THE NEW ZEALAND
MATHEMATICAL SOCIETY (INC.)

NEWSLETTER

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Colloquia

Since the last newsletter, we have hosted the 1996 mathematics colloquium at Massey University. My first attendance at a Colloquium was at Auckland University in 1968, when I had just begun my Junior Lectureship at Massey. Although many memories merge easily with later colloquia, I do remember clearly my only meeting with Professor Henry Forder, who took a lively interest in the proceedings, even in his retirement. I also recall, those days, that the meeting also served the Statisticians and the academic Computer Scientists. I remember John Butcher describing his bold introduction of computing into his first year Applied Mathematics course with about 1000 students, with a locally written language that had yet to be implemented!

The colloquia, as a seed to the disciplines, have spawned separate conferences for the Statisticians, Operations Researchers, Computer Scientists and Mathematics Teachers. We also see more specialist conference such as in Combinatorics and in Applied Mathematics. Is there still a place for a broad spectrum meeting? This was indeed a puzzle for the organising committee as this year's colloquium had not attracted sufficient registrants at the closing date, to meet the budget. We had been faced by other difficulties, the introduction of semesters in some New Zealand universities had lead to the change of date, from the traditional autumn to midwinter. (Fortunately the Palmerston North weather was not unkind that week.) The common two weeks available, brought us into a clash either with the Australian Mathematical Society's Annual Meeting in Adelaide, or with the ACCMC meeting in Sydney and ICME in Madrid. We chose to avoid the former. Also we were sandwiched between two BIG colloquiua. The 1995 colloquium was integrated with the Aitken conference in Dunedin, and the 1997 colloquium will be incorporated with the Annual Meeting of the Australian Mathematical Society as a joint convention.

Although we could feel disappointed at the low participation this year from some of the universities, we remember that the colloquium serves New Zealand mathematicians, not the other way around. Indeed, I personally have attended only about half of the colloquiua that had been available to me during my time in New Zealand.

However I do value the contacts that we make across the universities and across the specialities

of mathematics. In the contributed talks, most presenters are aware that the audiences contain many non specialists, and make their work more accessible to the generalists. This is good.

As I had been on the organising committee of the three previous colloquia hosted by Massey, it was difficult to avoid being given the task once more. I had an enthusiastic committee to assist in the planning and implementation of the meeting. We had a few setbacks, particularly with the late withdrawal, for health reasons, of our projected ANZIAM invited Lecturer, Professor Ren Potts. We were particularly grateful to John Harper for his substitution at very short notice.

A very enjoyable task was to be a member of the judging panel for the Aitken prize. We had twelve students who entered for the prize this year. Although it is difficult to make judgements across different fields, and although the standards this year were high, it was possible to identify two students who made very professional presentations, setting standards that many of their teachers would be pleased to attain. The initiative of the Society to establish these awards is commendable. It certainly acts as an encouragement for our research students to become involved in the colloquium and to make good quality presentations.

Farewell to Matt Varnish

With the recent sad loss of Derrick Breach (see centrefold, this issue) alias Matt Varnish, the Newsletter will no longer contain the cryptic mathematically flavoured crosswords that have been our unique back page feature for 17 years. Matt's devious puzzles have been a challenge for the cryptic minded readers, and to me personally have

offered puzzles and challenges that have bemused and often defied me.

This issue contains the solutions to his final contribution, No. 48 "Give us a number". I fear Matt's contribution is irreplaceable, and this leaves me with the problem of finding an appropriate replacement feature so that we can continue with a distinctive back page. I would welcome suggestions from the readership as to what they might wish to see in this place.

Mike Hendy

Editor

Letter to the Editor

Dear Sir

We have a number of concerns about the NZQA's overall plan to restructure the assessment of mathematics learning using unit standards.

1 The so called unit standards do not seem to us to specify a standard in a clear way. Indeed we doubt that it is possible to specify a standard in mathematics in a clear and unambiguous way, as required by the current policy, using only elements, performance criteria and range statements.

2 We are aware that previous attempts to describe the outcomes of mathematics learning as a series of performance criteria within a hierarchy of levels resulted in the reduction of mathematical content to just those aspects which can be accommodated to this format. This also led to the corresponding marginalisations of those other mathematical learning goals which do not lend themselves to such a clear specification and sequential development. Previous attempts to organise mathematics for assessment in this way, most notably those in the USA during the 1970s, have been subjected to considerable research. This research has led to the rejection of these approaches.

3 We are aware of comments from teachers that the unit standard approach is resulting in large amounts of time being spent on assessment. We believe much of this time would be better spent concentrating on teaching and learning.

Accordingly, we urge the NZQA to reconsider its commitment to the current unit standard approach, and to actively investigate more practical alternatives for the maintenance of national standards in mathematical assessment. In our view an alternative should be sought which:

1 recognises and builds upon those many existing practices within schools, polytechnics and universities which lead, via a variety of well established forms of internal and external quality assurance, to the establishment of national standards in mathematics assessment (e.g. the practice of having the design and the marking-standard of honours courses in mathematics appraised by another university);

2 allows individual providers (or groups of providers) to develop their own qualifications, and the courses leading to them, in such a way that they can be tailored to the specific needs and circumstances of the students taking these courses;

3 is based on the statement of course aims and objectives, and planned methods of assessment, moderation and quality assurance; and

4 adopts an approach to assessment which focuses, not on the prior specification of standards of attainment using performance criteria, but on the identification of the standard of attainment achieved by students, using a range of evidence (including, as appropriate, combinations of internal and external assessment).

In the case of school mathematics, in our view this would be best achieved by using assessment procedures which involve a mixture of internal and external assessment with the proportions anywhere from 0% to 100% depending on the course content, and the proportion of the student population studying the course.

These proposals do not involve the complete abandonment of recent work on unit standards for mathematics. Major parts of this work, particularly those which are directed towards the development of national assessment tasks, will be of lasting value for the future moderation of internally assessed components of mathematics courses.

Yours sincerely

(signed)

Professor Robert Goldblatt FRSNZ, Chairperson

On behalf of the Mathematics Department

LOCAL NEWS

AGRESEARCH

Ken Jury has retired as General Manager of the Dairying Research Corporation. A full appreciation of Ken's involvement with statistical and mathematical science in New Zealand appears as the lead article of the June 1996 newsletter of the NZSA. He was responsible for biometrics and computing at Ruakura from 1969 until 1979, when he became Director of Animal Research, and was also appointed to the Council of the University of Waikato. He was involved in setting up the Waikato Centre for Applied Statistics, and chaired the local organising committee for the 1992 International Biometric Conference at Waikato.

AgResearch maintained a high profile at the 1996 New Zealand Mathematics Colloquium. Four papers featured AgResearch authors:

Kao: A herd-based model of Tb control in cattle.

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

Gandar, Hall and Louie: A continuum mechanics approach to determining the cellular velocity field within a wool follicle.

Roberts: Integral equation models in epidemiology.

Mick Roberts

UNIVERSITY OF AUCKLAND

SCHOOL OF MATHEMATICAL AND INFORMATION SCIENCES

Ivan Reilly is away for July, visiting the following:

1. Centre for Mathematics Education, Open University, with which our Mathematics Education Unit has a link sponsored by the British Council.

2. The Dean and Faculty of Science at the University of Oviedo, Asturias, Spain. That university has an exchange agreement with the University of Auckland. (In fact, our chair of Spanish is the Prince of Asturias Chair.)

3. Two of his co-authors, Jesus Ferrer and Valentin Gregori, of Valencia, Spain.

4. The International Congress on Mathematics Education, ICME8, Sevilla, Spain.

5. The University of California main office for the Education Abroad Program, Santa Barbara.

DEPARTMENT OF COMPUTER SCIENCE

Professor Clark Thomborson (from the University of Minnesota) has joined the Department. Mr Michael Dineen from (Victoria University, BC) and Dr Bak Khoussainov (from Columbia University) have been appointed as Lecturers.

Dr Jeremy Gibbons has resigned, and he is now lecturing at Oxford Polytechnic, in England.

Professor Cris Calude is on leave in Europe.

Seminars

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

Dr Peter Fenwick, "Block sorting text compression".

Dr James Noble (University of Technology, Sydney), "Abstract program visualisation with objects".

Miro Kraetzl (Defence Science and Technology Organisation), "Analysis, modelling, control and management of LANs and WANs in tactical and strategic military situations".

Dr Christian Collberg, "Automatic compiler re-targeting".

Dr P. S. Thiagarajan (SPIC Science Foundation, Madras), "Linear-time temporal logic over product state spaces".

Professor Brian Wyvill (University of Calgary), "Metamorphosis of Boolean compound soft objects: Implicit Surface meets CSG".

Professor Charles J. Colbourn (University of Waterloo), "Erasure Codes".

Dr Hans Guesgen, "Towards anytime constraint satisfaction".

Dr Bill Havens (Simon Fraser University), "Asynchronous Backtracking".

Dr Xinfeng Ye, "Multicast primitives for mobile hosts".

Professor Bob Doran, "Recent developments in computer architecture".

Dr Antonio Albano (University of Sydney), "The Fibonacci language: an approach to merge relational and object technology".

Dr John Hosking, "Do you see what I mean?".

Professor Andre Nies (University of Chicago), "Logical questions about free groups".

Dr Jeremy Gibbons, "Drawing dotted and dashed lines (and recording intentions)".

DEPARTMENT OF MATHEMATICS

At the 1996 NZ Mathematics Colloquium at Palmerston North, Associate-Professor M K Vamanamurthy was presented with one of the two NZ Mathematical Society Research Awards for 1996, with the accompanying citation: "For his prolific and far-reaching work in analysis and topology, especially for his contributions to the theory of quasiconformal mappings and special functions; contributions that are characterized by both analytic ingenuity and geometric insight."

Bridget Jones, Deputy Principal of Parua Bay School (Whangarei), has been awarded a teacher fellowship by the Royal Society of New Zealand, to spend 6 months from April 1996 working with Mike Thomas on factors related to the use of calculators and computers in primary school mathematics classrooms.

A Lectureship was advertised and it attracted 133 applicants, several of whom are very highly qualified.

The 1996 NZ Mathematics Colloquium, held at Massey University in July, was attended by 25 staff and students from this Department. Lectures

were given by:

Jianbei An, "Quasi-radical subgroups of general linear groups".

John Butcher, "A generalization of Runge-Kutta methods".

Jiling Cao, Ivan Reilly and M K Vamanamurthy, "Comparison of convergences for multifunctions".

David Chen "The problems of the form $BU' = a(U)$, and a transistor amplifier example".

Marston Conder, "Cyclic groups of automorphisms of Riemann surfaces".

Colin Fox, "Mathematics on Antarctic sea ice" (Invited Address).

Andrew Hill, "Specializations of integrable systems".

Vivien Kirk, "Mutual synchronization of the flashing of populations of fireflies".

S Kopetschny, G Lambert, K Louie, J Springer and G C Wake, "Dynamical systems model of earthworms and litter".

David McIntyre, "Some applications of logic".

Alex McNabb, "Frictional heating of a descending plate".

Anjana Singh, "The numerical solution of initial-value problems".

Garry Tee, "Integer sums of powers of elliptic functions (mod p), for prime p".

M. K. Vamanamurthy, V V Aseev and M Vuorinen, "Quasiadditive properties and biLipschitz conditions".

Graeme Wake, "Cell-growth models with dispersions".

At the 1996 Conference of the Australian Mathematical Society, held at Flinders University of South Australia in July, Vaughan Jones gave an Invited Address on "Planar Algebras", Graeme Wake chaired the ANZIAM Council meeting, and Garry Tee presented a lecture on "Integer sums of powers of elliptic functions (mod p) for prime p". In the following week, Vaughan Jones attended a Conference on Mathematical Physics at the University of Adelaide, where he gave a public lecture on `Knots'.

At the conference on Geometric Group Theory, held at ANU in July, Marston Conder gave an Invited Address on "Group actions and regular maps on non-orientable surface", and Gaven Martin gave an Invited Address on "The geometry of Kleinian Groups". Warren Moors was a plenary speaker at the 25th Spring Conference of the Union of Bulgarian Mathematicians, at Kazanluk. John Butcher gave lectures at several conferences in Brazil, Europe and USA during his leave, and Margaret Morton gave lectures at conferences in Beijing and Sydney during her leave. Jianbei An attended the International Group Theory Symposium at Beijing in May. Gaven Martin gave an invited lecture at a conference on Conformal Geometry at Trondheim, and he and Norm Levenberg both gave invited lectures at a meeting of the Swedish Mathematical Society at Umea.

John Butcher, Gaven Martin, Vivien Kirk, Margaret Morton, Boris Pavlov and Bill Barton have returned from leave. Mark Wilson has gone on leave to attend a conference on Ring Theory in Hungary, and Tim Marshall is in Australia for June and July.

Recent visitors included Professor John R. Giles (University of Newcastle), Professor Robert D. Russell (Simon Fraser University), Professor Q.I. Rahman, (Université de Montreal), Professor Jiang Shouli (Shandong), Professor Len Bos (University of Calgary), Professor Zbigniew Slodkowski (University of Illinois), and Professor Mikhail Gromov (IHES, Paris).

The Open University/BBC Education TV series "Seeing through Mathematics" was made as part of the Open University's new foundation course in mathematical modelling. The first program had an audience of over half a million, when screened in the UK in February 1996. The final program "Refining the View" (30 minutes long) features items on the construction of bamboo scaffolding in Hong Kong, monitoring the survival rate of the Hector's dolphin population (around Banks' Peninsula), Antarctic sea-ice (with Colin Fox interviewed about his research), and the fluctuation in the level of Lake Wakatipu.

The 1997 Summer Workshop will be held, again at Tolaga Bay, in 1997, January 3 to 11, with the theme of discrete groups and hyperbolic manifolds. The invited speakers include Martin Bridson (Oxford), David Epstein (Warwick), Andre Haefliger (Geneva), Linda Keen (CUNY), Colin MacLachlan (Aberdeen), Walter Neumann (Melbourne) and David Singerman (Southampton).

Isaac Newton Connection

Graeme Wake, Professor of Industrial and Applied Mathematics (of the University of Auckland), is an invited participant and contributor at the forthcoming (August/September) research programme on the Mathematical Modelling of Plankton Population Dynamics at the Isaac Newton Institute at Cambridge, UK.

The Isaac Newton Institute for Mathematical Sciences is an international research centre, sponsoring visitor programmes in topics across the whole spectrum of mathematical research. Modelling via mathematics has occurred (traditionally) in physics - hence the personification via Isaac Newton - and now extends into chemistry, biology, medicine and agriculture. Almost no area of science has not benefitted from the modelling process.

This six-week programme on plankton modelling is designed to play a key role in ocean-atmosphere dynamics. Their effects range from alterations on a local scale of the structure of the sea-surface temperature and mixed layer depths, to ocean basin-wide emissions of potentially important climatological gases. Plankton comprise the lowest trophic level in the oceanic food chain, and are crucial to the maintenance of world fisheries. The programme is designed to bring together mathematical and numerical modellers from around the world, together with biological oceanographers to review, improve and develop models, addressing particularly the need to understand the space and time distribution of plankton behaviour and its relationship with the physical dynamics of the ocean-atmosphere systems, for example, the algae blooms.

The invited participants include 40 from Europe, North America and New Zealand. Experts from these countries have been involved in modelling this area of food-chain dynamics affecting fisheries resources. Graeme Wake has been involved in applying advanced non-linear dynamical methodology to these problems so as to identify thresholds between grossly different physical outcomes.

Seminars

Dr Kumar Vetharaniam (Tamaki), "Mathematical modelling of animal growth".

Dr Andrew Reztsov (Tamaki), "A method for construction of cubature formulae for integration and use in mathematical modelling".

Rowan Killip, "Wave attenuation in narrow channel".

John MacCormick, "Using semigroup theory to calculate the determinants of certain kinds of operators".

Dr Shaun Cooper (Massey-Albany), "The Macdonald identities and some extensions".

Alexei Boiarkine, "On stochastic perturbations and averaged evolution".

Grant Emms (Acoustics Research Centre), "Control of sound transmission through an aperture using active sound absorption techniques: a theoretical investigation".

Professor Thomas Kaijser (Linköping University), "On stochastic perturbations of iterations of circle maps".

Professor John R. Giles (University of Newcastle), "A differentiability characterisation of Banach spaces not containing l1".

Professor Marston Conder, "Bounds for the number of symmetries of a compact non-orientable surface".

Professor Q. I. Rahman (Université de Montreal), "Zeros of complex polynomials", and "On a polynomial inequality of Erdös related to that of Bernstein".

Professor Boris Pavlov, "Convolutions of singular measures and new spectral branches of few-body Hamiltonians and Liouvillians".

Professor James Cannon (Brigham Young University), "Squaring rectangles; a discrete Riemann Mapping Theorem", "Recognising Kleinian groups combinatorially".

Professor Tamas Erdelyi (Texas A&M University). "Littlewood-type problems on polynomials with -1,0,1 coefficients".

Professor Mikhail Gromov (IHES, Paris), "The geometry of groups".

Professor Rick Millane (Purdue University), "Cylindrically averaged spectra of distorted lattices".

Dr Robin Knight (Oxford University), "Compact monotonically normal spaces".

Kerry Richardson, "Metrisability of resolved spaces".

Professor Elmer E Rosinger (University of Pretoria), "Algebraic and order-completion methods for solving nonlinear PDEs, and a solution to Hilbert's Fifth Problem".

Dr Steve Smith (University of Illinois at Chicago), "Subgroup complexes".

Dr Warren B. Moors, "Norm attaining functionals on C(T)"

Garry J Tee, "Integer sums of powers of elliptic functions (mod p) for prime p".

John MacCormick, "On a class of Markov chains on general state spaces".

Dawn Jones, Judy Paterson, Sue Noble, Rosheen Gray and Edie Mak (Senior College of New Zealand), "Winner's Edge - educating senior secondary students".

Dr Don Kreher (Michigan Technological University). "Hunting t-Designs with t > 3".

Professor Robert D Russell (Simon Fraser University), "Adaptive numerical methods for solving PDEs, and their applications".

Professor Gordon Knight (Massey-Albany), "Critical factors in the implementation of the new mathematics curriculum".

Alastair McNaughton (Tamaki), "Solution of an LP by the Rebound Method".

Professor Gaven Martin, "Some problems in conformal geometry".

Dr Paul Bonnington (Tamaki). "Obstructing outer-cylindrical embeddings of a graph".

Dr Robyn Zevenbergen (Griffith University), "Mathematics practice: Its role in the construction of social difference".

Professor Len Bos (University of Calgary), "Kergin interpolation".

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DEPARTMENT OF STATISTICS

Dr Russell Millar has joined the Statistics group in the Division of Science and Technology at Tamaki as Senior Lecturer. Russell was previously at The University of Otago. He is a graduate of Auckland and did his PhD at the University of Washington, Seattle. His major research interest is in the application of statistics to fisheries and fishing.

Alastair Scott has gone on leave until 1997, and Alan Lee is Acting Head of Department. Arden Miller has gone on leave, and Constance Brown has returned from leave.

At the Sydney International Statistics Congress in July, members of this Department presented the following papers:

Brian Eastwood, "Optimal sample allocation in clinical trials".

Ross Ihaka, "The R language".

Alan Lee, "Modelling scores in the 1995 Winfield cup".

Paul Murrell, "The Simplisp graphics package".

Chris Triggs, John Curran, John S Buckleton and A J Walsh, "The energy problem in forensic glass analysis: a divisive approach".

David Scott, "A comparison of computable bounds for Markov chain Monte-Carlo rates of convergence".

Andrew Balemi and Arden Miller also attended that Congress.

Seminars

Dr Thomas Kaijser (Linköping University), "On a class of Markov chains on general state spaces".

Dr M. Xie (National University of Singapore), "Statistical process control for high-quality processes".

Dr Chris Heyde (Columbia University and ANU), "Avoiding the Likelihood: New Methods of Quasi-Likelihood for statistical Inference".

Professor David R. Brillinger (Berkeley), "Statistical analysis of the tracks of moving particles".

Dr Günther Sawitzki (University of Heidelberg), "Extensible Statistical Software".

Dr Murray A. Jorgensen (University of Waikato), "A dynamic EM algorithm for estimating mixture proportions ".

Dr John Buckleton (ESR), "DNA Statistics and the trial of O. J. Simpson".

Dr James Currall (University of Glasgow), "Computers in Statistics Teaching - a Scottish Perspective".

Dr Gita Mishra (University of Newcastle), "On conducting a large trans-disciplinary health study".

Dr Rick Mugridge, "Report on the Java Developers Conference".

Garry J. Tee

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UNIVERSITY OF CANTERBURY

DEPARTMENT OF MATHEMATICS AND STATISTICS

Dr Darlene Heuff (British Columbia) has recently been appointed to a lectureship in applied mathematics and will arrive at the start of next year. We are also advertizing for a lectureship or senior lectureship in statistics. Details can

be found elsewhere in this issue.

Derrick Breach will be honoured by a commemorative issue of the Australasian Journal of Combinatorics.

Thomas Kaijser, who was kindly loaned to us for a year from the University of Linköping, has gone back to Sweden.

Andrew Hill obtained his PhD and has now moved north. Our loss is Auckland's gain.

The contract for the new Mathematics and Computer Science building has now been awarded and in return we have a fine new hole where a lawn used to be. In time this may transform to something more like the architect's plans.

Technology moves ever onwards. We now have our very own paper shredder which copes with items such as damaging love letters, poor reviews of papers, doctors' refusals to agree to allergies to students, job refusals at other institutions...

Research Reports

No. 137 "Invariant Imbedding and Hyperbolic Heat Waves", David Wall and Peter Olsson, Calmers University of Technology, Sweden.

No. 138 "Multiple Minimum Coverings of Kn with copies of K4-3", C C Lindner, Auburn University and Anne Penfold Street, University of Queensland.

No. 139 "Interval and bounding Hessians", Chris Stephens.

No. 140 "On the Existence of Topological Ovals in Flat Projective Planes", G Steinke, B Polster (University of Adelaide) and N Rosehr (Universität Kiel).

No. 141 "Diagonalization of Matrices over Regular Rings", P Ara, K R Goodearl, K O'Meara and E Parado.

No. 142 "Separative Cancellation for Projective Modules over Exchange Rings", P Ara, K R Goodearl, K O'Meara and E Parado.

No. 143 "General Time Reversible Distances with Unequal Rates Across Sites", P J Waddell (Massey) and M Steel.

No. 144 "The Number of Nucleotide Sites Needed to Accurately Reconstruct Large Evolutionary Trees", M Steel, L A Székely and P Erdös (Hungary).

Seminars

Thomas Kaijser (Linköping University), "On the computation of the Kantorovich metric for images".

Professor Rainer Loewen (University of Braunschweig), "Ovals in topological projective planes".

Professor Rainer Loewen (University of Braunschweig), "Piecewise linear maps of R^n or Piecewise linear maps of Euclidean space".

Professor Lou Fishman (Iowa State University), "Reformulation of the Helmholtz Equation with Application to Direct and Inverse wave Propagation Modelling".

Dr Paul Smith (University of Dundee), "Modelling Electronic and Electromagnetic Systems".

Dr Rick Beatson (Canterbury), "Pieces of Radial Basis Functions".

Professor Ray Mines (New Mexico State University), "What exactly is a PID (Principle Ideal Domain)?".

Professor Wes Johnson (University of California, Davis) , "Case Deletion Diagnostics".

Professor Chuck Vinsonhaler (Connecticut), "Calculus Reforms - amazing or amusing?"

Professor Chuck Vinsonhaler (Connecticut), "Are (U.S.) mathematicians good problem solvers?"

Dr David Robinson, "Some mathematical paintings by Derrick Breach"

Professor Chuck Vinsonhaler (Connecticut), "Representations of partially ordered sets".

Dr Phillip Sharp (Auckland), "High performance computing: the PowerChallenge at the University of Auckland ... some of the issues".

Dr Peter Renaud, "Irrational thoughts - Apery's proof of the irrationality of Zeta(3)"

Professor Elemer E Rosinger (University of Pretoria), "Algebraic and order completion methods for solving nonlinear PDE's and a solution to Hilbert's fifth problem".

Peter Renaud

LANDCARE

Aroon visited CSIRO, Division of Atmospheric Research, Melbourne to discuss the coupling of soil organic matter and plant production models to permit climate impacts and CO_2 responses, to be investigated. He also got to discuss the progress of the Australian CLIMPACTS project, a climate impacts project that is modelled around the New Zealand version, involving CEARS at Waikato University and 5 CRI's.

Rhys Gibson, a former honours student of Graeme Wake, has left Landcare Research to join the Wellington computer firm, Paradigm Technologies. He has had a very productive 2 years at Landcare and has been working on erosion models using Monte Carlo methods.

Aroon Parshotam

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MASSEY UNIVERSITY

DEPARTMENT OF MATHEMATICS

Staff update:

Welcome to Dr Francis Thio who took up a Senior Lectureship at the Albany campus in June. Meanwhile, Bruce van Brunt, appointed as a Lecturer to the Department in 1991, has been promoted to Senior Lecturer. Vicki Fallaver has resigned her secretarial position during July after 19 months with us; we wish her well as she takes up her new position as MBA Secretary in the Institute of Executive Development here at Massey University.

Robert McLachlan has been elected to the NZMS Council. Robert McKibbin has recently been elected to the Editorial Board of the new "Journal of Porous Media".

Research:

A computational fluid dynamics (CFD) facility has been added to the tools available for numerical analysis in the Department. A new DEC AlphaStation with the PHOENICS package is now available for a variety of heat and mass transfer problems currently being investigated within the Department and in other faculties in the University, as well as providing a valuable capacity for approaching new modelling projects which involve fluid and energy flows.

Visitors:

Charles Little has had two visitors working with him on graph theory: Mike Plummer from Vanderbilt University (Nashville, Tennessee) and Michael Henning from the University of Natal. Others on briefer visits contributed to our seminar series, as listed below.

Staff travel/conferences:

Robert McLachlan is on leave for the second semester as a Visiting Fellow at the Isaac Newton Institute for Mathematical Sciences in Cambridge, England. The Institute, founded in 1993, hosts a series of six-month workshops, and the upcoming one is on the "Mathematics of Atmospheres". Robert will use the opportunity to get back into computational fluid dynamics (the subject of his PhD) and explore applications of Hamiltonian methods to atmospheric motion - although it is unlikely that better weather forecasts will immediately result. He is also relieved to be escaping another Palmy winter and spring and will not return until it warms up a bit, i.e., in December.

Robert McKibbin presented a paper the International Conference on Porous Media and their Applications in Science, Engineering and Industry held during June in Hawai'i, and, much closer to home, was an Invited Speaker at the Mathematics Colloquium.

Mahyar Amouzegar, during a fortnight's travel between semesters, went to San Francisco State University and gave a talk in their Applied Mathematics Seminar on "Global Optimization Methods for Bilevel Programming". He attended the XIX annual conference on Systems Engineering at the Universidad de Chile in Santiago where he presented a paper on "A Cutting Plane Algorithm for Linear Reverse Convex Programs", and also gave a talk at Universidad de Andes (UniAndes), Bogota, in Colombia. Meanwhile Mahyar has been invited to present a paper in the next INFORMS (Institute for Operations Research and the Management Science) conference in Atlanta, GA,

during November.

Also recently taking overseas leave are: Wolfgang Vogel (reported in the last Newsletter); Mike Carter in the UK, Spain (at the 8th ICME Conference, in Seville), Portugal (at the International Conference on the Relation between the History and Pedagogy of Mathematics, in Braga), and in South Africa (visiting the University of Witwatersrand and the University of South Africa); Glenda Anthony in Australia (at the MERGA conference - see below - and the Mathematics Education Lecturers' Association conference), the UK and Spain (at the ICME conference in Seville); Gordon Knight in the UK and Spain (at the ICME conference in Seville).

Mathematics Education Award:

Congratulations to Glenda Anthony who received the Practical Implications Award at the recent Mathematics Education Research Group of Australasia (MERGA) Conference in Melbourne. The award, consisting of a plaque plus $500, was designed to stimulate the writing of papers on original research related to mathematics teaching or learning. Specifically, the paper was required to identify a persistent and recurring problem in the practice of mathematics education, describe a research activity related to this problem and develop strategies to resolve it. In Glenda's paper "Classroom Instructional Factors Affecting Mathematics Students' Strategic Learning Behaviours" a range of factors including classroom orientation, task demands, worked examples, student opportunities to direct learning and assessment were discussed in relation to the development and use of learning strategies. Instruction, focused on the need for understanding and learning from errors, must model a wide range of learning strategies and provide students with feedback on their use of strategies and engender appropriate beliefs about mathematics and learning if students are to employ strategies directed at meaningful knowledge construction rather than at task completion. The paper is based on findings from Dr Anthony's doctoral research study which examined strategic learning processes in the senior mathematics classroom.

Scholars:

The 1996 Industrial Research Ltd Bursary in Applied Mathematics has been awarded to Mathematics Honours student David Sherriff. David was recently presented with his cheque and certificate by Dr Graham Weir, leader of the IRL Applied Mathematics Group, at a small ceremony here at Massey.

Congratulations also to our graduate students Tammy Smith and Anton Raviraj Selvaratnam who were joint winners of the Aitken Prize for the best student talks presented at the 1996 Mathematics Colloquium held at Massey University.

Recent PhD successes: Kelvin Watson (chief supervisor John Giffin), Peter Waddell and Elizabeth Watson (both in mathematical phylogeny, and co-supervised by Mike Hendy - the interdisciplinary link is noteworthy).

PhD student Mary Day has been a busy conference attendee and speaker recently. As well as giving a paper at the Mathematics Colloquium, Mary attended a conference on "Science - Women and Our Future" in Wellington during May and spoke on "The experiences of eight women mathematicians". She also attended the GASAT (Gender Science and Technology Association) Australia, New Zealand and the South Pacific 2nd Regional Conference which was held in Auckland during July and presented her paper "Disrupting the gender, mathematics and education literature: Different approaches to old questions". Publication of these papers is imminent.

Teaching:

A restructured 300-level programme will be offered in 1997 which introduces a new mathematical modelling paper and reassembles other material. Discussion is currently under way about our Honours-level programmes. Various new "joint" majors are available from next year in the new Bachelor of Information Sciences (BInfSc) degree to be offered by the Faculty, including programmes which link Mathematics with Computer Science, Physics, Statistics, Education and Finance as well as a major in Applied and Computational Mathematics which incorporates a theme of mathematical modelling techniques from traditional Applied Mathematics and Operations Research.

1996 Mathematics Colloquium:

Congratulations to the local group, headed by Mike Hendy, who so successfully organised the recent NZ Mathematics Colloquium at Massey. Most Massey Mathematics Department staff and postgraduate students attended, and contributed either by helping to organise the conference or by presenting papers. A brief report on the Colloquium can be found elsewhere in this issue.

Mathematics in the local community:

Albany staff Dr Shaun Cooper (Mathematics) and Dr Denny Meyer (Statistics) have been running a mathematical problem-solving competition for senior secondary school students on the North Shore; it has generated an unexpectedly large amount of interest.

Where are they now? - News of past students

Recent students who have completed their PhD's in mathematical phylogeny, supervised by Mike Hendy and Dave Penny, are now all on the move. This year's graduates include Liz Watson and Peter Waddell. Liz, a BSc in Zoology from Massey, did field work in Africa and DNA analysis in Germany developing some new network analysis to interpret her data on the Mitochondrial sequences of sub-Saharan Human populations. Liz has recently moved to Sweden with her partner Tom and her new son Leo. She is continuing with her interpretation of her sequence data which should lead to a greater understanding of the early human divergences.

Peter Waddell studied statistical significance of evolutionary tree analysis. During his studies he collaborated with software developers at the Smithsonian in Washington, and has contributed theory which is incorporated in the just-published software package PAUP* which extends the sophisticated and popular PAUP used by many phylogenists. Peter is now considering offers of Postdocs from the United States and Germany.

Mike Charleston, who was a PhD student and Graduate Assistant in the Department while investigating algorithmic aspects of phylogenetic reconstruction, left for a year as a Postdoctoral Fellow in Austin, Texas, in 1994, and then accepted a further Fellowship with zoologist Rod Page (formerly of the University of Auckland) in the Institute of Biomedical and Life Sciences at the University of Glasgow. After 8 months in Glasgow, Mike reports being surrounded by biologists who appreciate having a mathematician around, even if they don't all understand what he is up to. Computational facilities are excellent, but Mike is also seriously investigating the huge number of Glaswegian pubs!

Seminars

Professor Jürgen Stuckrad (University of Leipzig, Germany), "Gröbner bases and applications".

Dr Sören Perrey, "Mathematical models for games".

Dr Robert B. Russell (University of Auckland), "Adaptive numerical methods for solving PDEs and their applications".

Dr Kay Nieselt-Struwe (University of Auckland), "The origin of genetic codes".

Dr Michael D. Plummer (Vanderbilt University, Tennessee, USA), "Extending matchings in graphs: An update".

Dr Michael Henning (University of Natal, South Africa), "Homogeneous embeddings of vertex-transitive graphs in graphs".

Professor Elemer E. Rosinger (University of Pretoria, South Africa), "Algebraic and Order Completion methods for solving nonlinear PDEs, and a solution to Hilbert's Fifth problem".

Dr Charles Little, "A short proof of Read's formula for the number of labelled even graphs with n vertices and m edges".

Dr Igor Boglaev, "Domain decomposition algorithms for problems with boundary and interior layers and their parallel implementations".

Mathematical Physics Seminar

Professor Robert McKibbin, "Cycles, psychrometry and super-heated steam - thermodynamics in theory and in practice".

Dr Igor Boglaev, "Boundary and interior layer (singular perturbation) problems in physical and technological processes - analytical and numerical techniques".

Dr Joseph D. Seymour (Physics), "Some random thoughts on fluctuations and transport coefficients: An introduction to stochastic dynamics".

Professor Paul Callaghan (Physics), "Rouse modes, reptation and reorientation".

Mathematical Modelling Discussion Group

Professor Robert McKibbin, "Mathematical modelling: Interdisciplinary conversations".

Nigel Yee (Production Technology), "Modelling the behaviour of a pneumatic muscle for use in low-cost, lightweight robotics".

David Tanner (Production Technology), "Establishing sub-model hierarchies in building generalised system simulations".

Sylvia Estrada-Flores (Process and Environmental Technology), "Dynamic modelling of pressure vessels for refrigeration plants using a thermodynamic approach".

Dr Clive Marsh (Production Technology), "Modelling the uncertainty".

Dr Lilian Ferreira (Process and Environmental Technology), "Tray-by-tray simulation of distillation columns".

Dr Ken Louie (AgResearch, Palmerston North), "Is bigger better? - a Tale of Two Models".

Nigel Russell (Production Technology), "Neural network modelling of a falling-film evaporator".

Paul Milliken (Production Technology), "Issues in guaranteed cost control".

Julian Witt (Process and Environmental Technology), "Use of mathematical modelling to assess and improve coolchain performance".

Dr Igor Boglaev, "Mathematical modelling of the technological process based on internal oxidation".

Dr Mustapha Özilgen (Production Technology), "Recent advances in mathematical modelling of drying processes".

Robert McKibbin

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UNIVERSITY OF OTAGO

DEPARTMENT OF MATHEMATICS AND STATISTICS

Our greatest sympathy to Professor Vernon Squire who has taken over as Head of Department for at least the next five years. May he be a compassionate autocrat.

Professor Derek Holton was notified on 17 April that he had received a Paul Erdös Award for his significant contribution to the enrichment of mathematics learning within New Zealand. So far he is the only recipient ever from New Zealand. He was presented with the Award at the International Congress on Mathematical Education in Seville, Spain in July. The Paul Erdös National Award was established by World Federation of National Mathematics Competitions to recognise contributions of mathematicians that have played a significant role in the development of mathematical challenges at the national level, and which have been a stimulus for the enrichment of mathematics learning. The awards are made biennially. In 1996 there were 3 recipients.

Speaking of competitions, during the mid-semester break 11,700 scripts for the National Bank Junior Mathematics Competition (NBJMC) were marked by 25-30 senior maths students and committee members: John Curran, Graham Haase, David Hill, Derek Holton, Dennis McCaughan and Caryn Thompson. The Competition caters to students in forms 3, 4 and 5, and for the past few years over 10 000 students from over 250 high schools have entered. One of the principal aims of the NBJMC is to encourage students to write good mathematics and to explain clearly their answers.

In November last year a team from the BBC came to film part of a series for the Open University called "Seeing Through Mathematics", which is being screened in the UK this year. The series considers various applications of mathematics, including two being carried out by members of our Department: Dion Burns and David Fletcher. Colin Fox of University of Auckland, also features in the series.

From 12-17 April, the Department ran its eighth Mathematics Camp in Wanaka for Secondary School students. These camps are held to enable good maths students to extend the areas of maths they know about and to try out their problem-solving skills in the company of other able maths students. The maths programme was run by Professor Derek Holton and Dr Stefano Luzzatto (who was visiting the Department from Warwick University). The outdoor programme, which included rockclimbing and a 3-hour tramp above Diamond Lake among other things, was run by Coralie Daniel (a Mathematics PhD student) and Colin MacKenzie (a Phys Ed student).

Following the successful first international conference on Statistics in Ecology and Environmental Monitoring (SEEM 1), held at the University of Otago in December 1993, SEEM 2 was held at Otago from 24-28 June with the general theme Decision Making and Risk Assessment in Biology. The Centre for Applications of Statistics and Mathematics (CASM, the consulting arm of the Otago Mathematics and Statistics Department), was the organiser for this international conference. As with the first conference, SEEM 2 brought together biomathematicians, ecologists, environmental scientists, resource managers and statisticians with a common interest in the application of statistical methods to ecological and environmental problems. In particular, SEEM 2 provided a summary of the latest advances in the use of statistical methods in risk assessment at a level suitable for both scientists and managers.

New PhDs

Alastair Duffy. Supervisor: Professor Derek Holton; Provisional Title: Hamiltonian Graph Theory.

John Enlow. Supervisors: Dr Roland Broadbent (Department of Paediatrics and Child Health), Dr Patricia Cragg (Physiology), Professor Vernon Squire and Dr Ray Enlow (Department of Maths and Stats); Provisional Title: Modelling of Surfactant Administrations in Premature Babies and Asthma Patients.

Roger Glendenning. Supervisors: Dr Ray Enlow (Mathematics and Statistics) and Dr Patricia Langhorne (Physics); Provisional Title: Biphasic Metal (NiTi) REM Simulation with Orthodontic Applications.

Mr Charlie Laman. Supervisor: Professor Bryan Manly; Provisional Title: Randomization Tests of Abundance-based assembly rules in community ecology.

Mr Chris Linsell. Supervisors: Professor Derek Holton and Dr Bruce McMillan (Education Dept); Provisional Title: Activity based mathematics programmes.

Dr Robert Aldred and Dr Laimonis Kavalieris were each promoted to Senior Lecturer and Dr Peter Fenton was promoted across the bar on the Senior Lecturer scale.

Dr Russell Millar left the Department in mid-April to take a senior lectureship with the Department of Statistics at the University of Auckland, Tamaki campus.

Some Research Highlights

David Fletcher and Raymond Webster had a paper appear in the inaugural issue of the Journal of Agricultural, Biological and Environmental Statistics. The paper arose out of a problem encountered in the analysis of a recent cockle biomass survey at Papanui Inlet and Blueskin Bay, and was entitled "Skewness-Corrected Confidence Intervals for Stratified Biological Surveys".

Bryan Manly and David Fletcher were awarded a $60,000 contract by the Department of Conservation to analyse data on the accidental catch of marine mammals and sea birds by commercial fishing in New Zealand. The aim of the work is to assess the extent of the problem and advise on the design of future surveys to monitor the situation. Alyson Seyb, who has started an MSc in Statistics, will be employed as the research assistant.

Dr Laimonis Kavalieris spent two and a half weeks in April at the Queensland University of Technology working on part of a long term research project that aims to develop statistical methods to deal with time series data exhibiting long range dependence. Applications to modelling urban air pollution are driving this project, which continues to attract funding from the Australian Research Council.

Professor Vernon Squire, our HOD, has received the first copy of his book 'Moving Loads on Ice Plates', written with Roger Hosking (James Cook University, Australia), Arnold Kerr (University of Delaware, US) and Pat Langhorne (Physics), and published by Kluwer Academic in the Netherlands. The book is in the series 'Solid Mechanics and its Applications'. The research monograph was completed while Vernon was on Study Leave at Cambridge University, England, and Clarkson University in the USA. Some other work done jointly with Mike Meylan and Murray Barrett has also now appeared in Journal of Geophysical Research or is in the press. Vernon has recently been invited to give a plenary keynote address on marginal ice zone biology (he was surprised too) at a forthcoming Gordon Conference, and is scheduled as an invited speaker at ANZIAM '98.

Professor Bryan Manly travelled to Britain to represent New Zealand at a meeting arranged at the British Antarctic Survey in Cambridge by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). The meeting was concerned with technical aspects of the presentation and analysis of data that are used by CCAMLR to monitor animal populations that are part of the Antarctic ecosystem.

Seminars

Professor Vernon Squire, "Cool Maths".

Hugh Best (Wellington) "Demography of NZ fur seal (Arctocephalus forsteri) on West Coast, South Island, New Zealand".

Professor Bryan Manly, "Salmon Survival in the Snake River: Are Mark-Recapture Methods Scientifically Sound?"

Professor John Rayner (Wollongong), "Three vignettes: estimating Saddam's arsenal, Pascal's rectangle, and dots and lines".

Gary Dunnet (Statistics NZ), "How Statistics Match Superstition and Public Policy".

Dr Philip Dixon (University of Georgia), "Are Amphibian Populations Declining? The Difference Between Testing for Trend and No Trend".

David Tan (Centre for Atmospheric Science, University of Cambridge), "Spacecraft destabilization and atmospheric modelling".

Professor Jim Hartman (College of Wooster College, Ohio), "Undergraduate Mathematics in the United States - A Limited Viewpoint".

Professor Gary Krause (University of Missouri) "The use of Accelerated Life Tests to Estimate Long-Time Exposure (Chronic) Effects of Risk, Using Fishes".

Dr Hamish Spencer (Zoology), "The Mathematical Population Genetics of Genomic imprinting".

Professor John Rayner (Wollongong), "Extensions to the Sign Test".

Dr Ian Wanless (ANU), "Some Unusual Graph Games".

Dr Dennis McCaughan, "Pell and Pi: Two slices on number theory".

Dr John Harris, "A `proof' of the truth table for 'A != B'.

Dr David Fletcher, "All Creatures Great and Small: Tales from Statistical Ecology".

Dr Ross Sanders (School of Phys Ed), "Using Fourier Analysis in Human Movement Analysis".

Dr David Fletcher, "When to plant this year's crop? How simple statistical methods can be used to assess risk in agriculture".

Vernon A. Squire

VICTORIA UNIVERSITY OF WELLINGTON

DEPARTMENT OF MATHEMATICS

We are all delighted that Geoff Whittle received the NZMS Award for Mathematical Research at the Colloquium at Massey. That is, Geoff is delighted and the rest of us are basking in the reflected glory.

Rod Downey is being kept on his toes with two postdoctoral fellows recently arrived, Jeff Laforte from Michigan and Florida, and Richard Coles from Leeds. Both are funded by the Marsden Fund. André Nies of the University of Chicago has also been visiting Rod, and attended the New Zealand Mathematics Colloquium 1996.

Matt Visser completed an MSc in Mathematics at VUW in 1980 with a thesis on "Cosmic time, tachyons and the aether", and is now at Washington University in St. Louis. Last year his book "Lorentzian wormholes : from Einstein to Hawking" was published by the American Institute of Physics. His views on wormholes are discussed in the cover article of New Scientist for 26 March 1996.

John Harper was the ANZIAM invited lecturer at the 1996 New Zealand Mathematics Colloquium, where he spoke about some rather interesting applications of fluid dynamics, including a study of the way that bubbles rise in a beer glass.

Konnichi-wa to Vladimir Pestov, who visited Science University of Tokyo for two weeks in April to undertake joint research in noncommutative geometry and supergroup theory with Hideki Omori.

The Japanese connection is furthered also by Irene Pestov, who is completing a PhD in geothermal two-phase flows, and has been awarded a Japanese Science and Technology Postdoctoral Fellowship. It will be sayonara to Irene in November, when she goes to Tohoku National Industrial Research Institute (Sendai, Japan) for three months, to work on two-phase flows in pipes.

Here is a list of recent seminars in the department:

Mark McGuinness, "Geothermal Heat Pipes".

Vladimir Pestov (VUW), "Supergeometry, Point Functor, and a Certain No-Problem".

Irene Pestov, "Propagation of small disturbances through a porous medium saturated by a two-phase fluid".

Robert D. Russell (Simon Fraser, BC), "Adaptive Numerical Methods for Solving PDEs and their Applications".

Hahn Ko, "Some Tales of Large Cardinals".

Freda Goodall, Mark McGuinness, and Mimi Recker, "Geometric Constructions and Computer Graphics".

Geoff Whittle, "Combinatorics and Geometry".

André Nies (The University of Chicago), "Logical Questions About Free Groups".

Stephen Archer, "Borel Games, strategies for winning".

Vladimir Pestov, "A curious little example of nonstandard analysis at work".

David Tan (Cambridge University), "Fluids research: spacecraft destabilization and atmospheric modelling".

Karl Svozil (Vienna, visiting Auckland), "Quantum Computing".

Mark McGuinness

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WAIKATO UNIVERSITY

DEPARTMENT OF MATHEMATICS?

Ingrid Melchert had a baby girl, Laura Anne, weighing 7lb 8oz on 10 June. Ingrid will return to academic duties towards the end of July.

Ian Hawthorn was involved with mentoring Sarah Healy, a seventh former who took part in the World Mathematics Olympiad held in India in early July.

Alfred Sneyd has been on study leave since early June and is spending most of his time in Grenoble. The rest of his study leave will be spent in Kyoto and Brisbane.

The month of July was a month when a number of members of the Department caught the travel bug (some caught the flu bug as well, but that's another story).

Kevin Broughan attended the Mathematics Colloquium. He and Martin Glanvill, his DPhil. student, gave a talk on mesh generation for the finite element method. Kevin then headed off to Athens for the Second World Congress of Nonlinear Analysts.

In a similar vein, Ernie Kalnins attended the Colloquium before heading to Brisbane. After being back only a week from Australia, Ernie was away again; this time to give eight invited lectures on partial differential equations and special functions in Bogota, Colombia.

Douglas Bridges attended the Colloquium before going on study leave. His leave will involve some time in Japan and Vienna. Douglas was also overseas in April when he was in the Netherlands. While there, one of his duties was to be a PhD examiner. With all this movement of staff, Ian Craig was landed the task of being Acting Chairperson for a few weeks in July.

For the first time since your local correspondent has been here, the University's Information Day was held on a normal teaching day. This gave high school students the opportunity to see mathematicians in action. However, there were difficulties with finding rooms for our displays.

Seminars

A. Nies (University of Chicago), "Structures arising from computability theory"

M. Schroder, "Calculus without limits? Calculus without derivatives? Whatever next?"

I. Hawthorn, "How to prove some famous theorems with one hand tied behind your back".

E. Kalnins, "Superintegrability in two dimensional Euclidean space and associated polynomial solutions".

R. McIntosh (University of Regina), "Asymptotics and new mock theta functions".

D. Tan (Centre for Atmospheric Research, Cambridge University), "Fluids research: spacecraft destabilization and atmospheric modelling".

New Colleagues

DR MARK WILSON

Mark Wilson has taken up a New Zealand Science and Technology Postdoctoral Fellowship in the Department of Mathematics at the University of Auckland from February 1996. After graduating BSc(Hons) from the University of Canterbury he spent a year at the University of British Columbia before transferring to the University of Wisconsin-Madison, from where he received a PhD in mathematics in 1995. He moved to Auckland in 1995 for his wife's job and taught during 1995 in the Department of Mathematics before obtaining his current position.

His research interests are in (noncommutative) ring theory, specifically the structural properties of rings arising in representation theory, such as ordinary and twisted enveloping algebras of Lie algebras, Lie superalgebras and their generalizations.

DR WARREN MOORS

Warren Moors has taken up a New Zealand Science and Technology Postdoctoral Fellowship in the Department of Mathematics at the University of Auckland (from February 1995). After completing a BSc in Physics and an MSc in Mathematics at the University of Auckland, Warren went on to obtain a PhD in Mathematics at the University of Newcastle (Australia). Following this he took up a postdoctoral fellowship in Canada, to work with Jon Borwein at the Centre for Experimental and Computational Mathematics in Vancouver.

Warren's research interests include the topological and geometrical structure of Banach spaces, and non-smooth analysis.

Recent Mathematics Research Graduates 1994-6

The information presented below is in the following format: name; degree; institution; thesis title; date awarded; supervisor(s); brief description; current position.

Masters Degree

Arthur, Susan M; MCMS; The University of Waikato; "Factorial experiment studying the thickness of film produced by an extrusion process"; 1995; Mr Jeff Knowlton and Dr Ray Littler; Employed by an Auckland market research company.

Baxendine, Sandra; MCMS; The University of Waikato; "Investigation of a quality assurance system for a plant and soil laboratory"; 1995; -; Employed by Midland Regional Health Authority.

Broadstock, Neil; MSc, University of Otago; "Fractal geometry and hyperbolic iterated functions systems; 1996; Dr Peter Fenton; Iterated function systems are the context within which fractals are defined and described; Tutor, Mathematics and Statistics Department, University of Otago.

Cameron, Claire; MSc; University of Otago; "Modelling Survival of Hector's Dolphins around Banks Peninsula"; 1994; Dr David Fletcher; Using modelling techniques to estimate the survival rate of Hector's Dolphins around Banks Peninsula; Statistical Officer, Healthcare Otago.

Chapman, Sandra C.; MSc (with distinction), Victoria University of Wellington; "The Geometry of the Point-Path Generated by a Rigid-Body Motion in Two and Three Dimensions"; 1995; Dr P. Donelan; The differential geometry of point paths of planar and spatial rigid body motions is considered. The forms of sets of points with zero and stationary curvature (in the planar case) and zero torsion and curvature (in the spatial case) are given; in particular, the use of normal forms under the adjoint action on infinitesimal motions allows a complete analysis of degenerate cases; Research Officer at ACC.

Chen, Jinguo; MSc; University of Otago; "Central limit theorems for transfer function estimates"; 1996; Dr Laimonis Kavalieris; Derives limit theorems for estimates of a dynamic linear model describing the relationship between two time series; Management consultant with GML Consulting Ltd (Shanghai Office).

Clarke, **Ian M J** ; MSc; Massey University; "An investigation into the feasibility of constructing a mathematical model of ship safety" ; 1996; Professor Robert McKibbin; Mathematical methods associated with the many and various elements including structure, sea, operational and organisational influences that affect ship safety are reviewed. A single computer model is developed to assess variation of variables; Ship surveyor, Port of Tauranga.

Cole, Matthew; MSc; Massey University; "The cooling of spent anodes in the aluminium smelting industry"; 1996; Professor Robert McKibbin; Development of a mathematical model describing the heat transfer from cooling anode

butts suspended in air. Predicted temperature transients are compared with experimental data; Market analyst, Industrial Energy Ltd, Wellington.

Davis, Craig; MSc; University of Otago; "The real part of entire functions"; 1994; -; An account of the Wiman-Valiron theory as developed by the original authors and later Clunie, Kovari, Hayman and Fenton; PhD student, University of Illinois.

Devlin, Andrew; MSc; University of Canterbury; "Quality Improvement in Polystyrene Block Production"; 1994; Professor G.R. Wood; -; -.

Elder, Andrew A; MSc; The University of Waikato; "Reduction cell life prediction"; 1995; Dr Ray Littler and Dr Murray Jorgensen; -; Employed by NZ Aluminium Smelters.

Grant, Koryn; MSc; Massey University; "The Painlevé Property for Differential Equations; 1995; Dr B van-Brunt and Assoc Professor W D Halford; This thesis reviews various work done in connextion with the Painlevé property for ordinary and partial differential equations. The Painlevé property is revisited in the analytical framework of several complex variables and a different interpretation is given for existing results; PhD student at University of Kent.

Hamzah, Norhayati; MSc; Massey University; "The Age-Structured Population Models; 1995; Professor G C Wake; Age-structured population models are studied with particular attention given to long-term behaviour, in particular steady age distribution and stability. The linear-dependent model is generalised to a nonlinear age-dependent one with limiting effects - first on specific age class only, then on the whole population. The models are tested on possum populations using data from the Orongorongo Valley near Wellington; Lecturer, University of Brunei.

Jonazi, Joseph B; MSc; The University of Waikato; "Analysis of repeated measures"; 1996; Dr Murray Jorgensen; -; Returned to Malawi.

Joyce, William; MSc; University of Canterbury; "A One-Dimensional Generalised Autonomous Homogenous Kuramoto-Sivashinsky Equation"; 1995; Dr D.J. Wall; -; Canterbury.

Ko, Hahn; MSc (with distinction); Victoria University of Wellington; "Some Studies of Measurable Cardinals"; 1995; Colin G.Bailey; An introduction to large cardinals, normal measures, elementary embeddings from a measure, Scott's proof that there are no measurables in L, and a development of indiscernibles in L from a measurable cardinal; Department marker and tutor.

Lindsay, Susan; MSc; University of Canterbury; "Prediction of the Diameter Distribution of Forest Stands"; 1994; Professor G.R. Wood, -; Queensland.

Ling, Gang; MSc; The University of Waikato; "Investigation for the application of two kinds of robust control charts"; 1995; -; Now employed by Foresty Corporation, Rotorua.

O'Sullivan, Michael J.; MPhil; University of Auckland; "Scheduling and loading of fleet operations"; 1995; -; New methods for the efficient scheduling and loading of a transportation fleet are developed and tested; Presently PhD student, Stanford University.

Palliser, Christopher C.; MSc; Massey University; "Mathematical model of the forced cooling of anodes used in the aluminium industry"; 1994; Dr Robert McKibbin; Development of a mathematical model describing the forced-airflow cooling section of an anode baking furnace. Transient temperature and pressure distributions are calculated numerically for various mass flows of air, with the aim of predicting cooling times.' PhD student, Department of Mathematics, Massey University.

Pidgeon, David L; MA (Hons) 1st Class; Massey University; "Point and Lie-Backlund symmetries of certain partial differential equations"; 1995; Associate Professor Dean Halford; Differential forms are used to investigate symmetries of PDEs. Lie-Backlund symmetries are discussed, in particular for the Korteweg-de Vries - Burgers equation; Senior Tutor, Central Institute of Technology and part-time PhD student at Massey University.

Pirihi, Nicholas G.; MSc; The University of Waikato; "Statistical process improvement for processes with automatic process control"; 1995; -; Dr Ray Littler; Teacher at St. Paul's Collegiate, Hamilton, and will take up a Rhodes Scholarship at Oxford in September 1996.

Porteous, Michael; MA; University of Otago; "On Generalizing Matching Extensions"; 1995; Dr R E L Aldred; A survey of matching theory and n-extendability, motivation for the E(m,n) property (a generalization of n-extendability which edges are not only prescribed but some are also proscribed), basic results on E(m,n) graphs and the E(m,n) property in the context of other graph properties and constructions; Computer consultant, Wellington.

Rayner, Glen; MSc; University of Otago; "Moving Loads on Ice"; 1995; Professor Vernon Squire and Dr Ray

Enlow; A validation of the highly sophisticated model of Strathdee et al (1991) using unpublished moving load data from McMurdo Sound, Antarctica. Excellent agreement between theory and field data was obtained; PhD student at Queensland University of Technology.

Semple, Charles; MSc (with distinction); Victoria University of Wellington; "Matroid Representation Over Partial Fields"; 1995; Geoff Whittle; The notion of a partial field is axiomatised, and a theory of matroid representation over partial fields is presented. Closure under standard matroid operations is shown to hold. Some classes of matroids arising from characterising representability over GF4 are presented; T.A. at Victoria University, and PhD student.

Stratton, Wendy; MSc; University of Canterbury; "Weighted Young's Inequalities"; 1996; Dr H-Q Bui, -; -.

Taylor, Robert M; MSc; The University of Waikato; "The integers, scalar multiplication and its uniqueness - a categorical approach"; 1995; Dr Mark Schroder; -; -.

Thornley, Megan O; MPhil; University of Auckland; "Crew rostering under a seniority preferential bidding environment using column generation"; 1995; D.M. Ryan, A new column-generation optimisation tool was developed to assist Air NZ in its rostering of pilots; Southpac Corporation Ltd.

van Dolleweerd, Andrew P; MCMS; The University of Waikato; "An analysis of thickness variation in film produced by a blown-film extrusion process"; 1995; Dr Ray Littler; Employed by 1995 Dairy Board, Auckland.

Visch, Julian; MSc; University of Canterbury; "Fuel Consumption Models for Traffic Modelling by the Canterbury Regional Council", 1995; Dr E. Chacko; -; Canterbury.

Williams, Michael; MSc; University of Otago; "Numerical Models of Seiches in Lakes Dunstan and Wakatipu, New Zealand"; 1995; Dr Ross Vennell; The dissertation concerns the numerical modelling of seiches in Lakes Dunstan and Wakatipu. Seiches are natural oscillations that occur in bodies of water, e.g. the slopping that occurs in the bath initiated by an overly enthusiastic plunge. The properties of seiches depend very much on the shape and bathymetry of the lake being considered, and because they are very long they are modelled by the shallow water equations; PhD student, University of Tasmania.

Willis, Levi; MCMS; The University of Waikato; "Defining process variation limits"; 1995; Professor Nye John and Dr Ray Littler; -; Employed by NZ Aluminium Smelters.

PhD Degree

Anthony, Glenda; PhD; Massey University; "Learning strategies in Mathematics Education; 1995; Gordon Knight; Data obtained from an classroom observations, questionnaires, stimulated recall interviews and case studies are used to classify learning strategies of 6th form mathematics students. A quantitative and qualitative examination of the students' strategic learning behaviours highlights the passive nature of many students' learning behaviours. The interaction of person, context and instructional factors on students' use and development of appropriate learning strategies is explored; Lecturer, Department of Mathematics, Massey University.

Brown, Jenn; PhD, University of Otago; "The efficiency of adaptive cluster sampling"; Professor Bryan Manly; 1996; A theoretical investigation of a technique to improve the sampling efficiency of rare and patchily distributed populations; Working at the University of Wisconsin, Stevens Point, USA.

Craddock, Mark ; PhD; University of Auckland; "A continuous-time model for optimal hydro-electric scheduling"; 1996; A. Philpott; The thesis addresses a problem in the scheduling of electricity generation in a hydro-electric scheme consisting of a network of reservoirs and waterways connecting them. It discusses two alternative approaches to modelling such a system, one treating time as a discrete variable, and a new approach which treats time as a continuous variable. The main contribution is the development of two new algorithms for continuous-time network programming problems, their successful implementation as computer software, and their application to a real hydro-electric power system; Engaged with strategic modelling at ECNZ.

Dye, Shane; PhD; Massey University; "On a flexible model for New Zealand's Hydro-thermal Electricity Generation System; 1995; Dr John Giffin and Mr Jonathan Lermit; The thesis models the generation system of a generalised network with side constraints, using a Load Duration Curve representation of demand. This deterministic model is extended stochastically using Progressive Hedging strategies; Postdoctoral Fellow, University of Trondheim, Norway.

Hill, Andrew; PhD University of Canterbury; "Specializations of Generalized Drinfel'D-Sokolov Hierarchies"; 1996; Dr M.S. Hickman; -; Auckland.

Hjorring, Curt A. ; PhD; University of Auckland; "The vehicle routing problem and local search metaheuristics"; 1995; D.Ryan; Various metaheuristic algorithms were developed and compared; Carmen Systems, Gothenburg, Sweden.

Pan Hesong; PhD; University of Auckland; "Investigation of geothermal doublet systems in Rotorua"; 1995; M.J. O'Sullivan and D.H. Freeston; Combined experimental and numerical modelling of doublet systems, consisting of a production and injection well, in geothermal fields, with applications to Rotorua and Klamath (USA) reservoirs -- it was found that both are layered, heterogeneous, and influenced by strong regional groundwater flows; Consultant for small computer hardware/software company.

Saptadji, Nenny M.; PhD; University of Auckland; "Modelling of geysers"; 1995; M.J. O'Sullivan and D.H. Freeston; Field observations, laboratory experiments and computer modelling of geysers; Lecturer, ITB, Bandung, Indonesia.

Schou, Wayne C; PhD; The University of Waikato; "Scheme^N: Design, implementation and application"; 1995; Assoc. Professor Kevin Broughan; -; Employed by Forest Research Institute; Rotorua.

Thomas, Gill; PhD, University of Otago; "Discussion in Junior Mathematics: Helping one another learn?"; Professor Derek Holton and Professor Joe Diorio; 1995; Ways of encouraging children to engage in talk which develops their mathematical understanding; HOD Mathematics, Dunedin College of Education.

Zhang, Baoping; PhD; University of Canterbury; "Topics of Lipschitz Global Optimisation"; 1995; Professor G.R. Wood; -; Canterbury.

BOOK REVIEWS

Applied Functional Analysis: Applications to Mathematical Physics, by Eberhard Zeidler, (Applied Mathematical Sciences, Vol. 108). Springer-Verlag, 1995, 479pp, DM 118.00. ISBN 0-387-94442-7.

It can be argued convincingly that of all the major areas into which we roughly subdivide modern mathematics, Functional Analysis plays the dominant role by far - at least, as long as the recent impact of a theory on the life of humankind is chosen as a dispassionate criterion.

Even the purely superficial credentials of the discipline are nothing short of striking. Serving as *the* foundation for quantum physics is already enough to make a theory awesome. If one adds mathematical economics and optimisation methods (the areas of application which a prominent Russian functional analyst L. Kantorovich, a Nobel Prize winner in economics himself, staunchly considered to be no less important, promising, and rich in content than theoretical physics), no other area of mathematics - be it geometry, algebra, classical analysis, or topology - can boast of such an importance. The only possible exception, and at a certain stretch besides, could be a diverse assortment of mathematical tools known as `discrete mathematics,' serving as the framework for the concept of a Turing machine, theory of computation, and thence computer science. However, there are indications that computers might themselves `go quantum' within the next couple of decades as the chips continue to be downsized to the point where quantum effects become overwhelming. Within this possible scenario, functional analysis firmly and irreversibly displaces discrete maths as the major patron of computer science as well. *Che sarà, sarà.*

Functional analysis could have easily reclaimed some of the most famous results in the history of mathematics, such as the independence of the continuum hypothesis. Entire branches of mathematics could have been swallowed by functional analysis: to give just one example, the entire theory of locally compact spaces (a good half of topology!) is a mere dual version of the theory of commutative C*-algebras. Some of the newest developments in mathematics are being built up on a functional-analytic foundation (Connes' noncommutative geometry and, to a large extent, quantum group theory).

In view of all this, the importance of passing a good working knowledge of functional analysis down to younger generations of researchers is great and perhaps still growing. Books like the one under review are bound to be written at regular intervals simply because of a natural market demand.

The book is published in conjunction with an (often referred to) companion volume, entitled *Applied Functional Analysis: Main Principles and Their Applications*. For reasons which will become clear, I would be very curious to get acquainted with this accompanying book as well.

The book under review is an ambitious project: no other description fits the goal of explaining in less than 500 pages such a variety of topics as Banach spaces and fixed point theorems with applications to integral equations and ODE's, spectral theory, approximation theory, theory of Hilbert spaces, distributions, variational problems, Fourier transform, Hilbert-Schmidt operators, self-adjoint operators, a wide collection of boundary value problems, C*-algebras and quantum statistics, scattering theory, Feynman path integral, Dirac calculus, and even some solitons and inverse scattering theory!

Unfortunately, being such an ambitious project poses the major problem for the monograph. The author tried very hard to cover as much material as possible, and the presentation is succinct to an extreme. For example, all the basic theory of C*-algebras (definition, two major sources of examples, morphisms, states, pure states, von Neumann algebras, Gel'fand-Naimark theorem) is crammed into a mere three pages: 357-359. (For comparison, it takes

Dixmier at least 60 pages, to do the same in a proper way in his classic book *C*-Algebras*.) In such cases, every single word, every symbol, every small piece of notation suddenly become of importance, as they carry huge amounts of information and therefore are under extra strain and must be checked and double-checked as a matter of course; one expects the presentation to be much more careful and better organized than in a traditional monograph taking the reader's (and writer's) time in explaining things and able to afford an occasional slip or two. Unfortunately, this does not appear to be the case with Zeidler's book.

One of the most conspicuous inconsistencies is this: while every Banach algebra is assumed to be unital (cf. a definition on pp. 76--77), and a C*-algebra is defined as a Banach algebra with involution satisfying additional properties (p. 357), this *ipso facto* convention of unitality of all C*-algebras clashes with the definition of a sub-C*-algebra (p. 359), which is not required to contain the unit at all! It is well known to C*-algebra theorists how important it is to state clearly from the very beginning whether you are working in a unital or in a non-unital framework - and any reader of Zeidler's book will find themselves grossly confused.

Furthermore, the book gives the appearance of having been produced in great haste. Proposition 7 on p. 87 claims that every separable normed space can be represented as the union of an increasing sequence of finite-dimensional subspaces. One raises eyebrows, studies the proof, and eventually discovers that what the author really meant but failed to communicate was that the union of the chain of finite-dimensional subspaces is everywhere dense in the entire space, as it ought to be. OK, this was merely a *lapsus linguae,* one mutters to oneself, even if it should not be there at any cost, given the circumstances...

But here comes something much worse, a *coup de grâce* of sorts. What about the claim that the set of all continuous functions f such that f(a) = 1 is everywhere dense in C[a,b] equipped with the supremum norm (exercise 1.1.d, p. 92), and that the same is true for the set of functions f with f(a) > 0 (1.1.c)? The former statement is especially mind-boggling, because by combining it with an earlier exercise 5 on p. 30, the poor reader comes to an immediate conclusion that *every* continuous function on a closed interval [a,b] must vanish at the left endpoint! Ironically, the author himself contentedly refers to his choice of exercise problems as "a carefully selected collection" (Introduction, p. xvi).

I could go on and on for quite a while. The only thing I can make out of it all is that, sadly, the publishers seem not to have ensured adequate scrutiny of the manuscript of the book before accepting it for publication

Having now earned a copy of Zeidler's book through reviewing it for our Society, I feel with some regret that the new acquisition for my very modest office book collection is of a somewhat doubtful value. (Would you use such a book for learning *new* things after it proved to have such flaws in presenting things that you already knew? Would you recommend it to your students? Would you cite it in your research papers as a reliable reference source?) Certainly, I will stick as ever before to Reid and Simon's four volumes of *Methods of Modern Mathematical Physics* written with so much care and effort invested in their work and containing complete proofs of statements of results, which are, incidentally, all correct.

At the very beginning of his book, Eberhard Zeidler claims that "*there are two ways of teaching mathematics, namely, (i) the systematic way, and (ii) the application-oriented way,*" and stresses that "*the present book is based on the second approach.*" However, the reviewer was always sceptical about categorizing the mathematics that we produce and teach to our students otherwise than *good* and *poor*. In particular, the *poor* remains such even if labelled *applied*. The book under review only substantiates this conviction.

Vladimir Pestov, Victoria University of Wellington

Algebraic Topology. A First Course, by William Fulton (Graduate Texts in Mathematics Vol. 153). Springer-Verlag, 1995, 435pp, DM98.00. ISBN 3-540-94326-9.

William Fulton is particularly known as a prolific author of good mathematical books, and the introductory text on topology under review fully meets one's expectations. If the present reviewer were ever to teach an Honours course in topology in New Zealand, he would have probably selected the text under review as a textbook. It was written on the basis of an undergraduate course taught by the author at Brown University and the University of Chicago, which means that it would perfectly suit the needs of an Honours course at Victoria; the lecturer would have to spend some time providing a necessary background in basic analysis which is not part of the undergraduate curriculum, such as theory of differential forms (the task is greatly facilitated by the presence of a number of appendices containing the fundamentals from analysis and algebra needed in the course), but one's efforts would pay off. Browsing the book is ever delightful, and the targeted audience of it -- "students of mathematics or science who are not aiming to become practicing algebraic topologists" -- means that the presentation is both extremely intelligible and careful.

The contents of Fulton's book bring back to life the sweetest memories of this reviewer's PhD student years spent in the Department of Geometry and Topology at Moscow State University. Differential forms, vector fields, flows in Euclidean spaces; deformations and

homotopies; winding numbers, with applications to the fundamental theorem of algebra and Borsuk's fixed point theorem; degrees of maps and the fundamental group of the circle; cohomology, homology, their computation for

basic examples, De Rham's theorem; deformation retracts; indices and singularities of vector fields; vector fields on spheres and other surfaces; Poincaré-Hopf theorem; the Euler characteristic; Cauchy Integral Theorem; residue theorem; the Mayer-Vietoris exact sequences; covering spaces, fundamental groups, homotopy lifting, deck transformations; fundamental group and first homology group; universal covering; Van Kampen theorem; orientation; triangulation and classification of compact oriented surfaces; the fundamental group of a surface; Riemann surfaces and branched coverings; Riemann surfaces and algebraic curves; the Riemann-Roch and Abel-Jacobi theorems; higher dimensions; higher homology; duality between homology and cohomology; finally, an outline of simplicial complexes.

A large number of exercises and pictures represent especially attractive additional features of the book.

I like the book and highly recommend it to all teachers of beginners' courses in algebraic topology, as well as to those teaching themselves the basics of the subject (which is, after all, an essential part of the general mathematical culture).

Vladimir Pestov

Victoria University of Wellington

Modern Analysis and Topology, by Norman R. Howes. Universitext, Springer-Verlag, New York, 1995, 403pp, DM 68.00. ISBN 0-387-97986-7.

This book is designed to provide an integrated development of modern analysis and topology through the integrating vehicle of uniform spaces. It is intended that the material be accessible to a reader of modest background. An advanced calculus course and an introductory topology course should be adequate. But it is also intended that this book be able to take the reader from that state to the frontiers of modern analysis and topology in-so-far as that can be done within the framework of uniform spaces. This is an experiment worth the effort, but opinions will differ on how successful the author has been.

Modern analysis is usually developed in the setting of metric spaces although a great deal of harmonic analysis is done on topological groups and much of functional analysis is done on various topological structures. All of these spaces are special cases of uniform spaces.

On the other hand, modern topology often involves spaces that are more general than uniform spaces. It is the view of the author that "uniform spaces provide a setting general enough to investigate many of the most important ideas in modern topology, including the theories of Stone-Cech compactification, Hewitt Real-compactification and Tamano-Morita Para-compactification, together with the theory of rings of continuous functions, while at the same time retaining a structure rich enough to support modern analysis".

The best way of indicating the range of topics considered in this book is probably by listing the chapter headings. The first seven chapters are topological in essence while the last five are mostly analysis.

1. Metric spaces
2. Uniformities
3. Transfinite sequences
4. Completeness, cofinal completeness and uniform paracompactness
5. Fundamental constructions
6. Paracompactifications
7. Real-compactifications
8. Measure and integration
9. Haar measure in uniform spaces
10. Uniform measures
11. Spaces of functions
12. Uniform differentiation

It seems that much, perhaps even a half, of the material in this book has not appeared before in book form. So there is plenty to interest the expert as well as the novice.

An attempt has been made to document the history of all the central ideas, so references and historical notes are embedded in the text. These can lead the interested reader to the foundational sources where these ideas emerged. But the lack of a listing of all references in a bibliography is a major shortcoming. It infuriated this reviewer.

Ivan Reilly, University of Auckland

SPRINGER-VERLAG PUBLICATIONS

Information has been received about the following publications. Anyone interested in reviewing any of these books should contact

David Alcorn
Department of Mathematics
University of Auckland
(email: alcorn@math.auckland.ac.nz)

Applied Mathematical Sciences

108. Zeidler E Applied functional analysis. Main principles and their applications. 440pp.

Encyclopaedia of Mathematical Sciences

12. Novikov SP (ed) Topology I. General survey. 319pp.

35. Shafarevich IR (ed) Algebraic geometry II. Cohomology of algebraic varieties. Algebraic surfaces. 264pp.

49. Parshin (ed) Number theory. I. Fundamental problems. Ideas and theories. 303pp.

50. Arhangel'skii AV (ed) General topology II. Compactness. Homologies of general spaces. 256pp.

51. Arhangel'skii AV (ed) General topology III. Paracompactness. Function spaces. 229pp.

57. Kostikin AI (ed) Algebra VI. Combinatorial and asymptotic methods in algebra. Nonassociative structures. 287pp.

65. Shubin MA (ed) Partial differential equations VIII. Overdetermined systems. Dissipative singular Schrödinger operator. Index theory. 258pp.

77. Kostrikin AI (ed) Algebra IX. Finite groups of Lie type. Finite-dimensional division algebras. 239pp.

Graduate Texts in Mathematics

80. Robinson DJS A course in the theory of groups. (2nd ed). 505pp.

161. Borwein P Polynomials and polynomial inequalities. 465pp.

162. Alperin JL Groups and representations. 194pp.

Undergraduate Texts in Mathematics

Anglin WS The heritage of Thales. 282pp.

Axler S Linear algebra done right. 250pp.

Browder A Mathematical analysis. 345pp.

Childs LN A concrete introduction to higher algebra. (2nd ed) 500pp.

Elaydi SN Introduction to difference equations. 380pp.

Exner G An accompaniment to higher mathematics. 225pp.

Hairer E Analysis by its history. 373pp.

Miscellaneous

Baumann G Mathematica$^{reg.}$ in theoretical physics. 348pp

Diener F (ed) Nonstandard analysis in practice. 250pp.

Dodson CTJ Experiments in mathematics using Maple. 465pp.

Gerber HU Life insurance mathematics. (2nd ed) 217pp.

Ribenboim P The new book of prime number records. (3rd ed) 500pp.

Software Review

Ray Hoare from Hoare Research Software has been marketing a number of mathematical programs, such as

Mathcad, Mathematica, Maple and Matlab. However, much of the use of these programs is by people in science and engineering who use mathematics as a tool, rather than by mathematicians. Relatively few people are using them for teaching or developing mathematics.

A new program has just been released by MathSoft, called StudyWorks. It is explicitly designed for teaching maths and physics. Have a look at http://www.mathsoft.com/studyworks/prodinfo/proddes.htm to see the manufacturer's hype about it.

Ray is not a mathematics teacher, so can't really assess whether it meets a need for the NZ curriculum. He would like to hear from people who can comment on the hype, or would like to evaluate the full program. A free copy is available for the purpose of doing a review article suitable for publication in an appropriate NZ journal. Contact Ray at ray@hrs.co.nz, or phone 07 839 9102.

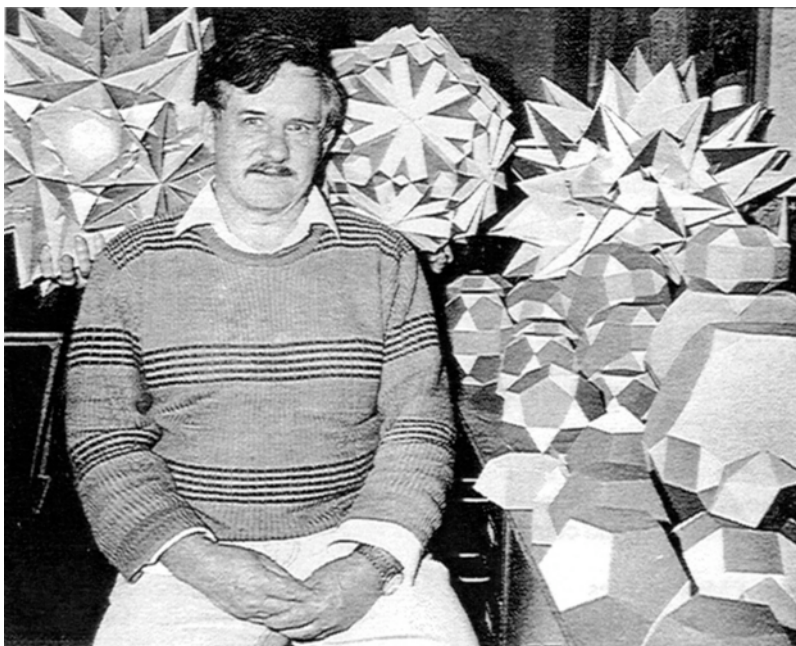Hoare Research Software Phone +64 7 839 9102

P.O. Box 4153 Fax +64 7 839 9103

Hamilton East, New Zealand Email info@hrs.co.nz

WWW page - http://www.hrs.co.nz/comm/hrs

NZMS Newsletter #67

CENTREFOLD

Derrick Breach

Derrick Breach, a senior lecturer in the Department of Mathematics and Statistics, University of Canterbury, died of a sudden and unexpected heart attack on the 27th April of this year, at the age of 62.

Derrick was born in Eketahuna, and brought up on a large Hawkes Bay sheep station managed by his father. After boarding school in Hastings, he went to Victoria University College in Wellington, where he took bachelor's and masters' degrees in science. He then went to Melbourne University, where he completed an MA by thesis under the supervision of the celebrated analyst and applied mathematician T.M. Cherry, which led to his first publication. He was awarded first-class honours for this work; in fact, his thesis would have earned a doctorate in many universities. From Melbourne he went to the University of Sheffield, where he spent a year as an assistant lecturer; and from there to the University of Toronto, where he did indeed obtain a doctorate. He remained at Toronto as an assistant professor until 1970, when he came to Canterbury.

Derrick was a mathematician of wide and formidable ability. He began his career as an applied mathematician, working in fluid mechanics; two of the papers he wrote in this phase of his career were widely cited, one being regarded as a classic. He never lost the mastery of classical analysis and the tenacity and skill in manipulation of special functions that he had deployed so effectively in this early work, and he was often consulted by colleagues

still in this field when they were faced with difficulties. In the early seventies he turned to research in combinatorics, and it is in this field that the bulk of his published work lies. As his work in combinatorics built up, it gained him a considerable reputation. As befits the generalist he was, he was a Fellow of the Institute of Mathematics and its Applications. On the specialist side, he was a Council Member of the Institute of Combinatorics and its Applications, a member of the Editorial Board of the Australasian Journal of Combinatorics, and a member of the Combinatorial Mathematics Society of Australasia. His department benefitted from his standing in the field, and his capacity to collaborate and make friends, through the frequent visits paid him by other mathematicians working in combinatorics, in particular Anne Street, from Queensland, and Curt Lindner, from Auburn.

Beyond research, Derrick served his department and subject well. He could, and did, teach a wide range of courses well at any level, and because of his seniority, breadth of knowledge and Olympian impartiality, he was almost inevitably coopted onto departmental committees concerned with appointments and promotions. He was an active member of the New Zealand Mathematical Society, and served on its committee as Secretary from 1986 to 1988.

Outside mathematics, Derrick's breadth of interests was legendary. He was passionately interested in language and words. While on the one hand, his minutes for the NZMS, and more particularly the minutes he took (voluntarily) for departmental meetings, were plain, accurate and succinct (although lightened by occasional waspish touches worth of Jane Austen), he had a love of the outlandish and obscure. He was proud owner of a first edition of the OED, all eleven volumes, and this possession he used to good effect in setting, under the pseudonym "Matt Varnish", the cryptic crosswords which appeared in every issue of the NZMS Newsletter from August 1980. Success in solving these demanded not just a well-stocked onamastichon, however; the solver also needed what the setter possessed; a broad and miscellaneous knowledge of mathematics and mathematicians, literature, and of general and curious facts. Derrick routinely solved the Press cryptic crossword in the tea-room every morning; this might take him as long as five minutes, during which he did not encourage conversation.

Derrick's love of and involvement in art are perhaps more widely known. He had, when he returned to New Zealand, a number of paintings and prints bought in Canada, and once settled in Christchurch, he set about adding to this, the works of New Zealand artists, to such effect that at his death, his collection was a major one. It was natural that he should have been elected to the University's Art Purchases Committee, and it is certain that of all the offices he held, that must have given him the greatest pleasure. He was also a keen amateur painter, turning out works ranging from the abstract (these could be described as geometrical/combinatorial) to topographical watercolours.

But if he left a masterpiece for posterity, it was neither strictly art, nor strictly original. Over a number of years, he constructed, from coloured cartridge paper, a complete set of the uniform polyhedra and many other polyhedra besides; these are the geometric models which, in glass cases, adorn the corridors of the Mathematics Department. They have excited admiration and envy from every knowledgeable visitor; indeed, when Roger Penrose, a recent Forder Lecturer, gave his public lecture at the university, he borrowed, with acknowledgement, a number of the models to help to illustrate the concept of symmetry.

The University Staff Club played a very large part in Derrick's life, and he repaid it by many services. He was a member of its committee for a term in the 70s, and again in the late 80s; he was president in 1990. but most of all, he was there; almost invariably for lunch, and very often in the evenings as well. It was appropriate that his funeral was held at the club. In his eulogy at that funeral, Robin Bond has recalled a little of the flavour of his presence there, where he seemed most at home; his conversation genial, relaxed, covering a remarkable range; laced with wit, and a little gossip, for he took as much pleasure as the next man, or perhaps a little more, in seeing pomposity punctured, dignity with dog-turn on its shoes. It is appropriate too that his bust, by the late Tom Taylor, should now look benignly at the club and its members, from a corner of the bar, a little further back than the subject himself used to stand.

This has not been an easy obituary to write. The normal conventions, that he was a valued and effective member of his department and university, and that he will be sorely missed by his colleagues and friends, are more than conventionally true; but they fail to capture the sense of loss that many of us feel. This sense of loss is intensified by the realisation, which I have found widely expressed by his friends, that there was a great deal about Derrick that we did not know, for, entertaining and sympathetic companion although he was, there was about him a formidable reticence, a well-defended private space. He seldom featured as the subject of his own conversation - perhaps that was part of the charm many of us found in it - and inquiries of a personal nature were not welcomed by him. Again echoing Robin Bond's words, he has left us while we still wished to know him better.

Emeritus Professor Brian Woods

Conferences

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. 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

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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.

Mathematics Summer Workshop

Tolaga Bay, 3-11 January 1997

Following successful workshops at Huia in December 1994 and Tolaga Bay in January 1996, a third Maths summer workshop will be held at Tolaga Bay from 3 to 11 January 1997. The theme of this workshop will be "Discrete groups and hyperbolic manifolds". You are warmly invited to attend and participate.

Invited speakers are: Kari Astala (Finland), Martin Bridson (Oxford), David Epstein (Warwick), Fred Gehring (Michigan), Andre Haefliger (Geneva), Linda Keen (CUNY, New York), Colin Maclachlan (Aberdeen), Walter Neumann (Melbourne) and David Singerman (Southampton).

The format is likely to be similar to the first two workshops, with some speakers giving a series of talks in the mornings, afternoons free for recreation or less formal mathematical activity, and talks again in the evenings.

For preparation, some knowledge of combinatorial group theory, low dimensional topology and hyperbolic geometry would help, but some of the series of talks will be expository in nature and aimed at non-experts. If you have time beforehand you might start reading "The Geometry of Discrete Groups" by Alan Beardon, or "Reflection Groups and Coxeter Groups" by James Humphreys, for example. Also we hope to spend part of one day following up the meeting held on the marae last time with local Maori leaders, so brush up on te reo Maori (and any songs from your own country if other than New Zealand).

A range of accommodation is available at and near Tolaga Bay, which is located about 50km north of Gisborne. There are motel units, hotel rooms (B&B), and tent sites (at a camping ground). Bring your family: partners and children are welcome to come along too and enjoy this beautiful area of the east coast of the North Island of New Zealand.

We expect most people to arrive on Friday 3 January, and leave on the morning of Saturday 11 January. As for previous workshops, we aim to keep costs for participants to a minimum (close to zero) using various research grants. A nominal charge may apply for family accommodation. In return for this we need to have fairly definite numbers sufficiently far in advance that we can confirm accommodation reservations with the motel owners, etc. Please register your preliminary interest as soon as possible so that further information can be sent to you as it comes to hand. In particular, accommodation needs to be booked early and confirmed by late October.

Contact: Expressions of interest, accommodation reservations, and other enquiries can be directed to Marston Conder, Department of Mathematics, University of Auckland, Private Bag 92019, Auckland, FAX: +64-9-3737457, Email: conder@math.auckland.ac.nz.

Organisers: Marston Conder, David Gauld, Vaughan Jones and Gaven Martin (with support from the University of Auckland and the Marsden Fund).

1997 Mathematics Colloquium

The 1997 Colloquium will be held at the University of Auckland on 7-11 July. This will be a joint meeting with the Australian Mathematical Society. The NZ Statistical Association intended to be involved with the Colloquium. Professor Gaven Martin is the Director of the 1997 Colloquium.

International Congress of Mathematicians in Berlin 1998 - A Progress Report

At its meeting in Luzern 1994 the General Assembly of the International Mathematical Union (IMU) unanimously selected Berlin as the site of the next International Congress 1998. In the following lines I would like to report what has happened since and what the participants can expect from the Berlin Congress.

A look back
Germany hosted the International Congress once before, at the beginning of the century. The third ICM, after Zürich 1897 and Paris 1900, took place at Heidelberg 1904 with about 300 participants under the chairmanship of Heinrich Weber. The first attempt to invite the mathematical community again to Germany was undertaken in the sixties. Professor Hirzebruch who was President of the German Mathematical Society at that time was authorized to prepare an application for the 1966 Congress. After the candidacy of Moscow this was no longer pursued. The idea to organize the International Conress in Berlin was first advanced at the opening session of the 1987 Annual Meeting of the German Mathematical Society in Berlin. Under the sceptical eyes of the politicians present, the mathematicians pronounced their wish to hold the Congress in both parts of the divided city, with free travel for all participants.

Probably a utopia under the given circumstances, but the enthusiasm carried on until, after the political changes, this utopia became reality. We feel very honored that Professor Friedrich Hirzebruch has agreed to again take an active part as honorary president of the Organizing Committee which is presided by Professor Martin Grötschel of the Technical University of Berlin.

Scientific Program
The scientific program and, in particular, the selection of invited speakers (about 150) lies in the hands of the program committee, appointed by IMU. Professor Phillip A Griffiths of Princeton serves as chairman of this committee. The Congress itself is scheduled to last from August 18 to 27, 1998. The opening day which is traditionally dedicated to the presentation of the Fields Medal will be held at the International Congress Center (which seats up to 5000 people). For the remaining days we will move to the Technical University situated in the center of town.

Fellowship Programs
For some time now IMU has supported participants from countries with difficult financial situations, and we will do our best to contribute to this program. We hope to be able to grant 100 - 150 fellowships covering accommodation in Berlin while IMU will provide for travel money. The details of this program will be announced in time by the IMU secretariat. In addition, we intend to also support mathematicians from the former socialist countries.

Public Events
The International Congress offers a unique opportunity to acquaint a wide audience with the problems, the achievements and the beauty of mathematics. Hence we intend to organize a number of popular events for the general public. Several ideas are under discussion at this moment, including evening lectures, an exhibition of mathematics in the arts and art in mathematics, films and videos, and a series on mathematics and music.

Accommodation and Social Program
Like any big city, Berlin naturally offers accommodation of any category. Since we know from experience that mathematicians usually do not belong to the highest paid people, we are trying to reserve a large number of moderately priced "Pensionen" (old-fashioned comfortable small hotels) and private rooms. As for the social program, there should be something for everybody from concerts to jazzclubs, from museums to boat trips on one of the hundreds of lakes surrounding Berlin.

Conferences around ICM 98
An addition attraction, especially for overseas participants, are conferences scheduled right before or after the Congress. So far, more than 20 proposals for such meetings have been advanced. Of course, these meetings need not take place in Germany, a number of them have already been set up in several neighboring countries. For information on the current status (or if you want to organize a meeting yourself) please contact the coordinator Professor Gerhard Frey, Department of Mathematics, University of Essen, Universitätsstr. 2, D-45141 Essen, Tel (49)201-3206457, e-mail: frey@exp-math.uni-essen.de. All conferences around ICM 98 will be announced in the official program.

Information about ICM 98
Whatever you want to know about the Berlin Congress, you find it in the WorldWide Web under the address http://elib.zib.berlin.de/icme98

There the current information is constantly brought up to date. You can read up on the IMU, on the past Fields medal winners, the mathematics sections of the scientific program, the conferences around ICM, and about the historical and political background of the city of Berlin. And last but not least you may pre-register for ICM 98 following the easy instructions. Several hundred mathematicians from around the world have already used this opportunity.

We, the Organizing Committee, and all mathematicians from Germany extend a hearty welcome to you. We will do our best to make your trip an experience long to remember - Auf Wiedersehen in Berlin 1998!

International Congress on Industrial and Applied Mathematics comes to Australia

It has just been announced that the quadrennial International Congress on Industrial and Applied Mathematics is to be held in Sydney in July 2003. The venue is expected to be the Sydney Convention and Exhibition Centre in Darling Harbour. This Congress is the largest conference in the subject in the world and focusses on the science of applied mathematics and the manifold applications of mathematical science, especially mathematical modelling, solid and fluid mechanics, mathematical biology, chemistry and physics, operations research and industrial mathematics. The host organisation is the group known as Australian and New Zealand Industrial and Applied Mathematics (ANZIAM) which has existed for 20 years as a Division of the Australian Mathematical Society.

The four yearly Congresses on this theme were inaugurated in 1987 with a meeting in Paris and the subsequent

meetings up to 1999 were (or are) all in the northern hemisphere (Washington DC 1991, Hamburg 1995, Edinburgh 1999). Professor Graeme Wake, Professor of Industrial and Applied Mathematics at the University of Auckland and current Chair of ANZIAM said that "The fact that one of the leading Southern Hemisphere groups in Applied Mathematics is able to host the fifth such Congress is a tribute to our contributions to our subject and our organisation. It will provide real boost to activities in the region and put a welcome spotlight on Industrial and Applied Mathematics in this part of the world".

It is expected to attract 2000 participants from around the world. Dr Noel Barton of CSIRO, Sydney has been appointed as Director for the Conference and he will be supported by a large team of colleagues from around the world, but mostly Australia and New Zealand.

Professor Graeme Wake

Conferences

1996 Mathematics Colloquium Report

The 1996 mathematics colloquium was held at Massey University between semesters 1 and 2, in July 1996. The colloquium attracted 76 registrants, comprising 43 staff and 25 students from New Zealand universities, 5 staff from CRI's and 3 from overseas. The programme began with an informal gathering at Wharerata, the Staff Club on Sunday evening, June 30, followed by four days of contributed and Invited talks, with the final day, Thursday July 4 being the specialised "Mathematical Physics" day. On Tuesday afternoon excursions were arranged to visit the Tui Brewery, Mangatainoka, and the Mathemaction Display at the Science Centre in the Manawatu Museum, followed by the Annual Dinner at the Dong Fong restaurant.

The Invited Speakers were:

Professor Paul Callaghan, Physics Department, Massey University, who spoke on "Some Fourier Depictions of Diffusion and Flow in restricted Geometries";

Dr Colin Fox, Mathematics Department, Auckland University, who spoke on "Mathematics on Antarctic Sea Ice";

Professor Mikhail Gromov, Institut des Hautes Etudes, France, who spoke on "Problems in Riemannian Geometry";

Professor John Harper, Mathematics Department, Victoria University of Wellington (ANZIAM Lecturer) who spoke on "Bubbles Rising in Line: Why is the First Approximation so Bad";

Dr Jeffrey C Lagarias, A. T. T Research, Murray Hill, NJ, who spoke on "Mathematical Quasicrystals";

Professor Robert McKibbin, Mathematics Department, Massey University, who spoke on "Geothermal Fields: Fertile Ground for Mathematical Modelling";

Professor John Stillwell, Department of Mathematics, Monash University, who spoke on "Numbers and Geometry in the History of Mathematics".

There were 42 contributed 30 minute papers, including 12 from students entered for the Aitken prize for best student presentation. The judges awarded two first prizes this year, which went to Thomasin Smith, Massey University for her paper "On Arithmetic Degree Theory" and to Anton Raviraj, Massey University for his paper "Gauss' Equation and Backlund Transformations" and were presented by the NZMS President, Professor Douglas Bridges (see picture at right).

The organising committee were grateful for the sponsorship provided by the New Zealand Mathematical Society, the Australian and New Zealand Industrial and Applied Mathematics Society and the Bank of New Zealand.

Mike Hendy, Convenor, Colloquium Organising Committee

1996 Mathematical Workshop at Tologa Bay

From Sunday 5th to Monday 13th of January 1996 the second NZ Mathematical Workshop took place at Tolaga Bay, the first having been held at Huia from 10 to 20 December 1994. The theme of the workshop was mathematics related to Statistical Mechanics. The pattern which worked so well at the previous workshop was followed again at this. There was a collection of invited overseas speakers, each of whom presented a series of lectures, there were other visitors and a local who presented a single lecture, and there was plenty of time available for informal discussions.

The same timetabling was followed as at Huia, in that we had lectures in the mornings and evenings, with the afternoons free for less formal activities. Lecture series were given by the following: Rodney Baxter (Australian National University), Peter Goddard (Cambridge University), Michio Jimbo (Kyoto), Tetsuji Miwa (RIMS, Kyoto),

Nicolai Reshetikhin (University of California).

Single lectures were given by the following:

Dietmar Bisch (University of California), Ruth Lawrence (The University of Michigan), Boris Pavlov (The University of Auckland), Yu-Kui Zhou (Australian National University), Tim Ziman (CNRS, Toulouse).

On Sunday we visited one of the 5 local marae. That was a very interesting experience, not only for the overseas visitors but also for the New Zealanders. The following attended from The University of Auckland: Jianbei An, Bill Barton (for the marae visit), Sergey Fedorov, David Gauld, Sina Greenwood, Vaughan Jones, Boris Pavlov, Ivan Reilly (for the marae visit), Arkadii Slinko, Mark Wilson, Barbara Burns (for the marae visit), Kelvin Hartnall, Christopher Heath, Elliot Lawes, John MacCormick, Abdul Mohamad, Benjamin So, Sanja Todorovic-Vasiljevic, Brian Van Dam, Rachel Weir.

Staff and/or students also attended from Massey University (both campuses), Waikato University, Victoria University of Wellington, St Petersburg University and the University of California at Berkeley.

Social events included the traditional windsurfing and walking. On Tuesday sixteen of us headed up Mt Hikurangi (the highest mountain in the North Island outside the volcanic National Parks), but the view from the top was thoroughly obscured by cloud; and also many walked to Cook's Cove. There were also opportunities to swim at the beach at Tolaga Bay, and also to visit other beaches. Some went horseriding, and others visited the city of Gisborne.

One bunch of Aucklanders (I won't say who!!) even took several wrong turnings on the way there, and ended up driving over a bank near Lake Waikaremoana - they arrived over a day late.

Despite advance concerns about the organization, the local community put on a superb welcome for us. They arranged a range of accommodation from tent sites to motel units. The local whare hauora was ideal for the students - they could work together without interference from oldies, but were close enough to join up when they wanted. The local people did up their town hall for our lectures and prepared amazing meals for us, beginning with a great dinner, and with the quality then monotonically improving. One night they turned on a barbecue on the beach; but somehow they got the weather wrong - that was the only rainy evening amongst the gloriously fine weather. The last dinner was fantastic, with a crayfish for each of us.

Visitors

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

The information for each item is arranged as follows: Name of visitor; home institution; whether accompanied; principal field of interest; dates of visit; principal host institution; principal contact person; comments. An up-to-date version of this list is maintained available on the Worldwide Web, at the URL

http://www.math.auckland.ac.nz/~mcintyre/Visitors

This site also contains a form for convenient submission of information about forthcoming visitors.

Professor Fan Chung; University of Pennsylvania; husband (Ron Graham); graph theory; 9-13 December 1996; University of Auckland; Professor Marston Conder; guest of Centre for Discrete Mathematics and Theoretical Computer Science.

Janet Dixon; University of Georgia; accompanied by husband, Philip Dixon (next entry); algebra and calculus; January to December 1996; University of Otago; Professor Bryan Manly.

Philip Dixon; University of Georgia; accompanied by wife, Janet Dixon (previous entry); statistics; January to December 1996; University of Otago; Professor Bryan Manly.

Alan Graham; Open University, England; unaccompanied; mathematics education; November and December 1996; University of Auckland; Dr Michael Thomas; was a visitor as part of British Council funded LINK scheme in 1993.

Professor Ron Graham; AT&T Bell Labs; wife (Fan Chung); combinatorics; 9-13 December 1996; University of Auckland; Professor Marston Conder; guest of Centre for Discrete Mathematics and Theoretical Computer Science.

Dr David Johnson; University of Nottingham; wife; combinatorial group theory; March-May 1997; University of Auckland; Professor Marston Conder.

Professor Gerhard Kristensson; Department of Electromagnetic Theory, Lund University, Sweden; -; -; early 1997; University of Canterbury; Dr David Wall; Erskine Fellow.

Hervé-Georges Morin; Université Laval, Québec, Canada; -; Sample Survey Theory (Statistics); September-December 1996; University of Auckland; Alastair J. Scott.

Dr Peter Olver; -; -; -; 24 March to 24 April 1997; University of Canterbury; Dr Mark Hickman; Erskine Fellow.

Dr Soeren Perrey; University of Bielefeld; accompanied by wife (Marlies) and son (Samuel); combinatorics (game theory), mathematical biology; November 1995 to October 1997; Massey University; Professor Mike Hendy; Post-doctoral Fellow.

Professor Fred Richman; Florida Atlantic University; accompanied by wife (Sue); constructive mathematics, infinite abelian groups; January-May 1997; University of Waikato; Professor D.S. Bridges.

Professor Gary Roach; Department of Mathematics, University of Strathclyde, UK; accompanied by wife; applied analyst, scattering processes; 5 October to 4 November 1996; Massey University; Assoc Professor Dean Halford.

Professor Romano Scozzafava; School of Engineering, Universita 'La Sapienza', Rome, Italy; -; subjective theory of probability in engineering; 9 August to 30 September 1996; University of Canterbury; Dr Frank Lad; Erskine Fellow.

Professor Richard Wilson; Universidad Autonoma Metropolitana, Mexico; -; topology; early 1997; University of Auckland; David Gauld.

Professor Keith Worsley; McGill University, Montreal, Canada; -; Statistics; December 1996-July 1997; University of Auckland; Alan Lee

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

David McIntyre. N.Z. Mathematical Society Visitors' Co-ordinator

Department of Mathematics, University of Auckland

email: mcintyre@math.auckland.ac.nz fax: (09) 373 7457

NZMS Notices

President's Report 1995-96

This report covers the period from the last NZMS Colloquium, in August 1995, to the end of June 1996.

MATHEMATICAL AND INFORMATION SCIENCES COUNCIL (MISC)

This body, comprising representatives of the NZMS, the NZ Statistical Association, the Operational Research Society of New Zealand,

the NZ Association of Mathematics Teachers (NZAMT), the Informatics Group of the NZ Computer Society, and Fellows of the Royal Society of New Zealand, continues to provide a valuable forum for discussion of a wide range of matters of concern to professional mathematicians. Of particular note this year was the discussion with Professor Don McGregor, Government Chief Scientist, which may lead to a review of mathematics in New Zealand comparable to the one in Australia whose report was published in January. The NZMS is grateful to Professor Graeme Wake, the retiring Convener of the MISC, for his sterling work in that capacity.

INTERACTION BETWEEN SCHOOLS AND UNIVERSITIES

At its meeting in February the NZMS Council asked me to discuss with NZAMT whether, and if so, how, the Mathematics and Statistics Departments in the universities might be of greater assistance to their counterparts in high schools. As a result of discussions with Mrs Jan Wallace, President of NZAMT, I was invited to join a working group to produce material for the "enrichment band" of high school students. (The other university academic of this working group is Professor Derek Holton, of the University of Otago.) The first meeting of this working group was held in Auckland in February, and led to the production of some enrichment modules for Form 4 that are currently being trialled in a number of high schools around the country, as part of a wider enrichment scheme called M^3. The working party will continue to meet, to produce more enrichment modules and to monitor the trials of the existing ones.

ACCREDITATION

Perhaps the most important issue that has come before Council in the past year is accreditation: should the Society offer levels of professional accreditation, and if so, what should be the criteria for those levels? I am grateful to Professor

Marston Conder for raising this issue and for carrying out much of the work leading to the paper that will be presented to the Annual General Meeting this week.

VISITING LECTURERS

The extended visit of Professor Elmer Rees (University of Edinburgh) as 1995 Forder Lecturer culminated in his talks at the Aitken Meeting in Dunedin in August 1995. The 1997 Forder Lecturer will be Professor Ian Stewart (University of Warwick), whose extraordinary rate and range of publication suggest that the NZ mathematical community is in for a treat from this "Renaissance man". Professor Stewart's visit will be co-ordinated by Dr Rick Beatson (University of Canterbury). The Society has once again asked the British Council, which in the past has been most generous in its support, for a contribution towards the travel expenses of the Forder Lecturer.

In November 1995 Professor Roger Grimshaw (Monash University) was the NZMS Visiting Lecturer. His counterpart in 1996 will be Professor Valerie Isham (University College, London). The co-ordinator of her visit, Dr Mick Roberts (AgResearch, Wallaceville Animal Research Centre), has already secured Lottery Board funding to help defray the cost of Professor Isham's return flight to New Zealand.

FINANCIAL GRANTS

Council has made the following grants between 1 September 1995 and 30 June 1996:

Donation to NZ Mathematical Olympiad Committee $ 500

NZ Mathematics Colloquium 1996 $1500

Student travel (5 students, 1996 NZ Colloquium) $1000

Research Fund assistance (6 grants) $1050 Donation to NZ Mathematical Olympiad Committee $ 500

NZMS Visiting Lecturer (Grimshaw) $ 750 Special grant to Professor G. Wake* $ 300

AITKEN PRIZE

The first award of the Aitken Prize, established in 1995 for the best paper or talk presented by a student at the NZ Mathematics Colloquium, was to Chris Stephens (University of Canterbury), for his talk entitled "Global Optimisation Requires Global Information", at the Aitken meeting in Dunedin. In addition, Charles Semple (Victoria University of Wellington) was highly commended for his paper "Large Matroid Representation Over Partial Fields".

The second Aitken Prize will be awarded later this week, at the current NZ Mathematics Colloquium. I am grateful to Professors Marston Conder, Mike Hendy, and Ernie Kalnins for acting as judges for the 1996 prize.

NZMS RESEARCH AWARDS

The 1994-95 Awards were presented, at the Aitken Meeting, to Dr Vladimir Pestov (Victoria University of Wellington) and Dr Neil Watson (University of Canterbury) for their outstanding research achievements in the preceding five years. The results of the 1995-96 Award round will be announced at the Colloquium Dinner. I am grateful to the judges for the time and care which they have invested in making their decisions.

PERSONAL

On behalf of the Society, I would like to congratulate Professor John Harper (Victoria University of Wellington) on his election to a Fellowship of the Royal Society of New Zealand.

It was with great sadness that we learned of deaths of two colleagues in the past year: Ken Ashton (Auckland) and Derrick Breach (Canterbury). I offer our condolences to their families and colleagues.

I would like to thank all the members of Council for their service to the Society. Special thanks are due to

The retiring Vice-President, Professor Marston Conder, who has now served a total of ten years on Council, as ordinary member, President, and Vice-President;

Professor Ernie Kalnins and Dr Rick Beatson, who complete their terms of office on Council this month;

Dr Stephen Joe, who has acted as more of a Society Administrator than a Secretary and who has kept me on the right track on many occasions; and

Dr Mark McGuinness, who is retiring from Council after two years of sterling service as Treasurer.

I would also like to thank Dr John Shanks (Membership Secretary); Professor John Butcher and Dr Joel Schiff (Editor and Managing Editor of the Society's Journal); Professor Mike Hendy (Editor of the Society's Newsletter); and Professor Derek Holton (NZMS representative on the NZQA Advisory group).

Finally, I thank all others who have helped me in my first nine months as President. I look forward to serving you in the coming year.

Douglas S. Bridges, 30 June 1996

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* To help defray the cost of Professor Wake's participation in the symposium Mathematical Sciences: Adding to Australia, in Sydney.

President's Letter to all NZMS Members

There are some items that arose at the last Council Meeting and the AGM of the NZMS, that I would like to bring to your attention.

1 The Society's records show that a number of members have neither paid their subscriptions nor indicated that they wish to withdraw from the NZMS. To encourage them to remain as fully paid-up members of the Society, I would like to point out some of the activities supported by subscriptions:

* grants towards the cost of overseas conference participation by NZ mathematicians

* grants to students to help pay for their participation in the NZ Mathematics Colloquium

* an annual grant of $1500 towards the cost of running the Colloquium

* the Aitken Prize, awarded to the best student presentation at the Colloquium

* publication of the Society's Newsletter, keeping us up-to-date with mathematical developments in New Zealand

* support for the New Zealand Journal of Mathematics

* support for the Forder Lecturer (every second year) and the NZMS Visiting Lecturer (every year)

* representing the interests of mathematicians to the government and on bodies such as the Royal Society of New Zealand (in particular, through the

latter's Standing Committee on the Mathematical and Information Sciences

and Technologies, on which the NZMS has two representatives)

The annual subscription amounts to roughly $1 per week - not a lot when you think of the benefits that the NZMS brings to the New Zealand mathematical community. So if you are in the category of unpaid members, please send your subscription promptly to Dr John Shanks, the Membership Secretary.

2 The income from sales of books published by the Society has declined rapidly in recent years; indeed, the "Mathematics with Calculus" book is no longer being sold. I am therefore asking you to consider whether there is a book - perhaps based on some of your lecture notes - that you might write for publication by the Society (which pays reasonable royalties to its authors). Please give this serious consideration and feel free to discuss it with either me (douglas@waikato.ac.nz) or the Secretary, Dr Stephen Joe (stephenj@waikato.ac.nz).

3 You will find elsewhere in this Newsletter information about the constitutional changes that were passed at the Society's AGM on July 1. These changes deal with the introduction of categories of accreditation for members of the Society. I would encourage you to apply for the appropriate category as soon as possible. (Incidentally, the initial Accreditation Committee will comprise Dr Alex McNabb, Professor Rob Goldblatt, and Professor Derek Holton.)

Douglas S Bridges, President, NZMS

Changes to the New Zealand Mathematical Society By-laws

The December 1993 issue of the NZMS Newsletter contains a listing of the NZMS by-laws. At the NZMS Council meeting held on 30 June 1996, the Council decided to make the following amendments to the NZMS by-laws:

1. By-law 4 was amended by replacing "on 1 June" by "after the Annual General Meeting". The amended By-law 4 then reads

"The Council and elected officers shall take up their positions after the Annual General Meeting in each year."

This change reflects the fact that the annual Mathematics Colloquium is tending to be held in July rather than the traditional month of May.

2. The last sentence of By-law 6, namely "The Secretary after consultation with Council shall prepare a complete list of nominations, which list shall be circulated to all members of the Society at least four weeks before the General Meeting", was deleted.

Since nominations would normally be called for in the April issue of the Newsletter and the AGM is before the August issue, this avoids a mail-out to all NZMS members. Any member wishing to see the list of nominations after nominations have closed (see the

amended By-law 6 below) should contact the NZMS Secretary.

3. In the second sentence of By-law 6, the word "written" was deleted, the phrase "countersigned by the nominee" was replaced by "including the nominee's consent", and "six" was replaced by "four". The amended By-law 6 then reads

"Each nomination of an Ordinary or Honorary member for the office of Incoming Vice-President, for a vacancy on Council or a nomination for the position of Auditor shall be put forward by two Ordinary or Honorary members of the Society. The nominations. including the nominee's consent, should be received by the Secretary not less than four weeks before the General Meeting at which elections are to be held."

This changes allows nominations by email and also allows more time for nominations.

These amendments to the by-laws shall come into effect THIRTY DAYS after publication of this notice, unless during this thirty day period TWENTY members of the Society shall petition otherwise, in which case the amendments to the by-laws shall then be submitted to a vote of the membership and shall not come into effect unless approved by a majority of those voting.

REPORTS AND MINUTES OF MEETINGS

MINUTES OF THE TWENTY-SECOND ANNUAL GENERAL MEETING

MONDAY 1 JULY, 1996.

The meeting was held at Massey University in Palmerston North and began at 4.32 p.m.

PRESENT: D. Bridges (Chair), D. Alcorn, K. Broughan, J. Butcher, M. Conder, G. Dixit, C. Fox, D. Gauld, R. Goldblatt, W. Halford, J. Harper, M. Hendy, S. Joe, E. Kalnins, V. Kirk, C. Little, G. Martin, D. McCaughan, M. McGuinness, D. McIntyre, R. McKibbin, R. McLachlan, K. Pledger, M. Roberts, C. Stephens, A. Swift, G. Tee, K. Teo, G. Thornley, M. Vamanamurthy, G. Wake, S. Woodward.

APOLOGIES: J. Turner.

1. MINUTES OF TWENTY-FIRST ANNUAL GENERAL MEETING:

It was moved from the Chair that the minutes of the previous meeting be accepted as a true and accurate record. The motion was carried.

2. MATTERS ARISING FROM THE MINUTES:

There were none.

3. PRESIDENT'S REPORT:

The President's report was delivered to the meeting and will be published in the NZMS Newsletter. It was moved (McGuinness/Swift) that the report be approved. The motion was carried.

Points to note:

(i) Professor Douglas Bridges and Professor Derek Holton were involved in the production of enrichment material for high school students.

(ii) The visit of Professor Valerie Isham, the 1996 NZMS Visiting Lecturer, would be of interest to both mathematicians and statisticians.

(iii) Only one nomination for the 1997 Visiting Lecturer had been received. More nominations would be welcomed.

(iv) The retiring Vice-President, Treasurer, and Council members were thanked for their contribution to the NZMS. This was greeted with acclamation.

4. TREASURER'S REPORT:

The Treasurer's report was delivered to the meeting and will be published in the NZMS Newsletter. It was moved (Kalnins/Halford) that the report be approved. The motion was carried.

Points to note:

(i) There were a few minor corrections to the financial statements of the NZMS.

(ii) There was a significant decline in revenue from book sales. Suggestions for new books would be welcomed.

(iii) The Incoming Council would consider the book agreement with NZAMT.

5. MEMBERSHIP REPORT:

A report from the Membership Secretary, Dr John Shanks, was circulated. It was moved (McCaughan/Wake) that the report be approved. The motion was passed.

6. ELECTION OF THREE COUNCIL MEMBERS AND INCOMING VICE-PRESIDENT:

(a) Previously received nominations for the three vacancies on Council were Dr Rick Beatson and Dr Vivien Kirk. A late nomination of Dr Robert McLachlan was accepted. It was then moved (Butcher/Goldblatt) that nominations be closed. The motion was passed. As the number of nominations did not exceed the number of vacancies, the Chair declared these three persons elected to Council. This was greeted with acclamation.

(b) The only nomination received for Incoming Vice-President was that of Professor Rob Goldblatt. In the absence of other nominations from the floor, the Chair declared Professor Goldblatt to be elected. This was greeted with acclamation.

7. ACCREDITATION:

(a) The amendments to the NZMS constitution to allow accreditation had been publicised in the April 1996 issue of the Newsletter.

(b) It was moved (Conder/McGuinness) that the motion be put.

Points raised in the discussion:

(i) A few minor changes to the wording of the constitutional change were suggested. The labels (a), (b), and (c), in the first paragraph of the proposed Article IV were replaced by (1), (2), and (3),respectively. Also, there was rewording so that the phrase "an area of mathematics"' was replaced by "mathematics".

(ii) The NZMS Council had suggested some changes to Rule 2(a). The last sentence in Rule 2(a) was to be amended to read "The initial Accreditation Committee shall consist of three Members of the Society who are Professors, Honorary Life Members, or Fellows of RSNZ, appointed for a period determined by Council". Also, the sentence "The members of the initial Accreditation Committee shall be invited to become Fellows without fee" was to be added to Rule 2(a).

(iii) The President would contact the three people whom it wished to form the Interim Accreditation Committee.

(iv) Other Professor bodies had similar accreditation schemes.

The vote was 26 for and 3 against the amendments to the NZMS constitution.

8. NEW ZEALAND JOURNAL OF MATHEMATICS:

Professor John Butcher presented the report of the NZJM. It was moved from the Chair that the report be approved. The motion was passed.

Point to note: Suggestions for improving the financial position of the Journal were: sponsors, expansion of the circulation base, subscription increases, ask authors of accepted papers to get their libraries to subscribe, exchange programmes, an electronic version of the Journal, optional page charges, and an endowment scheme.

9. RSNZ AND NZQA MATTERS:

(a) Professor Graeme Wake gave a verbal report on RSNZ matters. This included the role of the RSNZ, its restructuring (for which the legislation still has to be enacted), and its administration of the Marsden Fund.

(b) Professor Graeme Wake gave a verbal report on NZQA matters. The Mathematics Advisory Groups were being wound down as the NZQA thought that their work had been done. National Standard Bodies were to be established for which members would be appointed, not elected.

10. THE MORST KNOWLEDGE BASE:

Professor Marston Conder gave a verbal report on the MORST knowledge base. There were ten coordinators from different areas of science. Professor Conder was the coordinator for the mathematical sciences. He had got together a number of people in different areas of mathematics who were in the process of writing reports for the project. These reports were to highlight the strengths and weaknesses of the different areas of mathematical sciences in New Zealand.

11. 1997 MATHEMATICS COLLOQUIUM:

The 1997 Colloquium will be held at the University of Auckland on 7-11 July. This will be a joint meeting with the Australian Mathematical Society. The NZ Statistical Association intended to be involved with the Colloquium. Professor Gaven Martin is the Director of the 1997 Colloquium.

Note: At the Colloquium business meeting, Victoria University of Wellington offered to host the 1998 Mathematics Colloquium. This offer was accepted.

12. WWW PAGE OF EMAIL ADDRESSES:

(a) Professor David Gauld outlined discussions with American Mathematical Society officials concerning closer links between the AMS and NZMS. One suggestion was for a link from the appropriate AMS Web page to the NZMS home Web page. It would be useful for there to be a NZMS Web page containing a list of email addresses of NZMS members.

(b) A list of email addresses of NZMS members was to be put together. The email addresses would be obtained from Web pages that were already publicly available.

(c) It was suggested that a forms page be set up so that NZMS members could make their email addresses available if they were not available. They would also be able to request a link to their own home pages. Dr David McIntyre would be able to help with such a forms page.

13. GENERAL BUSINESS:

Professor Marston Conder informed members about the 1997 Tolaga Bay Mathematics Summer Workshop and an information sheet was distributed.

The meeting closed at 6.17 p.m.

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Treasurer's Report

New Zealand Mathematical Society Inc

Income and Expenditure Account for the year ended 31 December 1995

	1995	1994
Income		
Donations	–	250
Interest received	5,600	7,473
Subscriptions	4,819	5,025
Gross profit from books	2,400	5,063

NZAMT share of publication profits	394		
Other income	334		
		13,547	17,811
Less operating expenses			
Accountancy and audit fees	794		758
Affiliation fees	–		469
Donations	1,500		1,500
Newsletter	2,590		3,089
NZAMT share of publication loss			1,033
NZ Journal of Mathematics Grant	1,000		2,000
General Expenses			50
Posters and brochures	1,250		–
NZMS Lecturer	–		550
Postage & stationery	339		597
Travel & research grants	4,550		4,469
Travel/Council expenses	568		721
		12,591	15,236
Excess of income over expenditure		956	2,575
Plus accumulated funds at beginning of year		136,593	134,018
Accumulated funds at end of year		137,549	136,593

New Zealand Mathematical Society Inc

Balance Sheet as at 31 December 1995

		1995	1994
Accumulated funds		137,549	136,593
Represented by:			
Current Assets			
Petty cash imprest	9		–
Bank – general account	–		4,317
Textbook account	–		27
BNZ Autocall account	1,153		2,037
Accounts Receivable	1,318		2,485
Book stock on hand (Note 2)	13,613		10,938
GST refund due	152		
		16,245	19,804
Investments			
BNZ investment	66,391		125,967
BNZ Centenary bonds	62,000		
		128,391	125,967
Total Assets		144,636	145,771
Current Liabilities			
Petty cash imprest			42
Bank – general account	1,224		
Accounts payable	475		2,613
Owing to NZAMT	5,388		5,783
GST payment due			740
		7,087	9,178
Net Assets		137,549	136,593

MINUTES OF THE THIRTY-NINTH COUNCIL MEETING SUNDAY 30 JUNE, 1996.

The meeting was held at Massey University in Palmerston North and began at 12 noon.

PRESENT: D. Bridges (Chair), M. Conder, M. Hendy, S. Joe, E. Kalnins, D. McCaughan, M. McGuinness, and M. Roberts.

APOLOGIES: R. Beatson.

1. Minutes of 38th Council meeting:

These were approved.

2. Matters arising from the minutes:

(a) A draft itinerary and budget for the 1996 NZMS Visiting Lecturer, Professor Valerie Isham, was received from Dr Mick Roberts. A copy of her CV was also received. A grant of $1200 plus GST has been awarded from the Lottery Board.

It was moved (Roberts/McGuinness) that the NZMS contribute $1500 to Professor Isham's costs. The motion was passed.

Noted in discussion:

Thanks were due to Dr Mick Roberts for arranging financial support for Professor Isham's visit.

The amount of $NZ1500 from the NZMS was not to be perceived as setting a precedent for financial support for future NZMS Visiting Lecturers. The amount given was higher this year because of the higher than normal travel costs involved.

Professor Isham's visit should also be of interest to statisticians.

(b) Though nominations for the 1997 NZMS Visiting Lectureship had been called for in the April 1996 issue of the Newsletter, none had been received. This matter would be brought up at the AGM.

(c) The British Council had been requested to make a financial contribution to the 1997 visit of the Forder lecturer, Professor Ian Stewart, but were unable to do so at the current time because of budgetary constraints. The British Council was attempting to enhance the budget, and might be able to provide some financial assistance if this occurred. This information needed to be communicated to Dr Rick Beatson, the coordinator for Professor Stewart's visit. If no financial support was forthcoming from the British Council, then the London Mathematical Society would be approached. Professor Stewart would probably visit in April 1997.

(d) The issue of the funding of mathematics was in abeyance. The Chief Scientist, Professor Don McGregor, had been asked to consider a review of mathematics, similar to the one recently completed in Australia. MORST was apparently going to undertake a special project on mathematical sciences in 1997.

(e) The MORST knowledge-base project was raised. It had been realised that funding from PGSF was driven by socio-economic considerations with which the scientific community was not generally happy. The MORST knowledge-base project allowed perspectives from the scientific community as an alternative to those from Treasury. There were ten coordinators from different areas of science. Professor Marston Conder was the coordinator for the mathematical sciences.

He had got together a number of people in different areas of mathematics who were in the process of writing reports for the project. These reports were to highlight the strengths and weaknesses of the different areas of mathematical sciences in New Zealand.

(f) Professor Douglas Bridges and Professor Derek Holton were involved in the preparation of enrichment material targeted at the top 25% of fourth formers. Some teachers were keen for input from professional mathematicians. Further information about this interaction with schools is available in the 1995-1996 President's Report.

The NZ branch of ANZIAM was also keen to raise the profile of mathematics in schools. The Presidents of NZMS and ANZIAM (NZ Branch) were to liaise on the matter. It was not clear what needed to be done to raise the profile of mathematics.

3. Membership Secretary's report:

A report from Dr John Shanks was received. The number of members in arrears with their subscriptions was noted. Some action needed to be taken to recover these subscriptions. It was suggested that the President write to such members informing them of the work that the NZMS does. It was also suggested that HODs might be approached to get some support for NZMS.

4. Treasurer's report:

(a) A report from the Treasurer along with a budget and audited accounts were received. Overall, the 1995 financial year was a tighter year with a smaller surplus than in 1994. Interest income was down as was proceeds from sales of books. However, it was noted that rising interest rates will probably mean increased interest income in the 1996 year.

(b) The budget allocation in 1996 for the NZMS Visiting Lecturer was increased from $750 to $1500 while the allocation for conference travel for postgraduate student was reduced from $1500 to $750.

(c) The initiative for scholarship money by Dr Robert McLachlan and others was moving slowly. The President of the Operational Research Society, Dr Andy Philpott, still needed to be approached.

(d) As the NZMS subscription covered the running costs of the Society, it was moved from the Chair that it be recommended to the AGM that there be no increase in the NZMS subscription rate.

(e) The declining revenue from book sales probably meant that it was time to consider whether to produce another book. The Maths/Calculus books were no longer being sold. The President was to write to members of the Society asking for suggestions for another book.

(f) The NZMS wished to record its thanks to the retiring Treasurer for his sterling work.

5. Requests for financial assistance:

The following grants were approved:

Chris Stephens $500 CDMTCS $250

Irene Pestov $250 Mark McGuinness $500

Sharleen Forbes $250

Other applications were declined.

Noted in discussion: In previous years the budget for grants had been exceeded.

6. Accreditation:

(a) Professor Marston Conder was to present the accreditation proposal at the AGM.

(b) To be consistent with the current form of the Constitution, it was suggested that (a), (b), and (c), in the first paragraph of the proposed Article IV be replaced by (1), (2), and (3). Alternatively, this labelling could be removed.

(c) A few amendments to the Rules were agreed to. The last sentence in Rule 2(a) was to be amended to read "The initial Accreditation Committee shall consist of three Members of the Society who are Professors, Honorary Life Members, or Fellows of RSNZ, appointed for a period determined by Council.". Also, the sentence "The members of the initial Accreditation Committee shall be invited to become Fellows without fee" to be added to Rule 2(a).

(d) It was agreed that the interim Accreditation Committee would be appointed until 31 December 1997.

7. Nominations to Council for 1996:

(a) Nominations for Council of Dr Rick Beatson and Dr Vivien Kirk had been received. This was not enough to fill the vacancies on Council. Nominations would be called from the floor at the AGM. Professor Rob Goldblatt had been nominated as Incoming Vice-President.

(b) A decision on the new Treasurer will be made after the AGM.

8 1997 Mathematics Colloquium:

(a) The 1997 Colloquium will be held at the University of Auckland on 7-11 July. This will be a joint meeting with the Australian Mathematical Society. The NZ Statistical Association wished to be involved with the Colloquium. The Colloquium will precede the International Mathematical Physics conference in Brisbane.

(b) Professor Gaven Martin was the Director of the 1997 Colloquium. An impressive list of invited speakers was being constructed.

(c) The 1998 Colloquium will probably be held in the Victoria University of Wellington.

9 NZ Journal of Mathematics:

(a) The report from Professor John Butcher was received.

(b) There should be more institutional subscriptions to the journal.

(c) The council agreed to give $1000 to the Journal. Noted in discussion:

The NZMS agreement with the NZJM involved a commitment of $5000 over three years. This commitment had already been fulfilled. Grants to the Journal would not necessarily be a regular annual commitment.

The NZMS supported the Journal through membership of the Editorial Board, subscriptions from NZMS members, and direct grants.

10. Change to by-laws:

The proposed changes to the by-laws by Dr Stephen Joe were adopted. These would be publicised in the August 1996 Newsletter.

11. WWW page of email addresses:

(a) A list of email addresses of NZMS members was to be put together. The email addresses would be obtained from Web pages that were already publicly available.

(b) Dr John Shanks was to be contacted to see whether it was possible to get other email addresses and to obtain permission to make them available.

(c) The issue of commercial links from the NZMS Web pages was raised after a request from the Internet Book Shop. The Council decided to allow commercial links, but at a cost of $500 for a period of one year, after which the matter would be reviewed. The Secretary would email a draft letter to Council members. Other requests were to be processed in a similar manner.

12. NZMS Research Award 1996:

There were five candidates and two awards were to be presented at the Colloquium dinner.

13. Draft unit standards:

The paper from the Victoria University of Wellington was received. The report from Professor Derek Holton on the NZQA Mathematics Advisory Group was also received. Matters concerning the NZQA would be raised at the AGM.

14. Aitken judging panel:

The panel would consist of Professor Marston Conder, Professor Mike Hendy, and Professor Ernie Kalnins. There were twelve talks registered for the Aitken prize. The judges would have meetings on Tuesday and Wednesday of the Colloquium to decide on a prize winner.

15. Pacific Institute of Mathematical Sciences (PIMS):

The aim of PIMS was to facilitate communications between organisations involved in the mathematical sciences. Areas of collaboration were mentioned in the email message from Dr Bob Russell of Simon Fraser University. PIMS was a separate body from the Canadian Mathematical Society. It was suggested that a representative of PIMS might like to attend the 1997 Colloquium. The Department of Mathematics at the University of Auckland had already written a letter of support for PIMS. The President of the NZMS would write a similar letter of support.

16. Nominations for Fellowship of RSNZ:

Nominations for Fellowship of RSNZ could go through the current Fellows or through the NZMS. For 1997 it was agreed that the August 1996 issue of the Newsletter would call for suggestions for Fellowship of the RSNZ. These suggestions should consist of a short CV (containing at least a list of publications), suitable referees, and a letter of support. The suggestions would be considered by Council.

17. General business:

(a) A draft president's report and draft AGM agenda were circulated for feedback.

(b) A coordinated push for increased university funding for the mathematical sciences was seen to be more desirable than separate pushes by some subjects. A more graduated scale of funding for the different cost categories would probably be beneficial.

(c) The retiring members of Council, Dr Rick Beatson, Professor Marston Conder, Professor Ernie Kalnins, and Dr Mark McGuinness were thanked for their services.

(d) A paper seeking proposals for programme topics at the Issac Newton Institute for Mathematical Sciences was received from Dr Mick Roberts.

(e) An information sheet about the 1997 Tolaga Bay Mathematics Summer Workshop was received from Professor Marston Conder.

The meeting closed at 4.21 p.m.

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NZMS Research Award

This annual award was instituted in 1990 to foster mathematical research in New Zealand and to recognise excellence in research carried out by New Zealand mathematicians.

NZ Mathematical Society Research Awards for 1996 have been made to:

Mavina Vamanamurthy (University of Auckland) "for his prolific and far-reaching work in analysis and topology, especially for his contributions to the theory of quasiconformal mappings and special functions; contributions that are characterized by both analytic ingenuity and geometric insight"

and to

Geoff Whittle (Victoria University of Wellington) "for his work on matroids and other combinatorial structures, in which he has contributed fruitful ideas and found beautiful new results; placing him in the forefront of recent workers on difficult problems of matroid representation".

The awards for 1996 were announced at the 1996 Mathematics Colloquium in Palmerston North in early July. Other recipients to date have been John Butcher and Rob Goldblatt (1991), Rod Downey and Vernon Squire (1992), Marston Conder (1993), Gaven Martin (1994), and Vladimir Pestov and Neil Watson (1995).

Call for nominations: 1996/97 round

Applications and nominations are invited for the NZMS Research Award for 1997. This award will be based on mathematical research published in books or recognised journals within the last five calendar years: 1992-96. Candidates must have been residents of New Zealand for the last three years.

Nominations and applications should include the following:

(1) Name and affiliation of candidate

(2) Statement of general area of research

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

(4) A list of books and/or research articles published within the last five calendar years: 1992-96

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

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

A judging panel shall be appointed by the NZMS Council. The judges may call for reports from the nominated referees and/or obtain whatever additional referee reports they feel necessary. The judges may recommend one or more persons for the award, or that no award be made. No person shall receive the award more than once. The award consists of a certificate including an appropriate citation of the awardee's work, and will be presented (if at all possible) around the time of the AGM of the Society in 1997.

All nominations (which should include also the written consent of the candidate) and applications should be sent by 30 September 1996 to the NZMS President, Douglas Bridges, at the following address:

Professor Douglas Bridges

Department of Mathematics

The University of Waikato

Private Bag 3105

Hamilton

Please consider nominating any of your colleagues whose recent research contributions you feel deserve recognition!

ANZIAM (New Zealand Branch) Notes

Introducing ANZIAM

Australia-New Zealand Industrial and Applied Mathematics (ANZIAM) is a division of the Australian Mathematical Society (AustMS), and the New Zealand Branch was established in 1992 as a sub-division of the NZMS to represent the interests of industrial and applied mathematicians in this country. ANZIAM has a worldwide web page at:

http://solution.maths.unsw.edu.au/htdocs.ams/Anziam/anziam.html

Membership of ANZIAM is for those who wish to keep abreast of industrial and applied mathematics in Australasia and to maintain contact with the practitioners thereof. The current membership of ANZIAM stands at around 550 and of ANZIAM (NZ) at 41. Membership is available to interested persons who are already members of NZMS or AustMS for a fee of NZ$10. Contact the treasurer: Adrian Swift, Department of Mathematics, Massey University, Private Bag 11222, Palmerston North, A.Swift@massey.ac.nz.

A pamphlet introducing ANZIAM in more detail is also available from the treasurer.

AGM 30 July 1996

The annual general meeting of ANZIAM (NZ Branch) was held on the evening of 30 June 1996, at the opening of the 1996 Maths Colloquium. At the meeting, the following committee was elected for the following 12 months: Continuing: Mark McGuinness (Chair, Victoria), John Burnell (Secretary, IRL), Adrian Swift (Treasurer, Massey), Graeme Wake (Auckland), John Harper (Victoria), Rick Beatson (Canterbury). New: Simon Woodward (Publicity, AgResearch), Vivien Kirk (Auckland).

Coming Meetings

Following the success of the ANZIAM '96 conference in Masterton in February, three further New Zealand meetings are being planned in by ANZIAM (NZ):

1) Mathematics-in-Industry Study Group. ANZIAM (NZ) plans to hold a MISG-style meeting in New Zealand during 1997 following the format that has been so successfully held in Melbourne over the last few years. This will invite industry to present current problems, which will then be tackled intensively by attending mathematicians over a couple of days. Reports are usually published, and contracts for further research may follow.

2) Geothermal Workshop. ANZIAM plans to hold a workshop in Geothermal modelling, likely to be adjacent to one of the upcoming Geothermal Conferences in New Zealand.

3) Mathematical Biology Workshop. The timing and details of this are yet to be worked out.

Other upcoming meetings of interest are:

4) The 33rd ANZIAM Applied Mathematics Conference (ANZIAM '97). This conference will be held in Lorne, Victoria from 2-6 February 1997. Further information is available from ANZIAM '97, School of Computing and Mathematics, Deakin University, Geelong, Victoria 3217, Australia, Email amc97@deakin.edu.au.

5) ICIAM 2003. As mentioned elsewhere in this newsletter, ANZIAM will have the honour of hosting the Fifth International Congress on Industrial and Applied Mathematics in 2003, at Darling Harbour in Sydney. This is a major quadrennial congress with expected attendance in the order of 2000 delegates.

6) MISG 1997. Pamphlets for the 1997 Mathematics-in-Industry Study Group, 27-31 January 1997, University of Melbourne, are available from MISG 1997, Department of Mathematics, University of Melbourne, Parkville, Victoria 3052, Australia, Tel +613 9344 6762, Fax +613 9344 4599, Email

misg@maths.mu.oz.au, WWW

http://macserver.maths.mu.oz.au/misg/

Default.html.

FRSNZ

New Zealand members were delighted at the election of Dr John Harper as a Fellow of the Royal Society of NZ last December. John was the previous chair of the New Zealand branch.

News from "Head Office" (ANZIAM)

* The third special interest group (SIG) has been formed: Mathematics and Computers in Sport. This joins the existing SIGs in Computational Mathematics and Engineering Mathematics. There has also been a suggestion that we should form a SIG for Mathematics in Industry.

* The next ANZIAM Medal (for contributions to Applied and Industrial Mathematics) will be awarded at the 33rd ANZIAM Applied Mathematics Conference in Lorne in February 1997. The inaugural and to date only award has been to Professor Ren Potts from the University of Adelaide.

* The strategic plan of ANZIAM is in the process of being finalised and will be tabled for adoption at the 1997 AGM.

* Professor Ernie Tuck, University of Adelaide, has been elected as the deputy chair of ANZIAM, and is expected to succeed Graeme Wake as chair in February 1997.

Applied Mathematics Journal

AustMS, of which ANZIAM is a division, publishes two series of journals, one of which is reserved for publications in applied mathematics: Journal of the Australian Mathematical Society Series B (Applied Mathematics)

Editor Assoc. Professor C.E.M. Pearce

Department of Applied Mathematics

University of Adelaide

South Australia 5005

AustMS Gazette April 1996 (Vol. 23, No. 1)

The Gazette is the bimonthly newsletter of the AustMS, and often contains news of interest to ANZIAM (NZ) members, who do not automatically receive this letter. The April 1996 issue includes the following articles:

* Introducing the calculus of variations through geometric examples - T.C. Peachey.

* Tuck's double integral which should (?) but doesn't vanish - E.R. Love.

* A survey of first year calculus courses in Australian and New Zealand universities - Jamie Simpson.

* MISG 1996 - Kerry Landman and Tim Thwaites.

* ANZIAM Applied Mathematics Conference 1996 - Graeme Wake.

* Visiting mathematicians, Conferences, Notices of Preprints.

Simon Woodward

Situations Vacant

Lecturer/Senior lecturer in Statistics

Department of Mathematics and Statistics

University of Canterbury, Christchurch, New Zealand

Applications are invited from suitably qualified persons for the above continuing (tenured) position at the University of Canterbury.

Preference will be given to applicants with specialities in Biostatistics, and candidates with interests in Bayesian statistics are especially encouraged to apply. The department has just started a new course in Biometrics and wishes to extend this program as required.

Active research interests among the Statistics section within the Department include Bayesian models applied to engineering, medical, financial and industrial problems as well as applications of operational subjective statistical methods as originated by de Finetti.

Extensive modern computer facilities with various packages are readily available. Appointment at the Lecturer level is anticipated however consideration at the higher level for outstanding candidates is possible.

The salary for Senior Lecturers is on a scale from NZ$55,000 to NZ$63,000 (bar) and from NZ$66,000 to NZ$70,000 and for Lecturers is on a scale from NZ$42,000 to NZ$52,000 per annum.

Applications close on 30 September 1996.

Academic enquiries may be made to

Professor John Deely,

Telephone (64)(3) 364-2699,

Fax (64)(3) 364-2587,

email:<j.deely@math.canterbury.ac.nz>.

Conditions of Appointment and further particulars will be emailed on request to email <staffing.acad.appts@regy.canterbury.ac.nz>.

The University's WWW address is

<http://www.regy.canterbury.ac.nz/home.html>.

Applications quoting Position Number MT15 must be airmailed to: The Registrar, Attention Staffing Section, University of Canterbury, Private Bag 4800, Christchurch, New Zealand.

The University has a policy of equality of opportunity in employment.

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.

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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  (8)
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)
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