THE NEW ZEALAND
MATHEMATICAL SOCIETY (INC.)

NEWSLETTER

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PUBLISHER'S NOTICE

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Conferences	Dr Michael Carter (Massey University)
Problems and Queries	Prof Graeme Wake and Dr Mike Hendy (Massey University)
Visitors to New Zealand	Dr David Robinson (Canterbury University)

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Dr J Rayner	Mathematics and Statistics (University of Otago)
Mr G J Tee	Mathematics and Statistics (University of Auckland)

LOCAL NEWS

DSIR PHYSICAL SCIENCES,
Applied Mathematics Group, Mount Albert

News from Applied Maths, Wellington has been missing recently, as the previous correspondent was one of many of our staff to leave over the last few months. Uncertainties over funding and our role in government science, has helped positions in other institutions appear more attractive. The most popular move has been 'down the corridor' to Victoria. Mark McGuinness, from our Math Physics section, was appointed to a lectureship in the Mathematics Department. Vicky Mabin, from the O.R. section, left for a half-time position in the Management Group of the Commerce Faculty. Rona Bailey, also from the O.R. section, now has a half position with I.S.O.R. Kelly Mara from the Industrial Stats section left late last year to try his hand in the private sector.

Others who loss is only temporary are Peter Burgess, who has taken leave to study for a PhD in parallel computing at St. Andrews in Scotland, and Sarah Harper, an industrial statistician, who has taken leave to enjoy a world trip.

The effect of all these departures would have been bad enough, but they come on top an unsettling period of bidding for funding, and fighting for our continued existence.

The initial report of the C.R.I. task force suggested that Applied Maths would be scattered to the four winds (or the soil, water, geo, and ..., C.R.I.s). However, after further consultations with the task force it appears that they have accepted the argument that we will be more effective if we remain together. We have yet to see an official copy of the final report, but have had indications that our future as a unit is indeed secure.

Jean Thompson has been busy recently, organising a series of seminars on Total Quality Management in the Public Sector, with Tricia Caughley. In addition, she attended the Hunter Conference in Madison, Wisconsin. Steve White had a trip to Japan to present a report on some work that was completed for a Japanese geothermal company.

John Burnell

UNIVERSITY OF AUCKLAND
Engineering Science

This report covers a 12 months period. Peter Hunter has been promoted to Associate Professor and Andy Philpott to Senior Lecturer. Robert McKibbin has announced his resignation in order to take up a position as Senior Lecturer at Massey University. Mervyn Rosser has retired, and in February a celebration, attended by many former students, was held in Old Government House.

Sue Byrne is holding a joint appointment (half in Management Studies and Information Science) in 1991. Chris Price has been appointed for one year as a Lecturer (in optimization). After ten years as Head of Department, Ian Collins is taking a back seat and Mike O'Sullivan is taking over.

Don Nield returned in May after a year spent at Duke University, with visits to Turkey, Israel and England. At Duke he co-authored (with Adrian Bejan) a book on Convection in Porous Media which will be published by Springer later this year. In May Ian Collins attended the International Geomechanics Conference in Cairns, Robert McKibbin attended a conference on transport in porous media in Yugoslavia, and Peter Hunter visited colleagues in the USA and Canada.

Andrew McCullough, a past student now at UC San Diego, has won a US Presidential Young Investigator Award. PhD's have been awarded to Rosemary Segedin and Cedric Malate. Alistair Young now has a Post-Doctoral position at the University of Pennsylvania and Julie Falkner has a similar fellowship at the University of Waterloo.

Seminars

Dr M. Oral (U.Laval,Quebec) "A linearization procedure for quadratic and cubic mixed-integer problems", and "A methodology for evaluating and selecting R & D projects."
C.Malate (DES) "Modelling deposition of chemicals in geothermal reservoirs."
W.Wang (DES) "Cavity expansion in dry sand."
G.Hughes (DES) "Wave-like phenomena on a diffusive interface."
S.Pedder (DES) 'HUBERT'

Pan Hesong (DES) "Doublet systems for geothermal energy extraction."
C.Hjorring (DES) "The generalised petal method for vehicle routing."
Dr K. Oloyede (Mech.Eng,AU) "A constitutive model for the articular cartilage matrix."
Dr A. Philpott (DES) "Solving minimum-time optimal control problems by continuous-time linear programming."
Dr K. Burrage (Maths & Stats, AU) "The development of parallel numerical algorithms for an array of transputers."
Prof. P. Whittle (U.Cambridge) "Neural networks."
Dr C. Price (DES) "Non-linear semi-infinite programming."

D.A. Nield

Mathematics and Statistics

Alastair Scott was elected Fellow of the Royal Society of NZ, on June 27th. He has gone on leave to Southampton University for the rest of this year, and Ivan Reilly is Acting Head of Department during his leave; *except* that David Gauld will be Acting Acting Head while Ivan is away from June 22nd to August 31st, for IMO in Sweden; *except* that George Seber will be Acting Acting Acting Head from June 22nd to July 12th; *except* that Chris Triggs will deal with mail for the Head of Department whilst George is away. And when Chris is out, then ...?

John Butcher has gone on leave, to the University of Manchester. Simon Fitzpatrick has departed, to become Senior Lecturer at the University of Western Australia. Dr. Rosemary Segedin has been appointed as half-time Tutor. Daniel Tiourin (formerly a student at Moscow State University) has been appointed as half-time Assistant Lecturer.

Dr. Peter Whittle FRS visited the Department for two days, as the 1991 NZMS Lecturer.

The 1991 NZ Mathematical Colloquium, at the University of Otago, was attended by David Alcorn, James Reilly, Roy Swenson and others. Papers were contributed by: Ken Ashton , "Patterns and Logic"; John Butcher ,"*STRIDE* for delay-differential equations"; Marston Conder, "Group actions on the cubic tree"; Ganesh Dixit , "An inclusion relation between Cesàro and Nörlund matrices for absolute summability"; Bruce Calvert (and Simon Fitzpatrick), "Sets invariant under projections onto one-dimensional subspaces"; Colin Fox, "Pseudo-random phase gratings—or, what number theory has to do with concert halls"; David Gauld, "Some undecidable questions on topological manifolds"; Horst Gerlach, "On odd composite numbers which are Fermat pseudoprimes for many bases"; Shouli Jiang, "The strict p-space and related problems"; Mila Mrsévic, Ivan Reilly (and Hans-Peter Künzi), "Convergence and compactness in quasi-pseudo-metric spaces"; Margaret Morton, "Classification of 4- and 5-arc transitive cubic graphs of small girth"; Barbara Reilly and Margaret Morton, "Some factors affecting performance in the Bursary Mathematics With Calculus examination"; Ivan Reilly, "Take a look in the mirror"; Cecil Smith, "*STRIDE* for differential-algebraic equations"; M. K. Vamanamurthy (and M. Vuorinen), "The AGM and the logarithmic mean". Garry Tee gave an Invited Address on "Twenty-five years of New Zealand Mathematics Colloquia".

At the Colloquium Dinner, Gillian Thornley presented NZMS Research Awards to John Butcher and to Rob Goldblatt.

On May 30th, a 1-day seminar on *Careers in the Mathematical Sciences* for interested women students was attended by approximately 200 students, with displays arranged in the Departments of Computer Science, Physics, Mathematics and Statistics, and Engineering Science.

Seminars:

Dr. Ross Ihaka (University of Auckland), "Estimation of earthquake source parameters".
Dr. Steve Thompson (University of Alaska - Fairbanks), "Adaptive sampling".
Dr. John Ecclestone (Bond University, Queensland), "A randomised search procedure for constructing near-optimal block and row-column designs".
Professor Ralph Faudree (Memphis State University), "Complete closure for graphs".
Dr. A. R. Barnett (University of Manchester), "New ideas on Bessel function computation - or, what's a Coulomb function, anyway?".
Professor Max King (Monash University), "Forecasting using the linear regression model with AR(1) errors: a mixture of forecasts approach."

The series of Departmental seminars on Topology has continued in the second term.

A series of short seminars has been presented by Departmental staff, with three or four talks being presented from 1pm to 2pm on Wednesdays.

Our Temporary Tutors Geoffrey Pritchard, James Reilly, Cecil Smith, Paul Taylor and Melissa White presented a seminar, reporting their experiences in applying for "Graduate Study at Foreign Universities".

G. J. Tee

UNIVERSITY OF CANTERBURY
Mathematics

Roy Kerr has just retired as head of the department, and will be going on leave for nine months at the mid-term break. He will spend five weeks at Monash University in Melbourne before going on to his research institute position in Budapest for the rest of his year. Roy's replacement will be Peter Renaud.

We advertised recently to fill one of the vacancies caused by Brent Wilson's death and Robert Bull's retirement. (The money from Brent's position has been used to fund some visiting positions until now.) In the end it was decided to offer two jobs, one to Gunther Steinke (who has been a temporary lecturer with us this year), and the other to Stephen Joe, a former Massey student who is currently in Sydney.

Ian Coope goes on his sabbatical at the end of July. He plans to spend most of his time in England at the Numerical Optimization Centre at Hatfield and at the University of Bradford, but there will also be visits to Dundee and Manchester.

David Wall is away for about a month (July) on an Erskine Fellowship visiting, amongst other places, the Ames Laboratory and a SIAM conference in the States, and the IMACS conference in Dublin.

Rick Beatson will be visiting Mike Powell at the University of Cambridge for a couple of weeks around mid-term break. This is part of a continuing collaboration (dating back to an earlier Erskine Fellowship) studying radial basis functions.

And another absentee (it must that time of the year!) is Mark Hickman who is attending a relativity conference in Tokyo.

We have had two Erskine Fellowship visitors recently. Professor Roger Wets from the University of California at Davis was with us during June. While he was here he gave some lectures to Ian Coope's final year honours class in Optimization, as well a series of seminars (see below).

The other Erskine visitor is Professor Jim Dickey from the University of Minnesota, and he will be here until August. He is giving a series of seminars in Statistics (see below for the first two titles).

Another visitor is Professor Gina Mladineo from Ryder College in New Jersey. (At last, a woman mathematician! as someone remarked.) Gina will be here for two months and is stirring up our global optimization group of Bill Baritompa, Graham Wood and Graham's student Zhang Baoping as they look at probabilistic approaches to their problems.

As part of our attempts to improve our liaison with local secondary teachers, Therese Boustead (one of our tutors) has conducted a survey of local secondary school maths teachers. The main aim is to see what courses teachers would like us to offer, and whether there are other ways we can help them. We are a long way behind our North Island colleagues in this field, but hopefully this survey will show us how to make some progress. The survey and its subsequent analysis will form part of Therese's M.Ed. degree, and we hope to be able to tell local teachers about the results (and possible action?) some time in the third term.

Seminars

Professor James E. Hall (Westminster College, Pennsylvania), "Computers in the Mathematics Classroom", and "Tilings in Science and Art".

Professor John O. Herzog (Pacific Lutheran University, Washington), "An Elementary introduction to Chaotic Dynamical Systems".

Professor Vaughan Jones (Berkeley, California), "Von Neumann Algebras in Maths and Physics".

Professor Roger J-B Wets (University of California, Davis), "Is there an approximation theory for variational problems?" (a series of three seminars) and "Stochastic Optimization" (a series of lectures for our final year honours students).

Professor Jim Dickey (University of Minnesota), "Probability assessment methods for location-scale and spherical multivariate families. Predictive choice of prior distributions in regression analysis" and "Coherent probability assessment: interactive computerization of generalized versions of de Finetti's fundamental theorem of probability".

Dr. Ron J. Gribben (Universities of Brunei and Strathclyde), "Models of thin liquid film flows".

John Hannah

MASSEY UNIVERSITY
Mathematics and Statistics

It is now official—the Department of Mathematics and Statistics has split into two separate departments, Mathematics with Graeme Wake as HOD and Statistics with Jeff Hunter as HOD. This completes (perhaps!) a fragmentation process that started in 1974 when Computer Science split off from the then Department of Mathematics, which until then had embraced mathematics, statistics and computer science. In 1978 the Department of Mathematics became the Department of Mathematics and Statistics, and in 1982 Mathematics and Statistics became separate sections within the department, each electing its own chairperson. Now the sections have become departments, and Computer Science meanwhile has followed a rather similar path and split into a Department of Computer Science and a Department of Information Systems, so that the new School of Mathematical and Information Science which was reported on in the April Newsletter now comprises four departments.

We welcome Bruce van Brunt to a lectureship in Mathematics—more about Bruce appears on page 8.

The contacts which Graeme Wake made on his recent visit to Brunei have already borne fruit in the form of a three-week visit in June by Dr Ron Gribben of the University of Brunei-Darussalam. On the other side of the coin, Charles Little is away on leave in the USA and Adrian Swift in the UK, while Hugh Morton will be returning soon from a short leave in Canada.

Congratulations to Alastair Hall and Bob Sisson, both of whom have recently completed their Ph.D. theses and submitted them for examination.

Seminars

Graham Weir (DSIR Applied Maths, Wellington), "A porous media wave equation".
Howard Edwards (Massey), "Multiple comparisons in ranking and selection".
Douglas Bridges (Waikato: NZMS Visiting Lecturer), "Noncomputable numbers" and "Varieties of constructive mathematics".
John Lermit (Electricorp), "Optimization techniques for scheduling hydro-thermal electricity systems".
Ron Gribben (University of Brunei-Darussalam), "Models of thin liquid film flows".
Roger Openshaw (Education Department, Massey), "The coming of the new mathematics: a case study in secondary school curriculum innovation".

M.R. Carter

OTAGO UNIVERSITY
Mathematics and Statistics

Contrary to the predictions of Nostradamus, the end of the world did not coincide with the celebrations of 25 years of NZMS colloquia. Or maybe it did.

We have a few comings and goings to report. Dr. Malcolm Faddy has recently left our department to take up a position at the University of Queensland. We wish him well with his new appointment and shall continue to send him false weather reports from time to time.

Also leaving soon, although not permanently, is Dr. John Harris. John will be exchanging teaching positions with Prof. John Wenzel of Albion College in Albion, Michigan. The exchange will be from mid August 1991 for one year, in accordance with the University of Otago's exchange of staff policy.

Prof. Richard Anstee has now returned to U.B.C. after a year here on sabbatical. He has spread the word of the delights of Dunedin to his fellow Canadians though, and we are expecting Prof. John Moon from the University of Alberta to arrive in August for a year's sabbatical.

We are also expecting Prof. Bob Hemminger in July for a six month visit. Bob is returning after spending a year here in 1989-'90. Says he just can't get enough of the place. Sun worshipper you know!

As usual, we are doing all the usual university stuff, just like everyone else I imagine.

Robert Aldred.

VICTORIA UNIVERSITY
Mathematics
Institute of Statistics and Operations Research

We are glad to welcome Peter Cholak as a VUW Postdoctoral Fellow (from the University of Wisconsin) to work on recursion theory with Rod Downey.

Stephen Glasby has resigned to return to the Pure Mathematics Department at the University of Sydney from whence h came here - we shall be very sorry to lose him and his expertise with our HP computers (so much so that we have sold the computers and thrown ourselves on the mercies of the VUW Computing Service Centre's machines). As a result e-mail to somebody@math.vuw.ac.nz should now go to somebody@kauri.vuw.ac.nz.

John Harper has returned from a year's sabbatical spent at Northwestern University, Evanston, IL, (3 months), Cambridge, UK (7 weeks) and Oxford (7 months), working on plate tectonics at the first two and on interfacial fluid mechanics at the third.

Planning for the new Maths/ISOR building continues apace: it seems that we shall actually be moving 5 weeks early!! (12-13 Oct.) We have been asked how many boxes we shall need for putting our things in though nobody seems able to tell us how big the boxes are, not even the people who will be providing them!

J F Harper

UNIVERSITY OF WAIKATO
Mathematics and Statistics

Douglas Bridges, Ernie Kalnins, Ingrid Rinsma, Fay Sharples and John Turner attended the Dunedin Colloquium in May.

Douglas Bridges is the NZMS Visiting Lecturer for 1991, and is presenting seminars and public lectures on the topics Varieties of Constructive Mathematics, Non-computable Numbers, Compactly Generated Banach Spaces and Constructive Measure Theory

Ian Craig has returned from leave bristling with new ideas about advective derivatives, Cray access and modern movements in general in numerical analysis, numeric computation and their applications.

Graham French has begun a period of leave and is spending the major portion of his time in the Science and Mathematics Education Research (SMER) Centre here at Waikato.

The software system SENAC was awarded a commendation at the NZ Bits and Bytes/IBM Software Awards in Auckland in May. Kevin Broughan presented a one-day workshop on SENAC in London, also in May.

Dr John Eccleston, Associate Professor in the School of Information and Computing Sciences at Bond University, Queensland, visited WCAS for a month during May and June. The main purpose of the visit was joint research with Nye John and David Whitaker on aspects of the development of expert systems for the design of experiments.

Ian Saunders (also from Bond University, but recently appointed to a chair in Quality Improvement at the Queensland University of Technology) was here for a short period. Ian spoke on experimental design for continuous processes and made liberal use of the variogram. Some members may have heard Geoff Jowett extolling the merits of this facility.

Coming from Minnesota bearing gifts was Dennis Cook, who also spent a few weeks with us. As well as explaining some of his current research into Regression Diagnostics he demonstrated the wide scope of the XLISP-STAT statistical language, an S-like language based on LISP. The most significant points to note are that it's free and runs on Macintoshes of sufficient size.

Preparations are now well underway at Ruakura and the University for the International Biometric Conference to be held in Hamilton in December 1992. The Biometric Bulletin of May 1991 noted with glee the fact that the following conference in the series will also be in Hamilton (Ontario !) in 1994.

Murray Jorgensen visited the Department of Mathematics of the University of Queensland where he was able to spend rewarding time with Gordon Smythe, Geoff McLachlan and Kaye Basford. Also Sandy Weisberg was a fellow visitor, so he was able to balance himself nicely with respect to the other side of the Cook/Weisberg duo.

Nye and Murray both attended STATCOMP/BIOSTATS 91 at Coolangatta, Queensland, where the buzz-words of the year were Object-Oriented, Gibbs Sampler, Deconvolution, Overdispersed and Pixel. See if you can get them all into one paper—that, apparently, should ensure your success as a statistician !

Grant Keady has left us to return to the University of Western Australia. Grant was a visiting research fellow for the past two years in the Mathematical Software Project. His special field of interest is symbolic-numeric interaction. One of his converts to symbolic computation has been Judi McWhirter, who has been

investigating the use of symbolic differentiation in the fitting of nonlinear models.

Atawe Kogiri from the University of Technology, Lae, Papua-New Guinea, is visiting the Centre for Applied Statistics for the second semester with help from MERT under the Official Development Assistance programme. He will spend much of his time gaining biometrical experience at Ruakura.

Bill Bolstad was on the other side of the graduation ceremony this May, being top of the graduands list in the School of Computing and Mathematical Sciences to receive his DPhil. Peter Danaher's position has been filled, and we expect our new staff member to arrive in August.

Ray Littler's primary affiliation has been changed from Ruakura to the University, although he will continue to spend a substantial proportion of his time in Ruakura consulting.

There is a position in Numerical Analysis/Numeric Computation currently vacant in the Department of Mathematics and Statistics. E-mail d.bridges@waikato.ac.nz for information.

Kevin Broughan

NEW COLLEAGUES

Bruce van Brunt

Dr Bruce van Brunt has recently been appointed to a lectureship in the Mathematics Department of Massey University. He was born in California; most of his early life, however, was spent in the Pacific Northwest on his father's cattle ranch. He received his undergraduate education in Washington State at Gonzaga University.

Bruce completed a D.Phil in mathematics at the University of Oxford in 1989 under the supervision of John Ockendon and Bryce McLeod. He worked as a research fellow at the University of Birmingham from 1989 to 1991. His research interests include functional differential equations, applied analysis, and differential geometry along with mathematical problems arising in physics and engineering.

NOTICES

NONLINEAR BOUNDARY VALUE PROBLEMS
Wollongong, 30 Jan to 1 Feb, 1992

This special interest meeting on Analytic Methods in Nonlinear Boundary Value Problems in Science and Engineering precedes the annual Applied Mathematics Conference of the Australian Mathematical Society (Bateman's Bay, New South Wales, beginning Sunday night, 2nd February). This is one of the few meetings ever held with an emphasis on analytic methods in nonlinear boundary value problems, without focussing on one area of application or on solutions. The following have accepted invitations to speak:

C Rogers (Loughborough)
A Donato (Messina)
G Bluman (Vancouver)
G Wake (Palmerston North)
J R Philip (Canberra)
R Ogden (Glasgow)
A Newell (Tucson)
W F Ames (Atlanta)
R Guenther (Corvallis)
A McNabb (Palmerston North)

Other interested speakers are invited to contact the organisers. College accommodation will be available and hotel accommodation may be arranged.

If you are interested in attending, contact the local organisers: Professors P Broadbridge and J M Hill, Department of Mathematics, University of Wollongong, PO Box 1144, Wollongong NSW 2500, Australia.

VAUGHAN JONES
in Christchurch, Dunedin, Wellington and Auckland

The 1991 New Zealand Mathematics Colloquium Committee, in association with the Ministry of Science, Research & Technology, brought Professor Vaughan Jones F.R.S. (and Fields Medallist) from Berkeley for a week's visit in May.

He arrived in Auckland on Thursday 16th, and was interviewed by *The New Zealand Herald*. On Friday 17th he flew to Christchurch, where he gave a public lecture at the University of Canterbury and was interviewed by *The Press* and the *New Zealand Science Monthly*. He spent Saturday 18th at the Mathematical Olympiad training camp at Rangiruru Girls' High School in Christchurch, with secondary students who are preparing for the 1991 IMO. The 23 students there found Vaughan a most stimulating and entertaining visitor. He flew to Dunedin on Sunday 19th, to deliver 2 Invited Addresses to the 1991 NZ Mathematics Colloquium. He was interviewed by *The Otago Daily Times*, and on Tuesday 21st he featured in a radio talk-back session. At the Colloquium Dinner on Tuesday 21st he was awarded a certificate of Honorary Membership in the New Zealand Mathematical Society, and Dr. John Turner persuaded him to become the Patron of the International Guild of Knot Tyers.

Vaughan Jones receives the NZMS certificate from David Gauld. Photo G.J .Tee

On Wednesday 22nd, Vaughan Jones caught an early flight to Wellington, to meet the Prime Minister. Jim Bolger announced that a New Zealand Science and Technology Medal is to be founded, and that when it is the Governor General will award the first such medal to Vaughan Jones. That meeting was followed by radio and television interviews. On the morning of Thursday 23rd Vaughan flew to Auckland for lunch at the Vice-Chancellor's Suite in Old Government House. That lunch was arranged by the Dean of Science (Associate-Professor Roy Geddes) with about 16 guests, including Vaughan's parents and some of his former teachers and lecturers. (Mr. Jones told me that he hoped to be able to take Vaughan shopping that afternoon: the previous week had been so fully occupied that Vaughan had not been able to get near any shop so far.) At 1pm, Vaughan gave a public lecture in the largest lecture theatre at the University of Auckland. That theatre (Library B28) was filled with 420 people, including many secondary students (who had come during their vacation), and many additional people went to theatre B15 for a televised relay of the lecture.

Vaughan Jones explained in his lecture that the mathematical theory of knots had been founded in the 1870s by the physicists William Thomson (later, Baron Kelvin) and Peter Guthrie Tait, to develop Thomson's theory that atoms are knotted vortices in ether (an hypothetical substance filling all space, whose vibrations constituted light and heat). Knot theory was extensively developed for some decades, but interest waned after it became clear that chemical atoms are not knotted vortices of ether. In 1928 John Alexander shewed that, from a picture of any knot, a polynomial could be constructed which is invariant when the knot is changed in form, provided that the string does not get cut or joined. Hence, if 2 knots have distinct Alexander polynomials then they are not equivalent, i.e. they cannot be changed into each other (unless they get cut and joined). However, many pairs of polynomials which are known (on other grounds) to be non-equivalent do share the same Alexander polynomial. For example, the simplest non-trivial knot is the trefoil, whose left-hand and right-hand versions are mirror images. In 1916 Paul Dehn had found a complicated proof that the left and right trefoils are distinct, but the Alexander polynomials do not distinguish between knots which are mirror images.

At the University of Geneva Vaughan Jones had studied von Neumann algebras, and in 1984 a colleague there suggested to him that his algebraic work might be applicable to the theory of braids (e.g. plaiting). Visiting Columbia University (in New York) he met Joan Birman, who has written a book about knots and braids, and he asked her to teach him something about knots. He then tried using his skills in von Neumann algebra, and he quickly constructed an invariant polynomial for knots. He assumed, naturally enough, that he had re-derived the Alexander invariant polynomial: it took him some sleepless nights before he realised that his

polynomial is different from Alexander's. It is much more effective than Alexander's in distinguishing between knots—indeed, the very simplest instances of Jones polynomials prove that the left and right trefoils are distinct.

Meanwhile, electron microscope photographs of cells had revealed that, during the reproduction of a cell, its DNA loop gets knotted and then unknotted. Molecular biologists had been baffled by the problems of distinguishing knots from photographs of the tangled loops of DNA. At Berkeley, the molecular biologist Nicholas Cozzarelli had failed to get any help from mathematicians when he asked them about knots, and so he and his colleagues had spent much time in constructing knots from such photographs, and then trying to twist one knot into another. If they succeeded then those knots are indeed equivalent, but when the researchers could not find a way of twisting one knot into another then eventually a vote would be taken on whether they thought that those knots really were distinct. Late in 1984 Cozzarelli obtained a pre-print of Vaughan Jones's first paper on knots, and he realised immediately that the Jones polynomials provided a very simple and effective technique for identifying and distinguishing knots. Front-page articles soon appeared in the *New York Times* and in *Le Monde* about that novel application of mathematics to biology, and Cozzarelli then discovered that the inventor of the Jones polynomial had recently moved into an office only 200 metres from his own!

Several other researchers have subsequently constructed various invariant polynomials for knots; but the original Jones polynomial has proved to be the most useful such invariant. The Jones polynomial has become a major topic in research in many different branches of science, from pure mathematics to genetics, from statistical mechanics to electromagnetic fields, and from the "superstring" theory of fundamental particles up to cosmology.

The lecture was received with great interest by the large audience. Dr. Michael J. J. Lennon had first suggested to Vaughan Jones, when Jones was a graduate student, that he should undertake a research project; and Vaughan acted on that advice. Dr. Lennon, when moving a vote of thanks to Vaughan Jones, announced that the Council of the University of Auckland has decided to award an Honorary D.Sc. to Professor Vaughan Jones F.R.S. The audience applauded with enthusiasm at that announcement.

An interview for the University's radio programme had been arranged for that afternoon of May 23rd. But that was cancelled to enable Vaughan Jones to get a few hours rest before heading back to Berkeley that evening, after a rather busy week.

G. J. Tee

LECTURESHIPS IN MATHEMATICS
Victoria University of Wellington

The University invites applications from suitably qualified men and women for two positions available from 1 February 1992.

Applications are invited in all areas of pure mathematics. Candidates are expected to have a proven record of research, and be committed to excellence in teaching.

Enquiries about academic aspects of the positions may be directed to Professor Rob Goldblatt, Department of Mathematics, e-mail (Internet): rob@kauri.vuw.ac.nz , fax +64-4-712-070.

The salary scale for Lecturers is NZ$37,440 - NZ$45,448 per annum, where there is a bar; then NZ$46,800 - NZ$49,088 per annum.

Applications should be forwarded to the Appointment Administrator, Personnel Office, Victoria University of Wellington, P.O. Box 600, Wellington, New Zealand with whom applications close on 1 October 1991.

The University is an equal opportunity employer.

Rob Goldblatt
rob@math.vuw.ac.nz

NZMS AWARDS FOR MATHEMATICAL RESEARCH

The inaugural awards which were based on work published over the previous ten years were announced at the Colloquium dinner, 21 May 1991. The recipients were

John Butcher University of Auckland

The Award is for establishing new fundamental connections between analytic stability properties and algebraic properties of numerical methods for the solution of non-linear differential equations; for implementing new methods; and for an outstanding monograph on Runge-Kutta and general linear methods.

Quoting from a referee's report:

"John C Butcher is recognised as one of the world's leading authorities in the area of numerical methods for the solution of initial value problems for ordinary differential equations. His work within the past 10 years is a continuation of his previous excellent work, following several distinct lines of approach, notably stability questions in nonlinear problems, implementation of methods for stiff systems, design of new methods. His monograph on the numerical analysis of ordinary differential equations of 1987 is an outstanding book which brings together large parts of the worldwide knowledge on the subject from the particular point of view of the author; it also contains substantial research results.

John C Butcher is distinguished for his penetrating analysis of the mathematical structures prevalent in the numerical treatment of ordinary differential equations. He is able to draw on a wide reservoir of mathematical knowledge in his sophisticated approaches to the analysis and design of numerical methods. His work is well-known to every researcher in the area, and his opinion is equally sought by experts and by newcomers. I do not know any other scientist worldwide who has contributed so much to the important area of numerical solution of initial value problems in ordinary differential equations within this period".

Robert Goldblatt Victoria University

The Award is for outstanding work in generalisations and applications of modal logic, including four books displaying a remarkable mastery of diverse aspects of mathematics from programming to space time geometry.

Quoting from referees' reports:

"Robert Goldblatt is a highly competent and versatile mathematician whose personal research contributions and didactic qualities have made him an influential member of the community.

This period of his work concerns generalisations and applications of modal logic. Note the breadth, from programming to spacetime geometry - no one else in modal logic has anything like this. The mathematical depth is equally impressive, especially in the paper on Varieties of Complex Algebras. This paper sets up an abstract theory of great generality, in terms of universal algebra and topology, which includes modal logic as one of many special cases".

From the assessor's report:

"We see common strengths in the work of John Butcher and Robert Goldblatt, albeit expressed in the particularities of their different research fields. Their strengths include

(i) A research productivity building on substantial work accomplished before 1980 but developing that work throughout the '80's through major papers containing significant results in their fields.

(ii) A very high standard of expositional mathematical writing in which they give comprehensive accounts of the mathematical fields in which their specific research is placed.

This is specially evident in the several expository works of R Goldblatt but is also strongly present in the major reference work written by J C Butcher.

(iii) The reputation that each has achieved in world-wide communities of mathematical scholars attesting the high regard in which each is held as a mature researcher and mathematical scholar".

General Comments from the Assessors

"We were impressed by the high quality of mathematical research submitted by all candidates.

At the same time we were disappointed that the various communities of mathematical research in New Zealand were represented so unevenly in the candidates presented for consideration. The Society needs to broaden the awareness amongst the mathematical community that such awards are being made and so ensure that all potential recipients are being considered. We believe that there are several other mathematicians in New Zealand with generally comparable research records.

For this reason we have been cautious in recommending awards on this inaugural occasion".

NZMS AWARD FOR MATHEMATICAL RESEARCH
1991 Round

Applications and nominations are invited for the NZMS Award for Mathematical Research. (Nominations should include the written consent of the candidates.) These should be sent to Gillian Thornley, Department of Mathematics, Massey University, Palmerston North, by 1 October 1991.

Purpose of the award

The purpose of this award is to foster mathematical research in New Zealand and to recognise excellence in research carried out by New Zealand mathematicians.

The award will be based on mathematical research published in books or recognised journals within the previous **five** calendar years only.

Candidates must have been residents of New Zealand for the previous three years.

Procedures

Candidates should supply the following:

- Name and affiliation
- Statement of general area of research
- Names of two persons who are willing to act as referees
- A list of research published within the previous five calendar years
- Two copies of the **five** most significant publications selected from the above list
- A clear statement of how much of any joint work is due to the applicant.

A judging panel shall be chosen by the NZMS Council. The judges may call for reports from the nominated referees and/or obtain whatever additional referees' reports they feel necessary.

The judges shall recommend one person for the award, or a joint award to more than one person, or that no award be made.

No person shall win the award more than once.

The award shall consist of a certificate including an appropriate citation of the awardee's work.

Publicity

Announcements of the award(s) and presentation of certificate(s) for any year shall be made at the AGM of the Society (if at all possible). Also an announcement including the appropriate citation(s) shall be made in the NZMS Newsletter, and in a national press release.

PRE-DOCTORAL THESIS COMPETITION

The winners of the New Zealand Mathematical Society pre-doctoral Thesis Competition were announced at the Mathematics Colloquium at the University of Otago. They are:

First Prize:

Brian Dorofaeff (University of Waikato) for his thesis "Eigenvalue Equations associated with Operators arising from Enveloping Algebras in Lie Theory".

Highly Commended:

Hongying Huang (University of Otago) for her thesis "Cyclic Symmetry in Finite Element Analysis".

Both theses were for Masters degrees. The competition included theses and projects submitted between 1987 and 1990.

Adrian Swift for organised the competition, and the judging panel comprised Gloria Olive (convenor), Derek Holton, Bryan Manly and Vernon Squire.

PROPOSED NZMS CONSTITUTIONAL CHANGES
Notice of motion for the 1992 AGM

The following changes, designed to abolish exclusive language from the NZMS constitution are proposed by Derek Holton, John Giffin, Mike Carter, Kee Teo and Gillian Thornley. References are to the Constitution published in Newsletter No 32, December 1984 pp33-35.

Article III: Members

The fourth sentence be replaced with:

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

Article V: The Council

Paragraph 4, the fifth sentence be replaced with:

"Meetings of the Council shall normally be chaired by the President if present, or by the Vice-President."

In the seventh sentence replace:

"Chairman" with "Chairperson"

Article VI: Officers

Paragraph 3, combine sentences one and two as follows:

"The President shall be ex officio a member of all committees, and shall deliver the Annual Report of the Council at the Annual General Meeting (Article VII)."

The fifth sentence be replaced with

"The Treasurer shall keep the Society's financial records and prepare the necessary financial statements."

Article VII: Meetings

Paragraph 4,

The first sentence be replaced with:

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

In the third sentence replace

"Chairman" with "Chairperson".

HISTORICAL NOTE
The year(?) of marvels

James Joseph Sylvester (1814-1897) was Professor of Mathematics at the Royal Military Academy, Woolwich, from 1855 until 1870, when he was forcibly retired at the age of 56 as being "superannuated".

In 1876 the Johns Hopkins University was opened at Baltimore under President Gilman. He had been advised to found the faculty with an outstanding classicist and the best mathematician that he could afford. Accordingly, Gilman appointed Basil Gildersleeve as Professor of Classical Studies, and J. J. Sylvester as Professor of Mathematics.

Sylvester founded *The American Journal of Mathematics*, which published 30 papers by him before he resigned in 1883 to become Savilian Professor of Geometry at Oxford. During his 7 years at Johns Hopkins, he succeeded in establishing modern mathematics in the USA. Professor Gildersleeve had also founded *The American Journal of Philology*.

Johns Hopkins University celebrated its centenary in 1976 with a series of special symposia and lectures by distinguished scholars from around the world. The memory of J. J. Sylvester was honoured by a symposium on algebraic geometry, which was published as: *Algebraic Geometry: The Johns Hopkins Centennial Lectures*, (edited by Jun-Ichi Igusa), Supplement to *The American Journal of Mathematics*, 1977.

The first lecture in that volume is "An Introduction to J. J. Sylvester" by Harry Woolf, which starts with the following two sentences:

> It is a pleasure to extend to you the University's official welcome in this the 100th year of its history. As a proper reflection of the central values of The Johns Hopkins University we have chosen to emphasize the intellectual in the celebration of our *anus mirabilis*.

It appears that classical studies at Johns Hopkins University have not maintained the same eminence as mathematical studies there.

G. J. Tee

MATHEMATICAL CONFERENCES IN PERTH, WESTERN AUSTRALIA 6-10 July 1992

Three conferences will be held at the University of Western Australia from 6th July to 10th July, 1992. This is a unique opportunity for mathematicians to meet with experts from the various branches of Mathematics. Although distinct programmes will be run it is expected that some speakers will give expositions at more than one of the three conferences. The University is centrally located, on the bank of the picturesque Swan river, with the city only 10 minutes away by bus. Comfortable accommodation is available from the residential colleges across the road from the University. King's Park, one of the largest and best known parks in W.A. is within walking distance of the University. Below is some information pertaining to each of the three conferences.

Australian Mathematical Society, 36th Annual Meeting

Conference Director: Assoc. Prof. William S. Perriman, Curtin University. The following people are among those who have been approached and who have expresses interest in attending: Sun-ichi Amari (Tokyo), Petar Kenderov (Bulg. Acad. Sci., Sofia), Jerrold Marsden (Berkeley), Robert Phelps (Washington) and James Yorke (Maryland) together with some local notables. Accommodation has been booked at Kingswood College. It is likely that two mini-conferences will be held: one on Banach Spaces before the Annual Meeting and another on computer algebra following it. For further information, please contact the conference secretary: Dr P F Siew, School of Mathematics and Statistics, Curtin University of Technology, Bentley 6102. (email: tsiewpf@cc.curtin.edu.au]

Australian Statistical Society, 11th Conference

Conference Director: Prof T Brown, Univ. Western Australia. Major sessions being planned include topics on accident and injury statistics, medical imaging, statistics involved in law and proof, chemometrics/process modelling in industries, applied chaos/non-linear time series, combinatorics and design and statistical consulting. Also under consideration are topics on causal models, natural resource management and longitudinal data analysis and smoothing. For further information please contact the conference secretary: Dr Russell John, School of Agriculture, University of Western Australia, Nedlands, WA 6009. [email: aerdj@uniwa.uwa.oz.au]

Combinatorial Mathematics and Combinatorial Computing, 18th Australasian Conference.

Joint Directors: Prof C E Praeger (UWA) and Assoc Prof L. Caccetta (Curtin). The following people have expressed interest in attending the conference: R A Bailey (Goldsmiths College, London), B Bollobas (Cambridge), P Lorimer (Auckland), C M O'Keefe (Adelaide), S B Rao (ISI, Calcutta), D Street (UNSW), J Thas (Ghent), and D Younger (Waterloo). Accommodation has been booked at Currie Hall. For more information please contact the secretary of the organizing committee: Dr K Vijayan, Mathematics Department, University of Western Australia, Nedlands, WA 6009. [email: vijayan@madvax.maths.uwa.oz.au]

INTERNATIONAL MATHEMATICAL UNION
CDE-IMU Third World Conference Support and Travel Grants

Depending on the funds available, the COMMISSION ON DEVELOPMENT AND EXCHANGES of the International Mathematical Union (CDE-IMU) will continue to provide **Support to Conferences in Third World Countries and Travel Grants and Fellowships** to individual mathematicians.

The program **Support to Conferences in Third World Countries** applies to conferences organized by Third World Countries in a Third World Country. The funds made available by the CDE must be used to cover *Academic Expenses*. The organizers are to apply to the CDE c/o The Secretary at least nine months in advance (the application should include: a detailed scientific program, a list of invited speakers, a list of supporting organizations, a statement on intended use of CDE-support. In case support is granted, a scientific and financial report will have to be sent to CDE after the conference is held).

The program **Travel Grants and Fellowships** applies to individual mathematicians who make an extended research visit to a host institution which bears the living expenses. It applies both to mathematicians from Developing Countries who visit a research center (for at least one month) and to mathematicians from Developed Countries who visit a research center in a Developing Country (for an extended period of time). Individuals should apply at least four months in advance to CDE c/o The Secretary, (the application should include bio-data, a research program and an invitation letter from the host institution). This program includes the IMU-UNESCO visiting program.

Due to the limited funds presently at its disposal, the CDE cannot give financial support for attending conferences. The CDE is not in a position to suggest institutions to visit for mathematicians from Developing Countries. We are however willing to respond to requests from Developing Countries to invite mathematicians from Developed Countries or to induce some mathematicians of given speciality to visit them (**NB: the expression "Developing Country" does not apply to any European Country).**

Applications to CDE programs are to be sent to:

CDE c/o The Secretary, Professor Pierre Bérard, Institut Fourier, Université Grenoble 1, B.P. 74, F-38402 St Martin d'Héres Cedex (France)

BOOK REVIEWS

Dynamical Systems IV – Symplectic Geometry and its Applications, edited by V.I. Arnol'd and S.P. Novikov. Encyclopaedia of Mathematical Sciences, Volume 4, Springer-Verlag, Berlin-Heidelberg-New York, 1989, 283 pp, DM 128.
ISBN 3-540-17003-0.

This book is the fourth volume on dynamical systems in the Encyclopedia of Mathematics series published by Springer. The first three volumes cover material on Ordinary differential equations and smooth dynamical systems (Vol.1), Ergodic theory with applications to dynamical systems and statistical mechanics (Vol.2), and Mathematical aspects of classical and celestial mechanics (Vol.3). All these volumes are relatively compact and contain surveys of their respective topics. Volume 4 contains three review articles on the topics (i) Symplectic geometry by V.I.Arnold and A.B.Givental', (ii) Geometric quantization by A.A.Kirillov, (iii) Integrable systems I by B.A.Dubrovin, I.M.Krichever and S.P.Novikov. I will comment on each of these separately.

(i) This review article gives a comprehensive treatment of linear symplectic geometry, symplectic manifolds, symplectic geometry and mechanics, contact geometry, Lagrangian and Legendre singularities and Lagrangian and Legendre cobordisms. Symplectic geometry is the mathematical apparatus of areas of physics such as classical mechanics, geometric optics and thermodynamics. Whenever the equations of dynamics can be obtained from a variational principle symplectic geometry makes clear the relations between quantities appearing in the theory and is in fact the underlying structure in many of these systems. As can be seen from the topics covered in this review the material covered is mainly of a mathematical nature, applications to mechanics for example being discussed in greater detail in the third volume of this series. Of particular interest are the sections dealing with the classification of the critical points of functions and singularities of wave fronts and caustics.

(ii) The notion of quantization is based on the premise that classical and quantum mechanics are just realisations of the same abstract scheme. Various forms of quantization have been contemplated and terms such as asymptotic, deformational and geometric quantization have emerged. As suggested by the name, asymptotic quantization assumes that the observables and the states are expanded in a small parameter h. The constant

terms then correspond to classical mechanics and the first order terms to the quasi-classical approximation. The deformational approach investigates the algebraic structure of the algebra of observables and regards the quantum situation as a deformation of the classical one. The geometric approach by Kirillov in this article sets as its goal the construction of quantum objects using the geometry of the corresponding classical objects as the point of departure. The development is based on the thesis that every quantum system with symmetry group G can be obtained by quantization of a classical system with the same symmetry group. Then the irreducible representations of the group G must be connected with homogeneous symplectic manifolds. The method of orbits in the theory of unitary representations of Lie groups ties together the unitary representations of a Lie group G with the orbits of this group in the coadjoint representation which acts on the space g^* dual to the Lie algebra of the group G. The connection between quantization and the method of orbits is found in the theorem which states: *every G orbit in g* is a homogeneous symplectic G manifold and conversely every homogeneous symplectic G manifold is locally isomorphic to an orbit in the coadjoint representation of the group or a central extension of it.* The author is well known for his important work in the development of the coadjoint orbit method in Lie group representation theory. After stating the basic problem of quantization we are led to the results of this survey via the preliminary notions of prequantization and polarizations.

(iii) The article on integrable systems has as its aim the presentation of the modern theory of integrable systems as a constituent part of the inverse scattering method. Special emphasis is placed on finite dimensional systems. The finite dimensional dynamical systems to which the inverse scattering method is applicable are either finite dimensional in their original formulation or they arise during the construction of particular classes of exact solution of the field theoretic equations as restrictions of the latter to finite dimensional invariant submanifolds. What is emphasised is the significantly greater effectiveness of the inverse scattering method compared to classical methods of integrating Hamiltonian systems. The inverse scattering method allows one to explicitly produce solutions of the equations of motion as well as canonical action angle variables in terms of special classes of functions. The first chapter surveys modern views of the Hamiltonian formalism in both finite dimensional and field theoretic systems. Classical methods of integrating Hamiltonian systems using symmetry methods or separation of variables methods are outlined. The second chapter gives an account of modern ideas on the integrability of evolution systems. Important aspects of integrable evolution systems are discussed, often with a good supply of examples. For example the case of Lax pairs L,A of operators which satisfy $(dL/dt) = [L,A]$ is amply illustrated by examples such as the Boussinesq equation, nonlinear Schrödinger equation, Toda lattice and the equations of three wave interaction. The relation of this representation to the zero curvature representation is pointed out. This leads to a discussion of finite dimensional λ families. The final sections give examples of systems of integrability in two dimensions using theta functions, a discussion of pole systems and the relation of algebraic-geometric spectral theory of linear periodic operators to integrable systems. In particular this last topic gives a fascinating analysis of the Peierls-Fröhlich model, which describes the self-consistent behaviour of a lattice of atoms, and the Schrödinger difference operator in terms of algebraic-geometrical spectral theory.

In general the articles in this book are well written in a style that enables one to grasp the ideas. The actual style is a readable mix of the important results, outlines of proofs and complete proofs when it does not take too long together with readable explanations of what is going on. Also very useful are the large lists of references which are important not only for their mathematical content but also because the references given also contain articles in the Soviet literature which may not be familiar or possibly accessible to readers.

E.G.Kalnins
University of Waikato

A Course in Modern Geometries, by Judith N. Cederberg. Undergraduate Texts in Mathematics, Springer-Verlag, Berlin-Heidelberg-New York, 1989, xii + 232 pp, DM 88.00. ISBN 3-540-96922-5.

This book is intended for second and third-year university students. With the current up-welling of student numbers there come lamentations over their ill-preparedness for the study of mathematics as a university discipline and there is a yearning to re-instate the notions of logic and rigorous proof needed for a proper treatment of the subject. There is an impetus to provide courses in geometry at the undergraduate level (or, better, at the high-school level). For these reasons this book is of interest.

There are four chapters, one each on axiomatic systems and finite geometries, Non-Euclidean geometry, geometric transformations of the Euclidean plane, and projective geometry in the plane. The discussion is restricted to two dimensions. Each chapter has an introductory section called "Gaining Perspective", which may

be intended as a pun. I am tempted to add at the end of each chapter a section "Upon Reflection". Throughout I get the feeling that the cold text on the page lacks the enlivenment of the author's voice when lecturing. The casual utterance does not always go as well when it becomes the written word. Thus, on page 26, we have "Euclid's work was immediately accorded the highest respect and recognized as a work of genius. As a result all previous work in geometry was quickly overshadowed so that now there exists little information about earlier efforts". In the classical Grecian time scale just what does "immediately" connote; overnight? after five years? fifty years? How did books get 'published' in those times? Were the other geometry books remaindered in the agora? Was the book solely Euclid's work or did he extend a corpus of known results? Having been provoked into these questions by the writer's statements the reader is entitled to some references to back up those statements, otherwise one is left with an overswept view of the history of geometry. However there is a bibliography at the end of the chapter from which the readers can find facts for themselves.

How much geometry should a student "know" before being introduced to a set of axioms? If the answer is "none" then the student exposed to an axiomatic system may be baffled, and is entitled to ask questions such as "How do you know what axioms to make? Who decides the rules? What is meant by undefined? When you can't prove something but know it to be true do you add it as an axiom?" Euclid's foundations as translated by Heath are given as an appendix but some commentary on the literalness of the translation from the very succinct Greek would help. The discourse on the postulate of parallelism is very interesting but perhaps could be taken further. Nevertheless Chapter 2 is a reasonably compact introduction to Non-Euclidean geometries.

The use of Desargues' Theorem as an axiom in plane projective geometry must surely be a puzzlement to a newcomer to the subject. Here it is done so that harmonic sets can be used without the introduction of a co-ordinate system. Here a paragraph of enlightenment is needed to the effect that any plane projective geometry can be co-ordinatized and that the truth of Desargues' Theorem or otherwise in that geometry depends on the associativity of the algebra used. And perhaps the incidence relationships of Desargues' configuration can first be illustrated by the shadow cast on a plane by a triangular lamina in front of a light source, the very soul of perspective studies.

In Chapter 1, (p 15), the description of the matrix G in relation to error-correcting codes is not at all clear. In Chapter 3, (p 111), the table of frieze patterns has a serious error in the sixth row, which as it stands is essentially the same pattern as that of the fourth row. In Chapter 4, (p 151), the "proof" of corollary 1 of theorem 4.14 is defective in that a continuity argument is used without justification; "let P_2 approach P_1". This is a small blemish but it does need removing. Pappus' Theorem appears in an exercise on page 154. It would be better embodied in the main text, particularly if the book is designed to encourage further studies in geometry.

The geometries studied are confined to two dimensions. Since matrices and vectors are introduced much could be gained by indicating some of the results in three or more dimensions. This book in the hands of a critical instructor can serve as a reasonable introduction to the serious study of geometry. I think it could go much further into the properties of conics, for while I find the lead up to that topic nicely developed I do not get the sense of wonder that can attach itself to many of the splendid results on conics.

D.R.Breach
University of Canterbury

q-Series and Partitions, edited by Dennis Stanton. The IMA Volumes in Mathematics and its Applications, Volume 18. Springer-Verlag, Berlin-Heidelberg-New York, 1989, xii + 212 pp, DM 128. ISBN 3-540-97086-X.

This is a collection of papers coming from a workshop organised by the Institute for Mathematics and its Applications established at the University of Minnesota in 1982. (This institute is not to be confused with the British one of the same initials). Each year the Institute runs a workshop in a particular topic; that for 1987-88 was applied combinatorics. Contrary to the opinion of another reviewer that the authors of a certain collection of papers seemed to be unaware of each others' existence, here we have much interconnection and cross-referencing between the fourteen papers and the book does have a thematic unity.

Let $(a)_n = a(a+1)\ldots(a+n-1)$. Then the classic hypergeometric function is given by

$${}_2F_1(a,b;c;z) = \sum_{n=0}^{\infty} \frac{(a)_n (b)_n}{n!(c)_n} z^n.$$

The generalized hypergeometric function, ${}_pF_q$, has p bunches of factors upstairs and q bunches downstairs (so ${}_0F_0$ is an oblique description of the exponential function). The q-

analogues ${}_p\phi_q$, of the generalized hypergeometric functions have $(a)_n$ replaced by $(A;q)_n = (1-A)(1-A_q)\ldots(1-A_q^{n-1})$ and $z^n/n!$ replaced by t^n.

Specialized forms of the ${}_p\phi_q$'s provide the Gaussian polynomials, $\prod_{i=1}^{j}\frac{(1-q^{n+i})}{(1-q^i)}$, and many of the generating functions for the partitions of natural numbers.

The first paper, by George Andrews, is a survey of the proofs of the Rogers-Ramanujan identities. Here we are introduced to a splendid mechanism, the Unit Bailey Chain, whereby one can make sequences of identities of ever-increasing complexity. Thus starting with an equation for a certain ${}_4\phi_3$ we go to one for a ${}_6\phi_5$ and then to a ${}_8\phi_7$ and so on. Lie algebras come into plan. There is a very good bibliography at the end of this paper. The paper by George Caspar deals with bibasic summations, which involve ${}_pF_q$'s and ${}_p\phi_q$'s that are power series in two variables. Here de Branges' proof of the Bieberbach conjecture is mentioned.

Zeilberger's essay on identities is good reading for the non-specialist. One of the striking features of the book is the use of computer aided algebra. The mathematical community is coming to accept proofs "by computer". As Zeilberger writes; The purpose of the computer is to save humans the dreadful task of devising proofs that Hardy called scornfully "essentially verifications", and, [so allow them to] concentrate on trying to find insightful proofs. This short paper should be required reading for all.

There are four papers, by Bressoud, Goodman and O'Hara, Zeilberger, and I.G.Macdonald, on aspects of O'Hara's combinatorial proof that the coefficients of a Gaussian polynomial are unmodular, that is they increase to a maximum and then decrease as the degree of the variable increases. The combinatorial proof has long been awaited. Then follow three papers on certain integrals, by Gavan, Habsieger and Richards. In these we are led into group theory and root systems. The theme of group theory is continued in the next paper, by Stanton, on an elementary approach to the Macdonald identities. The last three papers, by Gessel, Ismail and Willard Miller Jr., are linked by the idea of orthogonality and involve such things as the rook polynomials, Hermite polynomials and the other classical orthogonal polynomials. In the last of these papers it is interesting to encounter the four-dimensional Laplace's equation, which seemingly is a long way from the topics of the first paper in the collection.

This is a very rewarding book particularly for those who take pleasure in the manipulation of complicated algebra to obtain surprising identities and even more so for those who, by finding applications for algebra, can see why certain results must hold even though a straight manipulative verification may be very tedious or almost not feasible. The number of different parts of mathematics encountered is surprisingly large. The references are comprehensive and the standard of presentation is high. One can follow the gist of all the papers without being an expert in algebra and special functions.

D.R.Breach
University of Canterbury

SPRINGER AND BIRKHÄUSER PUBLICATIONS

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

David Alcorn
Department of Mathematics and Statistics
University of Auckland
(email: alcorn@mat.aukuni.ac.nz)

Algorithmics and Combinatorics

5.	Nesetril J	Mathematics of Ramsey theory. 269pp.

Applied Mathematical Sciences

87.	Weder R	Spectral and scattering theory for wave propagation in perturbed stratified media. 188pp.

Encyclopaedia of Mathematical Sciences

26.	Nikol'skij SM (ed)	Analysis III – Spaces of differentiable functions. 221pp.
27.	Maz'ya VG	Analysis IV – Linear and boundary integral equations. 223pp.
69.	Barth WP	Several complex variables VI – Complex manifolds. 310pp.

Ergebnisse der Mathematik und ihre Grenzgebiete, 3.Folge

20.	Kostrikin AI	Around Burnside. 220pp.
22.	Faltings G	Degeneration of abelian varieties. 316pp.

Graduate Texts in Mathematics

122.	Remmert R	Theory of complex functions. 453pp.
127.	Massey WS	A basic course in algebraic topology. 420pp.

Grundlehren der mathematischen Wissenschaften

293.	Revuz D	Continuous martingales and Brownian motion. 533pp.
294.	Knus M-A	Quadratic and hermitian forms over rings. 524pp.

The IMA Volumes in Mathematics and its Applications

29.	Glimm J (ed)	Multidimensional hyperbolic problems and computations. 386pp.

ISNM (Birkhäuser)

97.	Küpper T (ed)	Bifurcations and chaos. 388pp.

Operator theory: Advances and Applications (Birkhäuser)

50.	Bart H (ed)	Topics in matrix and operator theory. 378pp.
51.	Greenberg W (ed)	Modern mathematical methods in transport theory. 327pp.

Progress in Mathematics (Birkhäuser)

88.	Cartier P (ed)	The Grothendieck festschrift. Vols I-III. 1568pp.

Progress in Probability (Birkhäuser)

22.	Pinsky MA (ed)	Diffusion processes and related problems in analysis. Vol. I: Diffusions in analysis and geometry. 519pp.
23.	Hahn MG (ed)	Sums, trimmed sums and extremes. 424pp.
24.	Cinlar (ed)	Seminar on stochastic processes, 1990. 351pp.

Recherches en Mathématiques Appliquées

14.	Ciarlet PG	Plates and junctions in elastic multi-structures. 215pp.
15.	Le Tallec P	Numerical analysis of viscoelastic problems. 136pp.

Texts in Applied Mathematics

5.	Hubbard J	Differential equations – A dynamical systems approach. Vol. I: Ordinary differential equations. 348pp.

Undergraduate Texts in Mathematics

	Hämmerlin G	Numerical mathematics. 422pp.
	Millman RS	Geometry – A metric approach with models. (2nd ed) 370pp.
	Palka BP	An introduction to complex function theory. 559pp.

Universitext

	Aupetit B	A primer on spectral theory. 193pp.

Vita Mathematica (Birkhäuser)

6.	Weil A	Souvenirs d'apprentissage. 201pp.

Miscellaneous

	Moerdijk I	Models for smooth infinitesimal analysis. 399pp.
	Smorynski C	Logical number theory I. 405pp.
	Struwe M	Variational methods – Applications to nonlinear partial differential equations and Hamiltonian systems. 244pp.
	Wang Y	Diophantine equations and inequalities in algebraic number fields. 168pp.

MATHEMATICAL VISITORS TO NEW ZEALAND

List No.29 : 1 July 1991

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

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

Professor Adriano Barlotti; University of Florence; wife (Margherita); geometry; September 1991; University of Canterbury; Dr David Glynn; very likely.

Dr Peter Cholak; University of Michigan; wife; recursion theory, theoretical computer Science; 22 June 1991 to June 1992; Victoria University, Wellington; Dr Rod Downey; postdoctoral fellowship.

Professor James Dickey; University of Minnesota; spouse (Martha); subjective probability, decision theory, computational methods; 6 June to 15 August 1991; University of Canterbury; Prof. John Deely.

Professor Duane DeTemple; Washington State University; wife; combinatorics, graph theory, math education; second half of September 1991, University of Canterbury; Dr Graham Wood; good speaker.

Professor Dinh Van Huynh; Institute of Mathematics, Hanoi, Vietnam; ring theory; January-April 1992; University of Otago; Dr John Clark; possible.

Dr William Gasarch; University of Maryland; wife; theoretical computer science; February and March 1992; Victoria University, Wellington; Dr Rod Downey; very likely.

Dr Charles E Gates; Texas A & M University; estimation problems in wildlife research; August 1991; University of Otago; Professor Bryan Manley; very likely.

Dr Robert Gentleman; University of Waterloo, Ontario; not accompanied; biostatistics, statistical computing; February to July 1991; University of Auckland; Dr Chris Wild.

Professor R L Hemminger; Vanderbilt University; graph theory; August 1991 to December 1991; University of Otago; Prof. Derek Holton.

Professor Reiner Horst; Universität Trier, Germany; global optimisation; February 1992; University of Canterbury; Dr Graham Wood.

Professor Sean McKee; University of Strathclyde; industrial mathematics; 28 July - 7 September 1991; University of Waikato; Prof. D.S. Bridges.

Professor Regina Mladineo; Rider College, Lawrenceville, New Jersey, USA ; global optimisation; June/July 1991; University of Canterbury; Dr Graham Wood.

Professor J W Moon; University of Alberta; graph theory; August 1991 to August 1992; University of Otago; Prof. Derek Holton

Professor Mila Mrsévic; University of Belgrade, Yugoslavia; topology; August 1990 to July 1991; University of Auckland; Prof. Ivan Reilly.

Professor Aleksander Pelczynski; Polish Academy of Sciences; Banach space theory, functional analysis; wife; August 1991; Victoria University, Wellington; Chris Atkin.

Professor Stephen M Samuels; Purdue University; wife (Dr Myra Samuels, biostatistician); probability theory and applications, dynamic optimization; 7 Jan 1992 - 8 May 1992; University of Canterbury; Dr Murray Smith; Visiting Erskine Fellow.

Dr Jiang Shouli; Shandong University, People's Republic of China; topology; February to July 1991; University of Auckland; Prof. Ivan Reilly.

Dr Steven Simpson; Penn State University; foundations, proof theory; reverse mathematics; November 1991; Victoria University, Wellington; Dr Rod Downey; possible.

Dr Günter Steinke; Christian-Albrechts Universität zu Kiel, Germany; wife and son; topological projective planes; from present indefinitely; University of Canterbury; Dr David Glynn.

Professor Anne Penfold Street; University of Queensland; combinatorics; 26 October -30 November 1991; University of Canterbury; Dr Derrick Breach; ARC Research Professor.

NZAMT CONFERENCE

The following overseas visitors are expected to attend the NZAMT Conference to be held at Victoria University of Wellington in September 1991. Further information from Dr Rod Downey, Victoria University, Wellington.

Keynote speakers:

Mary Barnes, Mathematics Learning Centre, University of Sydney, NSW 2006, AUSTRALIA Topic: Developing gender inclusive curriculum.

Dr Martin Hughes, School of Education, Exeter University, Exeter EX1 2LU, ENGLAND. Topic: Children and Number.

Alan Rogerson, 22 Violet Grove, Hawthorn, VIC 3122, AUSTRALIA. Topic: Maths education into the 21st century.

Hilary Shuard, CAN Continuation Project, Homerton College, Cambridge CB2 2PH, ENGLAND.
Topic: Towards 2000.

Others (workshops etc):

Dr Dudley Blane, Director of Maths Education Centre, Faculty of Education, Monash University, Clayton, VIC 3168, AUSTRALIA (Unconfirmed)

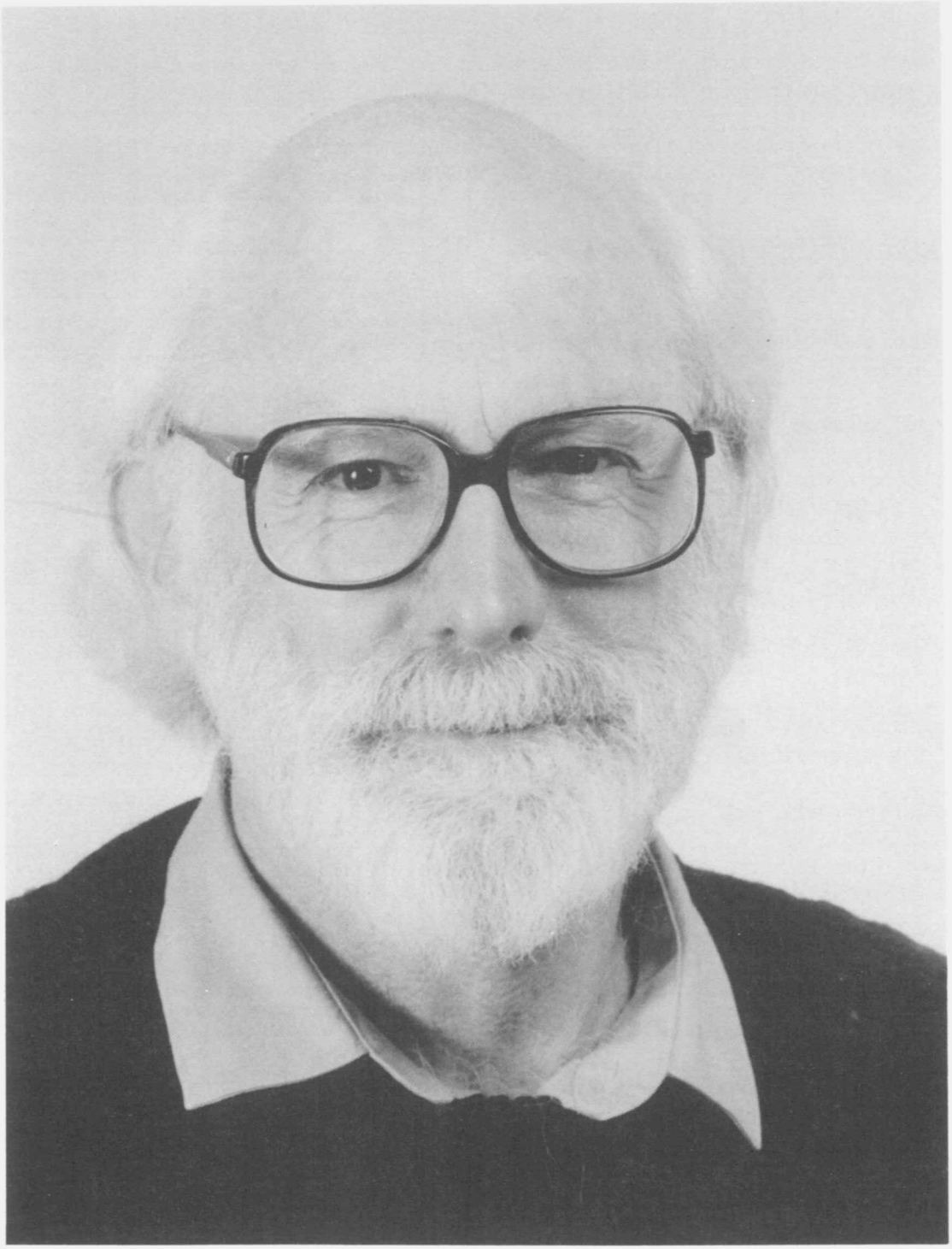
Professor Calvin Long, Washington State University, U.S.A

Dr Jules Tibeiru, University of Moncton, 636 Elmwood Drive, Moncton, New Brunswick E1A 2X5, CANADA.

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

David Robinson
N.Z. Mathematical Society Visitors' Co-ordinator
Department of Mathematics
University of Canterbury

CENTREFOLD



Mr Doug Harvie

DOUGLAS CLARK HARVIE

By Lindsay Johnston

The end of 1991 will see Doug Harvie formally retire from his position as Reader in the Mathematics Department and Institute of Statistics and Operations Research at Victoria University of Wellington. It is unlikely, however, that he will have given his last lecture at the University; his expertise in the area of optimisation will continue to be sought after and I would expect to see him back here, at least intermittently, for that reason. A stronger draw to keep him in touch with the University will be his regular sessions with the staff badminton group; not something to be given up lightly.

Doug is the longest serving member of both the Maths Department and the ISOR, having been appointed as a lecturer here in February of 1957. He had, at this time, already been at Victoria as a student from 1948 to 1951 and as a Junior Lecturer from 1953 to 1955. He was at Auckland Teachers College in 1952 and a teacher at Waipawa High School in 1956. In his 34 years here he has taught many students who have now become colleagues either at Victoria or at other universities; there will be many members of the N.Z.M.S. who will remember with affection his classes in what could be any of a huge range of topics. One colleague remembers her reaction to his first year lectures on trigonometry; she was convinced that he must be the N.Z. expert on trigonometry who would be teaching it at honours level and doing research in it. Some years later, on joining the staff, she discovered that teaching trigonometry was the "prize" for being the last to get a finals exam in for printing.

In 1957 the scene in university mathematics was very different from the present; Doug thinks of it as a lucky time in which lecturers were expected and able to teach in any area of mathematics. He had joined a department with only four other staff members, and with a principal interest in analysis he introduced such modern topics as topology into the courses. His willingness to teach new courses and try new methods has been a feature of his career; it would be difficult to find a topic he has not taught at some stage. Initially his main interest was analysis, but after trying one of the first electronic calculators and realising the new possibilities they opened up for Mathematics he had a growing enthusiasm for numerical analysis. This interest developed, with the help of periods of study leave at Dundee with R. Fletcher and then at the O.R. Department at Lancaster, into his present research and main teaching interest of optimisation. This interest has placed him firmly in the I.S.O.R. where he is the resident expert in this subject.

The most influential person on Doug's early career was Prof. J.T. Campbell who was lecturing at Victoria when Doug was a student and was his Head of Department when he returned as a lecturer. It was Prof Campbell who pointed him in the 'right' direction after he had second thoughts about his first choice of subject, Chemistry, and again when he had tried Physics. As Head of Department Doug remembers with affection how he tolerantly allowed him, as a new lecturer, to take over two of his honours courses and was always an encouraging mentor.

Since the early influence of Prof J.T. Campbell the Mathematics Department at Victoria University has always had a student-oriented approach to its own courses and has maintained very close links with the schools of the region. The Wellington Mathematics Association was one of the first in the country and Doug was a member of it for many years; his involvement helped to begin the tradition of publishing solutions to public examinations, a tradition which has been of great financial benefit to the Association. It was also because of his deep interest in secondary teaching that Doug became involved with the introduction of 'New Maths' in the late 1950s. Many of us have seen what we regard as some unfortunate effects of the 'New Maths', but with his involvement from the beginning Doug also sees a very positive side to the revolutionary change; the established syllabus and methods of teaching were not achieving what they should and the new order, with its emphasis on 'understanding' and the whole range of skills which can be taught through mathematics, was a shake-up which the system needed.

In his career Doug has served the University Mathematics Community well. He, with Prof. Campbell was an instigator of the annual Mathematics Colloquium, the first of which was held in Wellington in 1966. He was chairman of the Mathematics Department at Victoria for five years and has always encouraged younger members of staff, myself included. Doug has always been a friend as well as a colleague, and I for one am happy that his retirement will not mark his absence from the University scene in Wellington.

CONFERENCES

** 1991 **

September 1-5 (Balatonaliga, Hungary) **Colloquium on Intuitive Geometry**
Contact C. Szabados, Vice-Secretary General, Janos Bolyai Mathematical Society, Budapest, Anker Koz 1-3. I.111, H-1061, Hungary.

September 1–7 (Oberwolfach, Germany) **Topologie**
Contact MFOG: see (1) below.

September 2-5 (Kyoto, Japan) **Special Differential Equations**
Contact Masaaki Yoshida, Faculty of Science, Kyushu University, Higashi-ku, Fukuoka 812, Japan.

September 3–6 (Triese, Italy) **Functional Intgration and its Applications**
Contact ICTP: see (5) below.

September 3–10 (Erice, Sicily) **Applied Mathematics in the Aerospace Field**
Contact A. Salvetti, Dipartimento del Ingegneria Aerospaziale, Universita di Pisa, Via Diotisalvi, I-57100 Pisa, Italy.

September 4–7 (Bilbao, Spain) **IMSIBAC 4 (4th International Meeting of Statisticians in the Basque Country)**
Contact Professor J.P. Vilaplana, Faculty of Mathematical Sciences, University of Bilbao, E-48070, Bilbao, Spain.

September 8–14 (Oberwolfach, Germany) **Niedrigdimensionale Topologie**
Contact MFOG: see (1) below.

September 8–14 (Oberwolfach, Germany) **Knoten und Verschlingungen**
Contact MFOG: see (1) below.

September 9-13 (Noordwijkerhout, The Netherlands) **ICTMA 5: Teaching Mathematics by Applications**
Contact Jan de Lange, ICTMA5, OW & OC, Tiberdreef 4, 3561 GG Utrecht, The Netherlands.

September 9–13 (Geneva) **Journées Arithmétique**
Contact D. Coray, Section de Mathématiques, Université de Genève, 2-4 rue de Lièvre, CH-1211 Genève 24, Switzerland.

September 9–17 (Cairo, Egypt) **International Statistical Institute: 48th Biennial Session**
Contact ISI Permanent Office, 428 Prinses Beatrixlaan, P.O. Box 950, 2270 A2, Voorburg, The Netherlands.

September 9-27 (Trieste, Italy) **School on Dynamical Systems**
Contact ICTP: see (5) below.

September 11-14 (Minneapolis, Minnesota) **Fourth SIAM Conference on Linear Algebra**
Contact Professor R.A. Brualdi, Department of Mathematics, University of Oregon, Eugene, OR 97403, U.S.A.

September 13–15 (Eugene, Oregon) **Representation Theory (in honor of C.W. Curtis)**
Contact Representation Theory Conference, Department of Mathematics, University of Oregon, Eugene, OR 97403, U.S.A.

September 14-27 (Sendai, Japan) **An International Conference on Theoretical Aspects of Computer Software**
Contact T. Ito, Dept. of Information Engineering, Tohoku University, Sendai, Japan 980.

September 15–20 (Bieleveld, Germany) **DMV-Jahrestagung 1991**
Contact MFOG: see (1) below.

September 15–21 (Oberwolfach, Germany) **Geometrie der Banachräume**
Contact MFOG: see (1) below.

September 16-17 (Varna, Bulgaria) **7th International Summer School on Probability Theory and Mathematical Statistics**
Contact L Mutafchier, P.O. Box 373, 1090 Sofia, Bulgaria.

September 16–20 (Santiago de Compostela, Spain) **Summer School on Minimal Models, Lie Groups and Differential Geometry**
Contact Antonio Gomez Tato, Departamento de Xeometria e Topoloxia, Faculdad de Matematicas, Universidad de Santiago de Compostela, E-15707 Santiago de Compostela, Spain.

September 22–28 (Oberwolfach, Germany) **Nonlinear and Random Vibrations**
Contact MFOG: see (1) below.

September 23-27 (Klagenfurt, Austria) **Osterreichischen Mathematikertreffen**
Contact Prof. Winfried B. Müller, Institut für Mathematik, Universität Klagenfurt, Universitätsstrasse 65, A-9022 Klagenfurt, Austria.

September 23–29 (Kazimierz Dolny, Poland) **Sixth Symposium on Classical Analysis**
Contact T. Mazur, Technical University, Department of Mathematics, Malczewskiego 29, 26-600 Radom, Poland.

September 24-27 (Mexico City) **Seminar on Statistical Methods in Business and Actuarial Sciences**
Contact Enrique de Alba, Graduate School of Business, Univerity of Chicago, 1101E. 58th Street, Chicago, Illinois 60637, U.S.A.

September 25–27 (Lausanne, Switzerland) **Ninth GAMM Conference on Numerical Methods in Fluid Mechanics**
Contact I.L. Ryhming, IMHEF/DME, EPFL, Lausanne CH–1015, Switzerland.

September 27-28 (Oxford, Ohio) **19th Annual Conference on Statistics and its Applications**
Contact C. Dunne, Department of Mathematics and Statistics, Miani University, Oxford, Ohio 45056, U.S.A.

September 29 - October 1 (Pittsburgh, Pennsylvania) **Workshop on Bayesian Statistics in Science and Technology**
Contact Robert E. Kass, Department of Statistics, Carnegie-Mellon University, Schenley Park, Pittsburgh, Pennsylvania 15213, U.S.A.

September 29 – October 5 (Oberwolfach, Germany) **Kombinatorik Geordneter Menger**
Contact MFOG: see (1) below.

September 30 - Oct. 2 (Salzburg, Austria) **First International Conference of the Austrian Center for Parallel Computation**
Contact H.P. Zima, Institute for Statistics and Computer Science, University of Vienna, Rathausstrasse 19/3, A-1010 Vienna, Austria.

September 30 - Oct. 2 (Kyoto, Japan) **Representation Theory of Finite Groups and Finite Dimensional Algebras**
Contact Shigeo Koshitari, Dept. of Mathematics, Faculty of Science, Chiba University, Yayoi-cho, Chiba 260, Japan.

October 1-4 (Oldenburg, Germany) **SCAN-91 IMACS-GAMM International Symposium on Computer Arithmetic and Scientific Computation**
Contact J. Herzberger, Fachbereich Mathematik, Univ. Oldenburg, W-2900 Oldenburg, Germany.

October 2-4 (Clayton, Victoria) **Second Australian History of Mathematics Conference**
Contact Professor J.N. Crossley, Department of Mathematics, Monash University, Clayton, Victoria 3168, Australia.

October 3-4 (Kyoto, Japan) **Algebraic Theory of Codes and Combinatorics on Words**
Contact Masami Ito, Faculty of Science, Kyoto Sangyo University, Kita-ku, Kyoto 603, Japan.

October 3-10 (Varna, Bulgaria) **5th International Conference on Complex Analysis and Applications '91 with a Symposium on Generalised Functions**
Contact I. Dimovski, Complex Analysis and Applications '91, Institute of Mathematics, Bulgarian Academy of Sciences, 1090 Sofia, P.O. Box 373, Bulgaria.

October 7-9 (Kyoto, Japan) **Mathematical Topics in Biology**
Contact Masayasu Mimura, Faculty of Science, Hiroshima University, Naka-ku, Hiroshima 730, Japan

October 7-9 (Kyoto, Japan) **Spectral and Scattering Theory for Partial Differential Equations**
Contact Mitsuru Ikawa, Dept of Mathematics, Osaka University, Toyonaka 560, Japan.

October 7–10 (New Orleans, Louisiana) **9th International Symposium on Applied Algebra, Algebraic Algorithms, and Error Correcting Codes**
Contact H.F. Mattson, School of Computing and Information Sciences, 4-166 Center for Science and Technology, Syracuse University, Syracuse, NY 13244-4100, U.S.A.

October 7-11 (Trieste, Italy) **Workshop on Stochastic and Deterministic Models**
Contact ICTP: see (5) below.

October 13–19 (Oberwolfach, Germany) **Geometrie**
Contact MFOG: see (1) below.

October 14–18 (Minneapolis, Minnesota) **IMA Workshop on Sparse Matrix Computations: Graph Theory Issues and Algorithms**
Contact IMA: see (3) below.

October 15-17 (Kyoto, Japan) **Variational Problems and Nonlinear Elliptic Differential Equations**
Contact Kazuya Hayasida, Dept. of Mathematics, Faculty of Science, Kanazawa University, Marunouchi, Kanazawa 920, Japan.

October 18-19 (Ames, Iowa) **Differential and Delay Equations (to mark the retirement of Professor George Seifert)**
Contact Dr A.M. Fink, Department of Mathematics, 400 Carver Hall, Iowa State University of Science and Technology, Ames, Iowa 50011, U.S.A.

October 20-26 (Oberwolfach, Germany) **C*-Algebren**
Contact MFOG: see(1) below.

October 21-26 (Hansur-Lesse, Belgium) **Third International Workshop-Conference on Evolution Equations, Control Theory and Biomathematics**
Contact Professor G. Lumer, Institut de Mathematique, Université de Mons, Place du Parc 20, B-700 Mons, Belgium.

October 22-24 (Kyoto, Japan) **General Topology and Geometric Topology**
Contact Yasunao Hattori, Faculty of Education, Yamaguchi University, Yamaguchi 653, Japan.

October 23-25 (Kyoto, Japan) **Evolution Equations and Nonlinear Problems**
Contact Yoshikazu Kobayashi, Faculty of Engineering, Niigata University, Igarashi, Niigata 950-21, Japan.

October 25-26 (Mississippi, Mississippi) **11th Annual Southeastern Atlantic Regional Conference on Differential Equations**
Contact J.B. Gardner, Department of Mathematics and Statistics, Mississippi State University, Mississippi, Mississippi 39762, U.S.A.

October 27-Nov. 2 (Oberwolfach, Germany) **Statistische Entscheidungstheorie**
Contact MFOG: see(1) below.

October 27 - Nov. 2 (Oberwolfach, Germany) **Convergence Structures in Topology and Analysis**
Contact MFOG: see (1) below.

October 28 - Nov.1 (Kyoto, Japan) **The Recent Development of Algebraic Topology**
Contact Yutaka Hemmi, Department of Mtahematics, Faculty of Science, Kochi University, Kochi 780, Japan.

October 30 - Nov.1 (Kyoto, Japan) **Combinatorial Aspects in the Analysis of Mathematical Models**
Contact Masakazu Jimbo, Dept. of Elec. & Comp. Engineering, Faculty of Engineering, Gifu University, Yanagide, Gifu 501-11, Japan.

November 3–9 (Oberwolfach, Germany) **Mengenlehre**
Contact MFOG: see (1) below.

November 5-7 (Kyoto, Japan) **Study of Structures of Solutions to Partial Differential Equations**
Contact Shigetake Matsuura, RIMS: see(4) below.

November 11-13 (Kyoto, Japan) **Optimization Theory for Mathematical Programming Models**
Contact Masami Kurano, Dept. of Mathematics, Faculty of Education, Chiba University, Yayoi-cho, Chiba 260, Japan.

November 11–15 (Minneapolis, Minnesota) **IMA Workshop on Combinatorial and Graph-Theoretic Problems in Linear Algebra**
Contact IMA: see (3) below.

November 17–23 (Oberwolfach, Germany) **Singularitäten der Kontinuumsmechanik: Numerische und Konstruktive Methoden zu Ihrer Behandlung**
Contact MFOG: see (1) below.

November 18-20 (Kyoto, Japan) **Phase Transition and Optimal Control**
Contact Hideo Karawada, Faculty of Engineering, Chiba University, Yayoi-cho, Chiba 260, Japan.

November 18-20 (Kyoto, Japan) **Mathematical Aspects of Non-linear Waves in Fluids**
Contact Masayuki Oikawa, Research Institute for Applied Mechanics, Kyusyu University, Higashi-ku, Fukuoka 812, Japan.

November 20-22 (Kyoto, Japan) **Research on the Structure of Statistical Models**
Contact Masafumi Akahira, Institute of Mathematics, University of Tsukuba, Tennodai, Tsukuba 305, Japan.

November 20-22 (Kyoto, Japan) **Numerical Analysis and its Alborithms**
Contact Taketomo Mitsui, School of Engineering, Nagoya University, Chikusa-ku, Nagoya 461-01, Japan.

November 24–30 (Oberwolfach, Germany) **Numerische Methoden der Approximationstheorie**
Contact MFOG: see (1) below

November 25-27 (Kyoto, Japan) **Formula Manipulation and its Applications to Mathematical Study**
Contact Hidestune Kobayashi, Dept. of Mathematics, College of Science and Technology, Nihon University, Chiyoda-ku, Tokyo 101, Japan.

November 28-30 (Kyoto, Japan) **Nonlinear Analysis and Mathematical Economics**
Contact Wataru Takahashi, Faculty of Science, Tokyo Institute of Technology, Meguro-ku, Tokyo 152, Japan.

December 1–7 (Oberwolfach, Germany) **Statistik Stochastischer Prozesse**
Contact MFOG: see (1) below.

December 2–4 (St Petersburg, Florida) **Fourth International Conference on Numerical Combustion**
Contact Professor John D. Buckmaster, University of Illinois, 101 Trans Building, 103 S. Mathews Ave, Urbana, IL 61801, U.S.A.

December 2-6 (Berkeley, California) **Workshop on Statistical Methods in Imaging**
Contact MSRI: see (2) below.

December 7-10 (Victoria, British Columbia) **Canadian Mathematical Society Winter Meeting**
Contact B. Miers, Dept. of Mathematics, University of Victoria, P.O. Box 1700, Victoria, British Columbia V8W 272, Canada.

December 8–14 (Oberwolfach, Germany) **Stochastic Geometry, Geometric Statistics, Stereology**
Contact MFOG: see (1) below.

December 9-12 (Kyoto, Japan)) **Recent Topics in Algebraic Number Theory**
Contact Aichi, Kudo, Faculty of Liberal Arts, Nagasaki University, Nagasaki 852, Japan.

December 15–21 (Oberwolfach, Germany) **Quantenstochastik**
Contact MFOG: see (1) below.

December 16-19 (Kyoto, Japan) **Complete Analytic Geometry and Related Topics—Mathematical Physics and Complex Geometry**
Contact Toshitake Kohno, Dept. of Mathematics, Faculty of Science, Kyushu University Higashi-ku, Fukuoka 812, Japan.

December 18-20 (Kyoto, Japan) **Groups and Combinatorics**
Contact Hiroyoshi Yamaki, Institute of Mathematics, University of Tsukuba, Tennodai, Tsukuba 305, Japan.

December 23–26 (Varanasi, India) **International Conference on Generalised Functions and their Applications**
Contact R.S. Pathak, Department of Mathematics, Banares Hindu University, Varanasi 221 005 India

December 27–31 (Las Cruces, New Mexico) **Holiday Symposium on the Impact of Software Systems in Mathematical Research**
Contact R.J. Wisner, Homotopy Theory Symposium, Dept. of Mathematical Sciences, New Mexico State University, Box 30001, Las Cruces, New Mexico 88003–0001, U.S.A.

** 1992 **

January 1-11 (Oberwolfach, Germany) **Mathematische Optimierung**
Contact MFOG: see (1) below

January 5–8 (St. Augustine, Trinidad) **2nd Caribbean Conference on Fluid Dynamics**
Contact Dr. Harold Rankissoon, Department of Mathematics, University of the West Indies, St. Augustine, Trinidad.

January 6-10 (Kyoto, Japan) **Automorphic Forms and Associated Zeta Functions**
Contact Koichi Takase, Dept. of Mathematics, Miyagi University of Education, Aranaki, Sendai 980, Japan.

January 6-17 (Rio de Janeiro) **Topology Workshop**
Contact P.A. Schweitzer, S.J., Dipartamento de Matematica, Pontifical Catholic University, 22453 Rio de Janeiro, Brazil.

January 12-18 (Oberwolfach, Germany) **Applied Dyamics and Bifurcation**
Contact MFOG: see (1) below.

January 13–17 (Minneapolis, Minnesota) **IMA Workshop on Linear Algebra, Markov Chains and Queueing Models**
Contact IMA: see (3) below

January 19-25 (Oberwolfach, Germany) **Modelltheorie**
Contact MFOG: see (1) below.

January 16-18 (Kyoto, Japan) **Numerical Analysis for Partial Differential Equations in Engineering and its Related Topics**
Contact Yuusuke Iso, RIMS: see (4) below.

January 21-23 (Kyoto, Japan) **Generation and Statistics of Turbulence**
Contact Shigeo Kida, RIMS: see (4) below

January 26-Feb.1 (Oberwolfach, Germany) **Applied and Computational Convexity**
Contact MFOG: see (1) below

January 27-29 (Orlando, Florida) **Third ACM-SIAM Symposium on Discrete Algorithms**
Contact SIAM: see (6) below.

February 2-8 (Oberwolfach, Germany) **Thermodynamische Materialtheorien**
Contact MFOG: see (1) below.

February 9-15 (Oberwolfach, Germany) **Numerical Methods for Parallel Computing**
Contact MFOG: see (1) below.

February 16-22 (Oberwolfach, Germany) **Funktiontheorie**
Contact MFOG: see (1) below.

February 23-29 (Oberwolfach, Germany) **p-Adische Analysis und Anwendungen**
Contact MFOG: see (1) below

February 24 – March 1 (Minneapolis, Minnesota) **IMA Workshop on Iterative Methods for Sparse and Structured Problems**
Contact IMA: see (3) below

March 1-7 (Oberwolfach, Germany **Klassifizierende Räume und Anwendungen der Steenrod-Algebra**
Contact MFOG: see (1) below.

March 8-14 (Oberwolfach, Germany) **Mathematische Stochastik**
Contact MFOG: see (1) below.

March 15-21 (Oberwolfach, Germany) **Recyclungstheorie**
Contact MFOG: see (1) below.

March 22-28 (Oberwolfach, Germany) **Teichmüller-Theorie und Modulraume Riemannscher Flachen**
Contact MFOG: see (1) below.

March 26-28 (Kyoto, Japan) **Number Theory and Related Areas**
Contact Yasutaka Ihara, RIMS: see (4) below

March 29 - April 4 (Oberwolfach, Germany) **Topologische Methoden in der Gruppentheorie**
Contact MFOG: see (1) below.

March 30 - April 3 (Berkeley, California) **Workshop on Statistical Methods in Molecular Biology**
Contact MSRI: see (2) below.

April (USA) **Eighth International Conference on Mathematical and Computer Modelling**
Contact X.J.R. Avula, President IAMCM, University of Missouri, Rolla, Dept. of Engineering Mechanics, P.O. Box 1488, Rolla, Missouri 65401-0249, U.S.A

April 5-11 (Oberwolfach, Germany) **Algebraische K-Theorie**
Contact MFOG: see (1) below.

April 6–10 (Minneapolis, Minnesota) **IMA Workshop on Linear Algebra for Signal Processing**
Contact IMA: see (3) below.

April 7-10 (Lisbon) **Statistics in Public Resources and Utilities and in Care of the Environment (SPRUCE)**
Contact V. Barnett, Dept. of Probability and Statistics, The University, Sheffield S3 7RH, UK.

April 12-18 (Oberwolfach, Germany) **Mathematische Logik**
Contact MFOG: see (1) below.

April 26-May 2 (Oberwolfach, Germany) **Gruppentheorie**
Contact MFOG: see (1) below.

May (L'Aquila, Italy) **Conference on Classification of Algebraic Varieties**
Contact E.L. Livorni, Dipartimento di Matematica, Universita, Via Vetoio, loc. Coppite, 67100 L'Aquila, Italy.

May 11-13 (Chicago, Illinois) **Fourth SIAM Conference on Optimization**
Contact SIAM: see (6) below

June 1–5 (Minneapolis, Minnesota) **IMA Workshop on Linear Algebra for Control Theory**
Contact IMA: see (3) below

June 1-5 (Kalamazoo, Michigan) **7th International Conference on Graph Theory, Combinatorics, Algorithms and Applications**
Contact Y. Alari, Department of Mathematics and Statistics, Western Michigan University, Kalamazoo, Michigan 49008-5152, U.S.A.

June 14–20 (West Lafayette, Indiana) **5th International Symposium on Statistical Decision Theory and Related Topics**
Contact Shanti S. Gupta, Department of Statistics, Purdue University, West Lafayette, IN 47905, U.S.A.

June 15-18 (Edmonton, Canada) **Wave Phenomena II: Modern Theory and Applications**
Contact Canadian Applied Mathematics Society Conference, Applied Mathematics Institute, University of Alberta, Edmonton, Alberta, Canada T6G 2G1.

June 15–19 (Toronto, Canada) **Twenty First International Conference on Stochastic Processes and their Applications**
Contact G.L. O'Brien, Department of Mathematics, York University, 4700 Keele Street, North York, Ontario M3J 1P3, Canada.

June 17-20 (Nova Scotia, Canada) **4th International Conference on Computers and Learning**
Contact I. Tomek, Jodrey School of Computer Science, Acadia University, Wolfville, Nova Scotia BOP 2X0, Canada.

June 22-26 (Toronto, Canada) **5th International Meeting on Statistical Climatology (5IMSC)**
Contact Francis W. Zwiers, Numerical Modeling Division, Canadian Climate Centre, 4905 Dufferin Street, Downsview, Ontario, Canada M3H 5T4.

June 22-26 (Toronto, Canada) **12th Conference on Probability and Satistics in the Atmospheric Sciences**
Contact Paul Mielke Jr., Department of Statistics, Colorado State University, Fort Collins, Colorado 80523, U.S.A.

July 6-31 (Minneapolis, Minnesota) **Environmental Studies: Mathematical, Computational and Statistical Analysis**
Contact IMA: see (3) below.

August (Kazan, U.S.S.R.) **The International Conference Lobachevsky and Modern Geometry denoted to the 200th Anniversary of Lobachevsky 's birthday**
Contact V.V. Vishnevsky, Department of Geometry, Kazan University, 18 Lenin Street, Kazan, 420008 - U.S.S.R.

August 3–7 (San Sebastian, Spain) **IMSIBAC 5(5th International Meeting of Statistics in the Basque Country**
Contact Professor J.P. Vilaplana, Faculty of Mathematical Sciences, University of Bilbao, E–48070 Bilbao, Spain.

August 3-7 (Clearwater, Florida) **6th Workshop on Lie-Admissible Formulations**
Contact G.F. Weiss, Chairman of the Organizing Committee, 6th Workshop on Lie Admissible Formulations, The Institute for Basic Research, 495 A-19, no. 1577, Palm Harbour, Florida 34682-1577, U.S.A.

August 16–23 (Quebec City, Canada) **ICME7 : Seventh International Congress on Mathematics Education**
Contact D. Wheeler, Department of Mathematics, Concordia University, 7141 ouest, rue Sherbrooke, Montréal, Québec H4B 1R6, Canada.

August 19–26 (Melbourne, Florida) **World Congress of Nonlinear Analysts**
Contact Professor V. Lakshmikantham, Department of Applied Mathematics, Florida Institute of Technology, 150 West University Boulevard, Melbourne, FL 32901-6988, U.S.A.

August 22–28 (Haifa, Israel) **18th International Congress of Theoretical and Applied Mechanics**
Contact A. Solan, Secretary, IC-TAM 1992, Faculty of Mechanical Engineering, Technion-Israel Institute of Technology, Haifa 32000, Israel.

August 25-29 (Rabat, Morocco) **3rd Islamic Countries Conference on Statistical Sciences**
Contact Secretary, Executive Board, Islamic Society of Statistical Sciences, 122-F Liberty Plaza, Gulberg-III, Lahore, Pakistan.

August 31 - Sept.2 (Pécs, Hungary) **4th International Workshop on Generalized Convecity**
Contact Professor S. Komlosi, Faculty of Economics, Janus Parnonius University, Rakoczi ut 80, H-7621 Pecs, Hungary

September 16-18 (Minneapolis, Minnesota) **2nd SIAM Conference on Control in the 90s**
Contact SIAM: see (6) below.

November (Gold Coast, Queensland) **AUSCRYPT '92**
Contact Professor W. Caelli, Faculty of Information Technology, Queensland University of Technology, P.O. Box 243, Brisbane, Queensland 4001, Australia.

**** 1993 ****

August 1-14 (Galway, Ireland) **Groups 93 Galway/St Andrews**
Contact: email groups 93 @ st. andrews.ac,uk (telefax +353 91 25700)

**** 1994 ****

August (Zürich, Switzerland) **The International Congress of Mathematicians 1994**
Contact R. Jeltsh, Seminar für Angewandte Mathematik, ETH Zürich, Switzerland.

Special Contact Addresses:

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

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

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

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

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

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

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

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

M.R. Carter

SECRETARIAL

MINUTES OF THE TWENTY-NINTH COUNCIL MEETING
Sunday 19 May 1991

The meeting was held in the library of St Margaret's College, University of Otago and began at 10.38am.

PRESENT: Gillian Thornley (in the Chair), John Butcher, Marston Conder, John Giffin, Robert Goldblatt, Derek Holton, Ingrid Rinsma, David Robinson and Kee Teo. Anne Street (representing the Australian Mathematical Society) and Robert Aldred attended the morning session by invitation.

1 **APOLOGY**: There were no apologies.

Gillian Thornley welcomed Ingrid Rinsma (attending her first Council meeting), Anne Street and Robert Aldred.

2 **MINUTES OF THE TWENTY-EIGHTH COUNCIL MEETING:**

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

3 **MATTERS ARISING FROM THE MINUTES:**

(a) David Robinson raised the matter of inter-University cooperation regarding **library journal cancellation.** David Alcorn (Auckland), John Clark (Otago), Gillian Thornley (Massey) and Neil Watson (Canterbury) will liaise. John Butcher suggested that the index of each non-common journal be circulated among the Universities, but it was noted that this would incur massive costs.

(b) Regarding the **funding of University Mathematics,** Marston Conder reported that a collation of 1990 enrolments in New Zealand Universities indicated that overall, 64.4% of Mathematics enrolments were in Science, Technology, Computing, Architecture, Engineering and Medicine, etc, whilst 35.6% were in Arts, Social Science, Commerce and Law, etc. At Stage 3, however, 87.4% of students taking Mathematics were involved in Science and Engineering only. He noted that responses to date from the Ministry of Education to his submissions on EFTS funding had been rather unhelpful, and tended to confuse the terms "course factor" and "cost category". He suggested, therefore, that any further lobbying by the NZMS should be channelled through the New Zealand Vice-Chancellors' Committee rather than the Ministry of Education. It would be necessary to prove that the existing cost category for Mathematics, based on historical accounting, is inadequate, but even such an adjustment could lead to a "Catch-22" situation in the current block grant funding formula if no further provision is made.

John Butcher noted that, within Arts faculties, language subjects were recognised as being more expensive than others, but that their relative funding was determined internally by each University. Mathematics teaching has changed recently, within its resource limitations, through increased tutorial and laboratory teaching. Mathematics continues to be recognised as an important subject through the Porter Report and current Secondary schooling initiatives - "everyone needs it, but few attain competence in it". Marston Conder responded that language subjects had received improved staff-student ratios through intensive lobbying by their Societies and by Heads of Departments, separately. The Council agreed that the Head of Departments Committee should take the matter up, as they have more access to information individually. Marston Conder agreed to continue his own efforts, despite his retiring from Council. Derek Holton will discuss the matter with Lockwood Smith at a future meeting.

Anne Street noted that Engineering Mathematics papers in Australia are funded at higher levels if they are taught by Engineering Schools. In the Australian funding scheme, Mathematics is in the second to bottom (of five) category, whilst Science is in the second to top category: the funding differential is not as marked as in the New Zealand scheme, however. She added that Australian Mathematics Departments would actually be well-off if they received all the EFTS funding which each University received for their operation.

(c) In the matter of the **New Zealand Journal of Mathematics,** Marston Conder spoke to a draft proposal from the Mathematical Chronicle Committee suggesting an agreement be drawn up between them and the NZMS to create the New Zealand Mathematical Chronicle. Considerable discussion ensued, involving the rationalisation of reciprocity exchanges of journals; the need for the NZMS to see the Mathematical Chronicle's balance sheet; the amount of financial involvement required of the NZMS; the availability of the new Chronicle to NZMS members at a reduced rate; the scope of the journal, in particular the inclusion of papers on mathematical modelling; perhaps using the London Mathematical Society Bulletin as a model; the relationship between the new Chronicle and the NZMS Newsletter; a commitment to improving the quality and frequency of publication.

It was **agreed** to endorse the establishment of a Joint Committee with representatives from the NZMS (Derek Holton and Rob Goldblatt) and the Mathematical Chronicle Committee which would be charged with bringing forward future proposals in time for the 1992 AGM. It was also suggested that the NZMS Newsletter Editor be consulted by the Committee. The Society will contribute funding towards defraying expenses for any required meetings. David Alcorn was to be invited to speak to a (slightly modified) version of the draft agreement at the 1991 AGM.

(d) Regarding the **Mathematics Teachers Award,** Derek Holton reported that several nominations had been received, and that he and Trevor Boyle would be meeting soon. Negotiations on sponsorship from the National Bank had fallen through, but several alternative options were currently being pursued.

(e) In the matter of the **Aitken Centenary,** Gillian Thornley reported that she had written to the Edinburgh Mathematical Society regarding possible joint activities in 1995. John Butcher will follow this up when he visits Edinburgh later this year. Derek Holton added that the Chair in Statistics at the University of Otago may be renamed the Aitken Chair, and that the appropriate State-owned Enterprise has acknowledged that a commemorative stamp (as part of a series) remains a possibility. Further, Derek Holton has communicated with Aitken's son - a privately-funded medal won by Aitken will be bequeathed to the Hocken Library, together with a portrait. The Edinburgh Mathematical Society may be willing to hold conferences in both Edinburgh and Dunedin in 1995.

(f) Data on **age profiles and staff projections** for mathematics staff in New Zealand Universities are being gathered by Derek Holton.

4 CORRESPONDENCE:

All relevant correspondence is dealt with elsewhere in the Agenda.

5 REPORTS

(a) TREASURER. Kee Teo presented the audited financial statement for 1990. He noted that assets had increased slightly over the previous year; that the one-off payment to ICOTS distorted expenditure; that publications income had declined; that next year's accounts will display **true** income and expenditure, with the value of unsold books being shown explicitly. Given that the Secondary School Mathematics text is selling poorly, he recommended that its sales be discontinued as of June 1, 1991, and that the remaining stocks (currently valued at approximately $6,000) be written off, jointly with NZAMT. Rob Goldblatt will deal with Lindsay Johnston over the possibility of disposing of some of the remaining copies at the NZAMT conference, Wellington in September.

Discussions ensued over the future of NZMS publishing. Gillian Thornley suggested that more input from individual Mathematics Associations be sought regarding what changes and improvements are

desirable in the current publications, especially in light of the proposed curriculum revisions. Certainly the need for such texts will continue as long as there are people interested in writing them. At the University level, an appropriate discrete mathematics text is still desperately needed. Derek Holton suggested that a Mathematics Magazine for secondary students be considered, and asked for ideas - a recent Australian venture had been successful.

Kee Teo is to provide NZAMT with a balance sheet, plus accompanying explanations of the changes in accounting procedures and profit-sharing regarding publications.

Subscriptions continue to cover most of the Society's expenses; therefore it was **resolved** that a nil increase in subscription fees be recommended to the AGM.

(b) MEMBERSHIP: Nil report.

(c) PUBLICATIONS: Gillian Thornley reported that McGraw-Hill paid $500 compensation over the plagiarism of five pages of Modelling Activities.

(d) NEWSLETTER: Nil report.

6 ANNUAL GENERAL MEETING

(a) PRESIDENT'S REPORT: Gillian Thornley to present the President's Report at the AGM. [It is appended to these minutes. Ed.]

(b) NOMINATIONS FOR COUNCIL: No AGM election to be necessary, as it was decided to coopt Robert E L Aldred as Secretary.

(c) CONSTITUTION - AMENDMENTS TO ABOLISH EXCLUSIVE LANGUAGE: Gillian Thornley tabled a document summarising proposed changes to the Constitution to remove exclusive language. This will be published in a future Newsletter and considered at the 1992 AGM. [It appears in the Notices section of this issue. Ed.]

7 APPLICATIONS FOR FINANCIAL ASSISTANCE:

(a) Gillian Thornley presented a summary of fee disbursements of NZMS funds over the current financial year.

(b) The Secretary noted that $1000 (one thousand dollars) of the $1250 set aside had been granted to students attending the Colloquium. Priority had been given to students presenting papers and currently enrolled in a postgraduate degree at a New Zealand University. Those awarded grants were

I Aptekar (Victoria)	$400
Zheng Baoping (Canterbury)	$100
C P Scott (Victoria)	$400
C E Smith (Auckland)	$100

(c) As decided at the previous Council Meeting, $1000 (one thousand dollars) was set aside for the New Zealand Mathematics Teachers Award.

(d) Research, Conference and Travel Support. It was **moved** from the Chair that

Mr Mark Billinghurst be (retrospectively) granted $500 (five hundred dollars) towards the cost of attending the Summer School on Nonlinear Dynamics and Chaos at the Australian National University in January 1991.

Associate Professor Rod Downey be granted $350 (three hundred and fifty dollars) towards the cost of

travel to the University of Illinois at Urbana-Champaign and the University of Wisconsin at Madison in August 1991 to continue collaboration with colleagues.

Dr Margaret Morton be granted $500 (five hundred dollars) towards the cost of attending and presenting papers at the Annual Conference of the Australian Mathematical Society and the Gender and Science and Technology Conference in Melbourne in July 1991

Associate Professor Ivan Reilly be granted $350 (three hundred and fifty dollars) towards the cost of attending conferences in Switzerland, Czechoslovakia, to give lectures at the USSR Academy of Science and Moscow State University and to lead the NZ team to the 32nd International Mathematical Olympiad in Sweden, July-August 1991.

8 1993 FORDER LECTURER:

An ordered list of three candidates was agreed to. The London Mathematical Society makes the final selection.

9 NZMS VISITING LECTURERS:

Gillian Thornley noted that Professor Douglas Bridges (Waikato) is the 1991 NZMS Visiting Lecturer; Ingrid Rinsma has organised his itinerary. Possible suggestions mentioned for 1992 were:

Chris Roger (Combinatorics)
John Cannon (Symbolic Computation)
John Loxton (Number Theory)
Hiam Rubinstein
Vera Pless (Coding Theory)

Anne Street agreed to communicate with Chris Roger who will be in Australia June-August 1992. Rob Goldblatt noted that Hiam Rubinstein may be invited to the 1992 Mathematics Colloquium anyway. Tank Aldred "agreed" to look out for other suitable candidates.

10 NEW ZEALAND MATHEMATICAL OLYMPIAD COMMITTEE:

Derek Holton reported that the Olympiad Team had been chosen after the Christchurch camp; most of the team are from Christchurch. The Minister of Education attended the camp for half a day. "Cluster groups" for promising 6-7 form students have been organised, some outside the University cities; Forms 3-5 "local" groups have been established. Ivan Reilly and Gordon Hookings now have 180 students participating in the Olympiad Certificate program, which provides extension material for Forms 1-7. The scheme is progressing well, with positive public support.

$20,000 travel support was provided by MoRST for last year; further support was forthcoming from a Rotary group, $2000 from NZAMT, and several anonymous donations, but there is still a considerable amount to be raised.

11 FOSTS:

Eleven submissions requesting that the Applied Maths Group be kept together under the new CRI structure were made in response to the initial Task Force draft. Vernon Squire and Derek Holton are coordinating NZMS input to FOSTS Science and Technology policy; ideas may be drawn from the Australian Mathematical Society's submission to ASTEC.

12 ACHIEVEMENT INITIATIVES:

Derek Holton reported on a meeting on Achievement Initiatives in Mathematics held in Wellington attended by forty educationalists. The Minister of Education's initiative on the extended English, Mathematics, Science and Technology core at Secondary level will definitely proceed. The first contract (on the curriculum for the next ten years) is to be let by November 1991. The next stage will address assessment, followed by learning support (from textbooks through professional development for teaching). It was noted that assessment procedures under the similar British model require 30% of class time - contrary to the supposed increased availability of cooperative and problem-solving activities. It was just as disturbing to note that staff promotion in the British system was based on the results of such assessment.

13 SCIENCE EDUCATION REVIEW:

Derek Holton noted that six months' contact with Greg Billington of MoRST still yielded nothing to report. No public announcement of the Mathematics Education Review, nor its inter-relationship with Item 12, was as yet forthcoming.

14 PRE-DOCTORAL THESIS COMPETITION:

A report from Gloria Olive indicated that the wide topic range, and uniformly high quality, of submitted theses from 1987 - 1990, made the judging task extremely difficult. It was agreed that certificates and awards of $150 and $100 be made to the First and Second prizewinners, that a press release and newsletter item be prepared, and that the 1992 winner be invited to present their work at that year's Colloquium. Derek Holton suggested that prize-winners be given two years' free membership of the NZMS.

15 NZMS AWARD FOR MATHEMATICAL RESEARCH:

Gillian Thornley summarised comments from the assessors' report. These included a plea for clarification of the nature of the Award; criticism for an apparent lack of publicity for the Awards, especially in the South Island; the case for (secret) nomination to increase prestigiousness; the small number of candidates; the impressive standard and strengths of submitted work; that candidates be asked for only a representative selection of their most significant work, rather than ten years' accumulation; a preference for a medal rather than a certificate (c.f. Australia); there was insufficient advertising of the fact that the first awards were "clearing a backlog".

The Council decided to stay with its decision not to have a medal, and reaffirmed that future awards would be based on publications over 5 years and should therefore be available to people in early to mid-career as well as senior staff. A press release, plus publicity through the NZMS Newsletter and Heads of Departments, are to be prepared.

16 NEQA QUESTIONNAIRE ON RESTRUCTURING NATIONAL QUALIFICATIONS:

It was decided that there was little to which the NZMS could contribute, expect perhaps in a commentary role. Gillian Thornley to pursue at the beginning of July.

17 FUTURE AUSTRALIAN MS/NZMS RELATIONS:

Anne Street reported that the common Australian vacation weeks (during which any joint AMS/NZMS meetings could be arranged) for the next three years are those starting:

1991 :	8 July,	30 September
1992 :	6 July,	28 September
1993 :	5 July,	27 September.

The general formula is that the common weeks occur in Weeks 19 and 31, calculated relative to the first Monday in March. Given the difficulty in coordinations, it was likely that any Joint Meetings would be held in November-December.

It was **resolved** that the NZMS sponsor/encourage representation to the AMS Council Meeting (or Steering Committee) wherever possible (at least once a year).

It was noted that the AMS Steering Committee meets twice a year, but the Council only once. The AMS will be asked to reciprocate in sending a representative to at least one NZMS Council Meeting each year.

18 OTHER BUSINESS:

Derek Holton mentioned that he had a copy of material on "Reviewing US Mathematics" produced by the Board on Mathematical Sciences consequential to recommendations of the 1984 David Report. This will be circulated to Council members; a NZ version, possibly including a precis of the US material, may be prepared.

Marston Conder requested a list of e-mail addresses and fax numbers of all University Mathematics Departments for inclusion in the NZMS membership list. Updates to be forwarded via local Newsletter correspondents.

A suggestion from David Alcorn that the NZMS consider buying facility for referencing Maths Reviews etc/leasing tapes from AMS Database Services was rejected as being too expensive.

Rob Goldblatt **moved** a vote of thanks to Gillian Thornley (outgoing President) and John Giffin (weary Secretary). The motion was **carried**, with acclamation.

Derek Holton is to advise the date of the next Council meeting.

The meeting closed at 4.37pm.

MINUTES OF THE SEVENTEENTH ANNUAL GENERAL MEETING 21 May 1991

The meeting was held on Tuesday 21 May 1991 in the Mathematics and Physics building at the University of Otago, and started at 5.39pm.

PRESENT: G Thornley (in the Chair), D Alcorn, R Aldred, D Bridges, P Bryant, J Butcher, B Calvert, M Carter, J Clark, M Conder, G Dixit, M Doherty, R Enlow, D Gauld, J Giffin, R Goldblatt, D Holton, E Kalnins, P Kelly, C Little, G Martin, D McCaughan, M McGuinness, M Morton, G Olive, K Pledger, I Reilly, J Reilly, D Robinson, J Shanks, C Smith, V Squire, G Tee, J Turner, G Wake, G Weir (and others who didn't sign the attendance sheet).

1 APOLOGIES: No apologies were received.

2 MINUTES OF THE SIXTEENTH AGM It was **moved** (D Robinson/M McGuinness) that the minutes be accepted as a true and accurate record. The motion was **carried**.

3 MATTERS ARISING FROM THE MINUTES: Nil.

4 PRESIDENT'S REPORT:

(a) Gillian Thornley presented her report to the meeting, including the following points:

(i) Douglas Bridges (Waikato) is the 1991 NZMS Visiting Lecturer

(ii) This Council has awarded grants in 1990/1991 totalling approximately $9000, from interest

accrued in 1989/1990.

(iii) The results of the inaugural NZMS Award for Mathematical research would be announced at the Colloquium dinner. The assessors were very impressed with the standard of work submitted. Candidates for the 1991 Award were requested to provide information on their research over the past 10 years; significant work from only the previous five years would be required of candidates for future Awards. The August Newsletter will provide details.

(iv) Two further submissions had been made to the Ministerial Task Group on the formation of the Crown Research Institutes reaffirming the desire of the NZMS to retain the Applied Mathematics Group, especially given the initial decision to not create a Mathematical/Information Sciences Institute. Graeme Wake is representing Mathematical/Information Sciences on the FOSTS Council.

(v) The President thanked retiring members Marston Conder and John Butcher for their service on the NZMS Council, and Kee Teo and John Giffin for their efforts as Treasurer and Secretary during the term.

(b) It was **moved** (John Butcher/Dennis McCaughan) that the President's Report be **accepted**. The motion was **carried**, with acclamation.

Mark McGuinness and Graham Weir thanked the NZMS for its support during the Crown Research Institute deliberations. Peter Bryant expressed disappointment on behalf of the organisers of the 1991 Applied Mathematics Conference at what appeared to be a proportionately small grant from the NZMS; he questioned whether the greatest general good for Mathematics was derived from conference or individual support. Gillian Thornley responded that the Council will consider this point carefully at its next meeting. She further responded to a question from Graeme Wake, indicating that individual grants were made to permanent NZ university staff to either attend a conference or to aid in bringing colleagues to NZ for cooperative research.

5 **TREASURER'S REPORT** Kee Teo reported that the Society's assets currently amounted to approximately $120,000. Because of declining interest rates, expected interest income for the current financial year would be only of the order of $7000. In order to generate more revenue, he suggested that the time was ripe for someone to write a new textbook for use in Secondary Schools. There had been difficulties obtaining consistent advice over how to treat unsold book stocks - the Dunedin auditors treated stocks as income, but the Palmerston North auditors disagreed. Kee Teo assured the meeting that the balance sheet for 1991/92 would be a true record.

John Butcher suggested using a procedure for depreciating/revaluing stocks, in order to avoid misleading conclusions; Kee Teo suggested writing off the unsold stocks of Secondary School Mathematics texts.

The proportion of profit due to NZAMT will not be paid until the profit exceeds half the stock value, since NZAMT doesn't pay for its stock, because of complications that arise from the financing of print runs.

The Treasurer further mentioned that collection of subscription arrears had led to an increase in subscription revenue. The present subscription fee still covered the operation of the Society - the publication of the Newsletter, Council travel and affiliation dues to the Royal Society of NZ. He thanked the staff at the University of Otago for managing to keep the Newsletter publishing costs very low, and suggested that no increase in Society subscription fees be imposed for the coming year.

6 **ANNUAL SUBSCRIPTION** It was **moved** from the chair that the annual subscription remain at $32 plus GST, with a reduction to $30 plus GST for early payment. The motion was **carried**.

7 **ELECTION OF COUNCIL MEMBERS** No election of Council Members was required. Margaret Morton and Graham Weir begin their three-year term, and Robert Aldred has been co-opted as Secretary. Derek Holton takes over as President for two years.

8 **POSTDOCTORAL THESIS COMPETITION** Gloria Olive reported on the recent competition, the first since 1986. Adrian Swift had been the organiser, Gloria Olive the convenor, and the judging panel consisted of Derek Holton, Brian Manly and Vernon Squire. Theses (from NZ Universities) completed between 1/1/87 and 30/12/90 were eligible for consideration; at most three from each university were allowed to be submitted, with ten submitted in total.

The standard of the submissions had been high, and the scope wide; judging had been a difficult, but pleasurable, task. The results were:

Winner: Brian Dorofaffe (Waikato) [$150] - (Supervisor: Ernie Kalnins)
Honourable mention: Hongying Huang (Otago) [$100] - (Supervisor: Ray Enlow)

The organisers and judging panel were warmly thanked for their efforts.

9 **MATHEMATICAL CHRONICLE/NZ JOURNAL OF MATHEMATICS** Gillian Thornley spoke briefly to a circulated document outlining an interim agreement between the Mathematical Chronicle Committee and the NZMS. David Alcorn then spoke in detail about the recommendations therein:

(i) A joint Committee be set up with members from the Mathematical Chronicle Committee and the NZMS to investigate the proposals.

(ii) That a broadly-based Editorial Board be established.

(iii) The production of the revised journal continue to be based in Auckland.

(iv) That the University of Auckland continue to be the repository for journals received under exchange rights.

(v) That a larger base of individual subscriptions be sought; discounts for NZMS members should be available.

(vi) That the journal be self-supporting, with upgraded quality and more regular issues.

David Alcorn mentioned that the Chronicle Committee was keen to have stronger links with the NZMS. John Butcher noted that international referees and editors would be needed to sustain quality. Graeme Wake voiced support for the proposal, but added that accountability would be important if the NZMS were to be involved, suggesting that the preparation of an annual report on operations would prove a mechanism for ensuring this.

After some further discussion, it was **moved** from the Chair that:

the interim agreement be approved, with John Butcher and Rob Goldblatt as representatives of the Society on the joint Committee (plus the involvement of the Newsletter Editor). The motion was **carried**.

David Alcorn and Marston Conder were thanked for their efforts and their constructive report.

10 **OTHER BUSINESS** Derek Holton thanked Gillian Thornley for all the work she had put in over the past two years of her very successful Presidency. This was received with whole-hearted acclamation.

The meeting closed at 6.33pm.

John W Giffin
Honorary Secretary

PRESIDENT'S REPORT 1990-91

It is my pleasure to report on the activities of the New Zealand Mathematical Society for the year 1990-91.

Visiting Lecturers

The 1990 NZMS Visiting Lecturer was Dr David Moore of Purdue University who toured in August prior to participating in the International Conference on the Teaching of Statistics.

Professor Douglas Bridges of the University of Waikato is the 1991 NZMS Visiting Lecturer.

The third Forder Lecturer, Professor Peter Whittle of Cambridge toured the country in March, taking the opportunity to keep in touch with his NZ roots. We are grateful to Howard Edwards for coordinating the arrangements and to the British Council for financial support.

We are particularly pleased to welcome Fields medallist, Vaughan Jones of Berkeley, as the 1991 NZMS Colloquium Lecturer.

Publications

Newsletter: The Council is grateful to all who contribute to the Newsletter, and especially to David Smith, the Editor, and John Shanks who oversees printing and distribution.

Textbooks: The Society continues to receive an income from profits on the sale of textbooks.

'Secondary School Mathematics' has been offered at half price for six months and will be discontinued after 1 June 1991. Thank you to Lindsay Johnstone who has handled the distribution of these books for several years. NZAMT will share in any loss on books which have to be written off.

'Mathematics with Calculus', 'Mathematics with Statistics' and 'Linear Algebra' continue to sell steadily. 'Modelling Activities' is selling very slowly, nearly half the sales being in Australia where it is distributed through PAM (Practical Applications of Mathematics). It is disappointing that New Zealand teachers and Colleges of Education have not shown more interest in this book.

Grants

The Council has distributed the interest from 1989 as grants. Details are on the attached sheet. [It is not attached. Ed.]

Pre-Doctoral Thesis Competition

Adrian Swift organised this competition for theses submitted between 1987 and 1990. We were not successful in finding a commercial sponsor and are therefore funding it ourselves. The results will be announced at the AGM.

NZMS Awards for Mathematical Research

Last May the Council decided to introduce a research award with the purpose of fostering mathematical research in New Zealand and recognising excellence in the research carried out by New Zealand mathematicians. This was announced at the 1990 AGM and advertised in the August Newsletter. The inaugural awards will be presented at the Colloquium dinner.

Funding for the Mathematical Sciences

The Council has been in correspondence with the Ministry of Education over the funding category for University mathematics and will continue to lobby for an improvement.

The President and Secretary made a submission on behalf of the Society to the Ministerial Science Task Group on Crown Research Institutes, seeking a congenial situation for the Applied Mathematics Group of DSIR.

International Mathematical Union

It was a privilege to represent New Zealand at the 11th General Assembly of the IMU at Kobe, Japan last year. A report of this was published in the December 1990 Newsletter.

I wish to thank all members of the Council for their contributions to the work of the Society during the year. I am particularly grateful to John Giffin and Kee Teo who as Secretary and Treasurer carry much of the routine work. To Marston Conder and John Butcher who are retiring (once again) from Council, we thank you for the time and energy and experience you have brought to the Council over the past three years and wish you well.

To the many other people who continue to work on special projects for the Society - thank you.

Gillian Thornley, President
16 May 1991

FINANCIAL STATEMENTS
for the year ended 31 December 1990

INCOME AND EXPENDITURE ACCOUNT

		1990 $	1989 $
Income			
Subscriptions	4,924		3,630
Interest	10,691		9,414
Donations	–		500
Publications (Note 2)	70,311		84,512
Miscellaneous Receipts	1,031		603
		86,957	98,559
Expenditure			
Newsletter	1,580		2,475
NZMS Visiting Lecturer	–		338
Forder Lecturer	–		700
Travel/Council Expenses	2,040		1,192
Travel and Research Grants	3,500		5,380
Donations	9,533		3,500
Miscellaneous	1,258		2,570
NZAMT share of Publications Profits	2,675		7,453
Publications (Note 2)	64,029		62,209
		84,615	84,817
EXCESS INCOME OVER EXPENDITURE		**$ 2,342**	**$ 13,742**

BALANCE SHEET

		1990 $	1989 $
Accumulated Funds			
Balance brought forward		122,641	108,899
Excess of income over expenditure		2,342	13,742
		$124,983	**$122,641**
REPRESENTED BY			
Assets			
Bank - General Account	6,302		6,198
– Autocall Account	90,955		78,374
- Massey Account	393		370
- Wellington Account	240		5,076
– Text Book Expense Account	105		669
		97,995	
Petty Cash		(7)	70
Debtors		6,926	10,188
Book Stock on hand		31,955	49,687
Resident withholding Tax		74	–
GST		–	774
		136,943	151,604
Less Liabilities			
Owing to NZAMT		10,128	7,453
Creditors		1,411	21,312
Owing for GST		421	–
		11,960	28,765
		$124,983	**$122,641**

NOTES TO THE ACCOUNTS

Note 1 Statement of Accounting Policies

General Accounting Policies: The following general accounting policies have been adopted in the preparation of the financial statements.

(i) The measurement base adopted is that of historical cost.
(ii) The matching of revenue earned and expenses incurred uses accrual accounting concepts, except that interest and subscriptions are accounted for on a cash basis.
(iii) Income and Expenditure are exclusive of GST.

Stock: Stocks of books are valued at the lower of cost or net realisable value.

Note 2 Publications

	Income	Expenditure	Profit	1989 Profit
Maths/Calc	21,827	17,601	4,226	10,366
Maths/Stats	21,684	20,743	941	4,348
Sec School Maths	6,810	7,348	(538)	1192
Modelling Activities	6,772	6,444	328	1,393
	57,093	52,136	4,957	17,299
Linear Algebra	13,218	11,893	1,325	2,003
Calculus	–	–	–	3,001
	$ 70,311	**$ 64,029**	**$6,282**	**$22,303**

AUDITOR'S STATEMENT
16 May, 1991

We have examined the accompanying Balance Sheet and Income and Expenditure Account of the Society and have obtained all the information and explanations we have required.

Stocks of Books have been accepted as advised by the Treasurer.

Subject to the matter referred to in the above paragraph in our opinion, the Balance Sheet and Income and Expenditure Account respectively give a true and fair view of the financial position of the Society at 31 December 1990 and of the results for the year ended on that date.

KPMG Peat Marwick
Chartered Accountants

PROBLEMS AND QUERIES

Your ever hopeful editors of this Section report that there is no PROBLEMS and QUERIES section this issue as no contributions have been received!! This brings into question whether

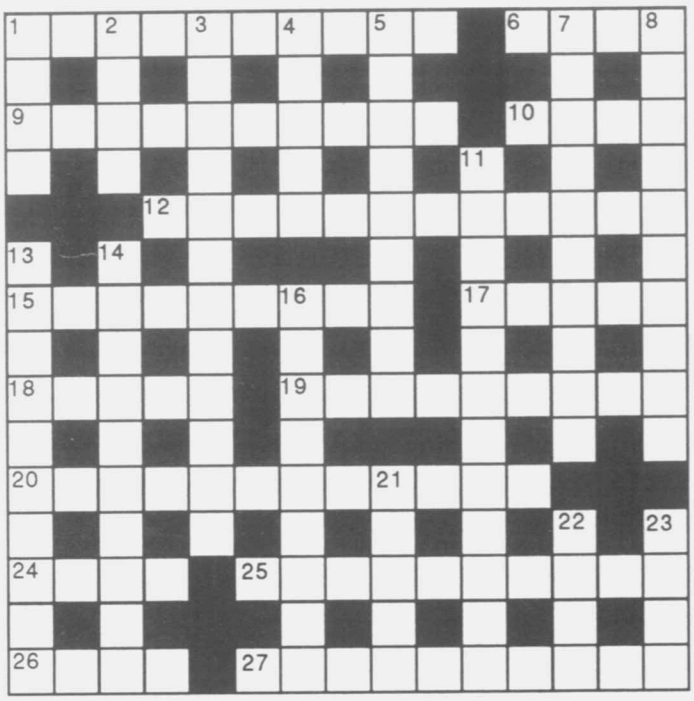
(i) the problems have been too hard/uninteresting/easy;
(ii) there is a need for such a Section.

We and/or the Newsletter Editor would be glad to hear views on this.

Mike Hendy
Graeme Wake

CROSSWORD

No 34 — Something Sinister — by K N Tode



The across answers, being more or less of a certain quality, are systematically not entered in the right way.

Across

1. Dextrous on reflection? (4-6)
6. Eastern sorcerers make image without direction (4)
9. Questioning the facts I with ground teeth have promises (10)
10. Evil aspect of alkaline interior (4)
12. Those that hold attention give rest to bookmen (12)
15. Her willis make an unfriendly one (3-6)
17. and 20 across. A trio from 25 (5,5,7)
18. A set of 20 from the nor-nor-south (5)
19. Warm wine (charged?) behind vertical bars (9)
20. see 17 across
24. Spirit with north eastern spirit (4)
25. Catchy slop about actors' unmentionable (5,4)
26. Monster has the beginnings of one great eye (4)
27. From a sin ensues discomfort (10)

Down

1. To clean, added to itself at the end (4)
2. Act the honour's dismal fate (4)
3. Agreement with the Scotsman first has music in his hands (12)
4. Not so hot (5)
5. Tuned trio played for much learning (9)
7. Guide for living (of 1.618... units?) (6,4)
8. Fixes the appointment as does the metronome (5,1,4)
11. Testimony in shortened car for past traces (3,9)
13. Doctor leads many directions in sartorial quality (5,5),
14. Contraction of norse night (10)
16. Many seamen have songs praising heavenly leaders (9)
21. Continue tearing for the cathedral place (5)
22. Messy arrangement of 26 (in Kensington?) (4)
23. Use a mess for him who bought one (4)

Solution to Crossword No 33