THE NEW ZEALAND MATHEMATICAL SOCIETY

NEWSLETTER

ANNUAL REPORT 1975/76

On behalf of the Council, I hereby present the second annual report of the society.

After its very energetic first year, the society has continued to grow in a number of ways, and is gaining wide recognition as a national society of mathematicians. In particular, it has been accepted as a member body of the Royal Society of New Zealand. Through joint meetings of our representatives with those of the Mathematical Associations it is making worthwhile contributions at the local level, and through the relationships it is establishing with various overseas organisations, it is seeking to play a role at the international level. We have increasingly close relations with the Australian Mathematical Society and we have now established a reciprocity agreement with the South East Asian Mathematical Society in addition to those we have with the London and Australian Societies. We have received very hopeful reactions to approaches we have made to the Edinburgh Mathematical Society and the Canadian Mathematical Congress.

The membership of our society now stands at 111, including 8 student members, 3 reciprocal members and 3 honorary members.

Although the society's own publication policy is still under discussion, its newsletters are becoming an increasingly valuable means for the dissemination and exchange of information on mathematical activities in New Zealand. We have now entered into an agreement with the Mathematical Chronicle to cooperate with each other in a number of ways.

During the year, council decided to promote local meetings of the Society from time to time and, with the agreement of the local organisers, to have its name attached to one of the principal lectures at each of the annual colloquia.

The inaugural essay competition, in spite of the low number of entries, was a worthwhile activity. The work of the prizewinner Mr J.G. Peterson was of a very high quality but each other entry also represented considerable effort and their authors are to be presented with merit awards. I offer the warmest thanks and congratulations of the society to all of the entrants.

I wish to acknowledge the many people who have given valuable service to the society during the year. In particular, I wish to thank the Council members, the honorary auditor, Professor D.M. Emanuel, and the various people who assisted with the judging of the essay competition. Above all I wish to pay special tribute to Dr K.A. Broughan for his untiring and effective work as secretary.

Finally, I offer my best wishes to Professor G.M. Petersen as he takes up the presidency of the society for the 1976/77 year.

J.C. Butcher,
President.

May 1976

MINUTES OF THE SECOND ANNUAL GENERAL MEETING

Held at Massey University
at 5.20 pm on Saturday 22 May, 1976

Present: Professor J. Butcher (Chairman) and 42 members.

Clause I   :   APOLOGIES

Apologies were received and accepted from Professor Butcher for lateness.

Clause II   :   MINUTES OF THE FIRST ANNUAL GENERAL MEETING, MAY 1975

Moved by Dr Harper seconded by Dr Broughan.

THAT THE MINUTES BE TAKEN AS READ AND CONFIRMED.

Carried

Matters arising from the minutes:

2.1   Leonid Plyushch,
2.2   Mathematical Associations,
2.3   Royal Society,
2.4   Essay Competition.

The information was noted.

Clause III   :   PRESIDENT'S REPORT

Professor Butcher introduced his report.

Moved by Professor Butcher from the chair.

THAT THE REPORT BE TAKEN AS READ.

Carried

Professor Petersen in response to a question by Professor Vere-Jones reported that plans were going ahead for a joint meeting in 1978 with the Australian Mathematical Society. The meeting will be held in Christchurch (most probably) in the 19th week of 1978.

Professor Butcher said that the society had taken over the production of the publication "Postgraduate Topics in Mathematics" from the National Committee.

Clause IV   :   TREASURER'S REPORT AND FINANCIAL STATEMENT

Professor Butcher introduced Professor Lorimer's financial statement.

It was noted that there was an excess of income over expenditure.

Moved by Professor Butcher from the chair.

THAT THE TREASURER'S REPORT BE ADOPTED.

Carried

Clause V   :   ELECTION OF OFFICERS

     Professor Butcher declared Professor Malcolm elected to the
Incoming Vice-Presidency and Professor Emanuel elected to the
position of Auditor as their nominations were unopposed.
There was an election for three council members for a term of
three years from the four nominations - Dr K. Broughan,
Dr I. Reilly, Dr W.B. Wilson, and Professor B. Woods.   Each
member present voted for three out of four names.   The members
Broughan,   Reilly and Wilson received the higher numbers of
votes and were declared elected by Professor Butcher.

Clause VI   :   GENERAL BUSINESS

(i)   Publications Sub-Committee: Professor Butcher said that the
Council had been discussing Publications in an attempt to
arrive at a publications policy for the Society.   He said
that a range of possible publishing ventures had been
considered but that in the short time available at meetings
it was difficult to go into the matter properly, and that
because of this, the Council intended forming a Publications
Sub-Committee.   He reported that the Society had committed
itself to publishing a brochure outlining employment
opportunities for mathematicians.   This was being produced
by a sub-committee including Dr Wake and Dr Davies.
Considerable progress had been made on this project.

(ii)   Finance: Professor Butcher reported that the Council had made
many decisions to spend money at the recent meeting and listed
some of the items of possible expenditure.   These included
the Employment Brochure, Royal Society levys, Mathematical
Chronicle, travel expenses for Council meetings and meetings
with the associations and Royal Society.   He pointed out that
the Council had decided to continue to meet twice a year and
that the Council intended to subsidise at least part of the
expenses involved from Society funds.   The N.Z.M.S. Lecture
at the Colloquium was another expense.   As well as these
there were the expenses incurred by the secretary and
treasurer.   The total cost of these ventures had been looked
at closely by the Council and reduced as much as was thought
possible.   It was now estimated to be of the order of $700.
He said that because of this the Council had recommended an
increase in the subscription rate to $7.00.   He said that
inflation was also a factor.

     Moved by Professor Butcher from the chair.

THAT THE SUBSCRIPTION RATE BE INCREASED FROM $5 to $7 FOR THE
FINANCIAL YEAR BEGINNING 1 APRIL, 1977.

                                            Carried

     The question of deriving funds from Institutional members was
raised by Mr B. Stokes.   It was pointed out by Professor
Malcolm that the Council had not been active in soliciting
institutional and other types of members as it was thought
that the society should offer a broad range of benefits to
members before attempting to do so.

(iii)   Chronicle: Members were referred to Newsletter 5 page 5 for
details of the arrangement worked out with the Mathematical
Chronicle Committee.

(iv)   <u>Publications</u>: Dr Pledger said that he hoped that the society would not embark on the publishing of a periodical but he thought that various types of occasional publications would be more appropriate. Professor Butcher said there was a general feeling in the Council that this was the best policy.

Moved by Dr Pledger seconded by Dr Harper.

THAT THE PUBLICATIONS COMMITTEE CONSIDER OCCASIONAL PUBLICATION RATHER THAN PERIODICALS.

Dr Joyce said that the motion could not be binding on the Society. As a rejoinder to this Professor Vere-Jones said the Council existed to express in action the wishes of the members of the society. The publications committee would be glad to have the guidance of the membership. It was pointed out also that the word periodical needed careful definition. It was suggested that the Newsletter might be expanded along the lines of the Notices of the American Mathematical Society.

The motion was withdrawn.

Dr Schroder hoped that the publications committee would now and then come up with ideas which it would feel appropriate to present to the membership. Dr Joyce pointed out that the Council would be happy to know the names of any members who would like to join such a publications committee, that it was not intended that the committee should consist of Council members only.

(v)   <u>Mathematical Associations</u>: Mr Stokes said that relations with the Associations had been a major concern of the Society and he was interested to know what has been happening in this area. Professor Butcher said that any development would be reported in the next Newsletter.

Professor Petersen reported that representatives of the Associations and Society had met in Christchurch on three occasions, explored possibilities and clarified their objectives. The idea was that the groups would cooperate for the good of Mathematics, but at the same time retain their separate identities. A lot of thought was put into finding the areas where they could cooperate on a national scale. There was considerable progress made at the last meeting. For instance a Mathematical Olympiad was going to be introduced. Other projects would follow.

In reply to a question about the Associations becoming Institutional Members of the Society, Professor Petersen remarked that there was distrust about entering into a close association. They had found that as independent bodies they were able to cooperate and embark upon joint projects. It was thought that it was better to work on something and get something done than to worry about how closely they were related on an organizational level.

(vi)   Essay Competition: There was a question from Dr Wake about the publication of the prizewinning essay. Professor Butcher said that this matter was being looked into by the Council. Professor Malcolm pointed out that he hoped there would be at least a descriptive paragraph about the nature of the winning essay published in the Newsletter. He said the essay was of good quality but somewhat technical in nature. Dr Harper said that it appeared that the essay was to be presented at the Colloquium in the form of a paper. Professor Malcolm replied that the paper concentrated on only one aspect of the Essay.

There being no other general business, the meeting concluded at 6 p.m.

<div align="right">
Kevin Broughan
Secretary
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(At a Council meeting immediately following the AGM, Dr Wilson was elected Secretary, Dr Reilly was elected Treasurer, Prof. Woods was co-opted for one year, and a Publications Committee, consisting of Prof. Sawyer (convenor), Dr Broughan, Dr Joyce and Prof. Vere-Jones, was set up).

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FOURTH COUNCIL MEETING
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The fourth regular meeting of the Council was held in the Social Sciences Tower block at Massey University on the afternoon of Friday 21 May, 1976 and morning of the following day.

The Council noted that the first *N.Z.M.S. Lecture at the Colloquium* would be given by Dr I.N. Stewart and decided that the transcript of each lecture would be considered by the Society for publication either in the Newsletter or in some other form.

Relations with Foreign Societies:

The Council agreed to promote the *exchange of the Newsletter* for the equivalent publications of foreign societies and to lodge any such publications in the secretarial files of the Society. The idea was that excerpts from such publications would be reprinted in the Newsletter, thus facilitating the dissemination within New Zealand of news from other societies. A specific 'exchange offer' made by the *Society for Industrial and Applied Mathematics (SIAM)* was before the Council. The Council agreed to exchange the Newsletter for the SIAM News.

Dr F.C. Durling represented the N.Z.M.S. at the Council and Annual meetings of the *Australian Mathematical Society* in May 1976. A report from Dr Durling was tabled. The Council decided that a reasonable number of copies of the Newsletter (of the order of 20 with a view to supplying one to each member of the Australian Council) be sent to the Secretary of the Australian Society. The dates proposed for the 1978 joint meeting of the Colloquium, Australian Mathematical Society and the N.Z.M.S. were discussed. There was general agreement that the second week of May was the best time for the 1978 meeting.

Correspondence between the Society and the *Mathematical Society of Japan* was considered. It was noted that this Society did not enter into reciprocity agreements. Professor Vere-Jones indicated that he would be on study leave in Japan later in the year. It was decided that the N.Z.M.S. should write to the Japanese Society and request that Professor Vere-Jones be given the opportunity of discussing matters of mutual interest with members of that Society.

It was noted that the *American Mathematical Society* was still trying to make a final decision about the cancellation of its reciprocity agreements and the introduction of 'foreign membership'. It was decided that the Secretary should make further enquiries.

The Council at the third Council meeting had directed that reciprocity agreements be sought with the *Canadian Mathematical Congress* and the *Edinburgh Mathematical Society*. Favourable responses had been given by both these organisations to the initial enquiry of the N.Z.M.S. and agreements were under discussion. Discussions with the *Institute of Mathematics and its Applications* about possible forms of cooperation were continuing.

Relations with N.Z. Organisations:

The Council agreed to seek an *exchange of the Newsletter* for the N.Z. Statistician and the N.Z. Operational Research journal on the basis of one copy of each issue being sent to the secretary of the other Society.

The *Auckland Mathematical Association* had indicated that it would consider introducing a reduced subscription rate for the N.Z. Mathematics Magazine for members of the N.Z.M.S. provided that the N.Z.M.S. was willing to distribute the Magazine to its members. The Council decided that it would accept any such offer.

The N.Z. Operational Research Society had indicated that it would consider introducing a reduced subscription rate for the journal N.Z. Operational Research provided that 25 or more N.Z.M.S. members were interested in subscribing to the journal. The Council accepted this offer also.

The Council had dealt by mail with a Royal Society proposal concerning a *1979 A.N.Z.A.A.S. meeting*. The idea was that member bodies of the Royal Society should take a very active role in organising this meeting. The Council ratified the following decision: The N.Z.M.S. proposes to organise, or combine with kindred societies to organise, a meeting of a mathematical nature which would take place as part of the A.N.Z.A.A.S. meeting in early 1979. The Royal Society had proposed that the meeting be held at Massey University. The Council decided that the N.Z.M.S. should write to the Massey University Department of Mathematics and seek guidance on finding people to organise the Mathematical part of the proposed meeting.

The Council noted that Dr M. Schroder had been nominated by the N.Z.M.S. for a position on the *National Committee for Mathematics* and had subsequently been appointed to the Committee. It was decided that, for the time being, he should be regarded as the representative of the N.Z.M.S. on the National Committee for administrative purposes.

Professor Vere-Jones reported on the Royal Society *Member Bodies' Meeting* of 7 May 1976. The main points in the report concerned changes in the rules for Member Bodies and National Committees, the 1979 A.N.Z.A.A.S. meeting, and the question of a mathematician or mathematics teacher being nominated to sit on the Royal Society sub-committee concerned with 'Science in Secondary Schools'. The Council decided that this last question should be taken up by Professor Petersen with the convenor of the Committee of Society and Association Representatives. The Council decided that Dr R. Davies should be the N.Z.M.S. representative on the Member Bodies' committee for the following two years.

A meeting of the *Society and Association Representatives* had taken place on 1 May 1976 in Christchurch and the N.Z.M.S. was represented at this meeting by Professor Malcolm and Professor Petersen. Professor Malcolm's report on this meeting was considered. It has been outlined elsewhere in this Newsletter.

The matter of nominations for *N.Z. Representatives to the International Conference of Mathematical Education* to be held in August 1976 in Germany was considered. The Council decided that the names G.H. Knight, M.F. Solloway and B.R. Stokes should be forwarded to the National Committee as possible nominations. The Council decided also that if a member of the Society was chosen as a N.Z. representative, he/she would be asked to represent the N.Z.M.S. and to deliver a report on the proceedings to the Council, and that provision should be made in the budget for a (very) small amount of money to cover incidental expenses such a representative would incur in attending the conference.

Financial Matters:

A report of the *Sub-committee on Employment* was received by the Council from the convenor Dr G. Wake. The Council approved a prepared outline for an employment brochure that the sub-committee was developing. The Council agreed that the brochure would be published in association with the Operational Research Society and the Statistical Association, that members of the N.Z.M.S. should receive a complimentary copy, and that the Society should assume financial responsibility for the production of the brochure.

A report was received from Dr R. Littler on his work as a *Departmental Employment Adviser*. The Council decided that the N.Z.M.S. should write to the Mathematics departments in the tertiary teaching institutions to see what advice about employment is or is not available to students.

Professor Butcher's report on the judging of the *Essay Competition* was received and the specific prizes approved. It was decided that the awards would be announced in the Newsletter, that the distribution of the awards would be considered by the President, and that the publication of the winning essay would be considered.

The Council agreed that, for the time being, the N.Z.M.S. should produce the publication *"Post-Graduate topics in Mathematics"*, that the publication date should be in the second term, and that the first issue should be published in 1976.

A report was received from the *Editor of the Newsletter* Dr D Joyce. The report is outlined elsewhere in this Newsletter. The Council expressed its encouragement to the Editor for the type of development described in the report. It was decided that provision be made in a publication fund to cover the cost of producing the Newsletter and that the Newsletter should be made available to selected Libraries.

The Council approved the 1976 *Budget* as outlined below:

1.	Chronicle	$ 20
2.	News-sheet	5
3.	Brochure	100
4.	Newsletter	150
5.	Travel - Royal Society Levy	20
	Society/Associations	42
	Council meeting	150
6.	Secretary's expenses	40
7.	Letterheads	10
8.	Treasurer's expenses	40
9.	Royal Society Affiliation fee	20
10.	N.Z.M.S. Colloquium Lecture	80
11.	I.C.M.E. Representative	20

$697

The Council decided to increase the *subscription rate* to $7.00 provided that the members agreed with this at the A.G.M.

New Proposals:

The proposals related to *Mathematical Education* outlined in Newsletter 4 were considered. The Council decided that the President should appoint a convenor who would form a sub-committee to consider and implement some or all of these proposals.

It was decided that a society member should be appointed by the President to conduct a survey of the Mathematical *Audio-Visual Materials* available for loan or sale in N.Z. or from a (limited) number of overseas sources, and to present the results of the survey in a form suitable for publication in the Newsletter.

Professor Sawyer reported that the Librarians had discussed the problem of *Journal cancellations* and had organised the following procedure: records of holdings and cancellations are kept by the National Library. If the number of subscriptions held in N.Z. for a Journal goes down to 2 the National Library notifies participating Libraries. The Council recommended to the Newsletter Editor that new journal subscriptions and cancellations of existing subscriptions be noted in the Newsletter.

A *Visiting Lecturer Proposal* was received with interest and the Council agreed to place it on the agenda for the next meeting. The original resolution was amended to read as follows: That in each year a Mathematician be appointed by the Council to visit all or several of the University centres in New Zealand and give one or two lectures on a topic chosen by the lecturer and approved by the Council. That this person be known as the "N.Z.M.S. Visiting Lecturer for 19XY". That the lecture series be sponsored by the Society or jointly by the Society and Mathematics departments whenever this can be done.

The question of *Publication* was discussed. The Council decided to form a publications sub-committee.

Finally a note of thanks was offered to the outgoing Council, to Professor Butcher for his work as President, and to Dr Broughan for his work as Secretary.

Kevin Broughan
Secretary

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It is of some historical interest to note that the formulas bearing the names of Gauss, Stirling, and Bessel were apparently first known to Newton, while the formulas attributed to Newton are due to Gregory. Further, Everett's first formula is due to Laplace, and Everett's second formula was apparently first given by Steffensen.

F.B. Hildebrand

Let us be glad that we can enter into the theory of sets, into that paradise from which no one can drive us out.

David Hilbert

NATIONAL COMMITTEE FOR MATHEMATICS

Minutes of a meeting held at Massey University
at 12.45 pm on Saturday 22 May 1976

PRESENT: Professors Petersen (in the Chair), Davidson, Kalman, Tate and Zulauf; Dr Schroder.

APOLOGY: An apology was received from Mr Kuzmicich.

MINUTES: The minutes of the previous meeting had been confirmed by post.

MATTERS ARISING FROM THE MINUTES:

1. Publication of the minutes of the previous meeting in the NZ Maths Society Newsletter was noted.

2. It was noted that the NZMS at its last Council Meeting had agreed to take over the preparation of the document on "Research Topics in Mathematics", with the understanding that this would be available before the end of the 2nd term in each academic year.

MEMBERSHIP OF NATIONAL COMMITTEE:

Professor Vere-Jones reported that the Member Bodies Committee of the Royal Society had recently put forward a number of recommendations concerning the role of the Member Bodies and the National Committees. In particular, it was suggested that the National Committees should be limited to a maximum of 6 members. The proposals were shortly to come before the Fellows Meeting of the Royal Society, and it was anticipated that National Committees would be notified of the outcome in June. No action appeared to be required of the Committee at the present time.

ANNUAL REPORT:

The secretary's report was received and approved.

ICMI (International Committee for Mathematics Instruction):

Professor Petersen reported that after correspondence between himself, the Royal Society and Professor Iyanaga (President of ICMI) New Zealand had been accepted as a member of ICMI. The appointment of New Zealand delegates to the meeting on Mathematical Education at Karlsruhe was discussed. It was agreed the Committee would recommend Mr G.H.Knight (Massey University) as New Zealand Representative, with Mr M.F. Solloway (Auckland Secondary Teachers College) as alternate, and Mr B.R. Stokes (Hamilton Teachers College) as second alternate if circumstances permitted him to attend the Meeting. The recommendations would require approval from the Royal Society. The composition of a Mathematics Education Subcommittee to act as liaison between ICMI and the relevant groups in New Zealand was then discussed. It was agreed to recommend to the Royal Society that a subcommittee of 4 be established, with one representative each from the National Committee, the Mathematical Society, the Mathematical Associations, and the Education Department, with provision for alternates to attend if required. It was also agreed that Professor Petersen should act as Convener and as the National Committee representative.

It was moved by Professor Kalman, seconded by Professor Vere-Jones that the Committee record its appreciation of the work done by Professor Petersen in securing New Zealand Membership of ICMI. This was carried by acclamation.

GENERAL:
Professor Vere-Jones asked if he could be relieved of the
position of Secretary as from the end of June, as he would be going on
leave in August.   It was agreed to take this matter up after the new
rules governing the operation and constitution of the National Committees
had been announced.

There being no further business, the meeting closed at 1.20 pm.

David Vere-Jones
Secretary

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MEETING OF REPRESENTATIVES OF THE SOCIETY AND ASSOCIATIONS

The meeting on May 1 was well attended with a representative from each of
the Associations in Auckland, Waikato, Wellington, Canterbury and
Southland.   Additional representatives were present from the Canterbury
Association.   An apology was received from the Nelson Mathematical
Association.   Professors Petersen and Malcolm represented the Society.

Mr Gus Gale was appointed Chairman of the meeting and also subsequently was
appointed Chairman for the next 12 months.   He had attended a conference
of the Australian Mathematical Teachers in Perth last January and reported
on this visit and spoke of the kind of development that he could see taking
place within New Zealand as a result of his Australian experiences.

Some discussion took place on the amount of formal structure which should
be given to the committee that was meeting.   It was agreed to give it the
name 'New Zealand Mathematics Coordinating Committee' and to have a
regular chairman appointed normally on a 3 yearly basis.   It was agreed
that each Mathematical Association and the Society could have up to
2 delegates attending each annually convened meeting but that travel costs
would be shared on a uniform basis between the Associations and the Society
for only one of the delegates from each group.   It was agreed that the
general pattern of development should follow that of the committee discussing
and agreeing to national projects of various kinds but the detailed
undertaking of these to be given to particular Mathematical Associations or
to the Society for actually carrying out.   It was commented that already
this was working in the sense that the Auckland Mathematical Association is
responsible for the publication and production of the N.Z. Mathematics
Magazine, the Wellington Mathematical Association is responsible for
organising the May School for 6th and 7th Formers, the Canterbury
Mathematical Association could be responsible for the National Olympiad to
be mentioned below and the Southland Association has undertaken
responsibility for the regular Mathematical Newsheet.

Mathematical Olympiad

Professor Petersen tabled a paper setting out both background information
about mathematical olympiads in other countries and a detailed proposal
for the establishing of one such here in New Zealand.   Considerable
discussion took place.   Canterbury and Wellington Mathematical Associations
already have established competitions of this kind in their local areas
and other Mathematical Associations are interested to begin in their own
situation.   It was agreed that the Canterbury Mathematical Association
be invited to make plans for the running of a national olympiad, the finals
to be held in Christchurch but with local Mathematical Associations
operating their own local competitions as the first phase of the national
competition.   The cost of sending finalists to Christchurch would need
to be borne either by some form of sponsorship from interested firms or

else from money raised by each of the local Associations. The Canterbury
Mathematical Association would be responsible both for the securing of
the prizes and also for the costs of hosting the group finalists, something
of the order of 20 students or so, during their time in Christchurch.

May Mathematical Course for Senior Students

The Wellington representative gave an account of the plans for the Senior
School or Conference to be run at Wellington College this coming May.
It was agreed that in future years while it may be appropriate for the
location to continue in Wellington because of ease of travel from other
parts of the country yet responsibility for the arrangements of the
programme could well be given to people in other centres.

New Zealand Mathematics Magazine

Quite a lot of useful discussion took place on the kind of editorial
policy that has developed over the last few years, the kind of articles
that teachers would find most helpful. It was agreed to ask the editor
to convene a group of interested people during a convenient time at the
Massey Colloquium to discuss and receive suggestions about future
development of the content of the magazine.

Mathematical Newssheet

Discussion took place on the purpose and value of the Newssheet. It was
agreed that its basic value was as a means of communication between
the committee members of the various Mathematical Associations and the
Society.

New Zealand Representatives to the International Conference of
Mathematical Instruction

Professor Petersen reported that the responsibility for appointing such
delegates was with the National Committee of Mathematics of the Royal
Society but he sought for support for the nominations of G.H. Knight from
Massey University and M.F. Solloway of Auckland Teachers' College.

Mathematics Colloquia

Professor Petersen and Mr Gale reported on plans for the 1978 Mathematics
Colloquium at Canterbury. Plans were being made for a full programme in
Mathematics Education to be run within the larger programme of the
Colloquium programme and Mr Gale together with members of the Canterbury
Mathematics Association would be responsible for developing and over-seeing
this programme. It was intended or hoped that secondary teachers of
mathematics would be attracted to it as a conference within the Colloquium
of members of mathematical associations and also the hope was expressed of
attracting some secondary teachers from Australia.

It was agreed to recommend to the organisers of the Colloquium in Wellington
in 1977 that the Wellington Mathematical Association be invited to share in
the planning of the programme so that a section of it could be developed
in such a way as to appeal particularly to the interests of Mathematics
teachers.

Secondary School Mathematics Syllabuses

There was some discussion of the suggestion, published in Newsletter Number 4, that the Society undertake a regular review both of mathematics syllabuses in secondary schools and examination papers at the national level. The suggestion was warmly received, interest expressed in it, and the desire expressed to continue to be informed of progress as such activity develops.

Diploma of Educational Studies

Nelson McKintosh from the Auckland Mathematical Association reported on preliminary discussions that have taken place within the Auckland Mathematical Assocation, with university people at Auckland and particularly with Dr Ivan Reilly about the development of a University course which would enable teachers to take some kind of Diploma in Mathematical Education. Warm interest was expressed in this idea and mention was made of possibilities in development of similar courses in other places.

Finally the meeting agreed to convene again sometime during the first part of next year in Christchurch, the actual time of meeting to be left to the discretion of the chairman of the committee, Mr Gale.

Wilf Malcolm

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NEWS FROM THE MATHEMATICAL ASSOCIATIONS

The second National Secondary Students Mathematics Course was held at Wellington College, 9-12 May, 1976. Forty-six seventh formers from Whangarei to Winton participated. The course was sponsored by the Wellington Mathematical Association and convened by Mr Trevor Boyle, Head of Mathematics, Horowhenua College, Levin. The main lecture course on Topology was given by Dr Ivan Reilly, University of Auckland. Other lecturers were Mr Doug Harvie, Professor Wilf Malcolm and Father John O'Neill. The students survived despite the intensive lecture programme and all-night sessions on the mini-computers made available by one of the local agents.

The Waikato Mathematical Association will hold its annual exhibition of student work, "A Match is Met", from August 15 to 31. The Annual Convocation and AGM will be held on Saturday October 2, the topic being "Objectives, Evaluation and Assessment".

The Auckland Mathematical Association will conduct a senior pupils' meeting, to discuss university courses, on August 17. The topic for their meeting on October 20 (7.30 pm at the University) will be "Feedback Systems". A Social Evening will be held at the Auckland Secondary Teachers' College on November 19.

For example, it is absurd to demand logical demonstrations from a professional speaker; we might as well accept mere probabilities from a mathematician.

Aristotle

EMPLOYMENT OF MATHEMATICS GRADUATES

The Society's committee on employment has prepared a brochure on employment for mathematician which provides commentary on

(1) the types of activity mathematicians are actually involved in during the course of their employment, with particular reference to the relationship between their training and their employment

(2) the expectations mathematicians may have when they embark on their employment and the extent to which these may be met

(3) the range and scope of the sorts of jobs available to mathematics graduates and other people who are qualified mathematically.

A number of mathematicians in teaching, government and industry were asked to write personalised accounts of their own experiences. It is hoped that these accounts, together with statistics as to where mathematicians have found employment, will make the publication of value to students currently studying mathematics and/or related subjects at any level. A copy of the brochure accompanies this issue of the newsletter and further copies will be supplied to Mathematics departments in tertiary institutions. Comments and suggestions for improvements are invited.

REPORT ON DUTIES AS A 'DEPARTMENTAL EMPLOYMENT ADVISER'

About 18 months ago the Mathematics Department at Waikato University agreed that a member of staff should act as an employment adviser to students within the department. As this adviser I have maintained a noticeboard providing current advertisements and information regarding graduate employment and postgraduate study, kept files on positions advertised (particularly in the Public Service),provided occasional reports to the department and discussed employment opportunities with students seeking advice.

In the case of students seeking immediate employment, perhaps the most important role of such an adviser is to make sure the student makes full use of the specialised advice available through university appointments officers and the like. However, I believe the most effective use of a departmental advisor is made by students who consult him earlier in their career with the aim of obtaining the general employment information which may influence their choice of courses and indeed of the level of qualification they seek.

To give useful advice in the latter case, information of the sort gathered on behalf of the N.Z. Vice-Chancellor's Committee and hopefully by the Society's employment committee is essential. It would also be valuable if some of the local information which may be gathered by individual departments and universities (e.g. as a result of surveys of local firms) were more widely available.

R.A. Littler

THE NZMS NEWSLETTER

The first five issues of the Newsletter have been produced and distributed by using the resources of the University Mathematics Department to which the current editor belonged.   It may be possible (and desirable) for this to continue for several years, while the Newsletter evolves and becomes established.

In my view, the current format is convenient, inexpensive and quite presentable.   Some savings on distribution expenses have been achieved by sending out the latest issue in departmental batches, for the "Honorary Correspondents" to distribute.

I would like to see the Newsletter develop along the lines of the Australian Mathematical Society Gazette, with contributed articles on such topics as teaching methods, course design, coordination of library resources, employment opportunities, as well as news, notices and reports of conferences and Council meetings.   The latest issue contained several such contributed articles and more may well be forthcoming after a little publicity.

I would think the abstracts of Colloquium papers could continue to appear in the Chronicle, while the Newsletter carried a report and commentary on the Colloquium as a whole.   I believe the Newsletter can play a very useful role while remaining largely complementary to the Chronicle, Mathematics Magazine, N.Z. Statistician, etc.

<div style="text-align: right;">

Donald Joyce
Editor of Newsletter

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ESSAY COMPETITION

The inaugural essay competition attracted five entries, covering a wide range of topics.   After considering the referees' reports, the President recommended to Council (and Council approved) that an open prize of $50 be awarded to Mr J.G. Peterson (Auckland University) and that book tokens to the value of $15 each be awarded to Messrs L. Homes (Otago), D. Mattina (Victoria), W. Rogers (Waikato) and P.J. Smith (Auckland). The titles of the essays were:

Peterson: "Single axioms for the classical equivalential calculus"
Homes: "Maps - a type of mapping"
Mattina: "Mathematically: aliens exist"
Rogers: "Missing Fibonacci numbers"
Smith: "A discussion of Bernhard Riemann's paper on the hypotheses
             that lie at the basis of geometry"

An abstract of Peterson's essay follows:

Single Axioms for the Classical Equivalential Calculus

The classical equivalential calculus is the portion of the propositional calculus in which equivalence is the only connective.   It has been shown by Lukasiewicz that the shortest single axiom for this system with substitution and modus ponens as rules of inference has eleven primitive symbols (variables or occurrences of the connective equivalence) and Lukasiewicz and Meredith have between them provided proofs for five such shortest single axioms. Meredith has further claimed (without proof) this property for six other formulas.   In treating the equivalential calculus, the essay shows that one of these six is not in fact a single axiom, and proofs are provided for all the ten known shortest single axioms. Furthermore, the theorem-proving computer techniques used in providing these proofs are discussed.

LOCAL NEWS

Auckland

Mr David Rhoades has been appointed a Junior Lecturer.
Lai Chin Diew has completed his Ph.D., from V.U.W.
Drs Calvert, Ramankutty and Walker have returned from overseas leave.
The intended visit by Warren Wong has been cancelled.

Seminars have been given by the following visitors:

R.J. Beran (Berkeley), on: "An efficient and robust estimator of location",

G. Gnanadesikan (Bell Laboratories), on: "Graphical methods for the
        evaluation of data",

M.Rosenblatt (La Jolla), on: "Density estimation",

M. Herzog (Tel Aviv and ANU Canberra), on: "The new sporadic simple groups",
        and "On recent classification of simple groups",

M.L. Levitan (Villanova, Penn.), on: "Ratio Limit Theorems in Markov
        Processes", and "An Over-determined Linear System".

Members of the Mathematics Department have given a series of seminars on
Catastrophe Theory:

Dr I. Stewart, on: "Introduction to Catastrophe Theory",
Mr R. Frimmel, on: "The Geometry of Catastrophes",
Dr G. Baird, on: "Euler Buckling" and "Collapse of Bridges",
Dr D. Gauld, on: "Light Caustics, Gas Laws, and other Physics Examples".

Other seminars given by members of the department included:

Mr C.D. Lai, on: "Wold's point process with Markov-dependent intervals",
        and "Characterization of bivariate distributions using
        canonical correlation coefficients",
Dr D. Ryan, on: "Vehicle scheduling",
Mr G.J. Tee, on: "Applications of Chebyshev Polynomials in Numerical
        Analysis" and "Romberg Integration with near-singular
        integrands",
Dr J.H. Verner, on: "Polynomial fitting in a channel",
Dr W. Walker, on: "Singularities of Ordinary Differential Equations",
Prof. J.C. Butcher, on: "Efficient Implementation of Implicit Runge-Kutta
        Methods".

G.J.T.

Massey

Dr Peter Thomson, a graduate of Otago and ANU, has joined the Mathematics
Department as a senior lecturer in statistics. His research interests are
in time series and stochastic processes.
Dr D.S. Bridges, lecturer in mathematics at the University College of
Buckingham, will be visiting Massey until mid January 1977. He is interested
in functional analysis, logic and set theory, and the foundations and
practice of constructive mathematics.

Seminars given in the department recently include:

James Beard (Victoria): "Faults, Pockets and Umbilics"
Sam Choy (Massey): "Weighing Designs"
Gordon Knight (Massey): "Student evaluation of mathematics teaching"
Dick Brook (Massey): "The geometry of least squares and biased estimators"
John Reynolds (Massey): "Least squares embedded in modification processes"
Terry Moore (Massey): "Efficient Biased Estimation"
Prof. Frank Harary (Michigan): "Recent results in Graph Theory including
                the Four-colour Theorem?" (read by Prof. Robinson)
Prof. Robert Robinson (Newcastle): "Isomorphic factorization in graphs"

Applied Mathematics Division, D.S.I.R., Wellington

Dr David Ratkowsky of the Hobart Branch of CSIRO, Division of Mathematics and Statistics, will be spending 9 months at AMD beginning in September.

Dr Ratkowsky has had extensive experience in the application of statistical methods to biological and physical problems and is particularly interested in multivariate data analysis including such procedures as principal components, discriminant and canonical variates analysis, classification and ordination.

R.B.D.

Victoria

From August 15 to 21 the Mathematics and Philosophy Departments will be running a Vacation School of Logic. It is intended to introduce logic to mathematicians, philosophers and computer scientists without previous specialist knowledge. There will be courses on a choice of six topics, and also research papers. Accommodation has been booked in Weir House. Contact Mr M Brockway, Mathematics Department, V.U.W. for further details.

Jock Hoe returned from his visit to Paris (see Newsletter No. 5) with his book on 13th century Chinese algebra of polynomials in press and accepted as his thesis for the Doctorat de Spécialité of the University of Paris VII.

David Vere-Jones has handed over the Chairmanship of the Mathematics Department to Wilf Malcolm. He is soon to go on sabbatical leave to Japan, where he has been awarded a Visiting Professorship by the Japanese Foundation for the Promotion of Science, and to Canberra.

J.F.H.

Canterbury

Ting On To, Graeme Wood, and Brian Woods have returned from leave, and Peter Waylen has begun leave at the Institute of Astronomy, Cambridge, and the Institute of Advanced Studies, Princeton. Brian Woods divided his leave between the Department of Engineering, Cambridge, and Cranfield Institute of Technology. His claim to have worked hypersonics out of his system should not be taken too seriously. Graeme Wood spent a year at Khon Kaen University, Thailand, on a Canterbury Centennial Fellowship.

Graham Logan received his Ph.D. in May, his thesis being about closure algebras and their dual spaces. He is now lecturing at the Christchurch Technical Institute. Ten students graduated M.Sc. in Mathematics during the past year. (An M.Sc. at Canterbury is a research degree consisting of a thesis only or a thesis and papers).

Renovations have been completed in the former Psychology section of our building. We now have more staff offices, shared offices for the Ph.D. students and teaching fellows, an M.Sc. room, an Honours 3 room, a statistical and numerical laboratory, a card punch room, a computer terminal room and tutorial rooms.

Gordon Petersen is having difficulty finding a suitable date for the joint Australian-New Zealand Mathematics Colloquium in 1978. The best time appears to be in the 20th week, when Victoria is the only University in Australia and New Zealand not having a vacation, so it would seem that Victoria will once again suffer a clash between lectures and papers.

P.J.B.

Otago

Dr P. Fenton, whose research interest is in complex analysis, arrived in May to take up a Lectureship.

Dr H.J. Efinger has resigned and will be leaving in August to return to Austria.

Dr A.B. Evans and Dr M.J. Curran, who have been Assistant Lecturers, have been promoted to Lectureships.

We are having an extended visit (June 1976 - January 1977) from Dr D.P. Mason, who is a Senior Lecturer on sabbatical leave from the University of Witwatersrand, Johannesburg. Dr Mason is presenting weekly lectures on "Relativistic Magnetohydrodynamics". We expect a 6-week visit in July and August from Professor A. Levine of Tulane University. Professor Levine visited in 1975 and had a successful collaboration with Professor Mandel on monitoring of adverse reactions to drugs. We also expect short visits in July and August from Dr Ian Stewart, Professor Frank Harary, and Professor René Thom.

Professor W. Davidson has been elected a Fellow of the Royal Society of New Zealand.

G.O.

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QUOTABLE QUOTES

One may say that mathematics talks about things which are of no concern at all to man ... It seems an irony of creation that man's mind knows how to handle things the better the farther removed they are from the centre of his existence. Thus we are cleverest where knowledge matters least : in mathematics, especially in number theory.

Hermann Weyl

I have an impression that there is a tendency to neglect the historical roots of the subject, and to build the theory on foundations which have actually been discovered later. This method undoubtedly arrives quickly at experts able to apply what they have learnt. But I doubt whether it is a good training for original research, because it fails to show how the pioneer finds his way in the jungle of unordered facts and obscure theoretical attempts.

Max Born

Academic persons, when they carry on study, not only in youth as a part of education, but as the pursuit of their maturer years, most of them become decidedly queer, not to say rotten; and those who may be considered the best of them are made useless to the world by the very study which you extol.

Plato

I remember saying many years ago when I started teaching that every student should get at least 70 per cent on his examinations. If he did not then he had been doing the wrong course. The idea that somebody with a dilute fraction of a demanding course is in any sense educated does not convince me.

Sir Hermann Bondi, F.R.S.

CONFERENCES 1976-77

Sep 6-9   **Conference on Nonlinear Waves and Solitons**
(Newcastle)   Details from Prof. N.C. Freeman, School of Mathematics,
The University, Newcastle upon Tyne,
NE1 7RU, ENGLAND.

Sep 6-10   **European Meeting of Statisticians**
(Grenoble)   Details from Mme Senechal, Institut de Recherches en
Mathématiques Avancées, Bp53, 38041 Grenoble,
FRANCE.

Sep 6-11   **NATO Advanced Study Institute on Boundary Value Problems
for Evolution of Partial Differential Equations**
(Liège)   Details from Prof. H.G. Garnir, Department of Mathematics,
Université de Liège, 15 Avenue de Tilleuls,
4000 Liège, BELGIUM.

Sep 20-24   **Symposium on Computational Statistics**
(Berlin)   Details from COMPSTAT, c/- Universitätsaussenamt de Freien
Universität Berlin, Harnackstrasse 4,
1000 Berlin 33, GERMANY.

Sep 28-29   **Mathematics at the Education/Employment Interface**
(Uxbridge)   Details from the Secretary and Registrar, Institute of
Mathematics and its Applications, Maitland
House, Warrior Square, Southend-on-Sea,
Essex SS1 2JY, ENGLAND.

Oct 8-10   **Annual Conference of Australasian Association for Logic**
(Canberra)   Details from Mr M.A. McRobbie, Department of Philosophy,
Research School of Social Sciences,
Australian National University, POB 4,
Canberra, ACT 2600, AUSTRALIA.

Nov 3-5   **Miniconference on Partial Differential Equations**
(Canberra)   Details from Prof. N.S. Trudinger, Department of Pure
Mathematics, School of General Studies,
Australian National University, POB 4,
Canberra, ACT 2600, AUSTRALIA.

Jan 4-7   **International Conference in Combinatorics, Computing
and Graph Theory**
(Barbados)   Details from Mr C.C. Cadogan, Mathematics Department,
The University of the West Indies, Cave Hill
Campus, P.O. Box 64, Bridgetown, BARBADOS.

Feb 6-9   **Australian Applied Mathematics Conference**
(Terrigal)   Details from Dr N.G. Barton, School of Mathematics,
University of New South Wales, POB 1,
Kensington, NSW 2033, AUSTRALIA.

Apr 18-23   **International Conference on Differential Equations**
(Uppsala)   Details from Dr G. Berg, 1977 Mathematics Conference,
University of Uppsala, Box 256, 75105 Uppsala,
SWEDEN.

N.Z. EXPORTS WOOD TO THAILAND

For a twelve month period from May 1975, Dr G.R. Wood of Canterbury University was with Khon Kaen University in Thailand, assisting with the setting up of their mathematics department. Khon Kaen is the administrative centre of the poorer north-eastern plateau, and the site of the only university in the north-east region of Thailand.

Thai students learn English much as we learn French, so the language difference, together with lack of student motivation, provided considerable difficulties in teaching. But the Keller Plan (yes, it's everywhere!) was used during the second semester to largely overcome these problems.

A staff of seven was lecturing each of the two thousand students at some level, so were well overworked by New Zealand standards. Yet in conjunction with two staff members a project was begun to link the department with the agriculture faculty via an ANOVA service. Programmes and an operating manual were written enabling staff of the agriculture faculty to analyse their experimental results, using a programmable calculator recently bought by the mathematics department.

So if you want to try stuffed squid, or be mistaken for a CIA agent, or dodge the odd snake as you walk to work, take a part of your next sabbatical at Khon Kaen University. You'd be welcome.

DANNEVIRKE GOLF

The Manawatu Evening Standard published the following report on May 25, under the heading "Dannevirke Golf":

> mathematics colloquiun -
>
> Mathematicians from all over New Zealand are in Palmerston North this weekend to take part in the eleventh national weekend include:- or gathering.
>
> Althogether 125 mathematicians, from schools, polytechnics, universities and other educational institutions, will be hearing and discussing 65 papers at Massey University.
>
> The last time a similar gathering was held at Massey was in 1970,when 70 people discussed 22 papers.
>
> Some of the topics which will be discussed this weekend include. "Orthogonality in the Affine Plane", "Fun with Tessellations", "Stability of Bifurcating solutions", and "Stability questions in the theory of general deterrance", which relates to accident compensation.

Another account of the 11th Mathematics Colloquium was printed in the Waikato Mathematical Association Newsletter:

> "The Annual Colloquium of N.Z. Mathematicians was held this year at Massey University and was a surprisingly stimulating experience for those who went. A new feature of the Colloquium was a whole day (out of the 2½) devoted to mathematics education and while this year it was aimed more at education in universities, it seems quite certain that the spot-light will (and should) be soon turned to other areas of our education system so that ideas can be spread widely and rapidly. This year for example, we heard of an exciting statistics course being run at Massey, which caters for every individual taking the course, and a student can ensure a pass by plodding along at his own rate. The old idea that universities put on a course and students are free to accept or reject it, seems happily to be dying with an appreciation by them that there is a responsibility to take the student as he is and start from there."

The inaugural NZMS Lecture was presented by Dr Ian Stewart (University of Warwick), who spoke on "Catastrophe Theory". The other invited addresses were given by Prof. Terence Nonweiler (Victoria), on "The Estimation of Areas and Integrals from Discrete Irregular Data", and Mr Garry Tee (Auckland) on the Russian woman mathematician Sof'ya Vasil'yevna Kovalevskaya. All three addresses were very well received.

The programme on Sunday was primarily concerned with Mathematics Education. Open University films were shown and papers were contributed by:

Mr G.H. Knight (Massey), on "Student Evaluation of Mathematics Teaching",
Dr R.J. Brook (Massey), on "A Self-Paced Study Course in Statistics",
Ms M.J. Clark and Dr L. Johnston (Victoria), on "Teaching of First-Year
            Students at V.U.W."
Mr H. Offenberger (Wellington Polytechnic), on "Bridging the Mathematical
            Gap for NZ Certificate Holders intent on Direct Entry into
            the University",
Dr G. Olive (Otago), on "Mathematics for Liberal Arts Students",
Mr A.E. Naftel (Palmerston North Teachers College), on "Cognitive and
            Affective Correlates of Performance in a Mathematics Education
            Course at a N.Z. Teachers' College".

(It is hoped that some of these papers will be published in the next Newsletter).

A lively panel discussion on "What should we teach in university mathematics courses, and why?" was led by Prof. Nonweiler, Dr Hugh Barr (AMD), Mr Peter Romanovsky (Careers Officer, Victoria) and Mr Bevan Werry (Christchurch Teachers' College).

Other features of the colloquium to attract favourable comment were the calculator and book displays and the bus trips (round the Massey Campus and farms, to Mt. Lees Reserve, and to the Mt. Bruce Wildlife Refuge).

The 12th Colloquium will be held at Victoria University during the week May 9-13, 1977.

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RECIPROCITY AGREEMENTS

Australian Mathematical Society

The terms of the agreement provide for individuals who are members of one Society to join the other for half the usual fee and thereby enjoy all the privileges of that Society, other than the right to vote.   This applies, of course, provided you are not resident in the country of the second Society.   Current subscriptions and prices are as follows:

(1)   Membership subscription (including the Gazette) : $15
            (with a remission of $2 for early payment)

(2)   Journal - Series A : $10

(3)   Journal - Series B : $2.50

(4)   Bulletin : $10

Thus members of the NZMS may join the AMS for $6.50 a year. They should obtain a note of authentication and an application form from our Treasurer and send both to the AMS Secretary (Mr W. Pye, Melbourne State College, 757 Swanston St, Carlton, Vic 3053, AUSTRALIA).

London Mathematical Society

The same terms apply as for the AMS (see opposite). Current subscriptions and prices are as follows (for the year beginning November 1, 1975):

(1)   Membership subscription : £3.00

(2)   Journal   : £6.00

(3)   Proceedings : £6.00

(4)   Bulletin   : £3.00

Thus members of the NZMS may join the LMS for £1.50 a year.
Application forms may be obtained from our Secretary.

Southeast Asian Mathematical Society

The same terms apply as for the AMS (see opposite). The current subscription is US$5.00, and privileges of membership include a quarterly newsletter and members rates for conferences, meetings and occasional publications.
Thus NZMS members may join the SEAMS for US$2.50. Application forms may be obtained from our Secretary.

OTHER N.Z. MATHEMATICAL PUBLICATIONS

Mathematical Chronicle

is published by the Mathematical Chronicle Committee, Department of Mathematics, University of Auckland, Private Bag, Auckland. The editors are Professor J.A. Kalman, Dr D.B. Gauld and Dr M.K. Vamanamurthy. The subscription is $7.00 per volume of three issues, with a reduced rate of $3.50 for individual subscribers, and a further reduction to $2.50 for members of the NZ Mathematical Society.

Mathematics Magazine

is published by the Auckland Mathematical Association, P.O. Box 6855, Auckland 1. The annual subscription for individuals is $4.00 and three issues are published each year.

Network

is published by the Mathematics Education Department of Christchurch Teachers' College (Secondary Division), Dovedale Avenue, Ilam, Christchurch 4. It exists to help provide an exchange of ideas among all those concerned with Mathematics Education in secondary schools.

N.Z. Operational Research

is published by the Operational Research Society of N.Z., P.O. Box 904, Wellington. The editor is Dr H.G. Daellenbach. The annual subscription for individuals is $4.50 ($6.00 including Newsletter) and two issues are published each year.

N.Z. Statistician

is published by the N.Z. Statistical Society, P.O. Box 1731, Wellington. The editor is Dr R.B. Davies. The annual subscription for individuals is $2.00 and three issues are published each year.

SUBSCRIPTIONS FOR 1976-1977

Members and prospective members are reminded that their subscriptions for
the year 1976 - 1977 were due on 1st April 1976.   The annual subscription
of $5 (reduced to $1 for students) should be sent direct to:

> The Treasurer
> New Zealand Mathematical Society
> Department of Mathematics
> University of Auckland
> Private Bag
> AUCKLAND

OFFICERS FOR 1976-77

President:	Professor Gordon Petersen	(Canterbury)
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	Dr Robert Davies	(AMD,DSIR)
	Professor Desmond Sawyer	(Otago)
	Professor Brian Woods	(Canterbury)

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THE NEWSLETTER

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Garry Tee (Auckland), Mark Schroder (Waikato), John Harper (Victoria),
Robert Davies (AMD), Ian Donaldson (PEL), Peter Bryant (Canterbury) and
Gloria Olive (Otago).

Contributions are invited from anyone who has anything to say of interest
to the N.Z. mathematics community.   Local News items may be sent to one
of the Honorary Correspondents or direct to the Editor (c/- Mathematics
Department, Massey University, Palmerston North, NEW ZEALAND).