THE NEW ZEALAND MATHEMATICAL SOCIETY

NEWSLETTER

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THE NEW ZEALAND MATHEMATICAL SOCIETY

The New Zealand Mathematical Society was established in 1974 to promote the development, application and dissemination of mathematical knowledge within New Zealand and to assist mathematicians in New Zealand to maintain effective co-operation with one another and with colleagues and mathematical societies in other countries.

Publications

The *Newsletter* comes out three times a year. It publicizes the business of the society and gives details of activities we sponsor. It reports conferences, notices, news of mathematical organisations and visiting mathematicians and focusses on matters affecting mathematicians in New Zealand. *Supplements* to the Newsletter include texts of conference addresses, reports of special conferences, and collections of papers on a theme. Special publications appear from time to time. The Society has produced a brochure *Employment Opportunities in Mathematics* which is intended to be repeated at intervals. It is a detailed survey of jobs in mathematics within New Zealand, with advice about seeking jobs, an outline of job prospects, present commentaries of people using mathematics in their job and other career suggestions. Our yearly compilation *Post-graduate Topics in Mathematics* is a list of research topics and supervisors available in New Zealand universities. It is for the information and guidance of students of mathematical subjects considered for post-graduate work.

Other Activities

The Society sponsors a special lecture at each Mathematics Colloquium. We also have a visiting lecturer scheme and we promote regional meetings on specialized mathematical subjects. Competitions for advanced students are held.

Membership

Members are able to receive the New Zealand Mathematical Chronicle at a reduced rate and to become reciprocal members of a number of overseas societies including the American, Australian, South East Asian, London and Edinburgh Mathematical Societies and the Canadian Mathematical Congress. Membership fees are due on the first of January each year. The full subscription is $12.00 and the student rate is $1.00. Applications for membership should be made to the Treasurer (Mr H.S. Roberts, Applied Mathematics Division, DSIR, Wellington).

EDITORIAL

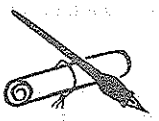
We are pleased to see contributions being made to the three new sections of the *Newsletter* and encourage readers to keep sending letters and supplying book reviews and problems.

In this issue we again give prominence to the human rights of mathematicians. Our article is concerned with just a corner of the grubby page recording man's inhumanity to man in our time. As a professional body the New Zealand Mathematical Society has a continuing role in drawing attention to the plight of mathematicians under duress and in working for the abolition of such inhumane treatment.

A Mathematics Subject Conference will be held under the auspices of the University Grants Committee in conjunction with the N.Z. Mathematics Colloquium in Auckland next May. The Subject Conference will provide a significant opportunity for mathematics curricula and related matters to be discussed by a widely representative group. The Supplement to the April *Newsletter* will provide background information and viewpoints.

Season's greetings!

Letters To The Editor:



We welcome correspondence on any item of interest to the New Zealand mathematical community. Letters should be typewritten (preferably double spaced) and normally not more than 150 words in length.

Editor, *Newsletter:*

I have been asked by a mathematician in the USA to try to locate Howard Firth, a mathematician or statistician who may now be in Australia or New Zealand. Hence I would appreciate any information or suggestions on how to find him.

Gloria Olive, Mathematics Department,
University of Otago.

Dear Dean,

I would like to take this opportunity to notify my friends in the New Zealand mathematical community that I will not be saying goodbye because I am sure I will meet them again at colloquia, conventions or conferences, and I suspect many will be visiting the University of the South Pacific as part of future sabbaticals (if there are going to be any after Wellington has wielded its/his quinquennial knife).

See you!

Donald Joyce, Massey University.

HUMAN RIGHTS

1. In the USSR.

The August 1979 issue of the *Newsletter* referred to several articles appearing in the *Notices of the American Mathematical Society*. Since then several more letters have been printed by the AMS and we list now the references to this material appearing in the Letters to the Editor sections of the *Notices* over the last year:

Volume 25, Number 7, pages 495-497 (November 1978)
Volume 26, Number 2, pages 115-117 (February 1979)
Volume 26, Number 4, pages 230-231 (June 1979)
Volume 26, Number 5, pages 305-308 (August 1979)
Volume 26, Number 6, pages 398-401 (October 1979)

The third of these references contains a definition of each of the terms "refusenik" and "dissident", together with a description of the Moscow Sunday Seminar. In view of the significance of these in the matter of human rights for Soviet mathematicians, we describe them here for the benefit of our readers.

A refusenik is a person who has been officially refused an exit permit from Russia for Israel (not to be confused with a person whose application for a permit has not been answered).

A dissident is a person who does not wish to leave the USSR, but wants a more liberal human rights policy to be carried out by the Soviet Union. In particular, a dissident desires freedom of expression, freedom of choice of living inside the USSR, freedom of travel and relaxation of the controls now employed to keep the population in check.

The Moscow Sunday Seminar (commonly referred to by the Soviet authorities as the Nonexistent Seminar) was organized about seven years ago by refusenik scientists who, as is standard in the USSR, lost their scientific positions as soon as they applied to emigrate. The Seminar, which meets every Sunday at noon in a private apartment has a total membership of about 70 with some 20 to 30 attending each week. A visit by a Western scientist is highly valued by the regular participants, not only for pure scientific and psychological reasons, but also because it makes known to the Soviet authorities that the participants are not abandoned by scientists in the West. More information about the Seminar can be obtained from the Committee of Concerned Scientists, 9 East 40th Street, New York, N.Y. 10016, U.S.A.

Important responses to the article entitled "The situation in Soviet mathematics" (*Notices* November 1978, pages 495-497) have appeared in the August and October issues of the same journal. The November article evoked considerable interest on the part of other scientific journals and newspapers (see, for example, *Science*, December 15, 1978 and March 16, 1979).

2 Dr José Massera

José Luis Massera is a distinguished Uruguayan mathematician who has been held in a military prison in Uruguay since November 1975. He was a leader of the Communist Party in that country, being a member of the parliament there from 1963 to 1972. Many letters and petitions from groups of mathematicians throughout the world have been sent to the Uruguayan authorities on behalf of Dr Massera and his wife, who is also in prison. Other organizations, such as Amnesty International, have campaigned on their behalf. The New Zealand Mathematical Society earlier this year wrote to the Uruguayan government seeking information on Massera's condition and the circumstances under which he is held. The following is a copy of that letter:

C/- Department of Mathematics,
University of Waikato,
Private Bag,
Hamilton, New Zealand.
16 October 1979

Dr Adolfo Folle Martinez,
Minister of Foreign Affairs
of the Government of Uruguay,
Montevideo,
Uruguay.

Dear Dr Folle Martinez,

I am writing to you on behalf of the New Zealand Mathematical Society to enquire of the circumstances of Dr José Luis Massera. Dr Massera is a mathematician of international prominence and representations have been made to our Society that we should actively campaign to secure an amelioration of the conditions of his internment.

We would welcome assurances from yourself that his circumstances and those of his family are as humane as you would wish them to be seen to be.

May we also take this opportunity to wish your government and our compatriot mathematicians success and good prospects for the future.

Yours sincerely,
(Signed)
John C. Turner,
President
New Zealand Mathematical Society.

Local News

University of Auckland: Department of Mathematics

Department of Computer Science

Professor John C. Butcher will become the Head of the Department of Computer Science when it opens on 1 February 1980; and *Dr Richard Lobb, Garry Tee* and *John Whale* will also transfer to it from the Department of Mathematics. *Dr Phil Cox* who graduated from Auckland and is currently in the Computer Sciences Department at the University of Toronto, has been appointed a lecturer in this new Department.

Visitors

Mr W. H. Moolman, a lecturer in Statistics at the University of Durban-Westville, is here for 6 months.

Dr R. G. Crawford is spending a sabbatical year here from Queen's University (Kingston, Canada), working on Information Retrieval.

Professor Charles Rees, from the University of New Orleans, is spending a year here, as an exchange visitor with Dr Ramankutty.

Dr R. P. Loh, from the University of Sydney, spent 15 days here.

Leave

Dr Ramankutty has gone to the University of New Orleans for a year, on exchange.

Mr John E. Whale is on leave at the University of London, where he is working on "Applications of Graph Theory and Computer Science".

Dr Alan J. Lee is at the University of North Carolina, where he is working on "Problems of angular-linear correlation".

Professor Alistair J. Scott has returned from the University of Wisconsin at Madison.

Professor John C. Butcher has returned from his visits to many universities in Europe and North America.

Professor George A. F. Seber has returned from his short leave, during which *Associate-Professor Hookings* was acting Head of Department.

Associate-Professor Peter A. Lorimer has returned from the University of Kaiserslautern.

Dr David J. Smith has returned from the University of Washington in Seattle.

Dr Graham Baird is spending 6 weeks at a Semi-Group conference at Monash University.

Professor H. G. Forder

Emeritus Professor Henry George Forder celebrated his 90th birthday on 27 September 1979, and was congratulated by visitors at his home in Selwyn Village. The next issues of the *Mathematical Chronicle* and of *The New Zealand Mathematics Magazine* are to be dedicated to him.

Seminars

The following seminars have been presented in the Department:

Professor Charles K. Chui (Texas A & M University), on "Some recent results in approximation theory".

Mr Leith Saunders (University of Auckland), two seminars on: "New methods for solving ordinary differential equations".

Professor G. E D. Duff (University of Toronto), on: "Some observations on the Navier-Stokes equation", and "Mathematical problems of tidal energy".

Professor W. L. Steiger (Princeton University), two seminars on:"L_1 methods for linear models".

Dr David B. Gauld (University of Auckland) on: "Lipschitz and quasiconformal unknotting of spheres".

Dr W. A. Marosz (San Diego State University), on: "Personalized systems of instruction in mathematics".

Professor Robin L. Plackett (University of Newcastle-upon-Tyne), on: "Current research in the analysis of categorical data".

Mr W. H. Moolman (University of Durban-Westville), on: "The Wilcoxon-Mann-Whitney U distribution for dependent variables".

Dr Jeff J. Hunter (University of Auckland), on: "The use of generalized matrix inverses in finding stationary distributions and moments of first passage time distributions and Markov chains".

Dr Christopher S. Withers (DSIR, Wellington), on "Non-parametric multi-sample confidence regions".

G.J.T.

University of Waikato

Dr Mary Fama has been appointed as temporary senior lecturer during *Professor Hosking's* two-year secondment to Bangkok. Her career includes: B.A. (Cantab) 1959, B.A. (Oxon) 1962, Ph.D.(Harvard) 1967, D.S.I.R. 1962-4 and 1968, Cambridge Acoustical Associates (Cambridge, Massachusetts) 1966-7, Temporary Lecturer (Sydney) 1969, Research Fellow (Civil Engineering, Sydney) 1970, Part-time Lecturer (Engineering Maths, Auckland) 1971-3, Mines Department 1973 to date.

The Waikato Regional Syllabus Committee met recently (with Prof Zulauf in the chair), and expressed deep reservations about the proposed changes to the Sixth Form maths syllabus.

Seminars

Dr R. C. King (Southampton) "Exceptional Lie Groups".

Dr P. B. Braun (Waikato) "Farey Series and the Riemann Hypothesis".

Dr I.J.D. Craig (Waikato) "Inverse Spectral Problems and the Hydrodynamics of the Solar Flare".

Mr B. S. Mudford (Waikato) "Dissipative Plasma Instability".

Prof L. C. Woods (Oxford) "The Thermodynamics of Non-linear Constitutive Relations in Gas Dynamics", and "'Scale': a Basic Concept in Applied Mathematics".

Dr N. A. Doughty (Canterbury) "Black Hole Thermodynamics - First Step to Quantum Gravity".

Dr A. Barnett and Dr C. Rutherford (M.W.D., National Water Quality Science Centre) "Mathematical Modelling and Water Quality".

Mr J. C. Turner and Mr D. N. Edson (Waikato) "Burnside and his PET'S".

The final seminar of the year was held on October 12 by the lake at Innes Common, with a large attendance of those interested in the thermodynamics of sizzling sausages, ballistics, the aerodynamics of frisbees, the attenuated acoustics of relaxed chatter and viscid hydrodynamics.

M.S.

Waikato Mathematical Association

The annual competition "A Match is Met" was successful - although entries were down on last year, quality and originality were, if anything, even more marked. Over a thousand people saw the exhibition at the Public Library and about $400 worth of prizes were won. The total number of entries was 175, 96 of them being submitted by Fairfield College.

The main theme of this year's Convocation was "Computers and the School", featuring the film "The Chips are Down", an illustrated talk on "Using Computers", and demonstrations of microprocessors. There was also a discussion of the proposed 6th Form syllabus.

The "Senior Session" attracted about 70 students from 6th and 7th Forms, who enjoyed afternoon tea and a stimulating talk from John Turner on graphs and networks. Competition was keen for the title of Quiz King 1979, finally won by Philip Dorrell of Te Kuiti High School. Philip was sponsored by the Association to attend the Wellington Senior Residential Course in August.

B.R.S.

Massey University

Staff

Donald Joyce has resigned to take up a three year appointment as head of mathematics at the University of the South Pacific, in Fiji.

Susan Byrne, a graduate in mathematics and information science from Victoria, has accepted a lectureship and will join the department in the new year. She is completing a PhD in optimisation at Imperial College, London, and will be the department's first woman lecturer for more than a decade.

Michael Hendy, who has been promoted to Senior Lecturer, has gone on six weeks' leave to North America.

During December, *Dick Brook* will return from a year in the USA and *Adrian Swift* will return from 3½ months in England.

Applications have closed for three "short-term" positions in the department - lecturer in mathematics, junior lecturer in statistics, and departmental technician (our first). A "long-term" lectureship in mathematics is advertised elsewhere in this issue

Courses

Mathematical Physics is undergoing something of a revival - a dozen mathematics and physics students enrolled for a 300-level course this year, and a 400-level course will be added next year. Both courses are taught by *Dean Halford* and *Adrian Swift*.

Greg Arnold and *Brian Hayman* are to offer a revised 300-level Population Theory course which will have three sections - population dynamics, population estimation and population genetics.

Staff at Palmerston North Teachers College are to offer B.Ed students at the college a sequence of three 100- and 200-level mathematics and statistics courses, designed for prospective primary school teachers.

The B.Tech. degree now has six options (Biotechnology, Computing Technology, Food Technology, Industrial Engineering, Industrial Technology, and Systems Mathematics), and the first Systems Mathematics graduate will be "capped" next year. As well as courses in processing, engineering and management, the Systems Mathematics option includes courses in calculus, linear algebra, numerical analysis, operations research, optimization, statistics and technological mathematics.

The offering of further extramural 300-level courses gives students the opportunity to complete degrees (B.A., B.Sc.) or post-graduate diplomas (Dip.Soc.Sc.) in mathematics or statistics.

Seminars

Professor C. K. Chui (Texas A & M University) presented "Some Recent Results in Approximation Theory".

Professor G.F.D. Duff (University of Toronto) spoke on "Mathematical Problems of Tidal Energy" and on "Inequalities and Rearrangements of Functions".

Michael Carter (Massey University) talked about "Structural Stability and Mathematical Modelling".

Gordon Knight (Massey University) spoke on "The 'Aha-experience' and the 'Freeze-effect' - a Catastrophe Theory Model".

Professor R. L. Plackett (University of Newcastle upon Tyne) reviewed "Current Research on the Analysis of Categorical Data".

Terry Moore (Massey University) talked about "Infinitesimals and Infinity - Calculus without Limit!"

Les Foulds (Massey University) spoke on"Identification of Minimal Phylogenetic Trees".

D.C.J.

Manawatu Mathematical Association

The annual Mathex competitions and static displays were successfuly held again in July.

A seminar for seventh form students was held in August at the Teachers College. Gordon Knight talked on 'Mathematics and the imagination', relying heavily on Edwin Abbott's "Flatland" for background. Graeme Hubbard launched some model rockets and discussed the mathematical aspects of their flight and Doug Carian spoke about the historical aspects of the concept of infinity. The afternoon seemed to be well received by the students.

G. H. K.

Manawatu Statistics Group

The Manawatu Statistics Group continued to flourish this year. A highlight for the year was the affiliation of the group to the New Zealand Statistical Association - its very first branch member. During the year the following talks were given

Brian Wickham (NZ Dairy Board): "Statistics and the Dairy Board"

Tim Ball (Applied Maths Division): "Tooth decay in the South Pacific"

Brendon Quirk (Department of Labour): "Employment Statistics"

John Tukey (Princeton and Bell Telephone Laboratory): "Concepts in data analysis"

Robin Court (Auckland University): "Problems in forecasting and planning electricity demand.

R.M.P.

Victoria University of Wellington

Unusually many academic staff members are leaving during this long vacation: *Jack Hutchings, Megan Clark, Mick Roberts* and *Bruce Christianson.* We shall miss then all. The gaps they leave cannot all be filled, thanks to our financial masters, but an advertisement for a Lecturer in Probability and Statistics appears elsewhere in this issue, and *Jock Hoe* will be back in 1980 from his extended stay in China.

Terence Nonweiler is on sabbatical at the Department of Aeronautical Engineering, Bristol University, until mid-1980.

Jim Ansell and *John Harper* will be giving papers at the General Assembly of the International Union of Geodesy and Geophysics in Canberra in December 1979.

J.F.H.

DSIR: Applied Mathematics Division

David Rhoades delivered a paper to the UNESCO Symposium on Earthquake Prediction last March in Paris.

Malcolm Grant visited three institutions in U.S.A. during October discussing Geothermal problems.

John Maindonald will be attending the 42nd meeting of the International Statistics Institute, and the associated meeting of the newly-formed International Assocation for Statistical Computing. At this conference he has been asked to convene a two-hour session on "Calculators, Personal Minicomputers and Computers in Statistical Computing". The meeting will be held in Manila in December.

H.S.R.

DSIR: Physics and Engineering Laboratory

Lara Fradkin is spending 3 months at the Australian National University on a Fellowship in the Department of Statistics.

I.D.

Ministry of Agriculture and Fisheries, Wellington

Dr John Revfeim left the Ministry shortly before Easter to join the Meteorological Service, Ministry of Transport.

Dr Murray Jorgenson has returned from two years leave of absence, during which he lectured in Mathematics at the University College of Botswana.

Margaret Gibbs left in November to take up a programming position.

June Atkinson is the Ministry's main contact for GENSTAT, the comprehensive statistical package developed by Nelder et al at Rothamsted. June recently visited Australia where she attended a GENSTAT conference in Canberra, sponsored by CSIRO.

Dr Kevin Hall and *Peter Mellalieu* have been seconded to the Ministry from PEL, Gracefield. They will be working mainly in the area of Operations Research.

M.J.

University of Canterbury

John de la Bere has gone to England on leave.

Gordon Petersen has returned from his study leave which included a visit to England, Germany, Poland and Hungary.

Peter Bryant is back from leave spent at the University of California, San Diego. He notes that, at UCSD, "First year students have a lower level of mathematical competence than in N.Z., few for instance have had any calculus before they enter university. Students are driven harder than here, with assignments every lecture and tests every 2 or 3 weeks in the final grade. Mathematical level at graduation after four years is about the same as here".

Recent visitors to the department included *Professor G. F.D. Duff* (University of Toronto), who presented a seminar "Some Observations of the Navier-Stokes Equations" and gave an informal talk "Twenty Years of Change in School and College Mathematics", and *Donald Joyce* (Massey University), who gave a seminar on "Experiment and Theory in Numerical Analysis".

Secondary Mathematics in Canterbury

The annual Cantamath competition for Form I - IV pupils was held in the Christchurch Town Hall in August. The competition continues to attract wide interest from both pupils and parents. About 2000 pupils had posters, designs or models displayed, while another 700 were involved in problem-solving competitions.

A successful function was held during October for senior students. Teams of 4 students from 20 schools competed in a problem-solving relay similar to those in Cantamath. They seemed to thoroughly enjoy the challenge and the informality of the evening.

The first round of the National Senior Mathematics competition attracted 2000 entrants. The 20 finalists gathered in Christchurch on Friday, October 26 to sit the final paper. They were entertained during the afternoon with a visit to the Mechanical and Chemical Engineering Departments at the University of Canterbury. The results of the competition were:-

1 = Timothy Robinson - Burnside High School
1 = Ross Smith - Rotorua Boys High School
3 = Philip Dorrell - Te Kuiti High School

A working party met at Templeton Hospital for a week during October to take the proposed new 6th form syllabus a step further. It will report to the Department of Education and to the Mathematics Steering Committee of the Universities Entrance Board.

Teachers in secondary schools are disturbed at the increasing losses of well qualified teachers from the profession even though the staffing situation in Canterbury is better than in many other areas. The problem is aggravated by the continued decline in the number of mathematics graduates coming through Teachers' College.

H.W.

University of Otago

Dr D. J. McCaughan and *Dr J. A. Shanks* have returned from their leave in the United Kingdom.

Professor S.P.H. Mandel will be on leave in both London and Cambridge for the first 2 terms of 1980.

The following seminars were held from July through October:

Dr G. A. Jain on "On a First Passage Theorem of D. G. Kendall".

Dr A. Skene on "Methods and Models in Medical Diagnosis".
(Dr Skene is a B.Sc. Honours Graduate of the University of Otago who is currently a Lecturer in Statistics at the University of Nottingham in the United Kingdom).

Dr D. J. McCaughan on "Subgroups which are Almost Normal".

Dr G. F. Liddell on "Square Roots of Matrices".

Dr J. A. Shanks on "Interval Analysis for Computation".

G.O.

problem section

Readers are invited to send problems for this section. Some indication should be given of how a problem has arisen and whether a complete solution is known and attribution of sources should be provided for problems that are not original. Attempts at solutions should be sent to the setter or to Brent Wilson, Mathematics Department, University of Canterbury, Christchurch.

Problem 2 *(Distinct Quadruples)*

Find the greatest number N(n) of distinct (unordered) quadruples which can be formed from n distinct objects in such a way that no two quadruples have more than one object in common.

Comments: It arises from a query from Rotary in that it was desired to organise dinners for foursomes of n = 70 people satisfying this criterion, i.e. each person dined with a different three people each time he or she dined. So far we have succeeded in showing that

$$N(n) \leq \frac{n(n-1)}{12}, \quad \text{(actually attainable if } n \equiv 1,4 \pmod{12}).$$

$$N(4p) \geq p^2 + 4N(p), \quad p \text{ prime.}$$

Hence for n = 68 = 4 X 17 we have

$$17^2 + 4N(17) \leq N(68) \leq \frac{68 \cdot 67}{12}$$

But since $N(17) \geq N(16) = 20$,

$$369 \leq N(68) \leq 379.$$

A more general problem is to select m-tuples satisfying this criterion from n objects.

Graeme Wake, Victoria University

Problem 3 *(All roads lead to one?)*

I can't yet give a source for this problem beyond saying that it is currently doing the international circuit. It will exasperate you but amuse your loved ones.

Take an odd number. Treble it. Add one (making it even). Divide by two. If the result is even keep on dividing by two until an odd number is obtained. Restart the process.

Comments: One is a fixed point and all trails seem to lead to it. The problem is to prove this, or to find another fixed point or loop, or to find an indefinitely ascending sequence. It is easy to show that the process is nearly stationary because the average reduction factor is

$\frac{1}{2}$($\frac{1}{2}$ the time) + $\frac{1}{4}$($\frac{1}{4}$ the time) + ... = $\frac{1}{3}$, neatly balancing the initial factor of 3

Brent Wilson, University of Canterbury.

Problem 1 *(Firing squad problem)*

Solutions to this problem which appeared in the last *Newsletter* are still sought; comments will appear in the next issue.

* * * * *

CONFERENCES 1980

January 5
(San Francisco)

American Association for the Advancement of Science Annual Meeting: Special Section on Secure Communications and Asymmetric Cryptosystems

Details from Gustavus J. Simmons, Manager, Applied Mathematics Department, Sandia Laboratories, Albuquerque, New Mexico, U.S.A.

January 7-11
(Las Cruces, New Mexico)

Frontiers of Applied Geometry Research Workshop

Details from Frontiers of Applied Geometry, Department of Mathematical Sciences, New Mexico State University, Las Cruces, New Mexico 88003, U.S.A.

January 8-12
(Austin, Texas)

International Symposium on Approximation Theory in Honor of George Lorentz

Details from E. W. Cheney, Department of Mathematics, University of Texas, Austin, Texas 78712, U.S.A.

January 14-18
(Canberra)

Eighth Biennial Conference of the Australian Association of Mathematics Teachers

Details from Ms Lois Boyd, Conference Co-ordinator, P.O. Box 20, Civic Square, Canberra, ACT 2608, Australia.

January 14 - February 9
(Canberra)

20th Summer Research Institute of the Australian Mathematical Society

Details from Dr J. Gani, Director-Elect 20th SRI, Division of Mathematics and Statistics, P.O. Box 1965, Canberra City, ACT 2601, Australia.

February 10-14
(Cowes, Australia)

Australian Mathematical Society Applied Mathematics Conference

Details from Dr F. Barrington, Department of Mathematics, University of Melbourne, Parkville 3052, Australia.

March 3-7
(Boca Raton, Florida)

Eleventh Southeastern Conference on Combinatorics, Graph Theory and Computing

Details from Frederick Hoffman, Department of Mathematics, Florida Atlantic University, Boca Raton, Florida 33431, U.S.A.

March 18-20
(Seattle)

Electric Power Problems: The Mathematical Challenge

Details from Albert M. Erisman, Boeing Computer Services Company, 565 Andover Park West, M/S 9C-01, Tukwila, Washington 98188, U.S.A.

March 31 - April 4
(Dundee)

Sixth Dundee Conference on Differential Equations

Details from E.R. Dawson, Department of Mathematics, The University, Dundee DD1 4HN, Scotland, U.K.

April 18-19
(Lawton, Oklahoma)

Conference on Convergence Structures

Details from Caroll V. Riecke, Department of Mathematics, Cameron University, Lawton, Oklahoma 73505, U.S.A.

May 2
(Storrs, Connecticut)

Fifth Invitational Symposium on the Unification of Finite Elements, Finite Differences and Calculus of Variations

Details from H. Kardestuncer, School of Engineering, University of Connecticut, U-37, Storrs, Connecticut 06268, U.S.A.

May 6-9
(Kalamazoo)

Fourth International Conference on Graph Theory and its Applications

Details from Directors, 1980 Graph Theory Conference, Department of Mathematics, Western Michigan University, Kalamazoo, Michigan 49008, U.S.A.

May 12-16
(Adelaide)

50th Jubilee ANZAAS Congress (incorporating the Annual Meeting of the Australian Mathematical Society)

Details from Dr D. L. Clements, Department of Applied Mathematics, University of Adelaide, GPO Box 498, Adelaide, SA 5001, Australia.

May 18-21
(Auckland)

15th New Zealand Mathematics Colloquium

Details from the Colloquium Secretary, Department of Mathematics, University of Auckland, Private Bag, Auckland, New Zealand.

May 27-31
(Freiburg in Breisgau)

International Symposium on Interval Mathematics

Details from Herrn Professor Dr Karl Nickel, Institut für Angewandte Mathematik, Universität Freiburg i. Br., Hermann-Herder-Str. 10, D-7800, Freiburg i.Br., Federal Republic of Germany.

May 28-30
(Madison)

Advanced Seminar on Singular Perturbations and Asymptotics

Details from Gladys Moran, Mathematics Research Center, University of Wisconsin, 610 Walnut Street, Madison, Wisconsin 53706, U.S.A.

June 16-20
(Arlington)

International Conference on Nonlinear Phenomena in Mathematical Sciences

Details from V. Lakshmikantham, Department of Mathematics, The University of Texas at Arlington, Box 19408, Arlington, Texas 76019, U.S.A.

July 7-31
(Trieste)

Summer Seminar on Complex Analysis

Details from International Centre for Theoretical Physics, P O Box 586, I-34100 Trieste, Italy.

July 8-11
(Les Arcs, France)

Fifth Conference on Automated Deduction

Details from Institut de Recherche d'Informatique et d'Automatique, Service des Relations Exterieures. Domaine de Voluceau, 78150 Le Chesnay, France.

July 14-19
(Jena)

Ninth International Conference on General Relativity and Gravitation

Details from E. Schmutzer, GR9, Sektion Physik, Friedrich-Schiller-Universität, DDR-69 Jena, Max-Wien Platz 1, German Democratic Republic.

July 28-August 1
(São Paulo)

Second Annual Conference on Topology of Manifolds and Homotopy Theory

Details from Antonio Conde, IMECC - UNICAMP, 13.000 Campinas-SP, Brasil.

August 10-16
(Berkeley)

Fourth International Congress on Mathematics Education

Details from ICME IV, Mathematics Department, University of California, Berkeley, CA 94720, U.S.A.

August 11-15
(Ottawa)

International Conference on Categorical Aspects of Topology and Analysis

Details from Louis D Nel, Department of Mathematics, Carleton University, Ottawa, K1S 5B6, Canada.

August 17-23
(Toronto)

Fifteenth International Congress of Theoretical and Applied Mechanics

Details from Ken Charbonneau, Executive Secretary, ICTAM Toronto, National Research Council, Ottawa, Ontario K1A 0R6, Canada.

August 18-22
(Brisbane)

Seventh Australasian Hydraulics and Fluid Mechanics Conference

Details from Conference Manager, 7th Australasian Hydraulics and Fluid Mechanics Conference, the Institute of Engineers, Australia, 11 National Circuit, Barton ACT 2600, Australia.

August 25-29
(Geelong)

Eighth Australasian Conference on Combinatorial Mathematics

Details from K.L. McAvaney, Division of Computing and Mathematics, Deakin University, Victoria 3217, Australia.

October 6-17
(Tokyo & Melbourne)

International Federation for Information Processing Congress

Details from IFIP Congress 80, GPO Box 880 G, Melbourne, Vic 3001, Australia.

October 13-15
(Madison)

Symposium on Transition and Turbulence

Details from Gladys Moran, Mathematics Research Centre, University of Wisconsin, 610 Walnut Street, Madison, Wisconsin 53706, U.S.A.

NOTES AND NOTICES

NZMS REGIONAL COUNCIL MEETINGS

It is current practice to hold two meetings of Council during the year - a full Council meeting each May at the time and place of the NZ Mathematics Colloquium, and "regional mini-Council meetings" each November when Council members from within a region meet in two or three centres, with at least one person attending more than one of these meetings. The regional meetings this year were held on November 10 in Palmerston North and on November 24 in Christchurch. The agenda included the following topics: reports from the education, publications and membership committees; NZMS Visiting Lecturer 1980; constitutional amendments and incorporation; overseas contacts; Sydney convention 1981; and human rights.

N.Z. MATHEMATICAL SOCIETY PUBLISHES BOOK

The Society announces the publication in December 1979 of the book *Partitions: Yesterday and Today* by Professor George E. Andrews who was the 1979 NZ Mathematical Society Visiting Lecturer. The book contains the lectures which he gave during his tour. This publication is one of the first major publishing ventures of the Society. An information leaflet with order form is enclosed with this issue of the *Newsletter*.

DELEGATE TO GENERAL ASSEMBLY OF ICMI

The Fourth International Conference on Mathematics Education is to be held at the University of California, Berkeley, August 10-16 1980. Applications or nominations are invited from interested New Zealand mathematicians who may represent this country at the General Assembly of the International Commission on Mathematical Instruction (ICMI) to be held in conjunction with the Conference. *Please send name, address and an outline of your itinerary to Dr M. Schroder, Department of Mathematics, University of Waikato, Private Bag, Hamilton,* who will forward this information to the National Committee on Mathematics which is responsible for the appointment of a delegate. *Applications or nominations should be submitted immediately.*

HONORARY MEMBERSHIP OF THE NZMS

There are three classes of membership in the New Zealand Mathematical Society - ordinary, honorary, and institutional. An honorary member shall be any person of distinction in the field of mathematics or any other person whose work or whose services to the Society are judged by Council to merit election to honorary membership. The Council now invites suggestions for honorary membership from members of the Society. *Please forward to the Secretary, Dr M. Schroder, before April 1980.*

MINOR EXPENSES FOR WORKSHOPS, TOPICAL MEETINGS, ETC

The N.Z. Mathematical Society has a small fund available to cover out-of-pocket expenses of a minor nature such as morning and afternoon teas and administration. Up to $40 is normally available for each function; larger sums may be available, subject to the prior approval of Council. Organisers of workshops, topical meetings, special schools, seminars, etc to be run under the aegis of the NZMS are encouraged to bear this in mind. Apply to the Secretary.

MEMBERSHIP FEES

Members are reminded that membership fees are due on 1 January 1980. The rates are:

Ordinary member:	$NZ12.00
Student member:	$NZ1.00
Reciprocal member:	$NZ6.00

Please forward your remittance to the Treasurer, Mr H. S. Roberts, Applied Mathematics Division, DSIR, Box 1335, Wellington. (See also next item)

INDIVIDUAL CONTRIBUTIONS TO IMU SPECIAL DEVELOPMENT FUND WELCOME

The following is a message from the Secretary of the International Mathematical Union:

"Mathematics has an essential part to play in the progress of developing countries. At Otaniemi, in August 1978, the General Assembly of the International Mathematical Union decided that its activities in support of Mathematics for development should be greatly increased and extended. It entrusted the organization to a new Commission on Development and Exchange (replacing an existing Commission on Exchange).

It is hoped that UNESCO and ICSU will give support for some specific projects but if it is to fulfill its mission, the Commission will require substantial funds at its own disposal. The aid which the Union can provide from its own limited resources is necessarily inadequate. It was therefore decided to invite contributions to a special Development Fund.

The Executive Committee is sure that there must be many mathematicians who would wish to contribute individually and has asked me to request you to bring the fund to the attention of your members".

If you wish to make a donation to the Special Development Fund, you may find it convenient to include it in your cheque when paying your membership fees for 1980 to our Treasurer, Stan Roberts, enclosing a note of explanation. The total amount donated by NZMS members will then be forwarded in a single cheque to the IMU, thereby saving bank charges and other administrative costs.

MID-WINTER TOPOLOGY WORKSHOP

This was a bit late this year, *viz* Thursday 16th August 1979. Anyway, the organiser's winter began about April 1978 and ended about September 1979, so when would mid-winter have been? Venue was the Mathematics Common Room at the University of Auckland. Participants: Bill Barit (Canterbury); John Turner, Mark Schroder and Derek Edson (Waikato); M. K. Vamanamurthy, Stuart Scott, Ivan Reilly, John Jarratt, David Gauld and Bruce Calvert (Auckland). Six of the above gave talks, various devices being used to determine the following order: Stuart talked about topological near-rings, a theory he is developing. John T. talked about knots which are minimally strongly covered by 2-gons (MSC_2 isn't just a degree award by some of our Universities!). Ivan talked about one of his favourite topics, non-symmetric topological structures, and threw a conjecture at his audience. David countered John's talk by unknotting (at least in the QC and LIP categories), describing some work he did in Helsinki. Vaman talked about hereditarily Lindelöf and discrete-subspaces-are-countable spaces, considering conditions under which $DC \Rightarrow HL$. Mark exposed his bias against $\mathbb{R}$ (but maybe he really is quite fond of it!).

The University of Auckland's Mathematics Department and the N.Z.M.S. are to be thanked for their sponsorship of the Workshop. The participants look forward to next year's Workshop.

David Gauld

FIFTEENTH NEW ZEALAND MATHEMATICS COLLOQUIUM

The Fifteenth New Zealand Mathematics Colloquium will be held at the University of Auckland from Sunday evening, 18th May, to midday Wednesday, 21st May, 1980. The Colloquium is held in conjunction with the Annual Meeting of the New Zealand Mathematical Society.

Contributed papers in any topic in mathematics or with a substantial mathematical content from other disciplines are called for, and suggestions for special interest sessions and invited speakers will be welcomed.

Accommodation. Single rooms in a modern hall of residence about 1 km from the University Campus have been reserved at about $14.50 per day for full board, and some rooms at an older University residence Hall which, though not as modern or well-appointed, is much closer to the University have also been reserved at about $14.00 per day.

The Second Notice and Preliminary Registration Form will be sent in February to all those who complete a notice of intention to attend, available from the Colloquium Secretary, Department of Mathematics, University of Auckland, Private Bag, Auckland, New Zealand.

ROYAL SOCIETY OF NEW ZEALAND AWARDS

Nominations or applications for the following two awards are invited:

Hamilton Award 1980 The prize shall be awarded for scientific research carried out in New Zealand or in the islands of the South Pacific Ocean which has been published within 5 years preceding the last day of January prior to the RSNZ Council meeting at which the award is made. Such publication may consist of one or more papers and shall include the first investigation published by the author. No candidate shall be eligible for the prize who prior to such period of 5 years has published the results of any scientific investigation in a recognised scientific journal. For the purpose of this award a recognised scientific journal will be interpreted as one for which papers are submitted to a referee prior to publication. No award will be made unless in the opinion of the RSNZ Council there is evidence of scientific work of great merit.

Nominations for this award should be sent to the Executive Officer, Royal Society of New Zealand, P.O. Box 12249, Wellington by 31 December 1979. At least two copies of the relevant publications and a supporting statement should accompany the nomination.

E.R.Cooper Memorial Award 1980. The award shall be

(a) the best single piece of original work,
(b) in the sciences of physics or engineering,
(c) for work carried out in New Zealand,
(d) preferably for contributions to the development of natural resources of New Zealand treated in the widest sense,
(e) for contributions published within four years preceding 31 December of the year prior to the year of the award (i.e. for papers published after 1 January 1976).

Applications or nominations for this award, supported by two copies of the publication to be submitted for consideration, should be sent to the Executive Officer, Royal Society of New Zealand, P.O. Box 12249, Wellington by 31 December 1979.

THE WELLINGTON MEETING IN ANALYSIS

This meeting, held 26-28 June 1979, was jointly sponsored by the Victoria University of Wellington Mathematics Department and the New Zealand Mathematical Society. Those speaking at the meeting included visitors from Warsaw, Edmonton and Perth, staff from the mathematics departments at Victoria and Waikato, and a member of the Applied Mathematics Division of D.S.I.R. The first speaker on the Tuesday morning was C.J. Atkin from Victoria. After a brief introduction to infinite-dimensional Riemannian geometry, he discussed what remains of the Hopf-Rinow theorem if finite-dimensionality is abandoned. In infinite dimensions it turns out that there may be pairs of points that cannot be joined by any geodesic; but such pairs must be sparsely distributed, and certain rather strong conditions are known which ensure that all pairs can still be joined by minimising geodesics.

Following this, G. C. Wake, also from Victoria, gave a talk on bifurcation theory. After introducing the basic notion of bifurcation from the trivial solution in a nonlinear eigenvalue problem, he drew attention to the global properties of a branch, emphasising in particular the powerful results due to Rabinowitz.

In the afternoon the first lecture was delivered by F.T.M. Schroder from Waikato. His topic was "Non-topological Stone-Weierstrass theorems", and he surveyed the problem of exhibiting the closure of a subalgebra of the algebra of continuous functions on a space when the notion of closure is interpreted in various non-standard ways.
He was followed by Z. Ogrodzka, formerly of Warsaw, who sketched the proof of the Anderson-Kadec theorem that all separable Fréchet spaces are homeomorphic.

On the Wednesday, the speakers were A. McNabb of A.M.D., W. Wojtyński from Warsaw, J. Gamlen from Edmonton, and E. Kalnins from Hamilton, in that order. The first speaker expounded a theorem on the factorisation of Fredholm operators: when can the Fredholm operator I-K be expressed as a product $(I-V_1) \cdots (I-V_n)$, where the V_i are all Volterra operators?

After him, Dr Wojtyński gave a talk on the Lie algebra of vector fields on a manifold. His main aim was to introduce the recent work of his student J. Grabowski, which established that, in both the C^∞ and C^ω cases, this Lie algebra completely determines the manifold (though not very explicitly). In the afternoon Dr Gamlen delivered a lecture on the perturbation theory of stochastic differential equations, and the day ended with E. Kalnins' exposition of the conditions for separation of variables in the wave equation on a Riemannian manifold.

Thursday's proceedings opened with a second lecture by W. Wojtyński. After explaining the relations between Banach Lie algebras, Banach Lie groups, and Banach associative algebras, he described his own attempts to create a structure theory for norm-closed Lie subalgebras of the Banach algebra of compact operators on a Banach space. Then C. J. Grigson from Victoria contributed an exposition of the geometric theory of partial differential equations, which goes back to Cartan and is of particular value in the modern theory of overdetermined systems. The meeting concluded with a discussion, conducted jointly by R. K. Milne from Perth and D. Vere-Jones from Victoria, of the problems and the known results concerning bivariate distributions.

It will be seen that throughout the meeting stress was laid on introductory exposition of various areas of analysis. It seems possible that the proceedings may therefore be of wider interest, and they will be published during the summer jointly by Victoria University and the N.Z.M.S. : copies may be obtained (once available) from either C. J. Atkin or G. C. Wake at the Department of Mathematics, Victoria University of Wellington, Private Bag, Wellington.

C. J. Atkin

PUBLICATION ANNOUNCEMENT

The Society is proceeding with the following publication

STATUS - A Statistical Computing Language

by

J.C. Turner and W.J. Rogers
University of Waikato

ISBN 0-9597579-1-0
Price to be announced (approximately $4.50)
Date February 1980

This is a Users Manual for STATUS, a statistical computing language which has been developed over the past six years by the authors at Waikato University, and tested extensively by lecturers and students at several universities in New Zealand and other countries. The language admirably fills the gap between simple interactive systems and large packages for statistical computations. It is quickly learned, even by students with weak mathematical background. And by its use students can simulate statistical experiments, analyse data, produce plots, and compute results from complicated formulae which involve matrix expressions. It is a vehicle for newer, broader, teaching methods and projects.

STATUS is currently available on the Burroughs B6700 machine at the Universities of Waikato, Auckland, Canterbury, Lincoln; at the University of Waikato it is also used on a PDP 11/70, in batch mode, via terminals, and with mark sense cards on a student 'cafeteria' system.

Orders are now being taken for the manual. Please send them to *J. C. Turner, Department of Mathematics, University of Waikato, Hamilton, New Zealand.* Further information about the STATUS language may be obtained by contacting either author.

SCHOOL BOY'S QUERIES

Philip Dorrell of Te Kuiti High School was sponsored by the Waikato Mathematical Association for the annual Form 6 and 7 residential mathematics course held in Wellington, 3 - 6 September 1979. Upon his return home he sent the following list of questions to the Secretary of the Waikato Mathematical Association. We reprint the original list here, with permission, and invite any interested reader to send comments either directly to Philip Dorrell, 4 Meads Street, Te Kuiti, or to Brian Stokes, Teachers' College, Private Bag, Hamilton for transmission.

1. I have heard of countably infinite matrices. What about a matrix indexed to R^2 (and vectors indexed to R). A vector would be a continuous function V(x), $x \in R$, a matrix a continuous function of two variables M(x,y) $x,y \in R$. Multiplication would be performed by integration.

This leads to questions like:- given matrix g(x,y) is there a matrix f such that

$$\int_{y=-\infty}^{y=+\infty} g(x,y)\, f(y,z)dy = \begin{cases} 0 & \text{if } x \neq 2 \\ +\infty \text{ or } 1 & \text{if } x = 2 \end{cases}$$

or can equations like g, h find j be solved for

$$\int_{-\infty}^{\infty} g(x,y)\, j(y)dy = h(x)$$

given g(x,y) is there a solution to

$$\int_{-\infty}^{\infty} g(x,y)\, h(y)dy = \lambda h(y)$$ λ being an eigen value.

presumably if

$$\int_{-\infty}^{\infty} g(x,y)dy = 1 \text{ for all } x$$

then g(x,y) would be a stochastic matrix and one value for λ would be 1. Can these integral equations somehow be transformed into differential equations?

2 Is it possible to generate a mathematically computable series of (for example) integers between 0 and 9 that is to all appearances random? That is, for any statistical test that can be carried out on a finite part of a random series the limit of the same test carried to infinity gives the same result on the computable series.

As an example one test is the percentage of 5's appearing. The series:-

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 . . .

is computable and would pass this test although it obviously wouldn't pass other tests.

The one restriction I put on the tests that can be performed is that the same result must be come to if the test is performed on the series with so many of the first numbers deleted i.e., the same result must be obtained if you start the test in a different place. Mathematically, if $\{a_n\}$ is any series and $f(\{a_n\})$ is a test that is a function of the series then

$$f(\{a_n\}) = f(\{a_{n+m}\})$$

where m is an integer.

This restriction rules out (I hope) any test that tries to work out the correlation of a computable series with itself.

A secondary question is:- Is there a computable series that passes every test that counts the frequency of a finite combination of digits? And would these tests guarantee the success of any other allowable statistical test?

3 A question on the axiom of choice.

Every mathematical concept can be represented as a finite series of mathematical symbols (or a finite series of English words if you're desperate) so therefore the set of mathematical concepts is denumerable. But the set of real numbers is not denumerable, so therefore there are real numbers which are not mathematical concepts i.e., they cannot be described.

Let R be real numbers and RD be describable real numbers.

R/RD is non-empty and in fact undenumerable. Now comes the tricky part - can you choose one member of this set - no, by definition it is impossible, thus providing a counter example to the axiom of choice. R is certainly a respectable set, and RD can be mapped into from the set of finite series of integers (each mathematical symbol or English letter or word corresponding to an integer) so R/RD must be a well defined set.

Is this an unresolvable paradox?

4 For every transfinite cardinal w, is there a set of cardinal numbers with cardinal number w?

5 Is there a method for solving $ax^3 = y^3 + b$ where b is a small integer and a the given integer and x and y are to be integers. Is this conjecture correct - for every $m \in I^+$ is there an $n \in I$ such that if $x > n$ then there is no solution of $ax^3 = y^3 + b$ with $|b| < m$?

6 Given a both-ways sequence $\{a_n | n \in I\}$ is there an infinitely differentiable function defined on R such that $f(n) = a_n$, $n \in I$

N.B. For the sequence $a_n = 0$ if $n \neq 0$
1 if $n = 0$

there is the function $\frac{\sin \pi x}{\pi x}$ if $x \neq 0$
1 if $x = 0$

which is infinitely differentiable and fits the sequence. Whether this can be used to solve the general case I don't know.

NEW BOOK

The N.Z. Association of Scientists has just published *Focus on Social Responsibility in Science*, edited by Wren Green. The book is based on the 1979 ANZAAS symposium on social responsibility in science. *Copies are available at $4.30 each from Focus Publications, N.Z. Association of Scientists, P.O. Box 1874, Wellington.*

COMBINATORIAL MATHEMATICS SOCIETY OF AUSTRALASIA

The Combinatorial Mathematics Society of Australasia was formed in 1978 to promote combinatorial mathematics: the investigation, construction, enumeration, and application of discrete configurations. It disseminates information about combinatorics and combinatoricists through its newsletter *Combinatorics*, and conducts an annual conference the proceedings of which are published (see announcement on page 14). There are currently ninety-three members representing eight countries.

Any interested person is invited to join C.M.S.A. Annual subscription for 1980 is $A4 for for those in full-time employment and $A2 otherwise. Members receive the newsletter and a reduction in the annual conference registration fee.

Please address all enquiries, giving your full name and address to: Kevin L. McAvaney, Director C.M.S.A., Division of Computing and Mathematics, Deakin University, Victoria 3217, Australia.

* * * * * *

VACANCIES

MASSEY UNIVERSITY: LECTURER IN MATHEMATICS

A vacancy exists for a Lecturer in mathematics. Duties include undergraduate, graduate and extramural (distance) teaching. Applicants with research interests in some branch of modern applied mathematics, and especially in numerical analysis, may be preferred. Salary: $NZ13,722 - $NZ16,861. Further details of the position, conditions of appointment and the University may be obtained from the Registrar, Massey University, Palmerston North. *Applications should be made as soon as possible.*

VICTORIA UNIVERSITY OF WELLINGTON: LECTURER IN MATHEMATICS (STATISTICS)

The Council of the Victoria University of Wellington invites applications from men and women for a Lectureship in the Department of Mathematics from persons with research and teaching experience in mathematical statistics and/or probability theory. The successful applicant will be expected to teach within the range of statistics and probability courses offered by the department, and to assist in consulting duties. Some preference will be given to applicants with a background in either time series analysis or statistical inference. The appointment is available from 1 July 1980.

The Professor responsible for statistics and probability in the department is Professor D. Vere-Jones. Current areas of research interests include experimental design, population models, stochastic point processes, applications of stochastic processes in geophysics, and topics arising from consulting work. The department maintains contact, through the Institute of Statistics and Operations Research, with statisticians in other university departments. There are also close links with statisticians and probabilists in the Applied Mathematics Division of the DSIR which is located on the university campus. The University has a Burroughs B6700 computer.

The department contains groups working on various topics in pure and applied mathematics and encourages staff to share their research interests and to teach from time to time outside their main discipline. Further details are available from either Professor D. Vere-Jones or the Chairman of the Department, Professor W. G. Malcolm. *Applications close on 14 March 1980.*

BOOK REVIEWS

We invite readers to submit reviews of books. Especially welcome will be reviews of books having direct relevance to New Zealand mathematics. In particular we encourage reviews of textbooks in mathematics based on classroom use. Reviews should ordinarily not exceed 350 words per book, typed with double spacing. However, in the case of textbooks longer reviews may be accepted.

Statistics - A Fresh Approach by Donald H Sanders, A Franklin Murph and Robert J Eng., McGraw-Hill Kogakusha Ltd, Tokyo, 1976. 367pp. International Student Edition $13.30 in NZ.

This book is written particularly for (American) students with little mathematical background who view a statistics course with some trepidation. The 'fresh approach' presumably refers to the general style of presentation which is informal, sometimes lapsing into a conversation with the student. Odd quotations and examples set in unusual situations are used to retain student interest. Thus, for example, we assist the staff of the monastery kitchen (the Fish Friar and the Chip Monk) in estimating the true percentage of monks who actually like fish and chips; we interpret the results of an opinion poll for the benefit of the Norwegian student Bjorn Talooz who is campaigning for the presidency of the students' association; and we do a spot of forecasting on behalf of the Icehole Swimming Pool Company.

The material covered is that of the traditional beginning course in statistics with the emphasis on explaining statistical procedures and interpreting the resulting conclusions. It is grouped in three sections - descriptive statistics, sampling in theory and in practice, coping with change. Sampling applications cover the estimation of means and percentages (including use of the t distribution) and hypothesis testing. Time series analysis and simple linear regression and correlation are presented as forecasting tools. A final chapter points to further developments and reminds the student that this is but an introductory booklet.

There are self-testing review questions at frequent intervals throughout the book with answers at the end of each chapter. Answers are not given for the sets of problems, though a teacher's guide is available containing worked solutions, multiple choice test questions etc. The number of problems provided is minimal and could have included a wider variety in some chapters - for example, all the sets of data for regression and correlation analysis produce high positive correlation coefficients.

The sample standard deviation is defined with denominator n (without mention of the common use of n-1) leading to a clumsy method of estimating the standard error of the mean from s (actually by multiplying by $\sqrt{\frac{n}{n-1}}$ and then dividing by $\sqrt{n}$). This is possibly the only place where the authors have failed to eliminate unnecessary complications.

The book is clearly set out with an introductory discussion at the beginning and a summary at the end of each chapter. In between we get a lucid step by step presentation of elementary statistical methods. I have used this book with a class this year and have found it very suitable for a course which assumes only School Certificate mathematics.

(Gillian Thornley, Wellington Polytechnic).

THE NEW ZEALAND MATHEMATICAL SOCIETY

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Members are warmly invited to contact any of the above if they have any suggestions or comments about the activities of their Mathematical Society.

The New Zealand Mathematical Society Newsletter

Editor: Dean Halford, Department of Mathematics and Statistics, Massey University, Palmerston North.

Assistant Editors: Michael Carter, Department of Mathematics and Statistics, Massey University, Palmerston North.

Donald Joyce, Department of Mathematics and Statistics, Massey University, Palmerston North.

This Newsletter was typed by Gail Tyson and printed by the Massey University Printery.

The Editor is grateful to the typists and to those who contributed copy. Contributions to future Newsletters are invited from anyone with items of interest to the New Zealand mathematics community and may be sent to the Editor or one of the following Honorary Correspondents:

University of Auckland	:	Garry Tee (Mathematics) Cecil Segedin (Theor. & App. Mech.)
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