THE NEW ZEALAND MATHEMATICAL SOCIETY

NEWSLETTER

COUNCIL NOMINATIONS

Nominations are invited for three positions on the Council of the Society: two Councillors and an incoming Vice-President. The Councillors normally hold their positions for three years, whereas the Incoming Vice-President becomes President for the second and third years and then acts as Outgoing Vice-President.

Candidates for these positions must be financial members of the NZMS. They must be nominated by two other financial members of the Society, and the nomination must be accompanied by the signed statement of the nominee that s/he is prepared to accept nomination. Nominations should reach the Secretary not later than 1 March 1986. The election of the Incoming Vice-President and two Councillors will take place at the Annual General Meeting in May.

Candidates are invited to submit a thumbnail biography for inclusion in the April Newsletter. This should accompany the nomination.

C O N T E N T S

Number 35 December 1985 ISBN 0110-0025

Sub-editorial

WHITHER?

The N.Z.M.S. publishes the Newsletter as a service to members, to give notice of and to report on the formal activities of the Society such as general meetings, awards, conferences and so on. Beyond this, its mix of features and services evolved gradually, within a tight budget of time, energy and money. Now with this issue, the first one printed commercially (at much greater cost), the time has come to look carefully at the Newsletter: at its format and frequency of publication, at its present services (with improvements or deletions) and at new ones. Present and possible services include -

local news and centrefolds (a most valuable feature, I feel),
conferences (I have some doubts about its value),
notices of events, awards and so on,
visitors (useful, but only if it can be kept complete and up to date),
feature articles (like earlier editors, I would gladly print suitable articles - but none has come in since I took over),
book reviews,
problems (because Prof. Zulauf wants to step down as problems editor, the section will cease unless a replacement comes forward),
comment and history,
the crossword (I hope Matt Varnish can find the creative urge again),
education (teaching strategies, hints and tips, nice examples, new courses, technology, maths in schools, teacher training, New Zealand aspects and differences ... the Newsletter has carried occasional feature articles on these topics),
'foreign affairs' (applications; relations with other disciplines, government and industry; contact with other mathematics or education groups here, or in the Pacific basin, or still further away), and maybe
publicity, advertising or sponsorship (for mathematical activities, for mathematics ... and even in or for the Newsletter, to counter higher costs).

Where do we go from here? Please let me or the Council know what you think. Questionnaire (in the April issue)? Questions or discussion at the A.G.M. in Christchurch?

Editorial

MEETING MATHEMATICIANS

Not long ago, I ran across the Editor's "Preview of AAAS Meeting, Atlanta" in an issue of Science (122, 2 December 1955). He wrote:

"As the list of participating societies and the outline of symposia show, virtually no field of science will be neglected. The special program "The crisis in science education" ... the three sessions of the International Geophysical Year, the four-part AAAS-ORINS general symposium "Atomic energy and agriculture", ... all promise a particularly stimulating, informative and significant meeting."

Some of this has dated badly, but the crisis in science education has returned: we badly need another Sputnik to bring this home to the general public (and the government).

On impulse, I checked the program for mathematical topics, to verify "no field ... neglected". I found almost none, except maybe for two sessions within the section on the History and Philosophy of Science: namely

(A) a session on Entropy (with L. von Bertalanffy of Mount Sinai Hospital, Los Angeles, W. Ross Ashby of the Center for Advanced Study in the Behavioral Sciences, Stanford, and Walter Rosenblith of M.I.T.), and

(B) a session on Creativity in Science (with R.J. Seeger of the N.S.F., Samuel Eilenberg of Columbia, Howard Hanson of Rochester, W.F.G. Swann of the Bartol Research Foundation, and Lamar Dodd of Georgia).

The shortage of maths confirms a universal maxim: where scientists gather, mathematicians flee. Much nearer the present in time and place, recent A.N.Z.A.A.S. meetings provide further confirmation.

Many mathematicians do not even put their wares on the scientific market (at such meetings, or smaller more specialised ones). Those that do, often address the buyer in a foreign language (mathematics) and provide no translation. However this insularity arose, it caused the isolation of mathematics from its potential clients in science, industry and government.

Further, it allows the general public to enjoy a range of myths, stereotypes, old wives' tales and partial truths about maths without risk of illumination, correction or exorcism. In the long run, this may be the greatest danger facing mathematicians, science education, and the scientific community in general.

The Newsletter is the official organ of the New Zealand Mathematical Society. It is produced in the Mathematics Department of the University of Waikato and printed at the Times Commercial Printers, Hamilton. The official address of the Society is:

New Zealand Mathematical Society (Inc.)
C/- The Royal Society of New Zealand
Private Bag
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.

News and Notices

N.Z.M.S. PRE-DOCTORAL THESIS COMPETITION

Entries are solicited for the 1986 competition. It is open to Honours and Master's theses on mathematical topics which have been presented this year or the last. Judging is mainly on the quality of the writing. In 1984, prizes totalling $300 were disbursed. Members are asked to urge supervisors to submit entries, which is to be done in the first instance by sending me details on a form available from the university mathematics departments or from any NZMS Council member.

W. Brent Wilson,
Mathematics Department,
University of Canterbury.

ROYAL SOCIETY REMINDER

The closing date for the next set of awards from the YOUNG SCIENTISTS' FUND is 1 March 1986. This set of awards, for those receiving late advice of a conference in the later part of 1986, is intended to enable young scientists to attend their first overseas conference. (Here, 'young' means under 32 on 1 January 1986.)

Editor's Note: This item, from the R.S.N.Z. Newsletter, does not indicate where applications should go. I recommend direct to the R.S.N.Z., Private Bag, Wellington, with a copy to the Secretary, N.Z. Mathematical Society, in case it has to be forwarded by the "Member Body".

CALL FOR PAPERS

Starting in 1986, the Mathematical Chronicle will publish two issues per year (mid-year and end of year). We would like our journal to more fully reflect the mathematical life in New Zealand. Therefore we especially invite local authors to submit papers for publication in the Mathematical Chronicle. We hope to publish papers within 6 months from submission.

Vol. 14 (December 1985) has just appeared. The next issue is planned for June 1986.

Send your papers to: Dr N. Wormald
Associate Editor Mathematical Chronicle
Department of Mathematics
University of Auckland
Private Bag
AUCKLAND (New Zealand)

For the Chronicle Committee:
P.R. Hafner
Managing Editor

TERTIARY MATHEMATICS STUDY GROUP

Information about this body, formed recently to "foster and promote informed discussion and communication on the entire range of problems associated with teaching mathematics at the tertiary level", can be found in the Australian Mathematical Society Gazette 12 (3), October 1985. To join, contact -

Jack Gray,
School of Mathematics,
University of New South Wales,
P.O. Box 1, Kensington NSW 2033,
Australia.

BEATRICE (HILL) TINSLEY - INFORMATION

Readers may have seen Christine Cole Catley's article on Beatrice (Hill) Tinsley in a recent Listener (30 November 1985). Scott Whineray, Chairman of the Education Committee of the N.Z. Institute of Physics has just written a 97 page book about her, a "tribute in memory of an outstanding physicist". He aims to get this into secondary schools, as evidence that "girls can do anything", even (maths and) physics.

Scott Whineray "Beatrice (Hill) Tinsley 1914 - 1981: astronomer" Massey University and N.Z. Institute of Physics Education Committee, Palmerston North, 1985.

Visitors

Correct at 5 December 1985

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

Definite Visits

Professor E.A. Bender; University College of San Diego, La Jolla, California; combinatorics; 3 Jan. 1986 - 28 Feb. 1986; University of Auckland; N.C. Wormald.

Professor C.J. Colbourn; University of Waterloo, Ontario; wife; combinatorics, graph theory, computer nets; 5 Jan. 1986 - 31 May 1986; University of Auckland; Dr P.B. Gibbons.

Dr E.J. Fackerell; University of Sydney; wife and family; group theory in differential equations and relativity; December 1985 - May 1986; University of Canterbury; R. Kerr.

Professor C. Godsil; Simon Fraser University, Canada; Graph Theory, Group Theory; June - August 1986; University of Otago; Professor D.A. Holton.

Dr A.N. (Sandy) McClymont; Center for Astronomy, University of Hawaii; MHD of solar/stellar atmospheres, astrophysics, radiative oranges; 6 December 1986 - 1 March 1986; Waikato University; Dr I. Craig.

Professor M.D. Plummer; Vanderbilt University, Nashville, Tennessee; spouse and two children; graph theory; June - August 1986; University of Otago; Professor D.A. Holton.

Professor Rolfe Tomlinson; University of Warwick; spouse; operational research, economies and diseconomies of scale; January - March 1986; Applied Mathematics Division, DSIR, Wellington; Dr Hugh Barr.

Professor Warren J. Wong; University of Notre Dame, South Bend, Ind.; wife and one child; finite groups; 20 December 1985 - 30 June 1986; University of Auckland; Dr M.D.E. Conder.

Very Likely Visits

Dr Peter M. Neumann; The Queen's College, Oxford; wife?; group theory, algebra, history of algebra; September 1986; University of Auckland; Dr M.D.E. Conder.

Professor L.B. Richmond; University of Waterloo, Ontario; combinatorics, number theory; Jan. - Feb. 1986; University of Auckland; N.C. Wormald.

Dr L.A. Székely; Eötvös L. University, Budapest; combinatorics; Jan. 1986 - December 1986; University of Auckland; N.C. Wormald.

One of the main aims for this listing is to enable institutions other than the principal host institution to invite visitors to spend time with them. Anyone wishing to issue such an invitation should do so through the listed principal contact.

Please Note: The production of these lists and the coordination of visits is dependent on my receiving information. When you have information about a visit, whether it be definite, very likely or possible, would you please forward the information to me at the earliest convenience.

Gillian Thornley (NZMS Visitors' Coordinator)
Massey University,
Palmerston North.

Conferences

Compiled by Dr. M.R. Carter, Massey University

1986

February 17-21 (Minneapolis, Minnesota)	*Workshop on Disordered Systems, Percolation, and Self-Avoiding Random Walks* Details from I.M.A., see below (a).
March 17-21 (Minneapolis, Minnesota)	*Workshop on Hydrodynamic Behaviour of Interacting Particle Systems* Details from I.M.A., see below (a).
March 24-28 (Atlanta, Georgia)	*Fourth International Symposium on Numerical Methods in Engineering* Details from A. Chandouet, C/- CETIM, B.P. 67-60304 Senlis Cedex, France.
April 2-8 (Barcelona)	*1986 Barcelona Conference on Algebraic Topology* Details from A.M. Castellet, Centre de Recerca Matematica, Institute d'Etudis Catalans, Apartat 50, Bellaterra (Barcelona), Spain.
April 8-10 (Chester, England)	*Stably Stratified Flow and Dense Gas Dispersion* Details from I.M.A., see below (b).
April 14-18 (Birmingham, England)	*State of the Art in Numerical Analysis* Details from I.M.A., see below (b).
May 12-16 (Perth)	*30th Annual Meeting of the Australian Mathematical Society* Details from R.P. Sullivan, Department of Mathematics, University of Western Australia, Nedlands WA 6009, Australia.
May 19-23 (Singapore)	*Combinatorics and Graph Theory Meeting* Details from C.C. Chen, Department of Mathematics, National University of Singapore, Lower Kent Ridge Road, Singapore 0511.
May 19-21 (Christchurch)	*New Zealand Mathematics Colloquium* Details from B.A. Woods, Department of Mathematics, Canterbury University, Christchurch, New Zealand.
May 20-23 (College Park, Maryland)	*International Conference on the Physics of Phase Space* Details from Y.S. Kim, Department of Physics and Astronomy, University of Maryland, College Park, Maryland 20742, U.S.A.
May 28-30	*The Mathematics and Applications of Remote Sensing* Danbury Management Centre; details from I.M.A., see below (b).
June 1-5 (Makone, Japan)	*First Japan Conference on Graph Theory and its Applications* Details from Jin Akiyama, Department of Mathematics, Tokai University, Hiratsuka, 259-12 Japan.
June 9-19 (Minneapolis, Minnesota)	*Stochastic Differential Systems with Applications to Control Theory, Electrical/Computer Engineering and Operations Research* Details from I.M.A., see below (a).
July 1-2 (Oxford)	*Mathematics in Major Accident Risk Assessment* Details from I.M.A., see below (b).
July 7-9 (Oxford)	*The Mathematical Theory of the Dynamics of Biological Systems* Details from I.M.A., see below (b).

July (Oxford)	*I.M.A. Control Group Conference* Details from I.M.A., see below (b).
July 22-26 (Edmonton)	*Conference on Constructive Function Theory* Details from Constructive Function Theory - 86, Department of Mathematics, University of Alberta, Edmonton, Alberta T6G 2G1, Canada.
July 27- August 1 (Seattle)	*Thirteenth International Biometrics Conference* Details from G. van Belle, Department of Biostatistics, University of Washington, Seattle WA 98195, U.S.A.
August 3-11 (Berkeley)	*International Congress of Mathematicians* Details from ICM-86, P.O. Box 6887, Providence RI 02940, U.S.A.
August 11-16 (Victoria, B.C.)	*Second International Conference on Teaching Statistics (ICOTS 2)* Details from T. Lietaer, University Extension Conference Office, University of Victoria, P.O. Box 1700, Victoria, British Columbia B8W 2Y2, Canada.
August 25-29 (Prague)	*Sixth Prague Topological Symposium* Details from Z. Frolik, Matematický ústav ČSAV, Žitná 25, 115 67 Praha 1, Czechoslovakia.
September 7-9 (Cardiff)	*The Mathematics of Surfaces* Details from I.M.A., see below (b).
September 8-13 (Halle)	*Algebra-Tagung Halle 1986* Details from Algebra-Tagung 1986, Sektion Mathematik, Martin-Luther-Universität, Universitätsplaz 6, Halle-Wittenberg, DDR-4010 Halle, German Democratic Republic.
September 23-25 (Reading)	*Optimization and Simulation of Large Scale Systems* Details from I.M.A., see below (b).
September 29-30 (Cardiff)	*Computers in Mathematical Research* Details from I.M.A., see below (b).
December (Oxford)	*Cryptography and Coding* Details from I.M.A., see below (b).

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

(b) The Deputy Secretary,
The Institute of Mathematics and its Applications,
Maitland House, Warrior Square, Southend-on-Sea,
Essex SS1 2JY, England.

TWENTY-FIRST NEW ZEALAND MATHEMATICS COLLOQUIUM

FIRST NOTICE

The Twenty-first New Zealand Mathematics Colloquium will be held at the University of Canterbury from Monday, 19 May to Wednesday, 21 May, 1986.

Papers Papers are invited on any topic in pure or applied mathematics, statistics, numerical analysis, mathematical physics, operations research and mathematics teaching.

Accommodation This has been reserved from Sunday 18th to Thursday 20th May in the University Halls of Residence. The tariff per day (at present provisional) is $26 for dinner, bed, and breakfast.

Letter to the Editor

The Editor:

Oxford Pascal on the Commodore 64 is a full implementation of Jensen and Wirth Pascal, with extensions for sound and graphics, and for bit-fiddling. Packed arrays of type CHAR can be read in just like strings in UCSD Pascal. Both tape and disk versions are available. Screen editing is just as in BASIC, with the addition of functions for finding and changing specified text strings. Small programs, requiring no more than 14K bytes, can be compiled and run from within the editor. If the compilation fails, or at the end of a successful run, control is returned to the editor. All errors found are listed on the screen, or can be printed. It seems an excellent development system for working with small program units. It is remarkably free of bugs. Execution is slow, similar to interpreted BASIC for programs where real arithmetic predominates. Of course features not available in BASIC often allow programs which will execute much faster than their BASIC counterparts.

I'd be interested to hear from any NZMS Newsletter readers who've had experience of other reasonably full Pascal implementations for the Commodore 64. I find it remarkable that I can run a respectable implementation of Pascal on a machine which now sells for under $500.

John Maindonald,
DSIR Applied Maths Division,
Private Bag, Auckland

Local News

PAPUA NEW GUINEA

Savitri Abeyasekera, Lecturer in Statistics, gave a seminar on 'Statistical Methods for analysing rainfall data'.

John Gough, Lecturer in Mathematics Education, is returning to Australia at the end of November.

Donald Joyce, Professor of Mathematics, is returning to New Zealand in the middle of December.

Vincent Malaibe, Lecturer in Applied Mathematics, is on study leave at the East West Centre, University of Hawaii.

Joji Takahashi, formerly Lecturer in Mathematics at Bayero University in Nigeria, joined the Department as Senior Tutor in mid-October; his major research interest is set theory.

Raka Taviri, Head of Mathematics, has been awarded an M.Sc. in Analysis by the University of New England.

Eight staff participated in the Mathematics Conference in Lae and papers were given by Om Ahuja *('An invitation to the study of spiral-like and related functions')*, Savitri Abeyasekera *('Statistical Games')*, Eddie D'Sa *(Spatial Disparities in Papua New Guinea')*, Bernard Dusczyk *('Shock wave reflection in incompressible elastic material')*, John Renaud *('A canonical form for matrix pairs'* and *'Mathematical research at the college level')*, Ramaswamy Sekkappan *('Successive sampling: a review')*, and Raka Taviri *('Fixed points of nonexpansive mappings in Banach spaces')*.

D.C.J.

OTAGO

Dr Ray Enlow will spend his study leave at the Aerospace Engineering Department of the University of Michigan in 1986.

Dr John Shanks has been promoted to Senior Lecturer.

Professor Derek Holton attended the annual meeting of the Combinatorial Mathematics Society of Australasia at the University of Sydney. He also presented a Psychology Department Seminar on "Sex Differences in Mathematical Performance" (at Otago).

Assoc. Professor Bryan Manly's book, "The Statistics of Natural Selection" was published by Chapman and Hall.

Seminars

Mr James Sneyd, *'A Model of a Hungry Enzyme Reaction'*

Mr Victor Flynn, *'p-adic Numbers'*

Dr Marston Conder (University of Auckland), *'Embedding Graphs into Surfaces'*

Mr Mark Ellingham (University of Waterloo, Canada), *'Isomorphic Factorization of Regular Graphs'*

Dr Dennis McCaughan, *'Sieve Methods in Number Theory'*

Mr Peter Johnstone (Invermay Research Station), *'How a Simple Statistical Model is Made to Earn My Living'*

Mr Ross Brown, *'Matchings, Alternating Paths, and Algorithms'*

Mr Richard Taylor, *'The Reconstruction Problem in Graph Theory'*

Mr Colin Hargreaves, *'LISREL: an Outline of Joreskog's Approach and Discussion of Questions Raised Thereby'*

Professor B.A. Woods (University of Canterbury). *'Withdrawal of a Heavy Viscous Fluid from a Layer, through a Point or Line Sink'*

Professor G.A.F. Seber (University of Auckland), *'The Role of Curvature in Analysing Non-Linear Models'* and *'Problems with Fitting Non-Linear Models'*

G.O.

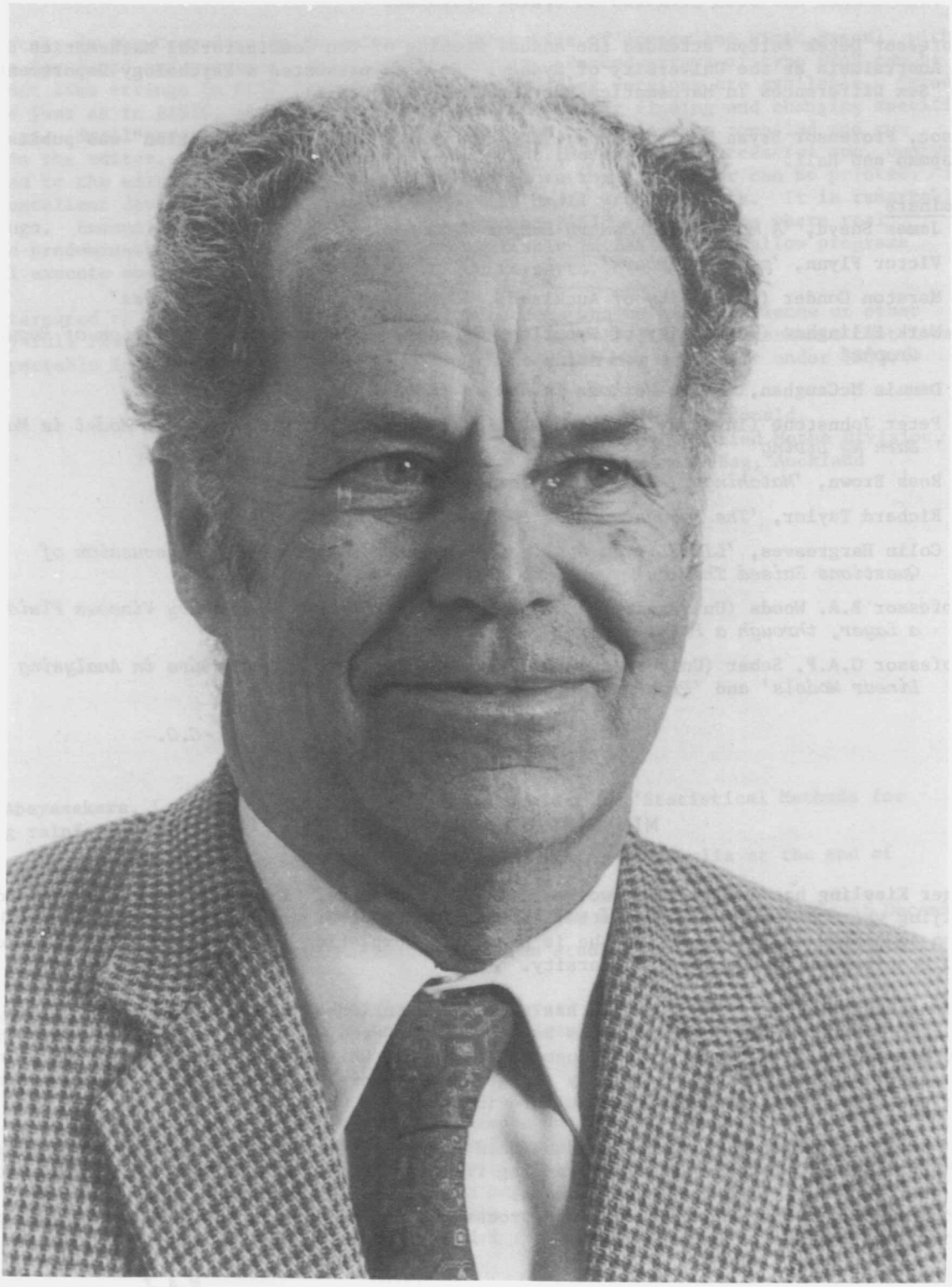
MINISTRY OF AGRICULTURE AND FISHERIES

Roger Kissling has departed on two years leave of absence. Initially he will be based in Beijing where he expects to be either teaching or computer programming. Robyn Green has been appointed a Biometrician. She is presently completing a Diploma in Operations Research and Statistics from Victoria University.

The Agricultural Research Division has recently established a small Systems Modelling group at Head Office. First to arrive has been Dr Chris Darkey, a Ghanaian who was previously with the Department of Agricultural Economics at Lincoln College. He will shortly be joined by two other OR specialists. Initially the group will develop simulation and optimisation models for the Meat, Fertiliser and Horticulture industries.

The Computer Services group have established an in-house packet-switching network called MAFNET. MAFNET links several CPUs ranging from the Prime 9750 at Ruakura, near Hamilton to the Vax 11/750 at Invermay, near Dunedin. Terminals to MAFNET can access any CPU. The terminals include microcomputers, word processors and dumb terminals and are located on MAF sites from Kaitaia to Invercargill.

M.A.J.



Centrefold

GORDON HOOKINGS

Having reached the 65 years age limit, Gordon Hookings is retiring after 38 years of service in the Department of Mathematics. Of Auckland University mathematicians, only H.W. Segar and C.M. Segedin had longer service.

Born in Napier, Gordon was educated at Vauxhall and Onehunga Primary Schools and Auckland Grammar School. At Auckland University College (1938-41) he was awarded a Shirtcliffe Graduate Bursary, a Senior Scholarship in Pure Mathematics, the Sir George Grey Scholarship and the Cook Memorial Prize in Mathematics. He graduated M.Sc. with First Class Honours in Mathematics and was awarded a Post-Graduate Scholarship.

The war years saw Gordon as an optical munitions designer for the DSIR (and half-time lecturer in Physics at Auckland University College) and as an aerodynamicist with Power Jets (Research and Development) Limited, a British Air Ministry firm. When the war ended he was able to resume his academic studies, as a research student at the University of Cambridge under the supervision of A.M. Binnie (1946-47). He was awarded an M.Sc. for his investigations of the flow of swirling water.

In 1948 Gordon was appointed to a Senior Lectureship at Auckland, and he became an Associate-Professor in 1967. He served as Head (or Acting Head) of Department five times. His teaching responsibilities have ranged through the greater part of the spectrum of courses (including Engineering Mathematics in the Ardmore days) which have been taught in the Department of Mathematics, and he has been examiner at all levels from University Entrance to Ph.D. He has served on the Promotions Advisory Committee, Senate and Academic Committee, and as President of the Lecturers Association. He has been a long-serving chairman of the Auckland Regional Syllabus Committee for Mathematics, and his many years of service (including one term as President) in the Auckland Mathematical Association were recognized by the award of Honorary Life Membership. Gordon spent sabbatical leaves at Cambridge University, at the Imperial College of Science and Technology, at Monash University, and in California (the last on a Fulbright-Hays award).

Gordon has been very active and successful as a glider pilot. With J.R. Court, he imported the first post-war glider into New Zealand. He won a New Zealand Championship, and one flight of his in the Wairarapa-Hawkes Bay area was the first soaring flight over Commonwealth territory to exceed 500 km. One early effort saw him soaring at over 20,000 feet. He has represented New Zealand both as a team member and as manager at several World Gliding Championships. Gordon's research on the ups and down of atmospheric flow (and in particular on downdrafts maintained by precipitation, and on thermals and plumes) is very happily related to his hobby, and it was most appropriate that he was awarded the Sir Henry Wigram Medal by the Royal Aeronautical Society and invited by that Society to give the first George Bolt Memorial Lecture. He was also an invited speaker at the Symposium on the Physics of the Lower Atmosphere at the eleventh New Zealand Science Congress.

Gordon has been active in several other sports, including tramping and skiing (the latter as a member of the Ruapehu Ski Club). He has been an enthuiastic member of the Mathematics Department teams in various activities including basketball (as netball was called) in the old days, and cricket and volley ball very recently.

We will miss Gordon's ready and steady service, both as a teacher and as an administrator. As a former student, I can testify that his clear and effective lectures have been well appreciated by his audiences, and he has always been readily available to students. Whatever the administrative task, whether it be organizing the movement of the Department into a new building or the provision of refreshments at a Mathematics Colloquium, one could always be certain that the job would be done efficiently and without fuss. We wish Gordon continued good health and an active and happy retirement together with his wife Margaret and children Clare, Alistair and Elizabeth.

Don Nield

Some double rooms may be available in the Halls, suitable for couples or families; we would like early notice of such requirements.

Motel accommodation can also be arranged.

The first circular and preliminary registration forms will be sent to all appropriate University and Government departments during December.

Any enquiries and suggestions for speakers, activities, etc., should be made to the Colloquium Secretary -

B.A. Woods,
Department of Mathematics,
University of Canterbury,
Private Bag,
Christchurch.

Book Reviews

PROBLEMS IN GEOMETRY, by M. Berger, P. Pansu, J.-P. Berry and X. Saint-Raymond, translated from French by S. Levy; Problem Books in Mathematics, Springer-Verlag (1984), viii + 266 pages.

This beautiful book, companion to an earlier, larger and costlier text (M. Berger, "Geometry", Springer-Verlag, 1985) which I have not seen, provides full solutions for selected problems therein. Nevertheless, the authors designed it to stand alone: they first offer (almost) enough explanatory material to "make sense" of the problems (ideas, definitions, basic facts, hints for solution, but no proofs), before "giving the show away" in the second half of the book.

They cover a wide range of finite-dimensional topics, largely avoiding differential and algebraic geometry:

a little on transformation groups and plane tilings,

a lot of "flat geometry" (affine and projective spaces, cross-ratio and barycentre, inversion and duality, ...),

polytopes (some convexity and compactness),

quadratic forms, quadrics and conics (Bezout's theorem, for instance),

(models of) elliptic and hyperbolic geometry, and

surprises such as Guldin's theorems from calculus and spherometers and Hooke's joints from the mechanical world.

With its clear, brisk English and its clean, attractive layout, and without any misprints that I could find, this book does a difficult task well, of making a comprehensive survey of geometrical detail easy and enjoyable to read.

Though I cannot use it as a text (students and solutions do not mix), I find it invaluable as a concise, well-indexed source-book (and reminder of half-forgotten geometry). Note: I accepted this review well before I was asked to be editor...

M. Schroder
Waikato University

"Genius is a perception of the obvious which nobody else sees."

- Ronald Weiss

Problems

Sub-editor: A. Zulauf, Waikato University

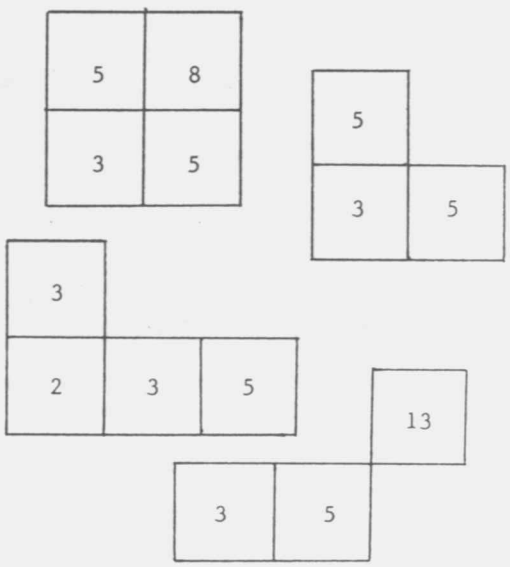
Problem 18

Let the Fibonacci numbers $f_1,f_2,f_3,\ldots$ be defined by $f_1 = 1$, $f_2 = 2$, $f_{k+2} = f_{k+1} + f_k$. The $n\times n$ *F-lattice* is obtained from the Cartesian integer lattice by assigning the value f_{i+j-1} to the cell with the point (i,j) at its top right corner $(i = 1,2,\ldots,n;$ $j = 1,2,\ldots,n)$.

A *folyomino* is a "king-move" connected set of cells whose total value is a Fibonacci number.

Examples:

8	13	21	34	55
5	8	13	21	34
3	5	8	13	21
2	3	5	8	13
1	2	3	5	8



Challenge: For $50 give me a formula for the number $F(n)$ of folyominoes in the $n\times n$ F-lattice.

J.C. Turner,
University of Waikato.

Note: As I shall retire from editing this section with this issue, please send proposed problems, solutions, relevant references and so on direct to the editor.

A. Zulauf

D.S.I.R.

A.M.D., Mount Albert

David Whitaker, author of "OR and the Micro' and until recently Senior Lecturer in Victoria University's Department of Business Administration, has commenced work at Applied Maths Division in Wellington and is due to join us here in the next month or two.

Jocelyn Dale has prepared an eight minute tape-slide show describing the work of the sub-station, available for borrowing by anyone interested. A deposit (refundable, $25 for educational institutions) is required. Alice Worsley, formerly of 1ZB, is the narrator. Formal mathematics is little in evidence. It proved an excellent introduction to a talk Jocelyn gave at a recent Auckland University seminar, attended by women students from the sixth form upwards, on careers for women in the mathematical sciences.

DSIR Applied Maths Division's Mount Albert substation has commissioned a woollen mural for their new office area. Shown here (from left ot right) are Stephen Barnett, Jocelyn Dale, Chris Triggs, Maude Cook (present as the designer), and John Maindonald. The mural has the title "In Search of ..." It symbolises "the paths we go along and the various resources involved in our research".

J.M.

A.M.D., Wellington

David Whitaker, formerly of the Business Administration Department, Victoria University has joined the Operations Research section of AMD. He will be transferred to Mt Albert in the New Year.

AMD's graphic specialist Lance Kibblewhite has joined the Australian computer company SPL. His move continues the usual trend for software specialists.

Malcolm Grant has been seconded to Head Office as geothermal coordinator, to replace Tony Mahon.

Kit Withers is spending 3 months at ANU, where he will continue to work on his asymptotic estimates.

Tony Aldridge has arrived at Joiner Associates in Madison to study applications of statistics to industry. There is speculation as to what extent he will return a para.

David Rhoades has returned from a month-long trip to China and Japan where besides climbing the Great Wall he attended conferences on fuzzy-mathematics and seismology.

Jean Thompson has returned from a 3-month trip to England. Jean assisted in the preparation of statistics courses for the Open University, attended a Genstat conference, worked on Genkey and visited Rothamsted for discussions regarding her classification scheme for e.coli.

Alex McNabb has returned from a 3 month trip to McGill, Oxford and Hiroshima Universities where he worked on asymptotics for parabolic systems.

Mark McGuinness has returned from a month long trip to Hawaii and the US where he gave papers on geothermal modelling. Mark's novel presentation in a poster session introduced the concept of the wet, white-washed sandshoe as a new teaching aid.

Tony Cooper has accepted an NRAC fellowship for Ph.D study at Stanford.

Robert Davies spent one week in Canberra as guest member to the advisory committee meeting on DMS.

Ray Brownrigg and Steve White attended the DECUS meeting in Hobart. Steve also visited Canberra to check on AMD's link with their Cyber.

Bruce Benseman attended the ASOR conference in Adelaide. A detailed account is given in the OR Newsletter.

A large fraction of the Maths Physics section attended the IUTAM meeting in Hamilton in November.

Rolfe Tomlinson will be visiting the Operation Research section during Jan-March 1986 to research scale in production systems.

G.J.W.

The Mount Albert Mural

I.U.T.A.M. SYMPOSIUM:

Single- and Multi-Phase Fluid Flow through Heterogeneous Permeable Materials

This Symposium attracted more than 50 to Waikato University in Hamilton for the week 18-22 November - nearly half of the visitors from overseas (Australia, the People's Republic of China, England, France, Japan, the Netherlands and the U.S.A.).

Review lectures and shorter papers covered a wide range of deterministic and stochastic theory, field observations and applications. Local research figured in the programme: the pioneering work of the D.S.I.R. on geothermal reservoirs such as Wairakei, and recent work on oil/gas fields (in Taranaki). The participants also enjoyed a field trip to Kihikihi, Wairakei and Rotorua, illustrating some of these themes.

I.U.T.A.M. International Scientific Committee:

Dr I.G. Donaldson, P.E.L., D.S.I.R.
Prof. G.K. Batchelor, Cambridge
Prof. P. Germain, Ecole Polytechnique
Dr R.N. Horne, Stanford
Dr A. McNabb, A.M.D., D.S.I.R.
Dr A.F. Moench, Geol. Survey, U.S.A.
Prof. V.N. Nikolaevsky, Academy of Sciences, U.S.S.R.
Dr J.R. Philip, C.S.I.R.O.
Prof. A. Verruijt, T.H. Delft

N.Z. Organising Committee:

Dr B.E. Clothier, Plant Physiology, D.S.I.R.
Dr F. Cook, Soil Bureau, D.S.I.R.
Prof. R.J. Hosking, Waikato University
Dr R.J. Jackson, Forest Service
Dr G.M. McBride, Water Quality Centre, MWD
Dr A. McNabb, Water Quality Centre, MWD
Dr A. Petch, Waikato Valley Authority
Prof. M.J. Sullivan, Auckland University
Dr A.D. Sneyd, Waikato University
Dr A. Taylor, M.A.F.
Dr H.R. Thorpe, Christchurch Science Centre, M.W.D.
Mr A.W.F. Thynne, R.S.N.Z.
Dr R.A. Wooding, A.M.D., D.S.I.R.

R.J.H.

WAIKATO

When Prof. Zulauf steps down as Head early next year, Prof. Hosking will take over for four years - and therewith, we enter the Age of Rotation.

We have just farewelled John Turner, on leave for six months in Santa Clara, and Peter Hill, who finally did get approval from the Indian authorities to serve a spell at Ootacamund. (See N/L 32.)

The wider mathematical community may not know of the Science Education Research Unit here, though it has already made a name for itself internationally. For some years, it has run the Learning in Science Project whose interim findings recently appeared in a down-to-earth book, "Learning in Science: the implications of children's science" by P.S. Freyberg, R.J. Osborne and others. This book opened my eyes to the kinds of difficulties facing

science teachers. Though the founders of the Unit (named above) both died this year, its work will continue, directed by Dr M.D. Carr. (So far, our contribution has been small...)

The seminars listed below include one in the Physics Department's series by one of our graduate students (*) and two run in conjunction with the Waikato Statistics Group.

Seminars

J. McWhirter, *'Reference Ranges for Enzyme Data'*.

E.V. Krishnamurthy (Waikato, Computer Science), *'Topology of the Computables'*

G. Williams (Waikato), *'Solution of Maxwell's Equations in the Kerr Metric: the Interaction of Light with Black Holes"* *

A.D. Sneyd, *'Instabilities of a Fluid Interface due to an Intense Normal Electric Current'*

B. Bolstad, *'Harrison-Stevens Forecasting and the Multi-Process Dynamic Linear Model'*

A.G. Barnett (M.W.D., Water Quality Control Centre), *'Cell Integral Principles in Hydraulic Computation'*

B. Manly (D.M.S., Otago University), *'Testing for an association between distance matrices'*

M.S.

MASSEY

Susan Byrne will be leaving us at the end of 1985, to go to the Department of Theoretical and Applied Mechanics at Auckland University. Susan's vigorous academic contributions and ebullient personality will be much missed - we hope Auckland realise how lucky they are! However, we in turn have pinched Graeme Wake from Victoria University and installed him in our newly created Chair of Mathematics. You win some, you lose some.

Dean Halford took three weeks leave last August to attend a workshop on general relativity and differential equations, at Monash University.

Our new Vuwriter mathematical word-processing system (using Apricot microcomputers) has now had most of the inevitable teething problems sorted out, and promises to be a very valuable asset to the department.

We are introducing a new 200-level paper on Discrete Mathematics in 1986, covering topics which are likely to be of particular interest to computer science majors. It will be interesting to see how many students the paper attracts.

Seminars

Dr Dean Halford, *'Bäcklund Transformations'*

Professor Ivan Reilly (Auckland University), *'Distance and Symmetry'*

Professor Douglas Bridges (University of Buckingham), *'Constructive Mathematics and Computability'*

Dr Graeme Wake (Victoria University), *'Mathematics of Combustion and Diffusion'*

Dr Ian Henderson, *'Mathematical approaches to the description and analysis of biological shape'*

Dr Ken Morison (DRI), *'Modelling and simulation of engineering processes using systems of differential/algebraic equations'*

M.R.C.

VICTORIA

The spate of departures continues with Graeme Wake, Sharleen Forbes and John Burnell. All three have given sterling service during their years in the Mathematics Department, as is obvious to those trying to devise next year's teaching programme! We congratulate Graeme on his appointment to the Chair of Mathematics at Massey.

Dr Colin Bailey, M.Sc. (Auckland), Ph.D. (Harvard), has been appointed as a Lecturer in Mathematics from a very strong field of applicants. He is currently an instructor at M.I.T. and will be arriving in the middle of 1986. His field is mathematical logic.

We congratulate Megan Clark and Peter Donelan on the birth of their second son, Max, on 15 October.

The Review of Mathematical Sciences at V.U.W. has been completed. Its report has been circulated to those directly involved but has not yet been to the University Council or Professorial Board; we await further developments with interest.

David Vere-Jones is about to go on sabbatical to China and Oxford, Rob Goldblatt to Stanford, and Lindsay Johnston to Monash.

Tony Vignaux visited the University of Fast Asia, Macao, as an examination moderator.

Overseas visitors in the last few months have included Profs. W.A.J. Luxemburg (Caltech), M.S. Longuet-Higgins (Cambridge), B.L.N. Kennett (ANU), K. Collis (Tasmania) and B. Gray (Macquarie).

Dr D.M. Jurdy (Northwestern) is to be a Visiting Fellow in the Research School of Earth Sciences for about two months from early in January, working with John Harper on plate tectonics.

J.F.H.

CANTERBURY

Roy Kerr has returned from a year's leave at Queen Mary College, London. While there he worked on the relativistic solution to the two-body problem. He also attended the presentation of the Hughes Medal by the Royal Society, awarded for his earlier work on relativity (as reported in Newsletter No. 31). The medal itself is impressive in appearance, but is not, apparently, of solid gold, as would have been the case fifty years ago. Such are the effects of inflation.

Peter Bryant departed in August for a year's study leave at the University of California in San Diego. He reports running his programs on a Cray computer at a speed 300 times that of Canterbury's Prime.

Ting On To will retire in February, 1986, being one of the first to take advantage of the provision for early retirement recently instituted by the university. He has been with the department since 1970.

Professor Ted Fackerell, of the University of Sydney will be visiting the department from December to May. His main interest is in group theory applied to differential equations, especially the equations of relativity.

Professor William J. Zimmer, a statistician from the University of New Mexico, will be with us until February.

Dr John Hannah, currently at University College, Galway, has been appointed to the department, and we expect to seem him in July. He is an algebraist, and is a graduate of the University of Canterbury.

Seminars

Dr Oscar Gardia (Forestry Research Institute), *'Some unsolved mathematical and statistical problems in forestry'*.

Mr David Tan (Department of Electrical and Electronic Engineering), *'Methods of phase retrieval in imaging'*

Professor Charles Swartz (New Mexico State University), *'The uniform boundedness principle without completeness'*.

Dr A.W. McInnes (University of Canterbury), *'The AGM and fast computation'* and *'On the use of quadratic approximation to accelerate convergence'*.

Dr D.J.N. Wall(University of Canterbury), *'Inverse scattering and the null field method'*.

Mr T.J. Connolly (University of Canterbury), *'Inverse problems and the Newton-Kantorovich method'*.

Mr R.L. Broughton (University of Canterbury), *'The linear algebra behind the double QR algorithm'*.

R.S.L.

"At the end of his two years, he expects to return to Canada and take up some kind of serious work, either as a professor at the University or at some other non-money making pursuit."

- Claude Bissell, "The Young Vincent Massey", University of Toronto Press, 1981.

AUCKLAND UNIVERSITY

MATHEMATICS AND STATISTICS

Two of our temporary teaching teaching staff, Connie Brown and Ian Hawthorn, left in the August vacation to undertake doctoral studies at (resp.) Harvard University and the University of Minnesota.

Dr Margaret Morton and Mrs Helen Scott helped organise a one-day seminar on Women in Science. The seminar was attended by over 250 people, mostly sixth and seventh form girls, who had the opportunity to listen and talk to various women who have made careers in the mathematical sciences.

The department was honoured in September by a visit from Sir Hermann Bondi (Master of Churchill College, Cambridge).

In September and October, Ivan Reilly circumnavigated the globe on a Claude McCarthy Travelling Fellowship. He spend his time in Austria, Yugoslavia and Greece, mainly doing topology, and in England and Scotland, examining current issues in mathematics education in secondary schools. (See N/L 34 for his plans.)

Upon Bruce Calvert's instigation, we have begun an informal workshop on teaching. This meets occasionally at lunchtime on Fridays in the coffee room, and already some interesting discussions have taken place. Also Bruce arranged a "Department Walk" at Karekare one fine Sunday afternoon, and Peter McInerney a Department Lunch at the Sun Sun restaurant at the end of the third term.

Dr László Székely (of Eötvös Lóránd University, Budapest) has recently accepted a post-doctoral fellowship in combinatorial mathematics, for 12 months commencing January 1986.

Dr Jeff Hunter has been promoted to Associate Professor and Dr Nick Wormald to Senior Lecturer, with effect from February 1986.

We were sorry to lose one of our secretaries, Eve Malbon, when she resigned after nine years with the department. Eve has taken up a position at the Princess Mary Children's Hospital in Auckland. We will miss her outstanding typing abilities and patience.

Also at the end of the year a wine and cheese function was held to mark the retirement of Gordon Hookings, after 38 years of service (see Centrefold). We wish Gordon the very best, although we hope to see more of him - especially at the bridge table!

Early in December the department was visited by Professor I.M. James, President of the London Mathematical Society. Professor James announced details of the new Forder Lectureship, set up by the L.M.S. out of a bequest from the late Professor H.G. Forder. The first Forder Lecturer will be Professor E.C. Zeeman, expected to visit New Zealand in May 1987.

Seminars

Mr Leonid Frants (Advanced Course of Study student, Auckland University), *'PROLOG and its relation to ITP'*.

Mr Ian Hawthorn (Auckland University), *'Why are* $\int_0^\infty e^x dx = -1$ *and* $\sum_{i=0}^{\infty} 2^i = -1$*?'*

Dr Marston Conder (Auckland University), *'Embedding graphs into surfaces'*.

Dr Ralph Fox (Auckland University), *'Generalized metrics and the* γ*-space conjecture'*.

Ms Sina Greenwood (Advanced Course of Study student, Auckland University), *'On the topology of* α*-sets'*.

Ms Sung Bee Hoon (Advanced Course of Study student, Auckland University), *'The hyperbolic geometry and Poincaré metric'*.

Mr Peter Hughes (Auckland University), *'The new Form 1 to 4 syllabus'*.

Dr Daryl J. Daley (Australian National University), *'A statistician's view of modelling examination marks'*.

Professor David Duncan (Johns Hopkins University), *'Problems of simultaneous inference'*.

Professor David Isles (Tufts University), *'Hilbert lives! The chilling effect of Gödel's Incompleteness Theorem on research in the foundations of mathematics'.*

Mr Colin Hargreaves (University of Kent), *'A new (?) form of asymptotic equivalence of distributions'.*

Associate Professor Bryan Manly (University of Otago), *'Testing for association between distance matrices'.*

Professor I.M. James (Oxford University), *'General topology over a base'.*

M.D.E.C. for I.L.R.

COMPUTER SCIENCE

Bob Doran became the new Head of Department on October 1, in succession to John Butcher, who will be on leave for 1986 at Bell Laboratories (Murray Hill, New Jersey).

Richard Lobb has returned from leave, at the University of Toronto.

Cao Liming is returning to China, after a 2-year visit to this Department.

Asbjørn Damhus, from Copenhagen, is visiting this Department. He is working on educational applications of computers.

Garry Tee delivered a lecture on "Mathematical science in New Zealand" at the 17th International Congress for the History of Science, at Berkeley. Following that Congress, he attended a conference at UCLA, on Newton and Halley.

Seminars

Mr T.J. McBride (University of Auckland), *'Do we need a Data Protection Act?'*

Professor E.V. Krishnamurthy (University of Waikato), *'Combinatory Logic and Programming'* (2 lectures)

Professor Allan Borodin (University of Toronto), *'Parallel Algebraic Complexity'*

Dr Richard Lobb (University of Auckland), *'The Aliasing Problem in Computer Grpahics'.*

G.J.T.

THEORETICAL AND APPLIED MECHANICS

Associate Professor Merv Rosser returns from his year's sabbatical leave and Dr Peter Hunter departs to spend his leave in Montreal, Canada.

On a more permanent basis, Mr Chris Patterson leaves the staff after nine years as Senior Lecturer in Operations Research. Chris moves to a new position as General Manager of Promanco Construction Information Services.

Associate Professor Don Nield transfers to T.A.M. from the Department of Matheamtics and Statistics as a result of the review of Mechanics teaching within the University.

Two new appointments in Operations Research have recently been confirmed. Dr Sue Byrne moves from Massey and Dr Andy Philpott returns from Cambridge.

Third Professional student David Robb won the G.T. Murray Memorial Prize awarded by the Institute of Professional Engineers for his 3rd Professional Project on the modelling and optimization of geothermal heating systems.

D.M.R.

Note the third definition of 'intelligent' in Webster's New Collegiate Dictionary (1979): 'able to perform some of the functions of a computer'.