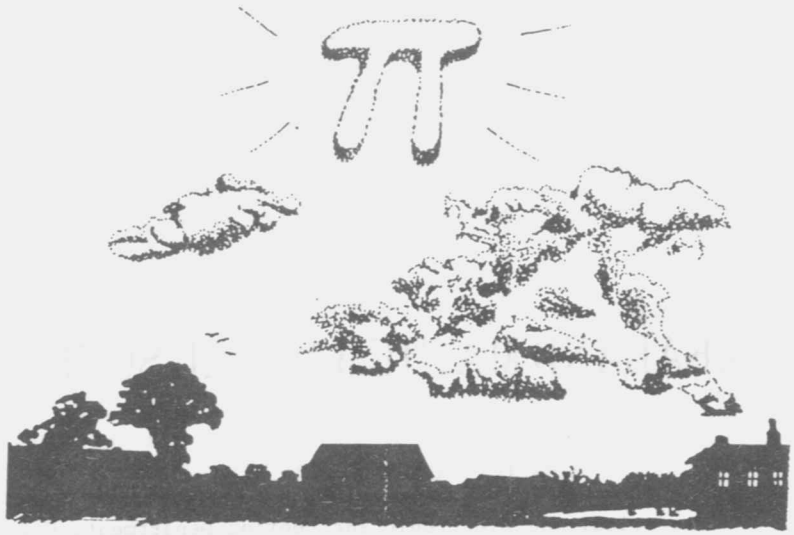
THE NEW ZEALAND MATHEMATICAL SOCIETY

NEWSLETTER



MATHEMATICS
~ pi in the sky ?

CONTENTS

Number 34 August 1985 ISBN 0110-0025

Editorial

For some years now, our brothers in A.M.S. have bemoaned the state of mathematics. Recent issues of the Notices record American concern over research funding, staffing and children's schooling. And at the Sydney Convention, R.G. Keats told the Australian story in rousing words, words reprinted in the July Gazette. In New Zealand, some disquiet has been voiced by a few individuals, mainly in the privacy of staff tea-rooms.

Do such problems really arise in New Zealand too? If so, does the N.Z. mathematical community wish to do anything about them - and is it equipped to do so? Should the NZMS take a lead? If it does not, who or what will? Federated Farmers? Or the Royal Society, with its responsibility for science as a whole?

The correspondence column of the Newsletter is open, and the Council of the NZMS meets in December.

THE NEW ZEALAND MATHEMATICAL SOCIETY

HONORARY CORRESPONDENTS

Prof. R.H.T. Bates	Electrical and Electronic Engineering Department, University of Canterbury, Private Bag, Christchurch.
Dr M.R. Carter	Department of Mathematics and Statistics, Massey University, Palmerston North.
Mr M. Doherty	Department of Statistics, Private Bag, Wellington.
Dr J.F. Harper	Mathematics Department, Victoria University of Wellington, Private Bag, Wellington 1.
Dr J. Heath	School of Maths & Science, Wellington Polytechnic, Private Bag, Wellington.
Dr M.A. Jorgensen	Biometrics Section, Ministry of Agric. & Fish., Private Bag, Wellington.
Prof. D.C. Joyce	University of PNG, University P.O., Papua New Guinea.
Mr R.S. Long	Department of Mathematics, University of Canterbury, Christchurch.
Mr J.H. Maindonald	DSIR-AMD, Mt Albert Research Centre, Private Bag, Auckland.
Dr S.A. Morris	Australian Mathematical Society, Department of Pure Mathematics, La Trobe University, Bundoora, Victoria 3983, Australia.
Mr P.R. Mullins	Department of Community Health, University of Auckland, Private Bag, Auckland.
Dr G. Olive	Department of Mathematics & Statistics, University of Otago, P.O. Box 56, Dunedin.
Mr K. Perrin	Department of Mathematics Education, Teachers College, Secondary Division, P.O. Box 31065, Christchurch 4.
Assoc. Prof. I.L. Reilly	Department of Mathematics & Statistics, University of Auckland, Private Bag, Auckland.
Dr D.M. Ryan	Theoretical & Applied Mechanics, University of Auckland, Private Bag, Auckland.
Dr M. Schroder	Mathematics Department, University of Waikato, Private Bag, Hamilton.
Mr G.J. Tee	Department of Computer Science, University of Auckland, Private Bag, Auckland.
Dr G.J. Weir	Applied Mathematics Division, DSIR, Private Bag, Wellington.
Mr I.F. West	Fisheries Research Division, P.O. Box 297, Wellington.

News and Notices

"FOR SERVICES TO EDUCATION"

In the Queen's Birthday Honours, 1985, Emeritus Professor J.T. Campbell was awarded O.B.E., "for services to education". The citation summarised his career (see Newsletter for this), and added -

played pioneering role in the application of statistical techniques in the agricult field and early work of design and analysis of experiments,

statistical consultant to New Zealand Dairy Board,

significant role in the formation of the Biometrics [Section] of the D.S.I.R.

SENIOR LECTURER/LECTURER IN STATISTICS

Applications are invited for a position of Lecturer or Senior Lecturer in the Depar of Mathematics. Applicants should have teaching experience and proven research ability Statistics; their special interests may be in any branch of theoretical or applied Stat but an interest in Biometrics, or Design of Experiments generally, will be especially we Experience in statistical consulting will be an advantage.

The Department of Mathematics offers programmes of study in Statistics and Operatio Research at undergraduate and graduate levels. It also maintains links with the Biometr Section of the Ruakura Agricultural Research Centre nearby. The appointee will be requi teach at any level, to carry out research, and to assist with consultancy.

The position is available from 1 February 1986. The appointment may be made on a t basis or for a fixed term of two or three years, depending on the stated preference of t applicant.

For further details, please write to the Registrar or to Prof. A. Zulauf, Universit Waikato, Hamilton, New Zealand.

NEW ZEALAND MATHEMATICAL SOCIETY

OFFICERS AND COMMITTEE, 1985/6

President:	Professor I.L. Reilly, Auckland
Out-going Vice-President:	Dr M.R. Carter, Massey
Secretary:	Dr M.D.E. Conder, Auckland
Treasurer:	Dr J. Shanks, Otago
Councillors:	Dr J.F. Harper, Victoria (to 1987)
	Dr M. A. Jorgensen, M.A.F. (to 1987)
	Dr E.G. Kalnins, Waikato (to 1987)
	Dr C.H.C. Little, Massey (to 1987)
	Dr W.B. Wilson, Canterbury (to 1988)
Newsletter Editor:	Dr M. Schroder, Waikato

NOTICES OF PREPRINTS

Since 1983 the Australian Mathematical Society has included a section in its Gazette under this heading. It lists the preprints of mathematics research and of teaching publications from universities and other tertiary institutions and research groups in Australia.

This section aids communication by providing a brief directory of current research acro Australia. Each issue of the Gazette contains notices of preprints which have become available since the previous issue and informs other colleagues of our latest research prepared in preprint form for distribution on request.

At the Third Australasian Mathematics Convention I consulted the President of the N.Z. Mathematics Society about New Zealand participation. So from Volume 12 No. 3 of the Gazette, the Notices of Preprints section will serve universities and other tertiary institutions and research groups in New Zealand as well as Australia.

Authors are invited to submit notices of their recent preprints under the following format:

1980 Mathematics Subject Classification
Name(s) of author(s)
University; institution or group address (of one of the authors)
Title of preprint
Secondary classification (if any).

Notices typed in this format should be sent directly to the Sub-Editor for Notices of Preprints:

Associate Professor J.R. Giles,
Department of Mathematics, Statistics and Computer Science,
The University of Newcastle,
Newcastle, N.S.W. 2308, AUSTRALIA.

Copies of standard submission of a notice forms will be distributed to all university mathematics departments in New Zealand.

THE AUSTRALIAN MATHEMATICAL SOCIETY

Our 30th Annual Conference will take place in Perth at the University of Western Australia, on 12-16 May 1986. The Director is:

Dr R.P. Sullivan,
Mathematics Department,
University of Western Australia,
NEDLANDS W.A. 6009,
Australia.

NZMS POSTGRADUATE STUDENT TRAVEL FUND

The NZMS has set up a fund to assist selected postgraduate students in the mathematical sciences to attend conferences in 1986. We are especially hoping to encourage attendance at the New Zealand Mathematics Colloquium to be held at the University of Canterbury (19-21 May, 1986), but the fund may be used to assist travel to any conference. The amount available per student will depend on the number and quality of applicants, but is likely to be about $200.

If you are yourself eligible and interested, you are invited to apply on the standard form, a copy of which accompanies this Newsletter. If you know of any eligible students who do not receive the Newsletter, please mention the existence of the fund to them and encourage them to apply. They need not be NZMS members.

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THE NEW ZEALAND MATHEMATICAL SOCIETY (INC.)

APPLICATION FOR 1986 POST-GRADUATE STUDENT TRAVEL GRANT

(to be submitted by 23 November 1985)

The Secretary
N.Z. Mathematical Society
Department of Mathematics and Statistics
University of Auckland
Private Bag
AUCKLAND

I hereby apply for a post-graduate student travel grant towards the cost of attending the following conference in 1986:

CONFERENCE: ....

PLACE: ..... DATES:.....

Personal Details

NAME:.....

ADDRESS:.....

.....

.....

DEGREES ATTAINED	UNIVERSITY	YEAR
.....	.....	.....
.....	.....	.....
.....	.....	.....

INSTITUTION CURRENTLY ATTENDED: .....

PRESENT COURSE OF STUDY/RESEARCH (give full details): .....

.....

.....

P.T.O.

Supporting Statements

Would you present a paper at the conference if able to attend? .....

.....

What benefits do you expect to gain from attendance? (be as specific as possible): .....

.....

.....

.....

.....

.....

Signed: ..... Date:.....

Supporting statement from supervisor or head of department:.....

.....

.....

.....

.....

.....

.....

Signed: ..... Date:.....

Local News

UNIVERSITY OF PAPUA NEW GUINEA

Savitri Abeyasekera has joined the department as Lecturer in Applied Statistics. previous position was Lecturer in charge of the Statistics Unit at the University of Co

Om Ahuja gave a seminar on the Bieberbach Conjecture.

Donald Joyce gave two papers at the Pacific Statistics Congress in Auckland and th participated in a Workshop on Statistical Development in the South Pacific, held in Van

John Renaud gave a seminar on Canonical Forms for Matrix Pairs. He has been promo Senior Lecturer.

Ramaswamy Sekkappan gave a seminar on Bayes and Least-Squares Procedures in Sampli Finite Populations.

George Styan from McGill University gave a seminar on Schur Matrices on his way fr Auckland to Montreal.

The University of Technology in Lae is holding a Conference on Mathematics Educati Mathematics from September 6th to September 9th, one week before the country's 10th Ann of Independence Celebrations.

D.C.J.

AUCKLAND UNIVERSITY

DEPARTMENT OF MATHEMATICS & STATISTICS

Two of our visiting Professors departed in June, Professor G.P.H. Styan of McGill University, Montreal, and Professor J. Dettman of Oakland University, U.S.A.

Assistant Lecturer, Dr Mike Paulin, resigned his position. Mike has gone to Los A to undertake postdoctoral research.

The two vacancies on the Departmental Committee were filled by Dr P. Hafner and Dr Ramankutty.

Professor A.J. Scott was appointed Acting Head of Department during Professor D.B. Gauld's absence on leave.

Two vacant lectureships have been advertised within the Department, one in Mathema and the other in Statistics.

Sadly, Professor G.A.F. Seber lost his wife Pat after a long illness.

The Pacific Statistical Conference was held at Auckland from 19 to 24 May and was thoroughly enjoyed by all who attended.

Professor Lorimer gave a series of seminars on 'Cryptography' and Professor Reilly Dr McInerney organised a Workshop during the May vacation for students who felt in need 'Top-Up' in the basic skills of Mathematics.

Seminars

Professor J.J. Seidel (Eindhoven Technological University), *'Harmonics and Combinatoric 'Discrete Hyperbolic Geometry'*.

Dr Chris Gibson (Liverpool University), *'Geometry of Robotics'*.

Professor G.P.H. Styan (McGill University), *'Schur Complements and an Analysis-of-Covar linear model'*.

Dr Bryan Manly (University of Otago), *'Tests to Compare Covariance Matrices'*.

Professor W.A.J. Luxemburg (California Institute of Technology), *'What is non-standard analysis'*, and *'The Radon-Nikodym Theorem revisited'*.

Professor F. Chong (Macquarie University), *'Inservice Postgraduate Courses for Mathemat teachers'*.

Dr K.G. Russell (Victoria University), *'Connectedness and Orthogonality in Experimental Design'*.

Dr B.D. Calvert (Auckland University), *'Characterisation of p-Additive Norms'*.

Professor J. Fournier (University of British Columbia), *'Mixed Norms, Rearrangements, Sobolev's Inequality, and Littlewood's Inequality'*.

Professor P.V. Rao (University of Florida), *'Estimation of Slope with Randomly Right Censored Data'*.

Dr D.K. Skilton (Simon Fraser University), *'Imbedding Posets in the Integers'*.

Professor G.F.D. Duff (University of Toronto), *'The Navier-Stokes Equations in Three Space Dimensions'*.

I.L.R.

DEPARTMENT OF THEORETICAL AND APPLIED MECHANICS

The T.A.M. Department has been appointed to organise the 1987 Applied Mathematics Conference of the Australian Mathematics Society. The Conference will be held at the Wairakei Hotel between 8 and 12 February 1987. Professor Gil Strang of MIT has accepted an invitation to be a principal speaker at the Conference. Organisers are Professor Ian Collin - Director, and Dr David Ryan - Secretary. Further details will be published in due course.

Our Department is looking forward to its move into new accommodation in extensions bein built at the School of Engineering. Planned computing laboratory facilities will provide valuable teaching space to support our courses. We also look forward to the imminent installation of the School of Engineering CAD system on a new IBM4341.

Dr Geoff Mohr has resigned to return to Australia. Professor Mervyn Rosser continues t enjoy his year's leave in the USA and the UK.

Professor Ian Medland has been appointed to the Structural Stability Research Council (AISC) Task Group #15 on Laterally Unsupported Beams.

Mr Ian Twomey, a 1984 Honours graduate in Engineering Science has been awarded the Operations Research Society's Student Paper Prize for his 3rd Professional Project on "Corporate Planning in New Zealand Steel Co Ltd".

Congratulations to Dr Robert McKibbin and his wife Helen on the recent arrival of daughter Emily Rose.

Seminars

Dr Martin Fieldhouse (Haverly Systems Europe Ltd), *'Linear Programming in Perspective?'*

Dr A.B. Philpott (University of Cambridge), *'Karmarkar's Algorithm'*.

Dr Sue J. Byrne (Massey), *'Quadratic Programming'*.

Professor George Mackie (Edinburgh), *'The Mathematics of Snooker'*.

Professor Bruce Morton (Monash), *'Spheroidal and Ring Vortices and Entrainment'*.

Dr J.P. Dempsey (Clarkson University, USA), *'Dynamic Crack Branching in Brittle Solids'*.

D.M.R.

DEPARTMENT OF COMPUTER SCIENCE

Barbara Reilly and Jennifer Lennon have joined the Department, as joint holders of a Senior Tutorship. Rob Burrowes and Matthias Otto are now the Departmental Technicians.

Kevin Burrage has returned from leave, and John Whale has gone on leave to London.

At the 3rd Australasian Mathematics Convention at the U. of N.S.W., Garry Tee gave a lecture on Materials in New Zealand for the History of Mathematics.

John Hosking has now gained his Ph.D. in Physics.

G.J.T.

WAIKATO UNIVERSITY

Professor Zulauf announced recently that he will step down from heading the Departm early next year, and that he will retire a year later.

At the beginning of this year, Ian Craig and Ernie Kalnins were both promoted, to S Lecturer and Reader respectively, and recently, Fay Sharples and Heather Gardiner were transformed into "real people". Thus after many years of struggle, they finally have co tinuing posts. The Department celebrated this at the Mandarin, Chinese style!

Graham French has just left for six months leave at Amherst.

Last but not least, planning for block G is well under way: this should house Mat Computer Science and Computer Services. Will we all fit in?

Seminars

Garry Tee (Auckland), *'New Zealand and Computing'*, and *'The History of Computing'*.

James Berger (Purdue), *'What can Bayesian analysis do for an applied statistician?'*

Prof. W.A.J. Luxemburg (C.I.T.), *'Non-Standard Analysis'* and *'The integral of sin(x)/x'*.

M.S.

MASSEY UNIVERSITY

The big news from Massey is that the University has approved the establishment of a second chair in the Department of Mathematics and Statistics, to be called the Chair of Mathematics. Brian Hayman will continue as Head of Department, and his chair will be renamed the Chair of Statistics. The appointment process is well under way, and we shou know the outcome soon after the appearance of this Newsletter.

As the list of seminars shows we have had the pleasure of entertaining a number of visitors in recent months. Especially pleasing was a visit from Massey graduate Stephen who is completing a Ph.D. at the University of New South Wales, where he will shortly be taking up a contract lectureship.

Seminars

Dr C. Gibson (University of Liverpool), *'Geometry of robotics'*.

Prof. G. Styan (McGill University), *'Schur complements and an analysis-of-covariance line model'*.

Dr A. Philpott (Cambridge University), *'Karmarkar's algorithm'*.

Prof. G. Mackie (University of Edinburgh), *'The mathematics of snooker'*.

Prof. W.A.J. Luxemburg (California Inst. of Technology), *'What is non-standard analysis? A remark on Hardy's paper in the Mathematical Gazette of 1902 with the title: "The Integral* $\int_0^\infty \frac{\sin x}{x}\,dx$*"'*.

Prof. J.J.F. Fournier (University of British Columbia), *'Resolution of the Littlewood conjecture for trigonometric sums'*.

S. Joe (University of N.S.W.), *'On collocation methods for integral equations of the seco kind'*.

Dr M.R. Carter, *'Counting a class of binary trees arising in the study of evolution'*.

M.R.C.

DSIR

Applied Mathematics Division

Alex McNabb's F.R.S.N.Z. is the main news item - see the centrefold. At present, Ale is working for three months at McGill University. Then he plans to visit Oxford briefly, and perhaps Japan too.

Rona Bailey has been appointed to the O.R. Section, after completing an M.Sc. from Canterbury.

Warwick Kessling has taken six months unpaid leave for a walking holiday about Europe.

Yunus Razali is spending six months at the A.M.D. studying geothermal reservoir engineering before returning to Indonesia.

Recent visitors to the A.M.D. have included Professors M.S. Longuet-Higgins, P. Armitage, A. Gardner and Dr Tomaru, all of whom gave seminars.

G.J.W.

CANTERBURY UNIVERSITY

Professor James O. Berger, a statistician from Purdue University, has been with us as an Erskine Fellow during June and July. He has given a series of ten lectures and seminars on Bayesian analysis, including theoretical and practical aspects.

During his stay, word was received that he has won the Presidents' Award, which is awarded by the Presidents of the American Statistical Association, the Biometric Society and the Institute of Mathematical Statistics, to the best young statistician in the world. The award will be presented to him at the Joint Meeting in Las Vegas in August.

Other visitors have included Professor Kenneth D. Magill and his wife Professor Saras S. Magill, both of the State University of New York at Buffalo, who were with us for two weeks, giving seminars on semigroups.

Congratulations to Paul Matthews, who has been awarded Ph.D. for his thesis 'Matrix algebra and other aspects of linear and quadratic programming', under the supervision of Ian Coope.

Seminars

Professor A.G. Mackie (University of Edinburgh), *'A critique of shallow water theory'*.

Professor M.S. Longuet-Higgins (University of Cambridge), *'Bifurcation and instability in steep water waves'*.

Professor Robert Groves (University of Michigan), *'Current research comparing personal visit and telephone interviewing surveys'*.

Professor John W. Dettman (Oakland University, Michigan), *'Analogous function theories in partial differential equations'*.

Professor Derek Holton (Otago University), *'Some open problems in graph theory'*.

Professor Kenneth D. Magill (S.U.N.Y., Buffalo), *'Ordering the local subsemigroups of a semigroup'*, and *'Recent results on congruences on S(X)'*.

Professor Saras S. Magill (S.U.N.Y., Buffalo), *'Dense semigroups of S(R)'*.

R.S.L.

UNIVERSITY OF OTAGO

Our new department chairman, Professor Derek Holton, has just arrived from the University of Melbourne - and plans to be in contact with various members of the NZ mathematical community in the near future.

Mr John Rayner will be collaborating with D.J. Best, of the CSIRO Maths & Stats Division at North Ryde, NSW, Australia, while on sabbatical leave this year.

Three of our first class honours graduates have received very attractive offers to pursue their Ph.D. degrees at prestigious overseas universities. In particular, Victor Flynn has a Prince of Wales Scholarship to study mathematics (especially number theory) at the University of Cambridge (Trinity College); Bruce McKinnon has a Graduate Assistantship and Fulbright Travel Award to study mathematics at Stanford University; and James Sneyd has a Teaching Assistantship at the Courant Institute of Mathematical Sciences (part of New York University) to study mathematical biology (with particular emphasis on differential equations and asymptotic methods). They all start in September, 1985.

Seminars

Professor George P.H. Styan (McGill University and Auckland University), *'Schur Complemen in Matrix Theory'*.

Professor W.A.J. Luxemburg (California Inst. of Technology), *'Euler's Sine Product Formul and Nonstandard Analysis'*.

G.O.

THE PRESIDENT'S PROJECTS

I propose to undertake research in two different parts of Mathematics, in two diffe countries, some time in the second half of 1985.

1. Research in Topology

Any point set topologist would give her/his right arm for the chance to make a visit one of the East European centres of topological research. My particular interests in no symmetrical topological structures, variations of continuity, bi-topological spaces, cha of topology and fuzzy topological spaces are strongly represented in the Belgrade resear group. Together with the Americans, the East Europeans are at the forefront of research point-set topology, and I would be able to learn much about the recent trends in the fie by visiting Belgrade.

From September 1981 to August 1982 Dr Mila Mršević of the Mathematics Institute, University of Belgrade, held a Post-Doctoral Fellowship in the Department of Mathematics University of Auckland. Arising from the work she and I did then and subsequently, we h written several joint papers. We hope to continue our collaboration in the future, and chance to meet would be a great boost to our joint efforts.

Recently I have been corresponding with a younger member of the Belgrade group, Dr D.S. Janković. We have agreed to a joint attack on two different topics and we hope for some success. Needless to say, a few days together would enable us to make more progres than we would achieve in a year of correspondence.

2. Research in Mathematical Education

On 1 January 1985 I took up an appointment as Subject Convenor for Mathematics of th New Zealand Universities Entrance Board, succeeding Professor David Vere-Jones. Inter- nationally, the last two or three years seem to have been a period of considerable chang in the teaching of Mathematics in the upper secondary school. This was one of the topic of major interest to me when I attended the International Congress on Mathematical Education in Adelaide late in August 1984.

New Zealand has been making significant changes in this period, especially in the n U.E.B. prescriptions for Mathematics for sixth and seventh forms. There is much that I could learn from a visit to appropriate institutions in Britain, where in some respects they are a little ahead of New Zealand.

Specifically, in England and Wales I would like to visit the new Secondary Examinat Council which was formally incorporated in May 1983 "to advance education for the benefi the public by promoting, encouraging and developing the efficient provision of systems o examination and assessment in England and Wales designed principally for pupils in secon education". I would hope to meet people from the Department of Education and Science, f the examining boards for CSE and GCE, and from secondary and tertiary institutions. Som the issues I would like to examine include the repercussions of the Cockcroft Report "Mathematics Counts" published in 1982, the question of the place of computing studies, alternative forms of assessment including "criterion referencing". In Scotland, I would like to look at the effects of the Dunning-Munn proposals, and have discussions with Professor W.D. Munn of Glasgow University who has recently stepped down from a four year term in the job corresponding to Subject Convenor in Scotland

August 1985 I.L. Reilly

Conferences

Compiled by Dr M.R. Carter, Massey University

1985

November 4-15 (Minneapolis, Minnesota)
Workshop on Large Deviation Theory
Details from Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, Minnesota 55455, USA.

November 18-20 (Norfolk, Virginia)
Second SIAM Conference on Parallel Processing and Scientific Computing
Details from Society for Industrial and Applied Mathematics, 117 South 17th Street, Suite 1405, Philadelphia, Pennsylvania 19103, USA.

November 18-22 (Hamilton, New Zealand)
International Symposium on Single and Multiphase Flow through Heterogeneous Permeable Materials
Details from IUTAM Symposium, Physics and Engineering Laboratory, D.S.I.R. Private Bag, Lower Hutt, New Zealand.

December 16-21 (Bombay)
Methods of Functional Analysis in Approximation Theory
Details from D.V. Pai, Indian Institute of Technology, Bombay, Powai, Bombay 400 076, India.

1986

January 13-17 (College Station, Texas)
Fifth International Symposium on Approximation Theory
Details from C.K. Chui, Center for Approximation Theory, Texas A & M University, College Station, Texas 77843, USA.

February 17-21 (Minneapolis, Minnesota)
Workshop on Disordered Systems, Percolation, and Self-Avoiding Random Walks
Details from Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church St S.E., Minneapolis, Minnesota 55455, USA.

March 17-21 (Minneapolis, Minnesota)
Workshop on Hydrodynamic Behaviour of Interacting Particle Systems
Details from Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church St S.E., Minneapolis, Minnesota 55455, USA.

March 24-28 (Atlanta, Georgia)
Fourth International Symposium on Numerical Methods in Engineering
Details from A. Chaudouet, c/o CETIM, B.P. 67, 60304 Senlis, Cedex, France.

June 9-19 (Minneapolis, Minnesota)
Stochastic Differential Systems with Applications to Control Theory, Electrical/Computer Engineering and Operations Research
Details from Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church St S.E., Minneapolis, Minnesota 55455, USA.

July 27-August 1 (Seattle, Washington)
Thirteenth International Biometric Conference
Details from Gerald van Belle, Dept of Biostatistics, University of Washington, Seattle, Washington 98195, U.S.A.

August 3-11 (Berkeley, California)
International Congress of Mathematicians
Details from ICM-86, P.O. Box 6887, Providence, Rhode Island 02940, USA.

August 11-16 (Victoria, British Columbia)
Second International Conference on Teaching Statistics (ICOTS 2)
Details from Professor T. Lietaer, University Extension Conference Office, University of Victoria, P.O. Box 1700, Victoria, British Columbia, Canada, B8W 2Y2.

August 25-29 (Prague)
Sixth Prague Topological Symposium
Details from Zdeněk Frolik, Matematický ústav ČSAV, Žitná 25, 115 67 Praha 1, Czechoslovakia.

Book Reviews

MATHEMATICAL LOGIC, by H.-D. Ebbinghaus, J. Flum, and W. Thomas, translated from Germa
by A.S. Ferebee, Undergraduate Texts in Mathematics, Springer-Verlag (1984), ix +
216 pages.

This is a translation of a book, originally published in German in 1978, which pre
first course in mathematical logic. Part A presents the basic theory of first-order la
covering the usual material on syntax and semantics in a thorough manner. Proof theory
developed by means of a sequent calculus, rather than the more common Hilbert-style axi
atisation, and a full treatment of Henkin's method of completeness proof given for coun
languages. For the uncountable case the proof is adapted via an appeal to Zorn's Lemma
Löwenheim-Skolem and Compactness theorems are derived from the Completeness Theorem and
number of applications and illustrations are given, including the non-elementary nature
notions of torsion group and Archimedean field, and the existence of countable non-stan
models of arithmetic. This part of the book closes with a discussion of the scope of f
order logic, reflecting on the notion of formal proof and the extent to which mathemati
be developed in the first-order language of set theory.

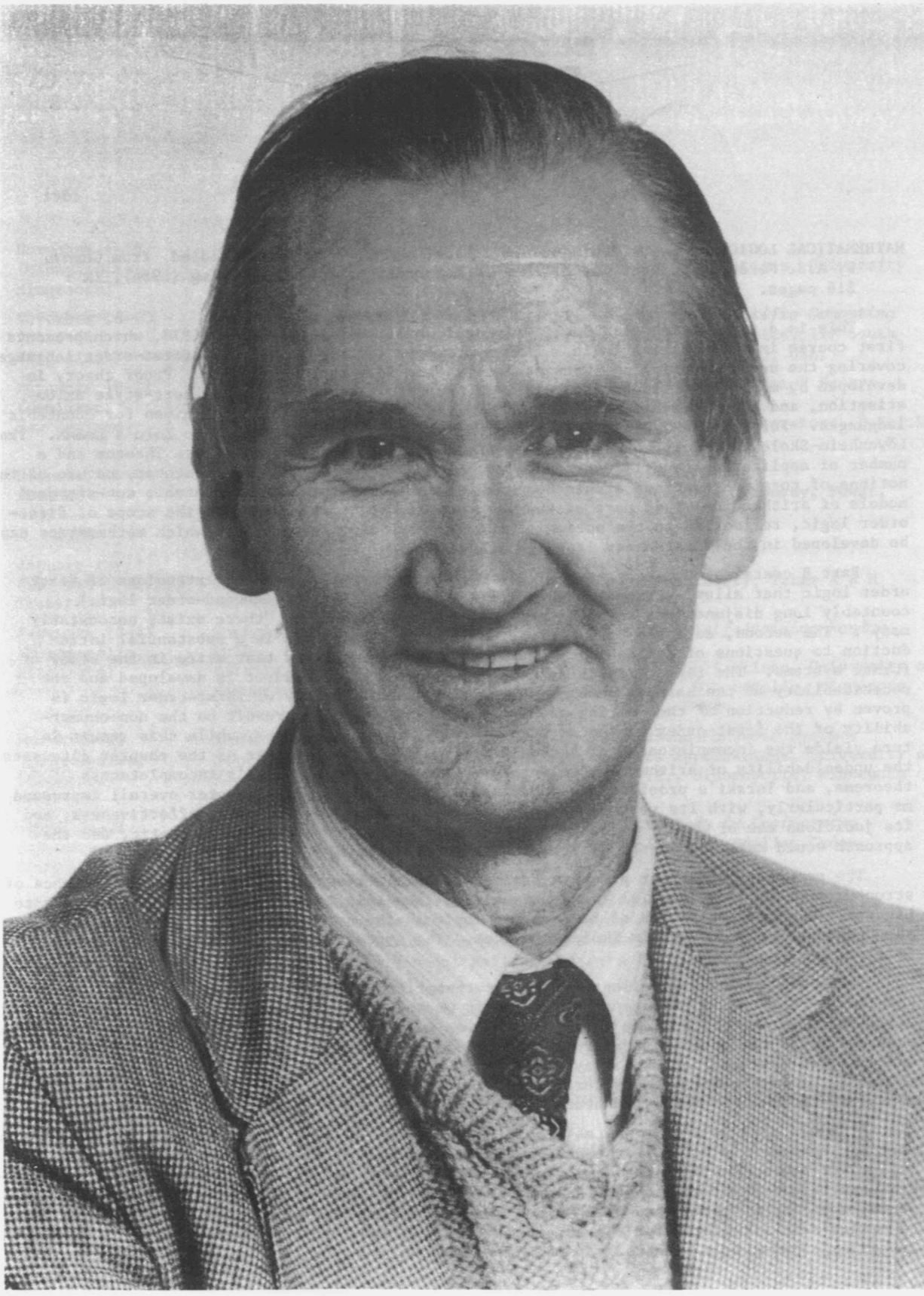
Part B contains four chapters. The first gives a brief glimpse of extensions of fi
order logic that allow, variously, quantification over relations (second-order logic),
countably long disjunctions and conjunctions, and the quantifier "there exists uncounta
many". The second, entitled "Limitations of the Formal Method", is a substantial intro
duction to questions of decidability and effective enumerability that arise in the stud
formal systems. The register machine model of computable procedures is developed and t
undecidability of the halting problem shown. The undecidability of first-order logic i
proven by reduction to the halting problem, as is Trahtenbrot's result on the non-enume
ability of the first-order sentences valid in all finite structures, while this result
turn yields the incompleteness of second-order logic. The remainder of the chapter dis
the undecidability of arithmetic, self-referential statements, Godel's incompleteness
theorems, and Tarski's proof of the undefinability of truth. This chapter overall impr
me particularly, with its very clear informal treatment of the notion of effectiveness,
its judicious use of Church's Thesis. The proofs given are very model-theoretic, and t
approach would make a good set of lectures in a course with that sort of emphasis.

The penultimate chapter presents Fraissé's characterisation of elementary equivale
structures in terms of partial isomorphisms, and then this is applied in the last chapt
Lindström's characterisation of first-order logic as the strongest logical system to sa
the Compactness and Löwenheim-Skolem theorems. The exposition here is a model of lucid
writing.

There are numerous excellent texts on mathematical logic already in existence, but
book has a distinctive character that makes it worthy of consideration. It begins with
brief introduction, illustrated by some examples from group theory and the theory of re
that considers the concept of a proof, and attempts to identify the distinctive feature
mathematical (as distinct from, say, philosophical) logic. The theme of logic as a too
the doing of mathematics recurs throughout, and helps make this the sort of text that w
appeal to those self- motivated students who are occasionally attracted to this area.

It would also be a very suitable text for a reading course. My one misgiving about
that it jumps straight into first-order languages without a prior discussion of proposit
logic. Of course for mathematics it is first-order logic that is important, but at the
graduate level (which this book claims to be) it is hard to see how the intricacies of
decomposability of terms, and free versus bound occurrences of variables, for example,
be a more suitable ground for the cutting of logical teeth than the properties of the t
functional connectives. But perhaps this is really a question of what one is used to.

Rob Goldblatt



Centrefold

ALEX McNABB ELECTED AS A FELLOW OF THE ROYAL SOCIETY OF NEW ZEALAND

In May of this year, Dr Alex McNabb was elected to a Fellowship of the Royal Socie New Zealand. Alex is section leader of the Mathematics Physics group of Applied Mathema Division, Department of Scientific and Industrial Research, Wellington, which is locate the Victoria University campus.

Alex McNabb is one of New Zealand's leading applied mathematicians and in the area continuum mechanics he is clearly one of the best known New Zealanders both here and ove His contributions both to the theory and application of mathematics, especially differe equations, has given rise to the high regard accorded his work by a widely diverse group scientists. He is the author of nearly 50 papers in applied mathematics.

On the practical side Dr McNabb has made notable contributions to a multitude of diffusion-type problems. These are a host of different applications: timber treatment, moisture in soil, heat and moisture in wool, hydrogen in metals, and, more recently, flo diffusion in geothermal applications. He has been crucially involved in the theory of hydrothermal systems as they appear in New Zealand and he, assisted by his colleagues at Applied Mathematics Division (D.S.I.R.), have made important contributions to our unders ing of these phenomena. The same is true of his work for New Zealand Steel on the smelt of iron sand. Notable amongst this work has been his 1963 contribution on the diffusion hydrogen in iron and steel - his paper on this subject was denoted as a Science Citation Index Classic in 1983. All of these applications involve a careful study of usually non linear processes involving non-linear differential equations.

No doubt motivated by the common mathematical problems which arise in these diverse applications, Dr McNabb has made very significant contributions to the theory of differe equations. In isolation, some people would regard this as pure mathematics but the use these results is too vast for the work to be regarded as just pure mathematics. His ear work on comparison theorems for coupled equations is widely quoted in major texts on the theory of differential equations. More recently his work on the factorisation of operat is indeed highly significant with wide applicability. A series of papers on this topic, initiated while he was a visitor to the University of Southern California in the late si has appeared and work along these lines is still proceeding. The idea involved is very useful - it shows how to solve an equation in operator form by splitting it into a numbe easily computable steps. Thus this work has both a theoretical and practical significanc

This unusual mix of interests of both theory and practice is a distinctive feature Dr McNabb's work. He has shone light on a greatly diverse number of areas and is rightl regarded as one of the leading figures here in New Zealand in the area of continuum mecha His publication list does not include of course the major contributions he has made via suggestions etc. to numerous co-workers in a host of institutions here and overseas. Not least has been a very large number of research students and younger scientists who have sought inspiration from him on how to tackle the problem of the day. More often than not Alex has provided more than one suggestion that will work. He is well-known as the best person to ask on a host of problems that arise in applied mathematics. The contributions has made, often quite casually and seldom published by him, are very significant and bear witness to the considerable influence he has had, and continues to have, on applied mathe atical research. Also we must refer to vast numbers of contributions Dr McNabb has made geothermal work via the geothermal circulars which have never been formally published. Therein can be found a comprehensive model of a geothermal system.

Alex has been a member of Applied Mathematics Division since 1954. Before that, he gained a M.Sc. with first class honours in Mathematics from Canterbury University College He was absent on leave from D.S.I.R. at Cambridge University 1954-1957 where he gained a in Mathematics. In 1971 Victoria University of Wellington awarded him, in recognition of major contributions to Applied Mathematics, a D.Sc. in Mathematics. He served one term o the Council of the N.Z. Mathematical Society and is a keen supporter of its activities. Alex's interest outside Mathematics and its applications, centre around his notable explo

as gymnast (N.Z. Champion 5 times 1948-1962 and British Universities Gymnastic Champion 1954) and recently as a gymnastics coach. His mathematical talents are recognised here too, as he includes in his many distinguished appointments that of "honorary lecturer in mechanics of gymnastics".

The mathematical community congratulates one of its distinguished members on his el to the Royal Society Fellowship and firmly believes the addition of another active mathe ian to its Fellowship (total now eight mathematicians) will greatly enhance the activiti the Royal Society.

Graeme C. Wake

Problems

PROBLEMS should be sent to the sub-editor, with solutions, references, comments and so o

SOLUTIONS should be sent to the sub-editor within three months: if a problem has alread been mentioned or solved elsewhere, please send details to the sub-editor.

Problem 17 *(of nags and tags and flags)*

A finite set N of nags and a finite set T of tags are given. Each nag has one or mo tags attached to it (different nags may have different numbers of tags), and each tag is exactly six times. We thus have the set of nag-tags (a subset of $N \times T$). Also given a six kinds of flag in three matching pairs: f and F, g and G, h and H. The prob is to find an algorithm that assigns a flag to each nag-tag in such a way that

(i) the six nag-tags with the same tag have different flags, and

(ii) nag-tags with the same nag can, with one possible exception, be arranged into pa having matching flags.

(M. Schroder, Waikato)

Sub-editor: A. Zulauf, University of Waikato

Hoytened interest: there's Goldie in them thar oils.

Previewing his art auction on TV news recently, Peter Webb said that art made a goo investment: he pointed to Hoyte, said it should sell for $50,000, and added that this represented a gain of 78% a year over the 40 years since its last sale, for £8.

Secretarial

MINUTES OF THE ELEVENTH ANNUAL GENERAL MEETING

OF THE NEW ZEALAND MATHEMATICAL SOCIETY

Held at the University of New South Wales, Sydney, Australia,
on 13 May, 1985.

PRESENT: M. Carter (President; in the chair), E.G. Kalnins, A.G. Mackie, M.J. Doherty, A.D. Sneyd, W.B. Wilson, J. Curran, B. Calvert, G. Olive, D. Holton, R. Goldblat D. Gauld, D. McCaughan, J. Clark, G.J. Tee, P. Fenton, M. Schroder.

Meeting declared open at 8.10 p.m.

1. APOLOGIES: B. Davidson, D. Halford, C. Little, I. Reilly, B. Woods, J.C. Turner, M. Conder, J. Shanks.

   Moved from the chair that apologies be accepted. CAR

2. MINUTES OF THE TENTH A.G.M.:

   Moved from the chair that the minutes be taken as read. CAR

   Moved that they be taken as a true record (Gauld/Olive). CAR

3. MATTERS ARISING FROM THE MINUTES:

   The President advised the meeting that Council had as yet taken no action to establish national committee to coordinate basic skills programmes; this was still under consideration.

   Other matters arising were dealt with under specific agenda items.

4. PRESIDENT'S REPORT:

   The annual report of the President was presented, copies of which had been previously distributed. In the course of the subsequent discussion the following points were bro up:

   (a) Profits of textbooks should be 'redirected into N.Z. mathematics'.

   (b) Council determines the amount of finance available to postgraduates for travel.

   (c) John Curran was thanked for his work as editor of newsletter.

   (d) B. Wilson expressed concern over the format of the thesis competition and the corresponding large amount of work involved on the part of the assessors. B. Cal asked if students are in fact aware of this competition. There was also some discussion of the Australian high schools math competition. N.Z. participation i such competitions as the mathematical olympiad needed an enthusiastic promoter. Derek Holton expressed an interest in such a role.

   (e) B. Calvert was thanked for his continuing work as the society's human rights representative.

   B. Wilson returned the discussion to the thesis competition. R. Goldblatt mentioned t examiners' reports should exist for theses and could be incorporated in the assessment the theses for the purposes of the competition. B. Calvert suggested the competition should enjoy a higher profile with more publicising. Council should consider these aspects of the competition.

   Moved from the chair that the report be adopted. CARR

5. TREASURER'S REPORT:

   D. McGaughan reported on the financial statement of the NZMS on behalf of J. Shanks. figures indicated the society to be in healthy state, principally because of publicati ventures.

   Moved that the report be adopted (McGaughan/Clark) CARR

   Subsequent discussion: M. Schroder indicated his concern with non-financial members o the society.

   Motion recommending no change in subscription was moved by (J. Clark/C. McGaughan).

Subsequent discussion resulted in an amendment by (B. Calvert/G. Olive) to lower the subscription by $1. NOT CARRIED

The motion of J. Clark and D. McCaughan was subsequently put. CARRIED

The Auditor was thanked for his services.

Council was given authority to appoint a new auditor, moved by (Gauld/Calvert). CARRIED

6. PUBLICATIONS REPORT:

Motion (Gauld/Schroder) that the report of the publications committee be adopted. CARRIED

J. Curran reported, as editor of the newsletter. He expressed his thanks to Prof. A. Zulauf and J. Clark for helpful contributions to its publication and also to the typist who was involved in the preparation. The newsletter is sent to many people overseas, and also to institutions. J. Curran expressed the view that a sub-editor would have been useful in his position as editor and would have enabled him to spend his time more efficiently.

J. Clark outlined the procedure by which Springer Verlag agree to provide books for review in the newsletter of the society. A new coordinator of this aspect might wish to carry on this work.

The President thanked Dr Curran for his report and suggested that an edited version be published in the newsletter.

7. CHANGE TO BY-LAWS:

The President noted that a change to the by-laws had occurred, which enabled council and officers to take up their positions immediately after the A.G.M.

8. ELECTION OF OFFICERS:

Ivan Reilly has been elected to the first two-year presidency of the NZMS. Two vacancies which will require filling on council would occur with the departure of B. Davidson and P. Hill. The election of officers for these vacancies was held and B. Wilson and M. Conder were elected to council.

9. GENERAL BUSINESS:

B. Calvert expressed concern on the funding of mathematics in New Zealand. In particular concern was expressed about a lack of visiting positions, Ph.D. Student positions and a difficulty in financing trips to overseas meetings. The society ought to consider raisin funds for working mathematicians. As far as post-doctoral positions were concerned, thos available would only sympathetically consider proposals directly of relevance to N.Z. (Goldblatt). It was suggested that these matters be put before council.

The discussion then turned to the matter of the role of the visiting lecturer. Qualities should be (Olive) good research credentials, outstanding speaker, able to relate to students at the non-research level, e.g. able to talk to high school students. D. Gauld mentioned the difficulty in obtaining suitable people. G. Olive suggested a set of grou rules be established and that Kevin Broughan be consulted on this point. B. Wilson expressed the view that a visitor was needed who raised the public status of mathematicians. The proposed arrangement with the London Mathematical Society for a visiting lecturer every two years was outlined. Council will look into these matters.

J. Curran requested that a letter of appreciation be sent from the Society to the typist responsible for producing the newsletter.

D. Gauld expressed the appreciation of the membership for the services of the outgoing president and this was carried by acclamation.

The meeting was declared closed by the outgoing President.

Ernie Kalnins
(Acting Secreatry)

PRESIDENT'S ANNUAL REPORT, 1984/85

On behalf of the Council of the New Zealand Mathematical Society, I have the honour of presenting the eleventh Annual Report of the Society.

The publishing activities of the Society continue to flourish, under the able directi of Professor Ivan Reilly, the convenor of the Publications Committee. The first-year university text "Calculus" has now been adopted by Auckland, Victoria and Waikato universi and copies have been bought by La Trobe University in Australia. The two-volume text cove the new sixth-form prescription is being marketed at present, and the texts for the new seventh-form prescriptions are in preparation; the school texts are all joint ventures wit the N.Z. Association of Mathematics Teachers. The Society is grateful to Bob Broughton, D Halford and Lindsay Johnston, the organisers of the writing teams for the school texts. Council is firmly committed to the policy of using the profits from our publications to promote mathematics and mathematical activity in New Zealand.

A fund to assist New Zealand post-graduate students to attend conferences has been established, and three students (Inessa Levi and Ingrid Rinsma from the University of Canterbury, and Robert Chan from the University of Auckland) were each granted $333 for travel during 1985.

A subcommittee of Council is at present drafting rules for a proposed fund to provide research assistance for New Zealand mathematicians.

Support for the Prince and Princess of Wales Science Award Scheme is continuing in th form of a contribution of $300 for 1985. Council noted with pleasure than an award had be won by Dr Peter Thomson (Department of Mathematics, Victoria University).

A grant of $50 was made to help defray the expenses of an Applied Mathematics Worksho held in Wellington. It was also agreed by Council that $500 should be contributed to the 1987 Australian Applied Mathematics Conference (to be held in New Zealand), to sponsor an invited speaker.

After some debate, Council reaffirmed the policy that the biennial Predoctoral Thesis Competition should be judged mainly on the quality of the writing, should be open to both Honours and Master's theses, and should normally be restricted to no more than three entri from each university. The 1984 competition was won by J.W. Davys of Waikato University ("Waves in Floating Ice"); second and third respectively were A. Thompson of the Universit of Canterbury ("Decomposable 2-(11,5,4) and 3-(12,6,4) Designs") and D. Harte of Victoria University ("Self Similar Stochastic Processes"). Burroughs Limited generously donated $2 and the Society contributed $50 to allow prizes of $150, $100 and $50 to be awarded. Nine entries were received. Thanks are due to Dr Ian Coope, who organised the competition, and Professors D.A. Nield, I.L. Reilly and D. Vere-Jones, who took on the difficult task of judging.

The Society is also most grateful to Dr John Curran, under whose editorship the News letter continues to flourish. The December 1984 issue was accompanied by supplements updating our lists of theses and research reports. Council has now decided to discontinue the latter list, but to continue to update the list of theses at regular intervals.

The 1984 NZMS Visiting Lecturer, Professor Hassler Whitney, toured in September. The Society appreciates the work of Dr Dean Halford in organising the tour, as well as his regular contribution by way of the maintenance of the list of mathematical visitors to New Zealand.

A questionnaire was distributed to all members of the Society in December, soliciting their views on the question of entrance to university. The results have been reported in the Newsletter. Council will no doubt continue to keep this important matter in mind.

As directed by the 1984 Annual Meeting, Council considered the question of the procedure to be followed by the Human Rights Representative. It was agreed that whenever possible, Human Rights issues should be submitted to the December Council meeting, so that the issue can be fully debated by Council and publicised in the April newsletter prior to the Annual Meeting. The thanks of the Annual Meeting and of Council were conveyed to Dr Bruce Calvert, our Human Rights Representative.

The Council met twice during the year; on May 7-8 1984 at Victoria University, and on December 6 1984 at the Science Centre, Wellington.

Let me conclude by thanking, on behalf of the Society, all the members of Council f their work on behalf of the Society during the past year. Special thanks are due to our

indefatigable secretary, Dr Charles Little, and our treasurer, Dr John Shanks, who also took on the task of editing the Post-Graduate Topics booklet; also to the two retiring members of Council, Professor Bill Davidson and Dr Peter Hill.

M.R. Carter
President

TREASURER'S REPORT 1984/85

1984 continued the trend of recent years which have seen the society's assets grow steadily due mainly to the success of its publications. The increase of balance from 1983 o about $9000 can be attributed mainly to the profits (about $7000) from sales of the Stage I Calculus text.

The Society's considerable funds provide a strong base for launching new projects such travel and research grants and new publications, as well as those already in operation. The latter can require substantial outlay especially early in the year; for example, the recent printing of the new Sixth Form book required about $11000 and reprinting of the Calculus tex required a (partial) payment of $4500.

Term Deposits: The Society's three term deposits were renewed and produced interest of $923.54. The Debenture stock with the Royal Society of N.Z. is due to matur in 1985.

Donations:

To the Society:	$90	Calculus authors
	$250	Burroughs for thesis competition
By the Society:	$300	Prince & Princess of Wales Award Scheme
	$500	Summer Research Institute, Auckland
	$50	Applied Mathematics Workshop, Victoria

Membership: There are 195 members of the Society with 156 financial.

John A. Shanks
Treasurer

REPORT OF THE PUBLICATIONS COMMITTEE, EDITED

During the past few years, the NZMS has been very active in the publishing field. The work *Calculus* is by now well known and has been adopted at Auckland, Waikato and Victoria. Interest has been shown in Australia as well, and copies have been sold at La Trobe Universi The two volumes of *Secondary School Mathematics* are also familiar NZMS productions. *Mathematics with Calculus* will soon be printed, and will be followed by *Mathematics with Statistics*. In fact, profits from publications largely account for the healthy bank balance of the Society. As the projects mentioned above have now either been completed or are neari completion, the Committee has been reduced to the two of us. Although there are no plans to initiate a major new publishing venture this year, ideas for the next project are being sought. If you have an idea, please write to us and we will be glad to consider it.

Ivan Reilly, University of Aucklan
Charles Little, Massey University

INTERNATIONAL CONGRESS OF MATHEMATICIANS

The next International Congress of Mathematicians will be held at the University of California, Berkeley, U.S.A., from Sunday 3 August to Monday 11 August 1986.

Further information is available from Marston Conder, Secretary of the NZMS, Department of Mathematics and Statistics, University of Auckland. Alternatively, registration forms and more detailed information may be obtained by writing directly to:

ICM-86,
Post Office Box 6887,
Providence RI 02940,
U.S.A.

Balance Sheet at 31 December 1984

1983	Accumulated Funds		1983	Assets	
12608	Balance b/forward	13773.16	21	General account	8017.49
1165	Plus: Excess of income over expenditure	9069.93	4215	Publications a/c	4583.40
			246	Aitken account	251.81
			334	Newsletter a/c	43.86
			192	Australian a/c	206.36
			2000	Debentures	2000.00
			6841	Term Deposits	7494.92
			13849		22597.84
				Less Liabilities	
			76	Subs in advance	24.75
					22573.09
			--	Plus sundry debt	270.00
13773		$22843.09	13773		$22843.09

Notes

1. Income to the Australian account has been included under subscriptions; bank fees under miscellaneous; Australian funds (A$147.40) have been converted to NZ$ at the rate A$1 = NZ$1.40, giving NZ$206.36 .

2. Stock on hand at 31/12/84, at estimated cost price without allowance for obsolete stocks, was $3839.44 (1983: $7442).

3. Sundry debt is interest from Auckland Term Deposit Account not yet received in Dunedin.

Auditor's Report

I have examined the above Balance Sheet and Statement of Income and Expenditure, together with the books of the Society. In my opinion, according to the best of my information and the explanations given to me, and to the books of the Society, the Balance Sheet gives a true and fair view of the State of the Society's affairs as at December 31st 1984, and the Statement of Income and Expenditure gives a true and fair view of these matters for the year ended December 31st 1984.

K.J. Tunnicliffe B.Com., A.C.A.
Management Accountant

7 May 1985

New Zealand Mathematical Society

Income and Expenditure Statement for Year Ended 31/12/84

1983	Income		1984	
2910	Subscriptions	- Full members	2532.00	
143		- Reciprocal	112.30	
13		- Student	10.70	
783		- Arrears	328.00	
--		- Advance	76.00	
3848				3059.00
63	Interest on current accounts	- General	88.95	
130		- Publications	231.48	
--		- Aitken	6.14	
193				326.57
846	Interest on Term Deposits			923.54
143	Interest on Debentures			90.00
--	Donations			340.00
12613	Publications			29625.23
30	Australian account net increase			--
9	Miscellaneous			--
236	AC Aitken Trust			--
17917				34364.34
	Expenses			
1005	Newsletter		823.58	
200	NZMS Visiting Lecturer		400.00	
1099	Travel		1136.53	
53	Royal Society of NZ		46.15	
600	Donations		850.00	
--	Thesis competition		300.00	
483	Teachers competition		--	
150	Colloquium Lecturer		150.00	
9	Mathematical Chronicle		--	
97	Miscellaneous		132.96	
13056	Publications		21455.19	
16752				25294.41
$1165	Excess of Income over Expenditure			$9069.93

ANALYSIS CONFERENCE

SINGAPORE 1986

The Conference (17-21 June 1986) will be preceded by a Workshop (11-16 June), and it wil emphasise harmonic and functional analysis. Invited speakers include E. Hewitt (University o Washington), G. Pisier (University of Paris VI) and J.J. Uhl (University of Illinois). Those interested should write (by 15 October 1985) to

Organising Committee, Analysis Conference,
Department of Mathematics,
National University of Singapore,
SINGAPORE 0511.

NEWSLETTER EDITOR'S REPORT 1985

I have now edited the Newsletter for 2 years at Otago during which time 6 issues have appeared. Otago University does not boast many members of the NZMS, so despite Professor Davidson's best efforts, I never found a subeditor to help me directly. Consequently I fo I had too much to do writing letters, soliciting articles, etc. to be greatly innovative. Thus it has been a period of consolidation of the Newsletter in its present form, with som of the sections growing in strength.

I am very grateful to Professor Zulauf who agreed early on to handle the problem sect which I believe considering the circulation has been quite successful. The books section has a steady flow of reviews thanks mainly to the availability of all Springer-Verlag text for possible review. The network of honorary correspondents has grown and they are furnis plenty of local news. Despite prophecies to the contrary we haven't run out of centrefold ideas yet, so if you haven't appeared we are probably working on it! In fact in response my sending copies of the Newsletter to Mathematical Reviews they now plan to review it, an hope will list the centrefold articles in their History and Biography section. My thanks Matt Varnish for continuing to supply fiendish crosswords, and to Michael Carter for suppl ing the conference listings. The letters to the editor section has not been a great succe In selecting feature articles I have tried to choose topics of general interest. Here I would like to thank David Smith of the Chronicle for the amicable way we have been able to divide up the invited papers presented at the annual colloquium.

The volume of information provided by the Newsletter has increased gradually. The to number of pages for the years 1982, 1983 and 1984 are 80, 104 and 112 respectively. Inevi ably this has increased the typing burden particularly in a smaller department. I am thus very grateful to Karen Smeets for supervising the typing and sometimes completing work in own time. The present photoreduction process means that even typed material coming in is retyped for uniformity. But if the present format is kept I have recommended to the new editor that the grid size be published and that some sections, such as secretarial, be typ at source to the correct specifications. This would distribute the typing more.

The effort required to proof-read the Newsletter has also increased and despite my be intentions there have been mistakes. An example occurred in a recent issue when Garry Tee reviewed a book under the pseudonym G. Gee! I also had the embarrassing experience of tak delivery of 300 copies of a Newsletter with a centrefold article on Professor Bill Davidso opposite a passport-size photo of him in the middle of a blank white page. I must say Professor Davidson was relatively unperturbed at his diminutive stature, but the air was b when I insisted the printer remove all the middle pages and blow the picture up to its correct proportions!

The printing costs of the Newsletter have remarkably gone down since it has been prin at Otago. For example, a 28 page Newsletter at Canterbury in August 1982 cost $205 but at Otago in August 1983 cost $138. Overall we have got more for less. The last 5 Newsletter at Canterbury totalled 124 pages and cost $880, the next 5 Newsletters at Otago totalled 1 pages (approximately 40% more) and cost $830. The cost of mailing my first newsletter was $119 over half of which was for overseas airmail. After my drawing this to the Council's attention they resolved that the Newsletter should be sent surface except when members elected to pay an extra $1.50 an issue for airmail delivery. No one has chosen to do this. The costs are now more reasonable, although the last two bulky issues (of 48 and 44 pages) were about $95 each for postage. We now send the Newsletter to 189 individuals of whom 34 are overseas, and to 54 institutions of which 39 are overseas.

Although time-consuming my task as Editor has been enjoyable, and this was due in larg part to the friendly cooperation I received from the numerous contributors. My sincere tha to all of them. Finally I would like to wish the new editor well in the year ahead.

M.J. Curran
9 May 1985

MINUTES OF THE SEVENTEENTH COUNCIL MEETING OF THE

NEW ZEALAND MATHEMATICAL SOCIETY

held in the Science Centre, Wellington, on May 27, 1985
at 10 a.m.

PRESENT: M. Carter (in the Chair), I. Reilly, M. Jorgensen, M. Conder, E. Kalnins, C. Little
J. Shanks.

M. Carter extended a warm welcome to M. Conder, who was attending his first Council meeting.

1. APOLOGIES: P. Hill, J. Harper, B. Wilson, W. Davidson, E. Irving.
It was noted by CL that P. Hill, who is retiring, wished his appreciation of the opportunity to serve on Council to be recorded.

Moved (IR/MJ) that the apologies be sustained. CARRI

2. MINUTES OF THE 16th COUNCIL MEETING ON DECEMBER 6, 1984:

Moved (EK/IR) that the Minutes be adopted as a true record of the proceedings of this meeting. CARRI

3. MATTERS ARISING FROM THE MINUTES:

(a) M. Carter announced that the results from the questionnaire on University Entrance h been inconclusive, and that it was therefore inappropriate for the Society to adopt policy on this matter.

(b) The draft rules for the proposed fund to aid research and support visits by overseas mathematicians were discussed. Consideration was given to an extract from a letter W. Davidson that had been supplied to the Council members, but it was agreed to keep the scope of the fund broad in keeping with the intent of the original document. Thought was also given to the question of where the ownership of funded items, such books and computer software, would be vested, and it was agreed to leave this questi of ownership flexible. It was resolved to change the wording of rule 6 to ensure th the invitation for applications includes mention of a deadline.

Moved (CL/EK) that the rules as amended be accepted and that the fund become operati during the year 1986/87. CARRI

(c) MJ distributed a written report which he and J. Harper had prepared concerning the NZMS archives. He remarked that the RSNZ had expressed no objection to having the archives stored at the Science Centre. The box which JS had deposited was still unopened, and JS remarked that it contained material which had been passed on to him. MJ felt that the organisation of the files would entail a great deal of work for little benefit. M. Carter suggested a further perusal of the archives with the aim of locating and filling any gaps there may be, and MJ undertook to try with JH t ensure that the archives were reasonably complete. JS remarked that J. Curran had undertaken to send past issues of the Newsletter to MJ. MC thanked MJ and JH for their efforts.

(d) Speaking as the Chairman of the Steering Committee, IR remarked that it was the intention of that Committee to seek, from a wide variety of sources, feedback concer ing the content of the school curricula. He felt that an official letter from the NZMS would not help at this time, and that it would be better to wait for a year or until the recent changes to the curricula can be seen in perspective.

(e) MC revealed that he had consulted D. Halford about reprinting the employment brochu They had agreed to await feedback from the Graduate Information Scheme before re-writing the brochure.

(f) IR undertook to try to circulate information about existing programmes for the development of basic mathematical skills, and will contact JH.

4. CORRESPONDENCE:

Moved (CL/IR) that the inwards correspondence be received and that the outwards correspondence be noted. CARRI

5. MATTERS ARISING FROM CORRESPONDENCE:

(a) MJ remarked that the Member Bodies' Committee had considered the report of the New Zealand Ecological Society on the threat of nuclear war and, while not endorsing t report, had nevertheless passed a resolution in support of it. It was agreed that NZMS should write to the NZES indicating that we share their concern and appreciat the importance of the issue but that endorsement of the report is beyond our compe ence.

(b) It was agreed that the NZMS should nominate people for both the National Committee for Mathematics and the National Committee for Theoretical and Applied Mechanics, and that these nominations should be considered annually at the December Council meeting.

(c) MC reported on a discussion he had had with D. Halford on the possible participati of the NZMS in the ANZAAS Congress to be held in Palmerston North in 1987. D. Hal had affirmed that the Congress would not be specialised, but that a session of hal day on some topic such as mathematics in the community would be appropriate. It wa agreed that it would be inappropriate for the 1987 Colloquium to be held in conjun ion with ANZAAS. IR emphasized that we must not miss this opportunity to publicise mathematics.

Moved (IR/JS) that the NZMS donate up to $500 to support a session on mathematics a the 1987 ANZAAS Congress. CARRI

(d) M. Conder agreed to assist in the compilation of the World Directory of Mathematici by contacting members of the NZMS who do not work in universities.

6. APPOINTMENTS:

Moved from the Chair that the following appointments be made:

M. Conder as Secretary
J. Shanks as Treasurer
M. Schroder as Newsletter Editor
M. Jorgensen as Visiting Lecturer Selector
B. Calvert as Human Rights Representative
G. Thornley as Co-ordinator of Visitors
M. Carter as Graduate Information Co-ordinator
E. Kalnins to administer the USP Fund and
J. Harper, if he is willing, to maintain liaison with S. Forbes on the development of a National Committee on Basic Skills.

CARRI

JS agreed to try to find a new Auditor.

Moved (IR/EK) that B. Wilson be asked to administer the 1986 Post-Graduate Thesis Competition. CARRI

Some discussion ensured on the continued necessity for a Publications Committee. Its wo during the coming year would entail the co-ordination of the writing teams and keeping abreast of developments.

Moved from the Chair that the Publications Committee comprise IR and CL. CARRI

It was agreed that Joel Schiff and David Alcorn be thanked for their assistance.

7. TREASURER'S REPORT:

JS tabled the Treasurer's Report for 1984, remarking that the finances were in a healthy state, mainly because of the profit from Publications. Apart from this profit, the excess of income over expenditure was about $900. He remarked on the necessity for havi a large account in order to meet publication expenses, and reported that at the AGM members had seemed satisfied at the state of the bank account. He expressed concern tha because the publications accounts were held in Auckland and Wellington, he did not have complete control of all accounts that he wished to have. It was agreed that he should take steps to ensure that he is kept informed of transactions on the publications accounts. M. Carter thanked JS for his service as Treasurer.

The meeting adjourned for lunch at noon, resuming at 1.15 p.m.

8. PUBLICATIONS COMMITTEE REPORT:

IR announced that the profit on *'Calculus'* during the past year would be approximately $4000 - $5000. This was a decrease from the profit accruing during the previous year, because of the availability of second-hand copies. The Society had already paid for abou 200 copies which remain unsold, and was still awaiting payment from some Wellington book shops.

Volumes I and II of *'Secondary School Mathematics'* were priced at $10 and $8.50 respectiv ly. An answer book for them will be compiled. After 4000 copies have been sold and all expenses paid, the profit would be $6000, to be shared equally between the NZMS and NZAMT It was agreed to ask NZAMT to contribute to the costs of the next joint venture. IR remarked that we had needed a bank balance of approximately $10,000 in order to embark on this project. He felt that the price of the volumes was too low.

Available funds permitted a run of only 2000 copies of *'Mathematics with Calculus'*. This book costs $7 to print. Production of *'Mathematics with Statistics'* was not so far advanced.

IR then asked where the Society should proceed from here in terms of publications. It wa agreed that a year should elapse before any major new project is undertaken.

IR reported that D. Halford is keen to have a written contract drawn up between his writing team and the Society. The copyright for *'Calculus'* now resided with the Society, a circumstance which facilitates the process of changing the text. The authors were agre able to this change. It was resolved that as a general policy, authors should receive 10 of the price of each book sold, where the price is defined to be 125% of the wholesale price. CL and IR agreed to frame a contract.

It was decided that anyone finding errors should contact an author or a member of the Publications Committee, and that a submission should be made to the Newsletter soliciting ideas for a new publishing venture.

IR remarked that he had been advised by Bernard Neumann not to involve the NZMS in the production of a journal. The Austral. Math. Bull. barely survives financially. Similarly research monographs seem not to be worth the effort.

IR was thanked for his efforts as Publications Convenor during the year.

9. FORDER GRANT:

M. Carter explained that the "Hardy lectureships in reverse" alluded to in the list of correspondence referred to a proposal by I. James, President of the London Mathematical Society, that was conceived in response to an earlier proposal by D. Gauld as to how to use money from the Forder bequest to the LMS in order to further contact between British and New Zealand mathematicians. MC read the relevant letter from I. James. The idea is that the LMS should fund biennially, from the Forder bequest, travel to New Zealand by an eminent British mathematician. It was expected that considerable prestige would accrue t this Lectureship. It was noted that the LMS proposed to establish a similar scheme with Australia, each scheme to be operative in years when the other is not. It was anticipate that a visitor to Australia or New Zealand may well spend some time in the other country. The lecturer's expenses within New Zealand could be met by an arrangement similar to that for the NZMS Visiting Lecturer.

Moved (IR/MC) that the James proposal be accepted with thanks. CARRIE

It was agreed that the NZMS should inform the LMS of the desired subject area of the visiting lecturer, and the LMS could then choose the lecturer. However it was decided to leave the subject area open for 1986. M. Carter agreed to write to the LMS expressing ou views.

10. MEMBER BODIES' REPRESENTATIVE REPORT:

MJ reported that he had attended the annual meeting of the Member Bodies' Committee. It was proposed that a Standing Committee on Science Education be formed. The need for the Member Bodies' Management Committee was questioned, but it was felt that the committee fulfils a useful role, and it was agreed to raise the number of member bodies' represent- atives on it from three to four. R. Batt reported on the progress of preparations for ANZAAS. There was discussion on the future of the RSNZ library, and MJ felt that it provided a useful backup for interlibrary loan requests. Affiliation fees per member wer raised for 1985/86 from 25¢ to 40¢ for full affiliation and from 10¢ to 15¢ for partial

affiliation. The request from the New Zealand Ecological Soceity for endorsement of report on the threat of nuclear war was discussed, and MJ read the motions carried in support of that report.

11. TEACHER'S PROJECT COMPETITION REPORT:

CL reported having been advised by T. Wilson that only one entry had so far been rece

12. USP FUND REPORT:

EK reported having received no replies to his contacts at the University of the South Pacific. It was suggested that we should be more flexible as to how the $500 of the should be spent. It was agreed that it could be spent to assist in travel to a collo or with the aim of furthering contact with mathematicians in New Zealand.

13. VISITING LECTURER CO-ORDINATOR'S REPORT:

MJ reported on the visit of W. Luxemburg, and it was remarked that P. Whittle could w the Visiting Lecturer from 1986. MJ said that special thanks were due to P. Hafner f assistance with the arrangements for W. Luxemburg's visit.

14. LOCATION OF FUTURE COUNCIL MEETINGS:

It was agreed that Wellington was the most suitable venue for Council meetings.

15. GENERAL BUSINESS:

(a) The fact of the last Annual General Meeting having been held without a quorum wa discussed. It was agreed that the next Council meeting should consider lowering quorum for Annual General Meetings held outside New Zealand. It was also decide a special meeting was needed to ratify the decisions of the last AGM. This meet should occur immediately before the next AGM.

(b) It was noted that at the AGM B. Wilson had questioned the value of the post-grad thesis competition. It was agreed to ask him to share his ideas on the matter a next Council meeting.

(c) Possible ways of securing additional funds for the development of mathematics we discussed. M. Carter agreed to circulate a summary of discussions he had had wi people in Australia, and further consideration of this matter was postponed unti next Council meeting.

(d) G. Olive had commented at the AGM that not all visiting lecturers are aware of t need to give some lectures accessible to a general mathematical audience. MJ ag to ask K. Broughan to draft and send to him a job description for the position o Visiting Lecturer. MJ would then send copies to G. Olive and D. Halford for the comments.

(e) JS asked for news about the CAP delegation being organised by J. Butcher, but Co members were unable to supply any information.

(f) JS again raised the matter of the draft rules for the fund to aid research and s visits by overseas mathematicians. It was agreed to remove "financial" and "int preted as the period" from rule 2.

CONCLUSION: The meeting concluded at 3.20 p.m.

C.H.C. Little
Outgoing Secretary

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c/- The Royal Society of New Zealand
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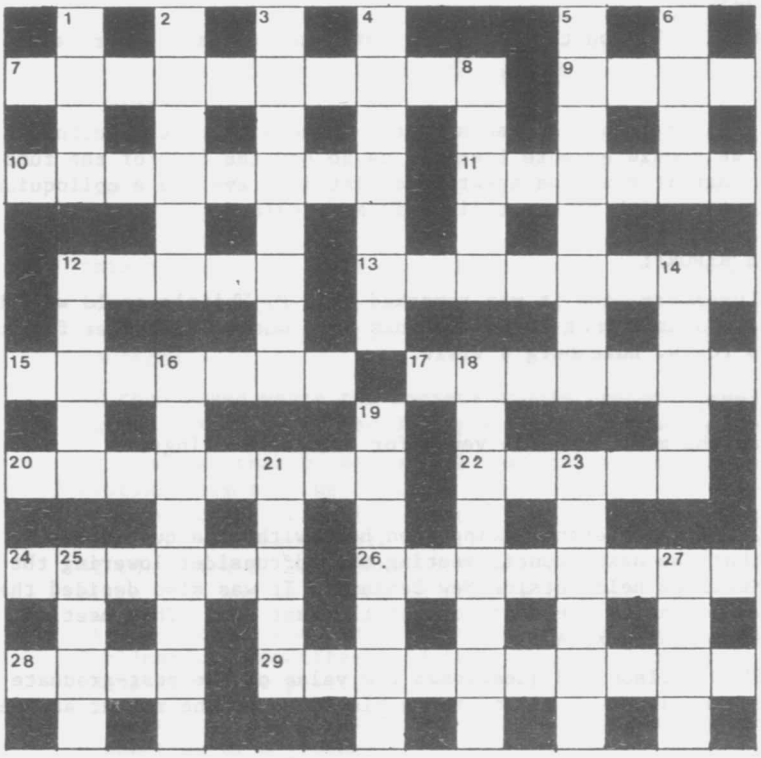
WELLINGTON

However correspondence should normally be sent direct to the Secretary, Dr M.D.E. Conder, Department of Mathematics and Statistics, Auckland University, Auckland, New Zealand.

Crossword

No. 17 NUMEROUS QUOTES by Matt Varnish



In addition, give the works from which the across clues are taken. The punctuation is exact and correct.

Across:

7. '"Thus σ should be as small as possible"'. (10)
9. 'All his dealings are square, and above board'. (4)
10. '.007 quivered: his steam was getting up, but he held his tongue'. (1,7)
11. 'And wisely tell what hour of day
    The clock doth strike by algebra'. (6)
12. 'Hold Infinity in the palm of your hand'. (5)
13. 'She had three lilies in her hand
    And the stars in her hair were seven'. (8)
15. 'We are coming, Father Abraham, three hundred thousand more'. (7)
17. 'Like coral insects multitudinous'. (7)
20. 'The English wish to make the world out of what we see... The Latin wants to make it ou
    of formulas...' (8)
22. 'If I knew I was going to die today, I think I should still want to hear the cricket
    scores'. (5)
24. 'All animals are equal, but some animals are more equal than others'. (6)
26. 'Their five eyes smouldering green and bright'. (2,2,4)
28. 'I lisped in numbers, for the numbers came'. (4)
29. 'Ten thousand saw I at a glance'. (10)

Down:

1. Correct sign of little moment (4)
2. Superior, the highest, the fi and best grade; could we ask anything more? (6)
3. Spirits with earth mother at pole are of the closest. (8)
4. To fashion on the transport i not honest. (7)
5. The cataract bird? (5-3)
6. Hint of a thread to help you (4)
8. Young lady goes with Eliot initially and gives unsettled accounts. (5)
12. Italian opera writer with one boot about. (5)
14. Could be hot by Virginia Wool brother. (5)
16. He is created on the battlefi (8)
18. The sceptical denial of all existence. (8)
19. Proffers $(DER)^{10}$. (7)
21. A base note is well lit up. (
23. Unbending animal and pole pla in the barrel. (6)
25. A cross word (but not impolit (4)
27. Four chapters before Samuel.

CROSSWORD No. 16 Solution

Across:
1. Cowboys, 4. Indians, 9. Hurley, 10. Kayles, 11. Ombre, 12. Turn, 14. Chess, 16. Stem, 17. Divert, 18. Domino, 22. Roam, 24. Skeet, 25. Solo, 27. Two up, 29. Gamble, 30. Afresh, 31. Sprints, 32. Crosses.

Down:
1. Cohorts, 2. Worker, 3. Yoyo, 5. Nuke, 6. All out, 7. Systems, 8. Rubber, 13. Novum, 14. Cards, 15. Sport, 16. Suits, 19. Oranges, 20. Lemons, 21. Noughts, 23. A homer, 26. Outers, 27. Test, 28. Pair.