Education)

"Assessment in secondary school mathematics: A British perspective".

John MacCormick (University of Auckland), "Decomposing a Lie algebra".

Professor Douglas Munn (University of Glasgow), "Special involutions",

Dr Andy Begg (University of Waikato), "Mathematics Curriculum: looking ahead".

Dr Christine Mynhardt (University of South Australia), _ .

Professor E.J.Cockayne, (University of Victoria BC), "Non-redundant queens on an *n* x *n* chessboard".

Dr Colin Fox (University of Auckland), "Average propagation of sound".

Dr Mikael Ronnquist (Engineering Science), "Optimisation in forestry: log cutting".

Dr Alex McNabb (Tamaki campus), "Membrane diffusion and flux responses".

Dr David G. H. Tan (University of Cambridge),"Fluids research: spacecraft destabilisation and atmospheric modelling".

Professor John Howie (University of St Andrews),

"The place of mathematics in education: recent initiatives in Scotland" and "Infinite semigroups of transformations".

Professor Dan Archdeacon (University of Vermont), "Sewing ribbons on graphs in space".

Dr Mark Wilson (University of Auckland), "Crossed products, old and new".

**DEPARTMENT OF STATISTICS**

Dr Karla Ballman, who has been a Lecturer at the Tamaki Campus, has resigned.

Both Robert Gentleman and Ross Ihaka have been promoted to Senior Lecturer.

Alastair Scott went on short leave to Berkeley. Lakhdar Aggoun has gone on leave to Saudi Arabia for a year.

Chris Triggs attended a Workshop on BUGS - (Bayesian inference Using Gibbs Sampling), Queensland Univ Technology, Brisbane, Dec 4-7, 1995.

Robert Gentleman was on a trip from 18 of Nov to 18 of Dec. He was at the Seattle Biostatistics Conference (21-23 Nov). Then he visited at UBC (Vancouver), Simon Fraser University (Vancouver), University of Heidelberg, University of Augsburg (both in Germany), ETH in Zürich and The American University in Cairo (Egypt). James Curran attended the National Forensic Science Technology Center Workshop - St. Petersburg, Florida.

Seven students are now enrolled for PhD. Gita Mishra has completed her PhD and has been appointed to a Lectureship at the University of Newcastle.

**Seminars**

Professor Leonard L. Scott (University of Virginia), "High weight theory, old and new".

Dr Phil Pollett (University of Queensland), "Quasistationary distributions for Markovian models".

Dr David Balding (Queen Mary and Westfield College, London), "Assessing genetic variability".

Michele Haynes (Queensland University of Technology), "Robustness of ranking and selection rules using generalised g-and-k distributions".

Garry J. Tee

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**UNIVERSITY OF CANTERBURY**

**DEPARTMENT OF MATHEMATICS AND STATISTICS**

Kaikoura was the setting for an international biomathematics conference in March 3-7. The meeting, called "Kaikoura '96" was organized by Mike Steel (in collaboration with colleagues at Massey University) and attracted about 32 participants, many from the US/Germany/Japan (and who mostly paid their own way). They included Professor Masami Hasegawa, a leading mathematical geneticist in Japan and David Swofford from the Smithsonian Institute, whose "PAUP" program is the most widely used package for reconstructing evolutionary trees. Others included Anthony Edwards, from Cambridge, who pioneered statistical approaches to phylogenetics in the 1960's and whose book "Likelihood" is a classic statistical text, and Scott Baker, who recently achieved notoriety when he identified varieties of endangered whale species in sushi and other seafood on sale in Tokyo.

A number of mathematicians also attended, including Professor Mike Hendy from Massey University, and Dr Daniel Huson, a departmental visitor from Universitat Bielefeld, who is working with Mike Steel for three months. Postgraduate students David Bryant, Isaac Freeman and Chris Tuffley also attended the conference. The meeting was held in the University's marine field station, which is spectacularly sited on the north-facing side of the penninsula, and participants had time to engage in whale watching, swimming with dolphins, and hiking up Mt Fyffe.

**Seminars**

Professor Curt Lindner, Auburn University, "How to embed a Partial Steiner triple system" and "Universal algebra and graph theory go hand in hand".

Professor Anne Street, University of Queensland, "Trades and defining sets" and "A few more subsets of Latin squares".

Dr Jonas Lundstedt, Royal Institute of Technology, Stockholm "Signal Restoration and Parameter Reconstruction on Non-uniform Transmission Lines".

Professor John Ll. Morris, University of Dundee, "Splitting strategies in the solution of differential equations ".

Professor Rainer Loewen, University. of Braunschweig "Structures of the real projective plane".

Dr Frank Lad and Dr Reg Dunlop, "Learning about the pulse width modulation of a square wave from digital measurements of its on and off components".

Dr Burkard Polster, University of Adelaide, "Integrating topological geometries"

Rick Beatson

As we went to press we received the sad news that Derrick Breach, a long-time member of the Department, died on Saturday April 27.

Editor

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**MASSEY UNIVERSITY**

**DEPARTMENT OF MATHEMATICS**

**Staff update:**

Robert McKibbin took up the Chair of Applied Mathematics in the Department at the beginning of February.

We welcome Dr Igor Boglaev, who has taken up a two-year lectureship. Dr Marijcke Vlieg, a

Massey Mathematics PhD graduate and temporary lecturer, has taken up a one-year lecturing position for 1996. Dr Francis Thio, currently an Associate Professor of Physics at the University of Miami, will join the Department as a Senior Lecturer at the Albany campus in June; this will bring the number of staff there to four.

Graduate Assistants for this year include Nicholas Allsop, Mary Day, Catherine Rivers, Anton Raviraj Selvaratnam, Thomasin Smith, Margaret Walshaw and Fiona Wharton.

**Postdoctoral Fellows & Visitors:**

After a period of 3 months working here with Mike Hendy, Dr Daniel Huson from the University of Bielefeld moved on to the University of Canterbury, but by now is homeward bound. Dr Anthony Edwards, Reader in Biometrics at Cambridge University, UK, spent about 2 months here early in the year, continuing collaborative research with Mike

Hendy.

Dr Yuji Kamoi left us for Japan after a year with Wolfgang Vogel. Dr Liam O'Carroll from the University of Edinburgh visited and worked with Wolfgang for about a month on a common research topic of Intersection Theory.

Briefer visits have been paid by Dr Rod Gentry (University of Guelph), Dan Hayba (US Geological Survey) and Dr Dan Archdeacon (University of Vermont), all of whom contributed talks and discussions about their current research work.

**Staff travel/conferences:**

Both Mike Hendy and Sören Perrey presented papers at "Kaikoura `96", an international workshop attended by mathematicians, computer scientists and biologists researching phylogenetic analysis techniques. The 30 participants, about half from overseas, spent 5 days at the University of Canterbury's Marine Research Facility at Kaikoura, a perfect retreat for research discussion.

Glenda Anthony presented a paper "Factors affecting Mathematics students' strategic learning behaviours" in the Mathematics Education Stream Programme of the 17th annual conference of the New Zealand Association for Research in Education held here at Massey during December.

Wolfgang Vogel has received two prestigious invitations. The Faculty of Mathematics at Ruhr-University of Bochum (Germany) has invited him to give a series of lectures to MSc and PhD students belonging to the "Graduiertenkolleg"; he will realize the course in block-teaching mode during his visit to the Max-Planck Institute of Mathematics in Bonn while on overseas leave during the period May-August later this year. He was also an invited speaker in a workshop held at UC Berkeley in March. Professor Vogel is now a member of the Editorial Board of the Australian Mathematical Society Lecture Series published by Cambridge University Press.

**Scholars:**

Congratulations to Nicholas Allsop, Ian Beale and Steven Johnston, all of whom have been awarded Doctoral Scholarships, and to Tammy Smith who has been awarded a Masterate Scholarship. David Sherriff and Steven Roderick are Massey Scholars in Mathematics for 1996. Nicholas Allsop was a Visiting Scholar at Sydney University for six weeks over the summer.

**Teaching:**

The introduction of a graduate programme in Mathematics at Albany in 1997 is planned; proposals are now under consideration. Curriculum reviews are continuing within the undergraduate, honours and masters programmes.

The second-year paper 60.204 Differential Equations and Modelling now includes the use of Maple. The software was bought in part using an "Innovation and Excellence in Teaching" grant which Robert McLachlan won last year. He has modified some material he found on the internet which appears to provide an excellent interactive introduction to both Maple and DEs.

Academic Board resolved to require all staff who have not previously supervised a PhD at Massey to attend an induction programme on PhD supervision at Massey before taking up supervisory responsibilities or as soon as possible thereafter.

**ANZIAM'96:**

A sizeable contingent of staff and postgraduate students from the Department attended ANZIAM `96, the Australia New Zealand Industrial and Applied Mathematics conference in Masterton in February. It was deemed to be a great success by most participants. Robert McKibbin and Adrian Swift were Co-convenor/Secretary and Treasurer respectively .

**1996 Mathematics Colloquium update:**

Massey University is to host the 1996 Mathematics Colloquium on 1 to 4 July this year. The topic for the Theme Day will be "Mathematical Physics". The invited speakers will be: Paul Callaghan (Physics, Massey), Colin Fox (University of Auckland), Mikhael Gromov (Inst. des Hautes Etudes Sci. - NZMS Lecturer), Jeff Lagaria (AT&T Laboratories), Robert McKibbin (Massey), Ren Potts (University of Adelaide - ANZIAM Lecturer), John Stillwell (Monash University). See elsewhere in this issue for registration details, etc.

**Seminars:**

Professor Roger Grimshaw (Monash University) was the NZ Mathematical Society Visiting Lecturer for 1995. An applied mathematician, his specialities include fluid mechanics which was the subject of his lectures. We enjoyed his visit and his two talks (see below). He and other visitors contributed to our departmental seminar series which

continues to be busy and interesting in its variety.

Our Mathematical Physics Seminar series, run jointly with the Physics Department, is going ahead again during the first semester this year. In addition, a Mathematical Modelling Discussion Group has started; this is a weekly interdisciplinary seminar/workshop which will bring technology and applied science staff and postgraduate students together with our Department's applied mathematicians for sharing of experiences and with a view to inclusion of mathematicians in applied research groups which are involved with modelling.

**Seminars**

Frances Krsinich (Massey University) "Greek solutions of the three classical problems: Duplicating the Cube, Trisecting the Angle and Squaring the Circle".

Professor Roger Grimshaw (Monash University) "Solitary waves generated by flow interaction with topography", "Interaction of a solitary wave with an external force".

Chris Palliser (Massey University) "Mathematical modelling of heat and mass flow in deep geothermal systems".

Dr Daniel Huson (Bielefeld University, Germany) "The form of an orbifold determines the number of tilings".

Matthew Cole (Massey University) "Mathematical modelling of the cooling of spent anodes in the aluminium smelting industry".

Dr Robert McKibbin (Massey University) "Mathematical modelling: Interdisciplinary conversations".

Professor Willi-Hans Steeb (Rand Afrikaans University, South Africa) "Teaching Mathematics through Object-Oriented Programming with applications to chaotic systems".

Dr Alfred Sneyd (University of Waikato) "Magnetohydrodynamics in industry and astrophysics".

Dr Song Ping Zhu (University of Wollongong) "Selective withdrawal from stratified streams".

Dr Anthony Edwards (Cambridge University) "Venn diagrams old and new".

Dr Francis Thio (Physics, University of Miami) "Plasma materials processing".

Dr Rod Gentry (University of Guelph, Canada) "The kinetics of tissue factor: Aspects of surface-mediated enzyme reactions".

Dr Daniel O. Hayba (US Geological Survey, Reston, USA) "Groundwater flow in magmatic-hydrothermal systems".

Dr Dan Archdeacon (University of Vermont) "Sewing ribbons on graphs in space".

Dr Klaus Neumann (University of Karlsruhe, Germany) "Heuristics and applications for resource-constrained project scheduling with minimal and maximal time lags".

Dr Liam O'Carroll (University of Edinburgh) "On Intersection Theory".

Douglas B. McLeod (San Diego State University) "Setting the standards: NCTM's role in the reform of Mathematics education".

**Mathematical Physics Seminar**

Dr Robert McLachlan (Massey University) "Computational fluid dynamics".

**Mathematical Modelling Discussion Group**

Professor Andrew Cleland (Food Technology, Massey University) "Dynamic model use for process improvement - a case study: Reflections on the last 15 years in meat plant refrigeration systems".

Professor John Edwards (University of Sheffield, UK) "On-line optimal control of chemical and separation processes".

Mr Ralf Schlothauer (Process & Environmental Technology, Massey University) "Modelling activity of a biocatalytic reactor system".

Robert McKibbin

**DEPARTMENT OF STATISTICS**

At the end of March the principal concern of the Department is the appointment of a new Professor. Dick Brook has been Acting Head since Jeff Hunter's elevation to Dean; he is the one most concerned to see an early outcome to the appointment process.

New arrivals in the Department are Alasdair Noble, an ex-school teacher who is lecturing at Palmerston North for a year; Rohan, from Sri Lanka, a Graduate Assistant, also at Palmerston North; and Thomas Yee, from Auckland University, a part-time lecturer at Albany. On his way to a full time lectureship at Albany from Newcastle-on-Tyne is Paul Cowpertwait. Then we have a number of visitors expected at Palmerston North later in the year: Larry Weldon from Simon Fraser University, Canada; Tom Hassard from the University of Manitoba, Canada; and Chris Theobold from Edinburgh University, Scotland. All these people can be financed because the rest of us teach far more students than we ought.

Paula McMillan was our Secretary even before the Department began, but she has now become Faculty Secretary. Her replacement, Manvir Edwards, is quietly organising Dick and the rest of us in a very pleasant sort of way.

After many years of cheerful assisting around the Department, John Koolaard has moved across the road to Crop and Food Research.

Last year Hugh Morton was awarded a prestigious Fulbright Fellowship, from which he has just returned. The news so far is that the snow was depressing, but the research excellent. More will be reported in due course.

As a special biennial treat Palmerston North students visit Statistics New Zealand in Wellington. Unfortunately Howard Edwards at Albany has set new standards by taking Albany students to the casino. Palmerston North would be grateful for ideas on how to compete.

The rather short seminar list suggests that we had little energy left for academic pursuits:

Charles Lawoko (Massey University), "A discussion of a selection of results on contextual classification of hyperspectral data".

Anthony Edwards, (Cambridge University) "The method of minimum Chi-square"

Jenny Edwards, (Massey University) "Statistics packages on the Massey network"

George Seber, (Auckland University), '"Two stage adaptive cluster sampling".

Greg Arnold

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**UNIVERSITY OF OTAGO**

**DEPARTMENT OF MATHEMATICS AND STATISTICS**

As is usual at this time of year, we have been counting our blessings - also known as students. Our EFTS tally is very close to last year's.

Even before the academic year began, we were cheered by the news that Andrew Lonie, a recent graduate of this department, had been awarded a Rhodes Scholarship. Andrew's long-term aim is a career in meteorology.

Temporary additions to our staff include two statisticians from the USA. Jim Hartman, from the College of Wooster, Wooster, Ohio, arrived last May and leaves in April. Philip Dixon, from the Savannah River Ecology Laboratory at the University of Georgia, is here from January to June. Meanwhile, Marti McCracken has extended her stay until June.

We are pleased also to have a prolonged visit by John Rayner, who was a member of this department for many years before moving to the University of Wollongong. John is spending part of his current leave with us.

Another recent visitor was John Stillwell (Monash), who came over for a week in January-February to work on a book with Derek Holton.

The seminar season is only now getting properly under way, but there have been some interesting contributions since the last Newsletter:

Roger Grimshaw (Monash), the 1995 NZMS Visiting Lecturer, on "Solitary waves generated by flow interaction with topography" .

Hugh Best (Science and Research Directorate, Department of Conservation, Wellington), on "Demography of the

New Zealand fur seal on the South Island's West Coast" .

Bryan Manly (University of Otago), on "Salmon survival in the Snake River: are mark-recapture methods scientifically sound?" .

Your regular Otago correspondent, Robert Aldred, is on leave through 1996. He has spent the first three months of the year at the Mathematics Institute of the Danish Technical University in Lyngby, where he has been working with Carsten Thomassen on various graph theoretical problems.

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Bram Evans

**VICTORIA UNIVERSITY**

**ISOR**

**Overseas news**

Peter Smith is back from leave where he worked at the University of Washington (Seattle) and University of Exeter. He visited and gave talks at AT&T Bell Research Labs (New Jersey), British Telecom Research Labs (Ipswich) and StatSci (Seattle). High points of the leave were coffee and bagels in Seattle and letting off 30 tons of explosive in a quarry. Megan Clark has returned from 6 months leave in Chester, visiting Mary Roundfield. Also visiting Universities in Hertfordshire and Durham, productivity was the theme of her leave.

She has now settled back into Clean Green Wellington with relief.

**Book Published**

Professor Tony Vignaux and Bernard Robertson jointly published a book on looking at evidence with a probabilistic view. Entitled "Interpreting Evidence - Evaluating Forensic Science in the Courtroom", it was published by Wiley (UK). They scooted over to the UK for a promotional sojourn, which I believe was most successful.

**Give Away**

John Harper has: Free to a good home as my study is becoming a cluster point or point of accumulation or limit point of such things! (Can anybody explain why we have 3 terms for the same thing?) NZ Maths Magazine vols 5-9. No dates printed on them but they appear to be about 1968-1972.

**Overseas Visitors**

Jim Zolman (University of Kentucky) and Herman Senter (Clemsom University of South Carolina) have both been here over the summer, Jim was with us for a short time and on his departure he very kindly donated some pottery mugs for our tea room. His wife's hobby was a big plus for ISOR! Herman is here till June, at present he is mountaineering and enjoying the sights of the South Island.

Just passing through Wellington on leave from Waikato, Klaus Neumann (University of Karlsruhe, Germany) dropped in and kindly gave a seminar on "Heuristic and Applications for Resource-Constrained Project Scheduling with Minimal and Maximal Time Lags".

**Social**

On the social side we held a Christmas Party this year on the 5th floor balconies and Tea Room, but the wind blew, so we spent most of the time indoors. Still every one behaved and no one fell over the balconies. In February we had another successful wine tasting run by Master of Wine, Alistair Gray.

**DEPARTMENT OF MATHEMATICS**

Professor John Harper recently returned from eight months research and study leave in UK (Cambridge) and USA (mostly Boulder and Santa Barbara ). While he was overseas he was elected Fellow of the Royal Society of New Zealand, in December 1995.

Dr Geoff Whittle has been gadding about again. He attended the South Eastern Conference in Combinatorial Mathematics and Computing, Baton Rouge, Louisiana early this year, and remained for a further two weeks visiting the mathematics department at Louisiana State University.

Irene Pestov, a very active doctoral student, gave a talk at ANZIAM96, the 9th conference presentation for her in the last three years.

Professor Rod Downey doesn't sit still for long either. He has returned from Cornell, and then went to Oberwolfach, Germany, in January, with a side trip to the University of Victoria, British Columbia.

Dr Malcolm Quinn, who completed BSc(Hons) in Mathematics in 1989 and was the top VUW student of his year has now completed a PhD at MIT entitled "A new completely integrable system on the symmetric periodic Toda lattice phase space".

Dr Yde Venema of the Free University of Amsterdam spent Nov-Feb in the Department as a VUW Visiting Fellow, visiting Professor Rob Goldblatt. Towards the end of his stay they were visited by Dr Patrick Blackburn, a Waikato graduate now working at the Department of Computational Linguistics, University of Saarland, Germany. This provided the opportunity for the unprecedented event of 3 logic seminars on one day, viz.

Yde Venema: "Atom Structures of Boolean Algebras with Operators".

Patrick Blackburn: Model-Theoretic Syntax.

Rob Goldblatt: "The Algebra of the Lambda-Calculus".

Charles Semple has won a PhD scholarship from Victoria University of Wellington to work with Dr Geoff Whittle on matroid theory.

Christine Cameron has started a Masters project in Fractal Geometry and Faults, jointly supervised by Dr Mark McGuinness and Professor Euan Smith from Geophysics.

Mark McGuinness

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**UNIVERSITY OF WAIKATO**

**DEPARTMENT OF MATHEMATICS**

**DEPARTMENT OF STATISTICS**

The former Department of Mathematics and Statistics has now officially been reorganized as the Department of Mathematics and the Department of Statistics. Alfred Sneyd and Kevin Broughan are the joint chairpersons of the Department of Mathematics while Nye John is the chairperson of the Department of Statistics.

Student enrolments in mathematics this year are close to the same as last year. Most of the second and third year courses have now been semesterized. This has resulted in a number of staff having unbalanced teaching loads. This allows more research time in one of the semesters, but results in the other semester being very hectic!

Paul Watson who completed his PhD at the University of Cambridge has joined us as a FRST-funded NZ Science and Technology post-doctoral fellow. He is working with Ian Craig and Alfred Sneyd on astrophysical MHD.

After being with us for four years, our computer support person Craig Lynch-Blosse has left to further his studies at the University of Auckland.

Ingrid Melchert is currently on study leave.

Ernie Kalnins attended the Mathematics Workshop held in Tolaga Bay, while Alfred Sneyd attended the applied mathematics conference held in Masterton.

Last year's review of mathematics recommended that there should be a person in the Department who would coordinate the first year mathematics courses. This role of first year coordinator has been taken on by Graham French.

Professor Alfred Seeger of the University of Stuttgart is visiting Ernie Kalnins, while Douglas Bridges has Professor Ray Mines of New Mexico State University as a visitor.

From the next issue of the Newsletter, Stephen Joe will taking over as the mathematics honorary correspondent.

**Seminars**

R. Mines (New Mexico State University), "What exactly is a PID??".

T. Forster (University of Cambridge), "Alonzo Church's set theory".

D. Levi (University of Rome), "Lie symmetries for discrete equations".

A. Seeger (University of Stuttgart and Max-Planck-Institut für Metallforschung), "Theory of magnetic resonance".

B D. McKay (Australian National University), "Eulerian circuits in complete graphs".

K. Svozil (Vienna University of Technology), "Recent trends in quantum mechanics".

V. Jones (University of California at Berkeley and University of Auckland), "Planar algebras".

Kevin Broughan

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# BOOK REVIEW

***Quantum Groups, Christian Kassel. Springer Verlag, GTM #155***

Quantum groups have received special attention in recent years in mathematical research. The basic notion of a quantum group is couched in the language of Hopf algebras. This book by Christian Kassel provides a reasonably well versed mathematical reader with an introduction to the subject. After necessary preliminaries dealing with algebras and Tensor products the book deals with the quantum plane and its symmetries, the Lie Algebra $SL(2)$, the quantum enveloping algebra of $SL(2)$ and the Hopf algebra structure of $Uq(SL(2))$. These are all aptly chosen topics for first chapters as they provide the best clear examples of what the subject is all about. This is in analogy with the study of the representation theory of $SU(2)$ and $E(2)$ for the case of Lie Algebras.

Subsequent chapters provide a generalisation of these examples. Braided bi algebras are introduced with a universal $R$ matrix inducing a solution of the Yang Baxter equation. The dual notion of cobraided bialgebras can be obtained from any solution of the Yang Baxter equation

using methods due to Faddeev, Reshetikhin and Takhtadjan. Drinfelds quantum double construction is then used to build braided Hopf algebras out of any finite dimensional Hopf algebra with invertible antipode. This is demonstrated in the case of the finite dimensional quotient of the Hopf algebra $Uq(SL(2))$. Further chapters progress on how to deal with such topics as Lower dimensional Topology and Tensor Categories and Quantum groups and Monodromy. This leads on into such topics as knots, links, tangles and braids. The close relationship between the newly discovered invariants of links (such as the Jones polynomial), R matrices and quantum groups is pointed out in these chapters.

Finally there are chapters on generalities on Quantum enveloping algebras, Cohomology and rigidity theorems and the Knizhnik-Zamalodchikov equations. Basically this is quite a good book on the subject of quantum groups. As mentioned earlier it covers the subject well using well known examples to get the ideas across. There are exercises at regular intervals which provide a supplement for the text material. There are also references and a notes section where a summary of what is going on is sometimes available. This is a mathematics book and is well worth reading. Those looking for other aspects of this topic such as applications to integrable systems and field theory can find treatments of these topics elsewhere.

Ernie Kalnins

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# CONFERENCES

## 1996 NEW ZEALAND MATHEMATICS COLLOQUIUM

The New Zealand Mathematics Colloquium is being held at Massey University July 1-4 this year. (Please check the WWW site for updated information.)

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## Call for Papers: DMTCS'96

**First Conference of the Centre for Discrete Mathematics and Theoretical Computer Science**

**9-13 December 1996, Auckland, New Zealand**

The Centre for Discrete Mathematics and Theoretical Computer Science, a joint venture involving the Computer Science and Mathematics Departments of the Universities of Auckland and Waikato, was founded in 1995 to support basic research on the interface between mathematics and computing. DMTCS'96 is the first of a planned series of

conferences organised by the Centre.

Original papers are solicited in all areas of Discrete Mathematics and Theoretical Computer

Science, but are especially encouraged in the areas of combinatorics, complexity, computability and constructivity. Authors are invited to submit papers either in hard copy by post, or electronically by email, to the address below. Electronic submissions should be in compressed PostScript format, printable in a standard Unix environment. LaTeX source of final versions of accepted papers will be required.

Joint submissions to other conferences are not permitted. Authors of accepted papers are expected to present their work at the conference.

The proceedings will be published by a major publishing company and will be mailed to the participants after the conference.

**INVITED SPEAKERS**

* G. J. Chaitin

* J. Dinitz

* R. L. Graham

* S. Hayashi

* G. Rozenberg

* A. Salomaa

* H. Siegelmann

* K. Weihrauch

**IMPORTANT DATES**

Submissions due: 15 June 1996

Notification: 15 August 1996

Final copies due: 1 October 1996

**CONFERENCE COMMITTEE**

* Paul Bonnington, Auckland

* Douglas Bridges, Waikato, co-chair

* Cristian Calude, Auckland, co-chair

* Marston Conder, Auckland

* Robert Doran, Auckland

* Peter Gibbons, Auckland

* Hans Guesgen, Auckland

* Steve Reeves, Waikato, secretary

**PROGRAMME COMMITTEE**

* L'aszl'o Babai, Chicago/Budapest

* Douglas Bridges, Waikato, co-chair

* Cristian Calude, Auckland, co-chair

* Gregory Chaitin, IBM New York

* Marston Conder, Auckland

* Jeffrey Dinitz, Vermont

* Jeremy Gibbons, Auckland

* Peter Gibbons, Auckland

* Ron Graham, AT&T Bell Labs

* Susumu Hayashi, Kobe

* Kathy Heinrich, Simon Fraser

* Steve Reeves, Waikato

* Grzegorz Rozenberg, Leiden

* Arto Salomaa, Turku

* Hava Siegelman, Jerusalem

* Klaus Weihrauch, Hagen

**PROCEEDINGS COMMITTEE**

* Douglas Bridges, Waikato

* Cristian Calude, Auckland

* Jeremy Gibbons, Auckland

* Ian Witten, Waikato

**ADDRESS FOR SUBMISSIONS**

DMTCS'96, Department of Computer Science, University of Auckland, Private

Bag 92019, Auckland, New Zealand, dmtcs96@cs.auckland.ac.nz.

**FOR MORE INFORMATION**

Contact the secretary, Steve Reeves, at stever@waikato.ac.nz.

May 29-31 (Wellington, New Zealand) **Science - Women and our future**

Contact Karen Field, 86 Daniell Street, Newtown, Wellington 6002, New Zealand.

e-mail: hancox@actrix.gen.nz

June 24-28 (Dunedin, New Zealand) **Decision Making and Risk Assessment in Biology**

Contact Conference Administrator, Centre for Applications of Statistics and Mathematics, University of Otago, P O Box 56, Dunedin, New Zealand.

e-mail: casm@math.otago.ac.nz

July 1-4 (Palmerston North, New Zealand) **1996 New Zealand Mathematics Colloquium**

Contact the Secretary, Dr Gillian Thornley, Department of Mathematics, Massey University, Private Bag 11222, Palmerston North.

e-mail: G.Thornley@massey.ac.nz

July 8-12 (Adelaide) **Fortieth Annual Meeting of the Australian Mathematical Society**

Contact R R Huilgol, Discipline of Mathematics, Flinders University, P O Box 2100, Adelaide, South Australia 5001.

e-mail: raj@maths.flinders.edu.au

July 8-12 (Sydney) **Sydney International Statistical Congress**

[Comprising: 13th Australian Statistical Conference, (July 8-12)

Computer Science and Statistics: 28th Symposium on the Interface

(July 8-10)

IMS Special Topics Meeting on Contemporary Nonparametrics (July 10-12)]

Contact Director, SISC-96, CSIRO Division of Mathematics and Statistics, Locked Bag 17, North Ryde, New South Wales 2113, Australia.

e-mail: sydney96@syd.dms.csiro.au

July 15-17 (Sydney) **Australian Engineering Mathematics Conference 1996**

Contact D Yuen, Port Kembla Laboratories, BHP Research, P O Box 202, Port Kembla, NSW 2505, Australia.

e-mail: yuen@resptk.bhp.com.au

July 15-19 (Graz, Austria) **Seventh International Conference on Fibonacci Numbers and their Applications**

Contact John Turner, Department of Mathematics and Statistics, University of Waikato, Private Bag 3105, Hamilton, New Zealand

August 20-23 (Melbourne) **ISIS: Information, Statistics and Induction in Science**

Contact Dr David L Dowe, Department of Computer Science, Monash University, Clayton, Victoria 3168, Australia.

e-mail: dld@cs.monash.edu.au.

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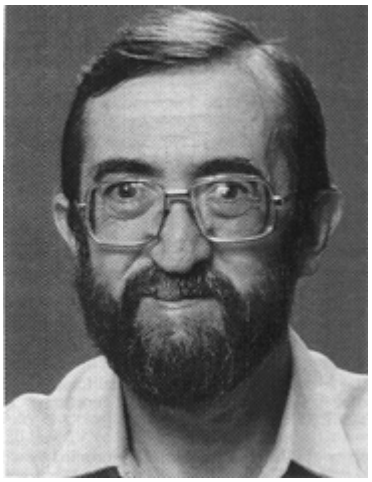
## *Centrefold*



# Ken Ashton, 1935-1995

Ken Ashton was born at Hyde, in England, on 1935 November 4th. His health was poor in his childhood, with cleft palate and defective vision. At primary school, a teacher beat him for not telling the time from a clock - which he could not see! A few years later his sight was found to be defective, and he began using spectacles.

After graduating BSc from the University of Manchester, Ken spent a post-graduate year at the University of Münster in Germany. He then became a Junior Lecturer in Mathematics at the University of Leeds. Professor Stan Wainer (at Leeds), now one of the leading recursion theorists in Great Britain, recalls that Ken was his first and most important instructor in mathematical logic. Ken became a skilled rock-climber and caver in Great Britain.

Ken came to the University of Auckland in 1967 as a Lecturer (later Senior Lecturer) in the Department of

Mathematics. His lectures (especially those on logic) inspired many students to advance in mathematics. He did much work on organizing Stage 1 courses; and he played a major part in founding the Stage 2 course on Principles of Mathematics. His cheerful presence was a feature of many of the annual New Zealand Mathematics Colloquia [1]. His research interests were mainly in logic, artificial intelligence, applications of catastrophe theory to vegetation zoning, mapping, and education [2]; but he published only a few research papers [3].

Ken became prominent in rock-climbing and caving in New Zealand, and he edited the Newsletter of the Auckland section of the Alpine Club of New Zealand. He did some research on cave flora and fauna (especially at Waitomo Caves), and he published several papers on speleology [4]. He married Annette in Auckland, and in 1992 he conducted their two sons over some of the more challenging rock climbs in New Zealand.

Ken had intense interest in literature, and he inspired a taste for poetry in some of his friends. He spoke German and French fluently, and had some command of a few other languages. He played a very active part in the musical life of Auckland, he sang in the University of Auckland Choir, and he attended several of the Waikato Summer Schools in Music. In the late 1970s he studied early music with Steve Rosenberg, as a result of which he became devoted to recorder playing, and he became Secretary of the Early Music Society. He and Annette attended many musical performances, he played piano and cello, and he played the organ at the Anglican Church in Northcote.

In May 1994 his piano playing deteriorated, and he realized that he was not seeing the keys at the left end of the keyboard. Four days later, he underwent drastic surgery at Auckland Hospital, for a malignant tumour in his right visual cortex. A few months later, he underwent a rigorous course of radiation therapy. In January 1995 he was looking forward to resuming lecturing - but he underwent more drastic surgery in March 1995. He and Annette visited Tasmania in June 1995, but he continued on sick leave.

Ken then decided to take early retirement, and a retirement ceremony for him was held in the Department of Mathematics on July 28 1995 .

Several colleagues gave brief lectures on mathematical topics relevant to Ken, and many other people gave spoken tributes to him. He was delighted with his farewell gift from the Department, of a portable CD player.

Ken cheerfully celebrated his 60th birthday at home on November 4th 1995 , and spoke of his hope that he might celebrate Christmas. But a few days later he entered an hospice, where he died on November 18th.

For the funeral service at the Anglican Church in Northcote, additional chairs had to be brought in. Several friends, from his very wide range of interests, spoke in tribute to his memory. His cello teacher said not a word - rather, she performed the Sarabande from Bach's Suite No.5 for unaccompanied cello.

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[1] Abstracts of lectures by Ken Ashton at the New Zealand Mathematics Colloquia:

"A model for the semantics of natural languages",

NZ Math. Mag. 5 (1968), 82.

"Algebraic structures in linguistic theory", Math. Chronicle 1 (1969), 45.

"Lattices and linguistic theory", Math. Chronicle 2 (1972), 103.

"Stratified structures", Math. Chronicle 4 (1975), 45.

"The Dedekind cut revisited", Math. Chronicle 4 (1975), 45.

"Algebra-like structures and biological structures", Math. Chronicle 5 (1976), 79.

"Forest community boundaries - an application of catastrophe theory", Math. Chronicle 6 (1977), 161.

"Ordination and classification within a complex structure", Math. Chronicle 8 (1979), 165.

"Constructs and structure", Math. Chronicle 9 (1980), 169.

"Pattern matching: a general principle and its logical consequences", Math. Chronicle 19 (1990),116.

"Pattern matching in mathematics education", Math. Chronicle 19 (1990), 117.

"Patterns and logic", Math. Chronicle 20 (1991), 166.

[2] Report Series of the Department of Mathematics at the University of Auckland:

"Nabla-structures", No. 8, 21 pages, June 1972.

"Nabla-structures, abstract algebras and structural analysis", No. 13, 9 pages, July 1972.

"Isomorphism theorems, composition series, direct and subdirect products of nabla-structures", No. 16, 17 pages, August 1972.

"Topological nabla-structures, applications in model theory, classification theory and elsewhere", No. 32, 19 pages, November 1972.

"Pattern matching, conceptualisation, semantics and logic", No. 306, 14 pages, September 1994.

[3] "Katasutorofii Yobanachi X, Ichijiha wa Honto ni Ugoku" ("Topics in Catastrophe theory X. Primary wave movement", translated into Japanese by H. Noguchi), Suri Kagaku (Mathematical Sciences) No.185, November 1978.

"The analyses of flow data from karst drainage systems", Transactions of the Cave Research Group of Great Britain 7 (1966), 161-203.

[4] "Limestone speleology", N.Z. Speleological Bulletin 4 (1968), 103-109.

"Artificial flood waves in caves", N.Z. Speleological Bulletin 4 (1968), 111-114.

"The classification and typology of stratified structures", Proceedings of the 6th International Congress of Speleology (1973), 199-209.

"Classification and typological theory of karstic structures", Proceedings of the 6th International Congress of Speleology (1973), 13-18.

Garry J. Tee

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# NOTICES

## NOTICE OF ANNUAL GENERAL MEETING

The Annual General Meeting of the New Zealand Mathematical Society will be held on 1 July, beginning at 4.30p.m. in AH2 at the 1996 NZ Mathematics Colloquium at Massey University in Palmerston North.

Items for the Agenda should be forwarded to the NZMS Secretary, Dr Stephen Joe, Department of Mathematics, The University of Waikato, Private Bag 3105, Hamilton (fax number: (07) 838 4666, email address: stephenj@waikato.ac.nz).

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## FORDER LECTURESHIP

The Forder Lectureship was established in 1985 following a bequest to the London Mathematical Society from the late Professor Henry George Forder (Professor of Mathematics at the University of Auckland 1934-55). Under the terms of this Lectureship, every two years an eminent mathematician in the United Kingdom is selected (by the London Mathematical Society Council in consultation with the NZ Mathematical Society Council) to tour New Zealand for a period of three to four weeks and to give lectures in the six main NZ university centres.

The first Forder Lecturer was Professor Christopher Zeeman in 1987, and was followed by Professor Sir Michael Atiyah in 1989, Professor Peter Whittle in 1991, Professor Roger Penrose in 1993, and Professor Elmer Rees in 1995.

The Forder Lecturer for 1997 will be Professor Ian Stewart of the University of Warwick. Further details of his visit are currently being arranged. The contact person for his visit is Dr Rick Beatson (University of Canterbury), email: rkb@math.canterbury.ac.nz. The NZMS is grateful to the London Mathematical Society for supporting this visit.

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## CALL FOR NOMINATIONS FOR NZMS COUNCIL POSITIONS

As the terms of office of the Outgoing Vice-President (Marston Conder) and three Council members (Rick Beatson,

Ernie Kalnins, and Mark McGuinness) come to an end in 1996, nominations are called for the following vacancies on the NZMS Council:

Incoming Vice-President

Council members (three)

The term of office of the Incoming Vice-President is one year, after which that person is expected to become President for a two-year period, and then Outgoing Vice-President for a further year.

The term of office of a Council member is three years. Council members may hold office for two (but no more than two) consecutive terms.

Nominations should be signed by two proposers and the nominee, all of whom should be current Ordinary or Honorary members of the NZ Mathematical Society. Please forward nominations by Monday 20 May to the NZMS Secretary, Dr Stephen Joe, Department of Mathematics, The University of Waikato, Private Bag 3105, Hamilton (fax number: (07) 838 4666, email address: stephenj@waikato.ac.nz).

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# NZMS VISITING LECTURESHIP

Each year the NZMS coordinates and provides some financial support for a tour of NZ universities by a visiting mathematician. Usually this person - known as the NZMS Visiting

Lecturer - will spend two to three days at each of

the six main university centres, and give at least two lectures at each place: one for a general audience, and one more closely tied to his or her own particular research interests. Recent NZMS Visiting Lecturers have included Professor John Loxton (Macquarie University), Professor Andreas Dress (University of Bielefeld), Dr Colin Maclachlan (University of Aberdeen), and Professor Roger Grimshaw (Monash University).

The NZMS Council has offered the 1996 NZMS Visiting Lectureship to Professor Valerie Isham from University College London. Professor Isham is likely to tour in October 1996.

Nominations for the 1997 NZMS Visiting Lectureship are now being requested by the NZMS Council. Names of suitable candidates should be sent, together with a brief description of their current position and field(s) of interest, to the NZMS Secretary, Dr Stephen Joe, Department of Mathematics, The University of Waikato, Private Bag 3105, Hamilton (fax number: (07) 838 4666, email address: stephenj@waikato.ac.nz).

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# AITKEN PRIZE (NZMS STUDENT PRIZE)

The NZ Mathematical Society offers a prize for the best contributed talk by a student at the annual NZ Mathematics Colloquium.

Known as the Aitken Prize, in honour of the New Zealand born mathematician Alexander Craig Aitken, this prize will be offered for the second time at the 1996 Colloquium to be held at Massey University in Palmerston North during the week 3-7 July 1996.

The prize will consist of a cheque for NZ$250, accompanied by a certificate.

Entrants for the prize must be enrolled (or have been enrolled) for a degree in Mathematics at a university or other tertiary institution in New Zealand in the year of the award. During the Colloquium, they should give a talk on a topic in any branch of the mathematical sciences.

A judging panel will be appointed by the NZMS Council, and make recommendations to the NZMS President and Vice-President for the award. Normally the prize will be awarded to one person, but in exceptional circumstances the prize may be shared, or no prize may be awarded.

Entrants should clearly indicate their willingness to be considered for the award when they register their intention to contribute a talk at the Colloquium. For the 1996 Colloquium, this information is required by the organising committee by May 31, to Secretary, 1996 NZ Mathematics Colloquium Committee, Mathematics Department, Massey University, Private Bag 11-222, Palmerston North, New Zealand.

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# REPORT ON THE AUSTRALIAN STRATEGIC REVIEW OF THE MATHEMATICAL SCIENCES

Over the last eighteen months, the National Committee for Mathematics of the Australian Academy of Sciences, has initiated and overseen a Review of the Mathematical Sciences. The final report was published in January 1996 and was publicised widely at a symposium held in Sydney on 23 February of this year. I was privileged to attend the symposium with the support of the Royal Society of New Zealand, the New Zealand Mathematical Society and the New Zealand Statistical Association. The motivation for attending was that a similar kind of exercise should be undertaken in New Zealand. Indeed the sub-committee for the Mathematical and Information Sciences of the Royal Society of New Zealand has recommended to the Ministry of Research, Science and Technology through the Chief Scientist therein that a similar exercise be held in New Zealand. His response is awaited.

The report that was produced across the Tasman is wide ranging and relevant. It contains specific recommendations for the enhancement and continued development of the Mathematical Sciences (including pure and applied mathematics, operations research, statistics, actuarial science, etc). It is clear that there are specific concerns to do with the research funding base in Australia, albeit that being probably better than it is in New Zealand, the ageing of the profession of mathematicians in Australia, and under-representation of groups (gender, ethnicity, etc). There are specific recommendations about forming cooperative research centres in locations across Australia of finite life, building up centres of excellence and moving these around the country as opportunities permit. The forerunner of this kind of exercise was the Centre of Mathematical Analysis at ANU in Canberra. At present there are no such CRCs in the mathematical sciences in Australia, although a number of bids are currently being considered. The relative immobility of staff between institutions is addressed and recommendations for enhancement of this movement, and perhaps joint appointments even, are canvassed.

The structure of the report is impressive. There are recommendations directed to professional societies, academic departments, scientific organisations and federations of industrial private stakeholders in the areas considered. Specific follow-up action has been signposted. The report is backed by good research and technical information.

To publicise the report, a forum was held with noted speakers from across the nation in the University of New South Wales in February of this year. Politicians attended as well as representatives of industry, though the publicity generated was perhaps overshadowed by the soon to follow federal elections in Australia. However, the National Committee for Mathematics in Australia (chaired by Professor Ian Sloan of the University of New South Wales) had geared itself up to produce a number of newsworthy items concerning the use, structure and power of mathematics across and within other disciplines at that time. A stream of news items and articles subsequently appeared. The impact will be hard to measure, although my feeling was that it was a success quite well managed. Congratulations to our Australian counterparts.

I am definitely of the opinion that we should follow up the exercise that our sub-committee has initiated and we strongly urge that the management of this process be retained by the profession in this country, albeit augmented by possible outside experts. There needs to be a thorough survey of groups within the country and regional meetings held to evaluate the health of our profession and the needs in the current funding programme. Previous admissions on Key Science Areas have signified that mathematics is everywhere but nowhere and is often falling through the cracks in the current science fabric, which stresses output areas rather than fundamental disciplines. It would be an interesting exercise to follow through the Australian one here to see how we measure up to our Australian cousins. One thing is certain - it is a big undertaking to do a Review of this size and complexity. Some risks are present but are worth taking for the good of our discipline(s), I believe.

I would like to thank the two professional societies and the Royal Society of New Zealand who supported my attendance at the symposium in Sydney in February.

Professor Graeme Wake

The University of Auckland

Convenor of the Sub-Committee for the

Mathematical and Information Sciences, RSNZ

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# 32nd ANZIAM APPLIED MATHEMATICS CONFERENCE

**Masterton, New Zealand: 4-8 February 1996**

The 32nd ANZIAM Applied Mathematics Conference was held in Masterton, New Zealand (100 kms north east of Wellington) on 4-8 February 1996. This was the third time the conference has been held in New Zealand (the other two were Wairakei 1987 and Hanmer Springs 1991). There were 172 registrants (including 35 students) and in addition 20 accompanying persons.

The venue of the Solway Park Travelodge Conference Centre proved to be excellent with good lecture facilities for the 120 talks (3 streams for the contributed papers and 7 invited plenary talks) and 5 posters. A reserve list of talks which were notified after the deadline of 8 December were slotted in as opportunities arose. The recreational and social facilities were excellent with pools, parks and a golf course nearby proving popular.

The invited speakers were:

Professor Don Cohen, California Institute of Technology "Forbidden Regions for Shock Formation in Diffusive Systems: The Design and Use of New Polymeric Materials".

Professor Ellis Cumberbatch, Claremont Graduate School, California; "Solutions to the linear wave equation with varying wave speed".

Professor Odo Diekmann, Utrecht, The Netherlands; "Physiologically structured populations: modelling and analysis".

Professor Eusebius Doedel, Montreal, Canada; "Algorithms and software for the numerical analysis of nonlinear differential equations".

Professor Shigeo Kimura, Conjugate Kanazawa University, Japan; "Natural Convection in Porous Media".

Dr Alex McNabb, University of Auckland, New Zealand; "The geothermal-vulcanology connection in the Taupo Volcanic Zone".

Dr Phil Pollett, University of Queensland, Australia; "Modelling Bistability in Telecommunications Networks".

In addition, a special session on "How to give an effective presentation" was delivered by Mrs Margaret de Mestre.

A half-day mini-symposium on Mathematics in Agriculture was held in recognition of the leadership in this area provided by New Zealand Applied Mathematicians. Professor Diekmann provided the plenary in this area. The Conference Booklet is now provided with an ISBN number for referencing purposes.

Special events were included with the theme dinner "Math-Hatters" competition (best hat) being a highlight. The T.M.Cherry Prize winners (joint) from 35 talks were:

Mr David Scullen, (University of Adelaide); "Three-Dimensional Steady State Nonlinear Free Surface Flow Computations", and

Mr Alan Gore, (University of Newcastle); "Normal Modes of Polytropic Atmospheres".

Highly commended in this competition were Mr Ian R Ball (University of Adelaide), Ms Sacha O Cyganowski (Deakin University), Ms Maureen P Edwards (University of Wollongong), Mr Gordon Hume (University of Sydney), Mr Dimitry E Pelinovsky (Monash University) and Ms Yvonne M Stokes (University of Adelaide). Professor Brian Gray of the University of Sydney chaired the Cherry Prize Committee.

In line with the pattern inaugurated at the 31st ANZIAM Applied Mathematics Conference, the students presented their nominations for the "Cherry Ripe Award". Those acclaimed in this area were: Dr Andrew Pullen, University of Auckland (winner) and honourable mentions were given to Dr Steven Barry (Australian Defence Forces Academy, UNSW), Dr Graeme Hocking (Murdoch University), Dr Mark McGuinness (Victoria University of Wellington), Dr Wayne Read (James Cook University, Townsville), and Dr David Stump (University of Queensland). Thank you to the student fraternity for their initiative in arranging this highly successful innovation.

The finances went well with sponsorship being provided from AgResearch (NZ Pastoral Research Ltd) and Massey University who assisted in the visit of Professors Diekmann and Kimura respectively. A small profit was made on the conference to return to the central organisation.

This concludes two years of planning. An exit questionnaire to the participants provided positive feedback for the Executive Committee of ANZIAM. The organisation was shared by a hard working committee (representing the New Zealand Branch of ANZIAM):

Professor Robert McKibbin, Massey University, Secretary and Deputy Director; Mr Adrian Swift, Massey University, Treasurer; Dr Michael Roberts, AgResearch, Technical Programme; Dr Graham Weir, Industrial Research Ltd, Accommodation; Dr Mark McGuinness, Victoria University of Wellington, Transport ; Dr Aroon

Parshotan, Landcare Ltd, Tours; Mr Easwaran Balakrishnan, Massey University, Conference booklet; with myself as Conference Director (being both Director and Chair of ANZIAM made it a hectic conference for me especially).

Graeme Wake

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# NOTICE OF MOTION FOR THE 1996 AGM

**Proposed Changes to the NZMS Constitution - Optional Accreditation**

Proposed by: Rick Beatson, Douglas Bridges, Marston Conder, Stephen Joe and Ernie Kalnins.

The purpose of the proposed changes is to introduce a scheme of optional accreditation of members of the Society. This scheme is largely based on the accreditation scheme introduced by the Australian Mathematical Society in 1994.

It advocates a 3-tier system to be overlaid on the existing membership structure, to enable Ordinary Members to apply to be certified as Graduate Members, Accredited Members, or Fellows, on satisfying an Accreditation Committee of their credentials. Those credentials would be described in a set of Rules to be determined by the Society.

Note that this scheme does not affect the Society's membership policy, and does not suggest a test on membership. All persons with an interest in mathematics in New Zealand should continue to be able to be considered for membership, and those members who see no need for their own credentials to have any further form of endorsement should feel under no pressure to seek accreditation.

The accreditation process may be viewed in general terms as one of arriving at a definition of a working "mathematician" in any situation, but particularly for industrial mathematicians and mathematical consultants, as well as academic and research mathematicians.

The need for some form of accreditation is supported by the following arguments, some of which have a professional basis reflecting current concerns of the scientific community:

* Greater certainty would be provided in the mathematics profession as a result of accreditation: those persons who consequently call themselves mathematicians would possess skills considered by the profession to be essential, and consulting mathematicians in particular would not be compromised by unqualified individuals in the field.

* Those persons without formal qualifications would be allowed to demonstrate publicly that they have equivalent skills - this is becoming increasingly important in fields such as mathematical modelling in medical research.

* Those persons with a first degree could be encouraged to undertake postgraduate work to gain a higher level of accreditation.

* Competency based standards and assessment are being promoted by Government and strongly supported by unions and other professional associations. In many areas of commercial and industrial activity, more mathematics is needed. If the Society has no standards asserted for its own members, it may not be accepted to contribute fully in determining mathematical qualifications of others and in protecting the term "mathematician" from abuse in other fields. Other organisations may well step in and assume that right. We have already seen the emergence of "software engineers" it may not be long before we are faced with "analytical engineers"!

Note that this scheme does not pertain to *programme accreditation*, as carried out by many other professional societies, nor does it back a more extensive *certification of membership,* as occurs with certain other societies and which would involve examination of competency at regular intervals.

As noted earlier, the Australian Mathematical Society introduced a similar 3-tier scheme in 1994. Also the NZSA and other national statistical associations are in the process of introducing certification of their members. The Institute of Mathematics and its Applications (IMA) has had an accredited membership since its foundation in 1964, and in the last few years, has introduced the term "Chartered Mathematician", so that non-members of the IMA may also have their credentials certified. The Institute of Combinatorics and its Applications (formed five years ago) models its structure on the IMA.

The scheme for optional accreditation proposed here is designed to be simple on all counts: easy to implement, and with little disruption to the traditional operation of the Society. If a good proportion of members take up the option and become accredited, then the Society will have a satisfactory base from which to argue its own case for competency based standards within the mathematics profession, if necessary. It should also have the effect of encouraging academics and other working mathematicians to see the usefulness of belonging to their professional

organisation, the NZ Mathematical Society, and enabling that organisation to endorse their activities as professional mathematicians.

Accordingly, the following changes to the Constitution of the New Zealand Mathematical Society are proposed. **These changes will be voted upon at the Annual General Meeting on 1 July**.

If these changes are approved, the Council will then consider the final wording of the Rules, and appoint the first Accreditation Committee.

Change numbering of Articles IV-XI in current Constitution to Articles V-XII, that is, increase their number by one, with consequential changes to references to these Articles.

Add the following:

Article IV: Optional Accreditation

An Ordinary Member (or Reciprocity Member) may apply to the Council to become a Graduate Member, Accredited Member, or Fellow. The Council shall make and issue, and may revise from time to time, Rules which shall give effect to the following requirements.

(a) A Graduate Member shall have completed a degree or diploma at a recognised university or other tertiary institution, the studies for which shall include as a major component an area of mathematics, and shall be currently employed or occupied in the development, application or teaching of an area of mathematics.

(b) An Accredited Member shall have completed a postgraduate degree in some area of mathematics at a recognised university or other tertiary institution, or shall have equivalent qualifications, and shall have been employed for the preceding three years in a position requiring the development, application or teaching of an area of mathematics.

(c) A Fellow shall be a person who currently has or previously has had the qualifications of an Accredited Member and who, in addition, is deemed by the Accreditation Committee (see paragraph below) to have demonstrated a high level of attainment or responsibility in an area of mathematics and to have made a substantial contribution to mathematics or to the profession of mathematician or to the teaching or application of mathematics.

An Honorary Member shall have the right to become a Fellow immediately upon application to the Council and without payment of a fee.

The Council shall establish an Accreditation Committee to consider applications for designation as a Graduate Member, Accredited Member or Fellow, and to administer the Rules described in the first paragraph above. In its determinations, the Accreditation Committee shall discount interruptions to employment such as temporary unemployment and parental leave.

A Graduate Member may use the abbreviation GNZMS, an Accredited Member may use the abbreviation MNZMS, and a Fellow may use the abbreviation FNZMS. These designations and the corresponding abbreviations are the rights of that class of Member only while the member remains a financial member of the Society and while the occupational requirements outlined in paragraph 1 continue to be satisfied. The occupational requirements shall be deemed to be satisfied by Honorary Members and in the case of interruptions to employment such as temporary unemployment and parental leave, and they shall not be applied in the case of retirement or promotion to an administrative or other position.

A fee shall accompany each application to the Accreditation Committee. The fee shall be additional to the annual subscription charged by the Society and shall be the only charge for accreditation.

**The Accompanying Rules**

The Rules should describe the mechanics of the Accreditation Committee, its processes for the verification of applicants' credentials, all fees to be charged, and other relevant matters. They should aim to be reasonably comprehensive, so that arguments and grievances may be resolved as often and easily as possible by reference to them. It may be necessary to revise the Rules from time to time as precedents arise and conditions change, and it should be within Council's rights to do this with reasonable speed and ease (without the necessity of writing them into the Constitution).

Allowing for the possibility of minor changes, the Rules would be initially as follows:

1 Nothing in these Rules shall be considered to apply to Honorary Members.

2 (a) The Council shall establish an Accreditation Committee normally consisting of three Fellows of the Society, each appointed for a period of three years. The initial Accreditation Committee shall consist of three Members of the Society who are either Professors or Honorary Life Members, appointed for a period determined by the Council.

(b) One member of the Accreditation Committee shall be designated as Chairperson. When required, another shall be designated as Incoming Chairperson and become the Chairperson in the following year, to ensure continuity in the Committee's procedures. The Committee may request assistance of any other member of the Society from time to time, as it sees fit.

3. The Committee shall each year call for Ordinary Members to apply, if they wish, for accreditation. Requests for accreditation may also accompany the initial application for membership of the Society. The application shall be made to the Chairperson of the Committee on the prescribed form, to be prepared by the Committee, and shall include the fee (see Paragraph 6 of these Rules). It shall also include a written reference, preferably from a current Fellow of the Society who knows the applicant, and any other required or desired accompanying material. Three copies of the application shall be submitted, except that the Chair may announce arrangements for electronic submission of the application.

4 In the verification of credentials, the Committee shall be guided by paragraphs 1 and 3 of Article IV, by the letter of reference, and by precedents. It may request further information from the applicant, consult referees of its choice, and, in satisfaction of "equivalent qualifications", may itself set examinations. The Committee shall have no right to set examinations for applicants whose degree or diploma is from a New Zealand university, as defined by the NZ Vice-Chancellors' Committee.

5 On receipt of an application, the Chairperson of the Committee shall circulate copies to the other members and following the necessary procedures (by correspondence or otherwise), shall determine the majority decision on each application. This decision shall be one of: agree to accreditation at the requested level, offer accreditation at a lower level, or refuse accreditation. The Committee should endeavour to finalise any request for accreditation within two months of receiving the application if the qualifications are largely from New Zealand, or within six months if there is a substantial overseas component.

6 As specified in paragraph 5 of Article IV, a fee shall accompany each application for accreditation. The fee shall be additional to the annual subscription charged by the Society and shall be charged once only, taking into account that

(a) there shall be a further fee if a subsequent application for accreditation at a higher level, or accreditation following a prior refusal of accreditation is received, and

(b) when examinations are to be set, an augmented fee for cost retrieval shall be charged, at a level determined jointly by the Chairperson of the Accreditation Committee and the Treasurer of the Society.

The basic fee shall be determined each year by Council and shall not exceed twice the annual subscription paid by an Ordinary Member. The fee shall not be refundable, regardless of the outcome of the application.

7 All legitimate relevant expenses of the Accreditation Committee, including charges for setting, assessing and marking of examinations, shall be reimbursed by the Society through the Treasurer.

8 Appeals against decisions of the Accreditation Committee shall be addressed to the President of the Society and decided upon by the President and Vice-President, taking into account all principles of natural justice.

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# MINUTES OF THE THIRTY-EIGHTH COUNCIL MEETING

**THURSDAY 1 FEBRUARY, 1996.**

The meeting was held at the Victoria University of Wellington and began at 10.30 a.m.

**PRESENT**: R. Beatson, D. Bridges (Chair), M. Conder, R. Goldblatt (standing in for M. McGuinness, Treasurer), M. Hendy, E. Kalnins, and M. Roberts.

**APOLOGIES**: D. McCaughan, S. Joe, and M. McGuinness.

1. **Minutes of the 37th meeting**: These were approved.

2. **Matters arising from the minutes:**

(a) For the 1996 NZMS Visiting Lecturership, Professor Valerie Isham (University College London) has been approached.

[*Note*: *Professor Isham has accepted the invitation, subject to suitable arrangements being made for her airfare, and*

*will spend three weeks from mid-October.*]

(b) There is a need to consider suitable candidates for the 1997 NZMS Visiting Lectureship.

(c) Professor Ian Stewart has accepted the Forder lectureship for 1997. Dr Beatson has agreed to be in charge of the visit and its associated administrative responsibilities.

(d) For the Royal Society meeting to be held the following day *[February 2]* an electoral college representative was necessary to replace Professor G. Wake. It was suggested that Professor J. Hunter might be suitable.

(e) Approval was given to support Professor G. Wake financially to the extent of $300 to visit Australia for the one-day Mathematical Sciences Symposium. It was agreed that he should publish a report of his trip in the Newsletter.

3. **Treasurer's report:**

(a) Professor Goldblatt reported on behalf of Dr McGuinness. No further requests for money could be met at this stage.

(b) It was agreed to communicate this to all the applicants, but that the application from C. Stephens be deferred while those from the other applicants be declined.

(c) There was also some suggestion that the application form be redesigned so as to carry more information such as previous application details. The use of subscription rates and accreditation to raise more revenue was also discussed.

(d) The signatures of Professor Bridges and Dr Joe, with Professor Conder as a backup were approved for financial transactions.

4. **WWW pages:**

The Web pages of the Society are to be transferred to the University of Waikato but the Web master directory is to remain in Auckland. The Newsletter will remain under the control of the Editor.

5. **Accreditation**: It will be put before the AGM that a system of accreditation be proceeded with by the Society. The model for this is the equivalent one in Australia where a three-tier system is in operation. A possible fee structure would be:

(i) Graduate Member $50

(ii) Accredited Member $75

(iii) Fellow $100

To start the process an interim Accreditation Committee consisting of mathematicians who are Fellows of the Royal Society is proposed. Matters concerning changes to the Constitution need to be addressed.

6. **Funding of Mathematics**: It was agreed that a persistent campaign be undertaken to improve the lot of mathematics funding. Included in this effort would be very clear comparisons with the situation in Australia and Great Britain. A coordinated and persistent case is to be made in this direction.

*[Note: At the Royal Society meeting it was agreed that Professor G. Wake would talk to the Government Chief Scientist, Professor Don McGregor, regarding setting up a working party to discuss the subject of level of funding.]*

7. Drs. Beatson and McGuinness, and Professor Kalnins are finishing their terms. Dr Vivien Kirk has agreed to be nominated. There need to be nominations from Wellington and at least one from the South Island (probably from the University of Canterbury). Nominations for Incoming Vice-President are also needed (perhaps from outside the University mathematics establishment).

*[Note: Professor Goldblatt might be persuaded to be nominated for Incoming Vice-President.]*

8. **Aitken judging panel**: Professor Conder outlined the procedures used in the first competition. The awarding of a first prize and highly commended was the precedent. The choice of judges should, if possible, reflect the material being presented; a single session for entrants seemed to work quite well at the Dunedin Colloquium. The assessment is based on 50% for content and 50% for presentation.

It was agreed to discontinue the predoctoral thesis competition.

9. **Job register**: The concept of a job register for mathematicians was discussed --in particular, the submission made by Associate Professor Kevin Broughan. Methods of advertising for jobs were suggested. Of particular mention was electronic mail and a bulletin board for jobs as well as a Web page. A charge of say $50 for such a service might make sense. The Society supported the idea but was not of a mind to contribute to the costs.

10. **Interaction with schools:** The necessity of communicating with the student population in the schools was discussed. The possibility of outreach programmes to high school students is seen as an important line of communication. In particular the use of audio-visual equipment is seen as a potential means of generating interest. Interaction between the university community and the teaching community with the assistance of the NZMS is also encouraged.

It was agreed that Professor Bridges communicate with NZAMT to ask them to find out how the university mathematics departments could be of help to school teachers and in particular, how they could help in the enrichment of Mathematics for students.

*[Note: Professor Bridges had discussions with Mrs. Jan Wallace, the new President of NZAMT, at the Royal Society meeting the next day, and was invited to a two-day meeting in February which he attended.]*

12. **General business**: Professor Mike Hendy outlined the current plans at Massey for the Colloquium. It was agreed to have the general business meeting before the dinner. The deadline for research awards was noted, as was the possibility that the successful recipients be present at the Colloquium.

The next Council meeting will be held on Sunday, 30 June at Massey University.

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# GRANTEE REPORTS

***Dr Angéle Hamel, University of Canterbury***

I would like to thank the New Zealand Mathematical Society for awarding me a grant of $200 to attend the Canadian Mathematical Society Winter Meeting at Simon Fraser University, Harbourfront Campus, in Vancouver, December 9-11, 1995. The year 1995 was the 50th anniversary of the founding of the Canadian Mathematical Society and, in addition to the usual sessions, the conference had special awards and events in recognition of that fact. While in Vancouver I attended sessions on Representation Theory and Computational and Experimental Mathematics, and also presented a paper entitled "Determinants for Schur functions, Q-functions, symplectic and orthogonal Schur functions".

After the meeting I travelled first to the University of Prince Edward Island, and then to the University of Waterloo, Waterloo, Ontario where I continued a long-standing collaboration with Professor Ian Goulden of the Department of Combinatorics and Optimization. We interacted on a number of projects and made excellent progress. In addition, I conducted several successful raids on the library and spirited home photocopies of many new papers in my areas!

I would like to express my gratitude again to the New Zealand Mathematical Society (and also my department at Canterbury) for contributing to the cost of this fruitful trip.

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***Kerry Richardson, University of Auckland***

I visited York University, Ontario for five months commencing 6 November 1995. I was developing the theory of resolutions. Resolutions provide a technique that enables one to construct designer topological spaces. If a topological space with certain properties is required then the theory tells you what you will need to construct this space and the technique itself will tell you how to construct it.

A fascinating feature of resolutions is that it captures all the seemingly far flung examples of topological spaces and one can construct them all with the same technique. More than that however, the butterfly space, for instance, constructed by resolutions generates an entire class of butterfly spaces.

But perhaps even more remarkable is that changing only the geometry of one of the building block spaces while leaving its topology unchanged actually changes the topology of the resolved space!

Almost nothing is known about special resolutions let alone resolutions of other kinds. Indeed what has been done so far is very much a pioneering work and I am grateful to Steve Watson for his time in teaching me the technique and encouraging me to pursue and push my ideas. I was able to discuss some results with Arhangel'skii, a well known topologist who was interested in the findings. This visit has been a tremendous boost to my research and the many results that will follow would not have been as quickly obtained without it.

The highlight of my trip? A visit to New York City. It really does pulsate 24 hours a day.

I acknowledge with appreciation the financial help of New Zealand Mathematical Society, Maori Education Trust and The University of Auckland Graduate Research Fund.

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# Crossword No. 47: Play fair a bit

by Matt Varnish


ACROSS

1 PA ZA YA EQ ET VZ VZ CB EY PN DU PO RB AG BP GL CR BY PC (15)
8 Slide in backward two-toer flower (4)
10 Priests' hand-warmers (or `Strine literature?) (5)
11 Cry painless colour (4)
12 Not a good thing to go down? (4)
13 A cat maybe a small thing (4)
14 Bright shiner endlessly alone (3)
15 Gold disc to exist before the last worker (6)
17 Make free of the sole noun (8)
20 *(The keyword for a Playfair grid, omitting J. It is self descriptive in a sense.)* (15)
23 Partly so, something in cell (8)
26 About the First Gentleman of Europe (6)
28 One in seven, one in opposites (3)
29 Loyal meadow left (4)
30 A strange plant (4)
32 Muddled assent for an unfledged eagle (4)
33 Once a disturbed water, big, ... (5)
34 ... small, thanks to the Royal Navy (4)
35. NC OP QO BG NB AT QY PC TZ EU EB HT IG RV GN UA (15)

DOWN

1 Community feeling to bring house lines together (15)
2 Victoria's archbishop honey possum (4)
3 Records attempt rich fabric (8)
4 Throwing some light while playing unlit mime scenes (4-11)
5 Attack makes donkey sicken (6)
6 Bit of a list to make up time (4)
7 Divinely divided cedeing old stone (as is Kiwi in retirement paradise?) (6-9)
9 Headless `face in a mystic light' encompassing spirit (4)
11 Repetitive up and downer (2-2)

16 Each once worth two sounding trays (5)
18 Three quarters of 27 dismissed (3)
19 Elba's blackness (5)
21 Step of the father (3)
22 Her and no other, the Hideaway operator (8)
24 Scots grandchildren make public cry (4)
25 Foursquare but not square shortbob pine (6)
27 Got on untreated toes the beginnings of a painful end (4)
29 Den of the evil liar (4)
31 The month leads a civilization (4)

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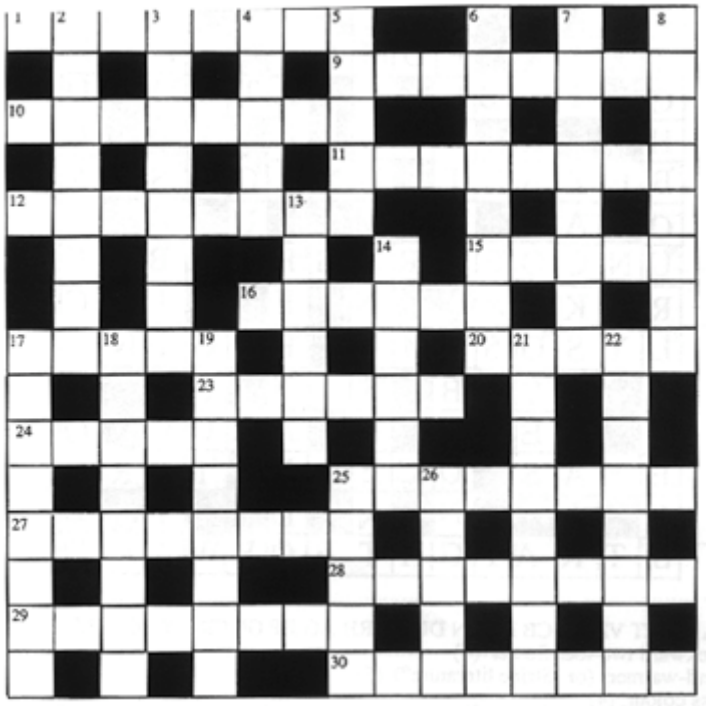
# CROSSWORD No. 48: Give us a number

by Matt Varnish



*Answers to clues include sequences of one or more letters with numerical connotations. Each clue refers to the whole answer and to the residual after the numerical part has been removed. Two answers, one a foreign word, are not in the 1993 edition of Chambers. Ignore the apostrophe in a possessive.*

ACROSS

1 Nothing is a big sacrifice (8)
9 Concerning a hundred outbid (8)
10 Exponential the airy (8)
11 Hurry double rated (3-5)
12 Measures Shakespearian surrounds (8)
15 Repose confused height of poetic inspiration (5)
16 Wizard's land south of the gas (6)
17 Medicine man rocks play (5)
20 Empty set trinity (5)
23 Gave use of a time dimension (6)
24 Void the lot (5)
25 Directions about hand tricks (8)
27 Give expression to ludicrous failure (3-5)
28 Estimate the French communications (8)
29 Broken cleat feeling slender organ (8)
30 Lean around the upper-class player (8)

DOWN

2 Former spouse is not an abductor (8)
3 Perhaps a long tot makes a nothing type of series (1, 3, 4)
4 O little one of the deep (5)
5 Sandwiches are fasteners (5)
6 Broken set of extreme obesity (8)
7 Father more obvious (8)
8 Edna's flower with Joy (8)
13 Joint teacher (6)
14 State of entire coherence (6)
17 Direction in time to explode (8)
18 A Northern Territory ring of a Scots wall
19 Element container from the riverbed (8)
21 Bird to raise further (8)
22 These suited to a T the describers (8)
25 Let's be worked metal (5)
26 In brief, estate to be (5)