THE NEW ZEALAND MATHEMATICAL SOCIETY

NEWSLETTER

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THE NEW ZEALAND MATHEMATICAL SOCIETY

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

Publications

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

Other Activities

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

Membership

Members are able to receive the New Zealand Mathematical Chronicle at a reduced rate and to become reciprocal members of a number of overseas societies including the American, Australian, South East Asian, London and Edinburgh Mathematical Societies and the Canadian Mathematical Congress. Membership fees are due on the first of January each year. The full subscription is $7.00 and the student rate is $1.00. Applications for membership should be made to the Treasurer (Mr H.S. Roberts, Applied Mathematics Division, DSIR, Wellington).

EDITORIAL

With this issue of the *Newsletter* we introduce three regular features: a Letters to the Editor section, a Problem Section and a Book Reviews section. We see the *Newsletter* as being able to provide a wider service to readers through this development, and hope that readers will take advantage of it to provide information and feedback. We desire that this publication be a usable medium. In particular, we encourage members to use the Letters to the Editor section; your correspondence will enable the Council of the Society to feel the pulse of the membership at large.

Also included in this issue is the Constitution of the Society, as approved at the Annual General Meeting in May this year.

Letters To The Editor:

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

Editor, *Newsletter*:

Would you consider placing advertisements in the *Newsletter* as a means of getting revenue for the Society, perhaps to offset the cost of printing? I envisage book publishers, book retailers, calculator wholesalers etc. being asked to participate.

Dean Halford, Massey University.

[I would certainly ask the Publications Committee to consider it. What do other members think? - Ed.]

PRESIDENT'S ANNUAL REPORT, 1979

On behalf of the Council of the N.Z. Mathematical Society I have the pleasure to present the fifth annual report of the Society.

This last year has been a year of steady growth in the activities of your Society. The membership now stands at 174 (as at April 1979). The most interesting increase has been in the participation of three new Institutional members (Burroughs Ltd., Mobil Oil (NZ) Ltd., National Mutual Life of Australasia) in the life of the Society. The first of these (Burroughs) has agreed to pay for the next (1979) edition of the Employment Brochure which is being edited by Ray Littler of Waikato University. (Spare copies of the 1977 edition, of which 2000 copies were distributed, are now almost exhausted. It is pleasing to learn of the many favourable comments that have been made on this publication).

We have been pleased to see that the scope of the Newsletter content continues to increase under the Editorship of Dean Halford. It is clearly the most tangible and immediate benefit to members who join the Society. The work-load on the Editor, and the Department in which he works, is now quite large. Involvement in other publishing ventures continues to increase in a rather sporadic manner but is generally increasing. We are still looking at the viability of further publications of the Society.

International relationships have been expanded this year with the conclusion of the much awaited reciprocity agreement with the American Mathematical Society and the opening of contact with the Chinese Mathematical Society. A tentative arrangement with the Japanese Mathematical Society is hoped to lead to the conclusion of a reciprocity agreement in the near future. We now have 8 reciprocal members in the N.Z.M.S.

As a member body we have been instrumental in urging the Royal Society of N.Z. to make application to join the International Union of Theoretical and Applied Mechanics. This was agreed by the Royal Society in March 1979. It was a great honour for me, as President of the Society, to be selected to represent N.Z. as delegate to the Eight General Assembly of the International Mathematics Union in Helsinki in August 1978. I found the experience informative and interesting. My report to the Royal Society on this meeting has been published in the December 1978 issue of the Newsletter.

Your Society made strong representation to the Minister of Immigration on behalf of Dr. Chin Diew Lai who was refused, in the first instance, an entry visa to take up a lectureship in statistics at Massey University. It was pleasing to learn of the subsequent change of heart by the Government.

During 1978 we did not sponsor a Visiting Lecturer to N.Z. as we had put all our available resources towards the first Australian/N.Z. convention in Christchurch. However, the programme has been resumed this year with the visit of Dr George Andrews from Pennsylvania State University. We are glad that his itinerary was arranged so that he could be present at the XIVth Mathematics Colloquium in Hamilton. We supported Dr Wojtynski (Warsaw) as the

N.Z.M.S. Colloquium lecturer this year.

Although no summer schools were held in the last year we were pleased to support the mid-winter topology workshop in Hamilton last July. We commend the running of these activities to all centres.

Last December the Council accepted, on behalf of the Society, the invitation from the Australian Mathematical Society to join with them in Australia in the SECOND AUSTRALIAN/ NEW ZEALAND MATHEMATICS CONVENTION in May 1981. We hope our membership will help to make this occasion as much a success as was the FIRST CONVENTION in Christchurch in May 1978. The Colloquium will also have the opportunity of combining forces with the Australians at that time and we urge them to do so.

We welcome the formation of the N.Z. Association of Mathematics Teachers in May 1978, and we look forward to future cooperation between the Association and the Society. The proposal to exchange Council membews is being implemented and Dr Wilson represented the Society at the first meeting of the N.Z.A.M.T. last month.

I am pleased to report that the proposal made last year of having mid-term Council meetings in various centres (Hamilton, Wellington, Christchurch) was successful and was achieved at little cost ($70) to the Society.

There are many more small but significant activities that your Society has conducted during the year which has made the last year a busy but rewarding one for your Council. I would like, on behalf of you all, to thank Council members for their support, especially the four retiring members: Professor Petersen, Dr Broughan, Dr Reilly and Dr Wilson, and commend the work of the Society to you all as worthy of your continuing support.

G C Wake
PRESIDENT

8 May 1979

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MINUTES OF THE 5TH ANNUAL GENERAL MEETING (1979)

The Annual General Meeting of the New Zealand Mathematical Society was held in Lecture Theatre 4 at the University of Waikato on Tuesday 8th May 1979 from 5.15 pm until 6.45 pm.

PRESENT: There were 36 members present at the opening, which later rose to a maximum of 44 members, finishing with 26 members.

APOLOGIES FOR ABSENCE:

1. Professor D. Sawyer, Dr D.J. McCaughan, Dr I.L. Reilly, and Mr B. Stokes.

MINUTES OF THE 4TH AGM:

2. Each member present had a copy, and they were then taken as read. (Turner/Thornley)

PRESIDENT'S REPORT:

3. This was read by the President and approved. (Wake/Turner)

TREASURER'S STATEMENT:

4. This was examined and then adopted, subject to a correction of the date in the auditor's report. (Wake/Thornley)

A vote of thanks to the outgoing Treasurer, Dr I.L. Reilly was then passed.

HUMAN RIGHTS COMMITTEE:

5. Dr Gloria Olive was appointed Convenor of this Committee. (Vere-Jones/Roberts)

RELATIONSHIP WITH NZAMT:

6. Last year Brent Wilson represented the Society on the Association's Council, and Brian Stokes represented the Association on the Society's Council. Our new representative was left to the Council to appoint on a meeting by meeting basis. A panel on Mathematical Education had been held at the Colloquium, and Professor Vere-Jones asked the Council to ensure that the information was passed on to the NZAMT. The incoming President, Mr Turner offered to see to this.

SECOND AUSTRALASIAN MATHEMATICAL CONVENTION:

7. A cheque for $1800 had been donated to the Society from the profits of the convention "for the purpose of assisting New Zealand speakers to attend overseas or international mathematical conventions". There was a great deal of discussion on how best to make use of this money. Finally, the following motion was put:

"That the bulk of the money be used to assist New Zealand speakers at the 1981 convention in Australia". (Turner/Harvie)

This was carried by 16 votes to 13. It was then suggested that Council look into the possibility of chartering an aircraft to Australia. The Council was also to consider the question of underwriting the Australian convention to a certain extent.

IMU ASSEMBLY:

8. The President mentioned that the Council intended to ask the Royal Society to apply to the IMU to increase our grading from Grade I to Grade II. The cost would be borne by the Royal Society. This action of the Council was endorsed by the meeting.

RECIPROCITY AGREEMENTS WITH OTHER SOCIETIES:

9. The President reported that the agreements with the U.S.A. had been completed, and that Council was going to explore the possibility of an agreement with the Mathematical Association of America. Negotiations were proceeding with China and Japan.

MEMBERSHIP OF IUTAM:

10. The President reported that the Royal Society had agreed to apply for N.Z. to join IUTAM. A national committee was being formed.

ROYAL SOCIETY SUPPORT:

11. Strong pleas had been made to the Royal Society for financial support. The matter had been taken further with the Minister of Science and now rested with a sub-committee of the Royal Society which was looking into the matter.

MATHEMATICS COMPETITION:

12. Council was investigating the possibility of a Pre-Doctoral thesis competition. IBM had offered prize money to the extent of $150. Discussion took place as to whether the winner of the competition ought to talk on their topic at a Colloqium, with many members doubting the latter point.

PUBLICATIONS COMMITTEE REPORT:

13. This was presented by K. Broughan and received. (Broughan/Harper)

SUBSCRIPTION:

14. Council recommended a subscription of $12 for 1980. This was approved after some discussion. (Wake/Turner)

CONSTITUTIONAL AMENDMENTS:

15. A slight amendment was made to the wording relating to the NZAMT representative on the Council. The amendments were passed in one block. (Roberts/Wake)

ELECTION OF OFFICERS:

16. The following officers were elected:

Incoming Vice President:	Dr D. Joyce (Unopposed)
Council:	Dr M. Schroder) Mr R. Long) After Election Dr G. Olive)

The Council is now constituted as follows: (with retiring dates in brackets)

President	John Turner	(1981)	
Immediate Past President	Graeme Wake	(1980)	
Incoming Vice President	Donald Joyce	(1982)	
Members:	Mark Schroder	(1982)	Secretary
	H.S. Roberts	(1981)	Treasurer
	W.D. Halford	(1981)	Editor
	D.C. Harvie	(1981)	
	G.M. Thornley	(1981)	
	R.S. Long	(1982)	
	G. Olive	(1982)	
	A.R. Clark		Auditor

GENERAL:

17. a. Incorporation. Council was instructed to investigate the possibility of incorporation in 1980, and to bring forward any necessary constitutional changes.

b. Professor Forder's 90th Birthday: Professor Kalman invited members to submit articles in honour of Professor Forder, to the Mathematical Chronicle.

A vote of thanks to the outgoing President was moved by Mr Turner and passed with acclamation.

H S Roberts
SECRETARY

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EXTRACTS FROM THE MINUTES OF THE EIGHTH COUNCIL MEETING (1979)

The Council Meeting of the New Zealand Mathematical Society was held in Room F1.08 of the Science Block at the University of Waikato on Sunday 6 May 1979 from 11 a.m. to 7 p.m.

PRESENT: Dr Wake (Chairman), K Broughan, W D Halford, D C Harvie, H S Roberts, G M Thornley, J Turner, B Wilson; Mr B Stokes was also present as an observer from the N.Z. Association of Mathematics Teachers (NZAMT).

EDUCATION SUB-COMMITTEE: Mr Turner said that the sub-committee had made a study of courses and of previous students. He had sent out circulars about these, but had only had two replies, one being his own. The sub-committee also recommended that the Council take notice of Professor Vere-Jones' Subject Conference. The Sub-Committee also hoped to make a collection of courses and contents.

RESOLVED: The new sub-committee be Mr Turner and Dr G Thornley, and consult with the NZAMT.

INTERNATIONAL UNION OF THEORETICAL AND APPLIED MECHANICS (IUTAM): The President reported that the Royal Society had agreed to make application for New Zealand to join IUTAM.

AUSTRALIAN MATHEMATICAL SOCIETY: Copies of minutes etc., are to be sent to Australia, and a copy of the Agenda for the next AGM with an invitation for an observer to be present.

AUSTRALASIAN MATHEMATICAL CONVENTION 1978: The Council had been advised that the Society was about to receive $1800 from the profits of the 1978 Convention. This matter was to be brought up at the AGM. The Secretary was to write to the Convention Secretary thanking them for the money.

ARCHIVES: The Secretary reported that the Archives of the Society had been deposited with the Royal Society in Wellington.

NZMS COLLOQUIUM LECTURER: The Chairman reported that the lecturer was appointed by the President for each colloquium. This year, Dr Wojtynski from Warsaw had been appointed.

EMPLOYMENT BROCHURE: The Chairman reported that the expenses for this were to be underwritten by Burroughs. A letter had been received from the Christchurch branch of the Department of Labour, showing very great appreciation for the brochure and applauding the Society on the value of the work done. The next issue of the brochure was hoped to be available in July 1979.

POST GRADUATE TOPICS: Concern was expressed over the lack of uniformity of content. The matter was referred to the Publications Sub-Committee.

ROYAL SOCIETY:

(1) A draft of the Annual Report to the Royal Society was adopted with amendments after Mr Harvie had spoken to it briefly.

(2) Nominations for the National Committee of Mathematics to be held over to the AGM. Whoever was elected should act as a Liaison Officer with the Council.

(3) Two nominations were forwarded to the Royal Society for Fellowships.

(4) The President of the Royal Society to be invited to future Council meetings.

(5) The Royal Society was looking further into the question of more financial support for overseas travel for mathematicians.

VACATION SHCOOLS: A second mid-winter Topology Workshop was to be held in Auckland during 1979 and an Analysis Course was to be held in Wellington in June 1979.

RELATIONSHIP WITH NZAMT: When attending the other's meeting each Society would pay its own expenses.

VISITING LECTURER FOR 1979:

A report was presented by Dr Broughan, concerning the visit of Professor George Andrews. The possibility of the 1980 lecturer being an indigenous mathematician was discussed.

RESOLVED: That the visiting lecturer be made an annual event, and that the report be accepted with thanks.

CONSIDERATION OF MATTERS TO BE RAISED AT THE 5TH AGM:

(1) ANNUAL REPORT: The draft Annual Report was presented by the President and adopted with amendments.

(2) 2ND AUSTRALASIAN CONVENTION: The timetable of 1981 for the next convention was accepted by the Council in the hope that the Colloquium would also do the same. In 1981 the AGM will be held in Sydney.

(3) SUBSCRIPTION: It was resolved that it be a recommendation to the AGM that the subscription be $12.

(4) RELATIONSHIP WITH NZAMT: Dr Wilson spoke to the meeting about the Bank of NSW competition for secondary pupils. He would like to see more co-operation with Australia in this matter. Constitutions between the N.Z. Mathematical Society and NZAMT were exchanged. The Association's representative, Mr Brian Stokes, accepted our constitutional amendment giving his organization a place on our Council. We also have a representative on the NZAMT Council on a meeting by meeting basis.

(5) IMU ASSEMBLY: It was agreed to recommend to the AGM that NZ be raised from Grade I to Grade II. There was one dissident vote to this.

(6) RECIPROCAL ARRANGEMENTS WITH OTHER SOCIETIES:

(a) U.S.A.: The President reported that the reciprocity agreement had been made. The Council was now to explore relationships with the Mathematical Association of America.

(b) China: The President reported that negotiations were under-way towards a reciprocity agreement. We had already been sent some copies of ACTA SINICA, which were agreed to be held by Victoria University.

RESOLVED: That a subscription be sent to the Mathematical Chronicle on behalf of the Chinese Mathematical Society.

(c) Japan: A reciprocity agreement was being negotiated.

MATHEMATICS COMPETITION: The essay competition was to be revised. A thesis competition was supported by all university mathematics departments except Auckland. IBM offered $150 for prize money.

PUBLICATIONS SUB-COMMITTEE: Dr Broughan presented a report and envisaged one project a year.

(1) An approach to the Royal Society concerning the published works of Professor Keith Bullen was approved.

(2) The relationship with the Mathematical Chronicle Committee to be taken up with them by the Publications Sub-Committee.

(3) That Mr Gary Tee be invited to join the Committee.

(4) Colloquium Addresses: The President of the Society was to seek the Colloquium AGM's permission to invite speakers at this year's colloquium to submit papers to the Newsletter for possible publication.

(5) The question of publication of Vol.2 of Dr Jock Hoe's translation of an early Chinese Manuscript was to be referred to the Publications Sub-Committee.

CONSTITUTIONAL AMENDMENTS:

These were agreed with a minor amendment concerning the NZAMT representative. The incoming council was to discuss the matters of incorporation, student membership, and the possibility of setting up Fellowships of the Society.

NEWSLETTER:

Dean Halford presented a report, and four recommendations were adopted.

BUDGET:

The budget for the incoming year was approved by Council.

THANKS:

The Council passed a vote of thanks for the three outgoing members: Drs Kevin Broughan, Brent Wilson, and Ivan Reilly.

H S Roberts
Secretary

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"One of the most deplorable results of the onset of these new all-powerful computing techniques has been the way in which they have tended to seduce far too many of us into the collection of data on a myriad of subjects, without our having any precise idea as to what we will do with it when we have got it.

There can be no greater waste of time and money than to embark on intricate programmes of applied research before one has a clear idea of the precise course of action one intends to embrace before, and I emphasize 'before', a single piece of data has been collected".

Rt. Hon. J. Harold Wilson - Presidential Address to Royal Statistical Society).

"One cannot escape the feeling that these mathematical formulae have an independent existence and an intelligence of their own, that they are wiser even than their discoverers, that we get more out of them than we originally put into them". (Hertz)

"To every complex problem there is always a simple solution and it is always wrong".

(H.L. Mencken).

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CONSTITUTION OF THE NEW ZEALAND MATHEMATICAL SOCIETY

ARTICLE I: NAME

The name of this organization shall be the New Zealand Mathematical Society (hereinafter referred to as "the Society").

ARTICLE II: OBJECTS

The purposes for which the Society shall be established are

(1) To promote the development, application and dissemination of mathematical knowledge within New Zealand.

(2) To assist mathematicians in New Zealand to maintain effective cooperation with one another and with mathematicians and mathematical societies in other countries.

The Society shall be administered with these ends in view and not for the purpose of financial gain for its members.

ARTICLE III: MEMBERS

The membership of the Society shall consist of three classes of members - ordinary, honorary and institutional members. Ordinary membership shall be open to any person interested in the objects of the Society. Election to ordinary membership shall be by vote of Council (Article V) upon written application and upon payment of the annual subscription. The amount of the subscription shall be determined by Council from time to time. However, a member of a Society with which the New Zealand Mathematical Society maintains a reciprocity agreement shall, upon application to Council, be admitted as and remain an ordinary member of the New Zealand Mathematical Society at a reduced subscription, provided that he is not normally a resident in New Zealand. An honorary member shall be any person of distinction in the field of mathematics or any other person whose work or whose services to the Society are judged by the Council to merit election to honorary membership. There is no subscription for honorary members. Institutional membership may be granted by the Council to Institutions, Associations, business enterprises and other organizations interested in the objects of the Society.

The Annual General Meeting shall set the subscription for the following financial year (1 January to 31 December) for ordinary members, which shall be payable in advance. The subscription for Institutional members will be determined by Council in each case.

Resignations from membership of the Society shall be made in writing. Any person more than two years in arrears in subscription is no longer a member of the Society.

ARTICLE IV: BRANCHES

With the approval of the Council (Article V), regional branches may be formed from members

of the Society normally residing in a particular region. Each such regional Branch shall elect annually a Convenor and a Secretary (who may be the same person) and other officers from among its members. The persons so elected shall constitute the Committee of the Branch, and shall arrange meetings, including an Annual General Meeting, and otherwise conduct the business of the Branch.

Each Branch may send a delegate to each meeting of the Council. Delegates shall be allowed to speak but not to vote.

ARTICLE V: THE COUNCIL

The Council shall be the governing body of the Society. It shall consist of the President, two Vice-Presidents (Article VI), and six elected members. The six elected members of the Council shall normally serve for three years, in such a way that the terms of office of two of them expire each year. These members may be available for re-election but shall not serve for longer than six years in succession. If a current Council member is elected to the office of Incoming Vice-President (Article VI) the vacancy will be filled by the election of a further Council member for a term of three years. In this event if there are insufficient nominations to Council to cover this circumstance, then extra nominations will be called for immediately at the Annual General Meeting. Editors of any journals the Society may publish, if they are not already members of the Council, shall have the right to attend meetings and vote on matters pertaining to their journals. Council may co-opt further members for limited periods for specific purposes. In addition to the above members, one Council member will be a representative appointed by the New Zealand Assocation of Mathematics Teachers.

The Council shall determine the policies of the Society and shall supervise the affairs of the Society according to such by-laws as the Council may adopt. A by-law or amendment or repeal thereof shall come into effect thirty days after notification to the membership in a publication of the Society or otherwise in writing, unless during this thirty day period twenty members of the Society shall so petition and the by-law or amendment or repeal thereof shall then be submitted to a vote of the membership and shall not come into effect unless approved by a majority of those voting. However, this restriction shall not apply to those by-laws adopted at the time this constitution is first ratified.

The Council may enter into working arrangements and reciprocity agreements with other societies and organizations.

The Council shall meet at least once a year, and at other times if requested by the President or at least three members of Council. Members of Council shall be notified at least two weeks before any such Council meeting. In addition, a special meeting of the Council shall be held as soon as possible after the Annual General Meeting (Article VII) to appoint a Secretary and a Treasurer (Article VI) who shall be chosen from among the six elected members of Council. Five members of the Council shall constitute a quorum, provided that at least one of the members present shall be the President or a Vice-President. The President, or in his absence a Vice-President, shall normally preside as Chairman at

each meeting of the Council. All matters at Council meetings shall be decided by a majority vote of members of Council present and voting. In the case of a deadlock, the Chairman shall have a casting vote.

Any vacancy in the Council or Offices (Article VI) occurring other than by the normal expiration of a term of office, may be filled by an appointment of the Council. Officers and members thus appointed shall hold office until the next Annual General Meeting. When the vacancy is in the office of President of the Society (Article VI) the choice shall be made from one of the Vice-Presidents.

ARTICLE VI: OFFICERS

The Officers of the Society shall be as follows:

(1) The President

(2) A Vice-President who shall normally be the person who held the office of President immediately before the President in office; which person shall be known as the "Immediate Past President".

(3) A Vice-President who shall be the person elected to succeed the President in the following year; he shall be known as the "Incoming Vice-President".

(4) The Secretary

(5) The Treasurer

The term of office of the President and the Vice-Presidents shall be one year. The term of office of the Secretary and Treasurer shall be one year, but these officers shall be eligible for re-election.

The President shall be ex officio a member of all committees. He shall deliver the Annual Report of the Council at the Annual General Meeting (Article VII). The Secretary shall be responsible to Council for the records of membership, meetings and correspondence of the Society. The Treasurer shall be responsible to the Council for the management of the financial affairs of the Society in accordance with the policies determined by the Council. He shall keep the Society's financial records and prepare the necessary financial statements.

ARTICLE VII: MEETINGS

There shall be an Annual General Meeting of the Society at such a time and in such a place as the Council may determine. The business of the Annual General Meeting shall be:

(1) To receive the Annual Report of the Council.

(2) To receive the duly audited Annual Statement of the income and expenditure and assets and liabilities of the Society.

(3) To elect the Incoming Vice-President.

(4) To elect members of Council.

(5) To appoint an Auditor for the ensuing year.

(6) To transact any other business of which notice in writing has been given to the Secretary at least six weeks prior to the Meeting.

Special General Meetings may be convened at any time by the Secretary or the President under the direction of the Council or upon the requisition of a petition of not less than 20 members of the Society to discuss only those matters specified in the petition.

Four weeks' notice of any Annual General Meeting or Special General Meeting shall be given to members.

The above regulations shall not apply to the Inaugural Meeting.

At every Annual General Meeting or Special General Meeting the Chair shall be taken by the President if present or in his absence by one of the Vice-Presidents, failing one of them, a Chairman to be nominated from members of the Council by the persons present at the Meeting. The quorum for General Meetings of the Society shall be twenty members. All business shall be decided by a majority vote of those present and voting. In the case of a deadlock the Chairman shall have a casting vote.

ARTICLE VIII: AMENDMENTS

An amendment to the Constitution may be proposed:

(a) by a petition of twenty members of the Society,

(b) by a decision of a General Meeting of the Society,

(c) by a decision of the Council.

An amendment shall be adopted by a majority of not less than three-fourths of the members who vote on the amendment by mail or at a General Meeting, provided the amendment has been duly proposed and the membership notified at least four weeks before the vote is taken.

This regulation shall not apply to the amendments (if any) proposed and adopted at the time this Constitution is first ratified.

ARTICLE IX: DISSOLUTION

The Society may be wound up voluntarily if the members, at a Special General Meeting duly called for the purpose, pass a resolution requiring the Society to be so wound up and the resolution is confirmed at a subsequent General Meeting called together for that purpose and held not earlier than thirty days after the date on which the resolution so to be confirmed was passed. Any assets remaining after all debts have been paid shall be given to organisations whose objects are similar to those of the Society.

BY-LAWS 1979

1. Date of the Annual General Meeting: The Annual General Meeting shall be held during the N.Z. Mathematics Colloquium at the same venue as the Colloquium.

2. Subscription Dates: The annual subscription shall be payable in advance and is due on 1 January in each year.

3. Subscription Rates: The subscription for Ordinary Members for the calendar year 1980 shall be NZ $12.00, except when the Ordinary Member is a student, in which case the subscription shall be NZ $1.00. The subscription for Institutional Members will be determined by the Council in each case.

4. Dates for Taking up Office: The Council and elected officers shall take up their positions on 1 June in each year.

5. Geographical Distribution: At least two of the Council members shall be residents of the North Island, and at least two shall be residents of the South Island.

6. Nominations: Each nomination of an Ordinary or Honorary member for the office of Incoming Vice-President, for a vacancy on Council or a nomination for the position of Auditor shall be put forward by two Ordinary or Honorary members of the Society. The written nominations, countersigned by the nominee, should be received by the Secretary not less than six weeks before the General Meeting at which elections are to be held. The Secretary, after consultation with Council shall prepare a complete list of nominations, which list shall be circulated to all members of the Society at least four weeks before the General Meeting. This by-law becomes binding on 1 January 1975.

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"Algebra is generous; she often gives more than is asked of her". (d' Alembert)

"Strange as it may sound, the power of mathematics rests on its evasion of all unnecessary thought and on its wonderful saving of mental operations". (Mach)

"Mathematicians are like Frenchmen: whatever you say to them they translate into their own language, and forthwith it is something entirely different". (Goethe)

"I am giving this winter two courses of lectures to three students, of which one is only moderately prepared, the other less than moderately, and the third lacks both preparation and ability. Such are the onera of a mathematical profession". (Gauss to Bessel, 1810)

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Local News

University of Auckland: Department of Mathematics

Enrolment

At the end of the first week the total number of students enrolled with the Department (for one or more courses) was 2100, an increase of 200 from the previous year.

Visitor

Dr Chris Triggs, who gained his M.Sc. in statistics here and is currently based at the University of Nottingham, is visiting for the second term.

Seminars

Dr B. B. Phadke (Flinders University) spoke on "Symmetric G-spaces".

Professor M.J.D. Powell (Cambridge) spoke on "Minimization without derivatives".

Professor George E. Andrews (Pennsylvania State University) spoke on "Ramanujan's lost notebook", and on "Sylvester and the Durfee square".

Professor J.W. Tukey (Princeton) spoke on "Smoothing and smelting in statistics" and on "Concepts in Data Analysis".

Dr David Gauld (Auckland) spoke on "Helsinki and Ann Arbor: a report on my short leave", and on "Unknotting spheres in the Lipschitz and quasiconformal mappings".

Colin Bailey (Auckland) gave a series of seminars on "Topoi".

G.J.T.

University of Waikato

Seng Ho and *Brett Mudford* both completed M.Sc. recently: the former returned to Malaysia, and the latter leaves shortly for Oxford to work under Professor L.C. Woods, aided by a Commonwealth Scholarship. *Peter Braun* has just completed D. Phil., with a thesis entitled 'Topics in Number Theory'.

Mr Peter Drummond helped us out in term I by teaching numerical analysis, and then took refuge in a post in Physics, after *Dr Ian Craig's* arrival.

[Dr Craig has this to say about himself: "Born 30.8.1950. Graduated B.Sc. (Hons) in Mathematics and Physics from University of London (1971). Obtained Ph.D. from University College, London (1974) working under Professor R.L.F. Boyd in the Mullard Space Science Laboratory. Science Research Council Fellow in Glasgow University, Department of Astronomy (1974 - 1976). Research Associate at the Institute of Plasma Research, Stanford (1977). Back to Glasgow (1977-1979), while still invited participant in Skylab Solar Flare and Active Region Workshop. Interests - music (rock, jazz, playing blues guitar) - art (life painting practitioner) - sport (everything except rugby and golf)"].

Mr French has gone on leave; both he and *Dr Sneyd* return at the end of the year. *Ms Gardiner* will be on leave in term III; *Mr Bolstad*, in terms III and I; and *Drs Braun* and *Broughan*, most of next year.

Professor Hosking will spend the next two years on secondment to the Asian Institute of Technology in Bangkok. *Dr Schroder* spent term I peacefully on leave in Hamilton (except for three weeks in Sydney at the S.R.I.).

The Dereidactyl is now undergoing pre-flight testing at Rukuhia airport, attached to a converted bus and with support from TV2.

In November, the whole department (at present scattered through the Science blocks) is to move into one of our 'relocatables', until block G is up.

Seminars

Dr Cyril Chapman (Medical Research Fellow, Auckland) spoke on the use of statistical methods in the study of the genetic causation of diseases.

Professor George Andrews (Pennsylvania State) addressed us on 'Ramanujan's "lost" notebook' and gave a public lecture on 'Sylvester and the Durfee square'.

Professor Tukey (Princeton) spoke at Ruakura on 'New Concepts in Data Analysis'.

Professor John Gamlen (Alberta, Edmonton) talked about discrete and continuous models in mathematical genetics.

M.S.

Massey University

Les Foulds has resigned to return to the Operations Research section of the Economics Department at Canterbury.

Courses

102 Principles of Mathematics is to be replaced by 104 Mathematical Models, which will consider models in pure mathematics, applied mathematics and statistics, including language and logic, probability, population genetics and population growth. 212 Statistical Methods and 304 Modern Geometry are to be offered extramurally in 1980 (the latter will allow some students to complete a fully extramural mathematics major).

Seminars

Dr L. R. Foulds (Massey University) spoke on "Comparisons of Labelled Trees".

Professor M.J.D. Powell (Cambridge University) presented "A Review of Algorithms for Constrained Optimization".

Professor G. Andrews (Pennsylvania State University) spoke on "Sylvester and the Durfee Square" and "Ramanujan's Lost Notebook".

Professor E. J. Hannan (Australian National University) spoke on "Transient Signals".

Graeme Winn (Ruakura) spoke on "General Rank-score Analysis".

Dr J. Gamlen (University of Alberta) talked about "Discrete and Continuous Stochastic Models in Mathematical Genetics".

Dr R. Milne (University of Western Australia) discussed "Extreme Correlation in Bivariate Poisson Distributions and Processes".

Professor J. W. Tukey (Princeton University) spoke on "Concepts in Data Analysis".

Dr C. D. Lai (Massey University) described "A Possible Stochastic Model for Earthquake Occurrences".

D.C.J.

Victoria University of Wellington

Ken Russell is recovering from a kidney transplant in Wellington Hospital. We all hope his operation will prove to have been a success.

Shirley Pledger has been appointed as a permanent part-time lecturer when she and Ken return from leave in Europe next year.

Sharleen Forbes is at present a temporary part-time lecturer.

Mick Roberts has been awarded his Ph.D. for his thesis entitled: "Stability and Motion of the Asthenosphere".

Thora Blithe and *Doug Harvie* have gone to opposite ends of Great Britain on sabbatical: the Universities of Surrey and Dundee respectively.

Our senior visitors, *Wojciech Wojtynski* and *Robin Milne*, have helped the mathematical life of the Department greatly, and have also made much appreciated contributions in their respective specialities of analysis (particularly Lie algebras) and statistics (particularly bivariate distributions).

The meeting in Analysis at the end of June was most successful. About 20 people attended, papers being contributed by 10 of them. Contributors have been invited to submit their papers for publication by the Society.

J.F.H.

University of Canterbury

Robert Bull has gone on leave. He will spend most of his time in California and British Columbia.

Alan McInnes is also on leave to be mostly spent in Maryland.

Seminars

Professor W. H. McCrea (Sussex University) talked on Large Numbers and Physical Constraints.

Professor J. W. Tukey (Princeton University) talked on Robust Estimation.

Professor George Andrews (Pennsylvania State University) talked on Ramanujan's Lost Notebook.

Dr Wojciech Wojtynski (University of Warsaw) spoke on Semi-Simple Lie Algebras of Finite and Infinite Dimensions.

P.F.R.

Secondary Mathematics in Canterbury

School Certificate Mathematics

The internal assessment of S.C. Mathematics is now in its fifth year, with the majority of schools in Canterbury and Westland taking part. Very few schools have withdrawn from the scheme. Pupils, teachers and parents seem to be very satisfied both with the organisation and with the effect on candidates.

Certificate in General Mathematics

This scheme for non-S.C. fifth form students is now in its sixth year and seems to be filling a real need in the schools. The only major difficulty with this (and internally assessed S.C.) is in educating employers in the implications of the schemes.

Cantamath 79

Organisation for this year's extravaganza are well under way. The venue is the Christchurch Town Hall on 9th-10th August. Last year 2,000 pupils from Form I-IV exhibited posters, designs, models, projects or took part in problem-solving competitions.

N.Z.A.M.T.

The recently formed Association of Mathematics Teachers had its first Countil meeting in April. Functions of the Association include co-ordination of the activities of member associations, and providing a united voice on matters of interest to mathematics teachers generally.

Canterbury Mathematical Association

Meetings so far this year have been (1) an informal look at mini-computers, (2) an address for students by *Alan Ramsay* on "Interesting Curves", (3) an address on number partititions by *Professor Andrews*.

The July meeting looks at "Calculators in the Classroom". Two new books have been added to the association's list of resources for teachers.

H.W.

University of Otago

Visitors

Professor W. H. McRea was a William Evans Visiting Professor from mid-March until his departure at the end of June. During this time he gave a course of lectures in Astronomy, two seminars (listed below), and open lectures sponsored by both the Science Faculty and the Royal Society. In addition, he (together with his former student, *Professor W. Davidson)* participated in the special Open Lecture Series commemorating the centenary of Einstein's birth. He spoke on "Einstein's Life and Work" and Professor Davidson spoke on "Gravitation, Cosmology and Einstein". (The other 2 participants were *Professor Dodd*

(Physics Department) who spoke on "Space, Time, Energy and Einstein", and *Professor Musgrave* (Philosophy Department) who spoke on "Einstein's Influence on Philosophy").

Professor George Andrews (the NZMS Visiting Lecturer for 1979) of Pennsylvania State University visited our campus in April. He gave lectures on "Partitions" and "Ramanujan's 'Lost' Notebook". Both of these lectures were video-recorded by our Higher Education Development Centre (AVLC).

We also had a visit from *Professor M.J.D. Powell* of Cambridge University in April. He gave a lecture entitled "A review of algorithms for constrained optimization".

Professor John Tukey of Princeton University and Bell Telephone Laboratories visited our campus in June. He gave a lecture on "Concepts in Data Analysis" and chaired a discussion involving a film on displaying multivariate data.

Seminars

Dr P. Fenton on "Small Entire Functions".

Dr J. H. Harris on "Problems with the consistency of existentially strong scientific theories".

Assoc Professor P. Tichy (Philosophy Department) on "Hintikka Distribute Normal Forms".

Professor W. Davidson on "Tests of General Relativity using Space Probes".

Professor W. H. McCrea on "The constancy of physical constants: DIRAC's Hypothesis".

Dr G. F. Liddell on "Examples of Physical states & their models in Quantum Mechanics".

Professor W. H. McCrea on "Rotational instability: astronomical applications".

Professor P. van Moeseke (Economics Department) on "Existence Theorems in Economics".

Dr J. Clarke (Organiser), *Dr M. J. Curran, Dr D.G.B. Hill,* and *Dr G. F. Liddell* have given a series of lectures for a special departmental seminar on "Lattice Theory".

Other

Our Department entertained a group of 50 Intermediate School Students in a "Saturday Club" as an activity for the International Year of the Child. It was organised by *Dr G.F. Liddell* and almost everyone in the Department contributed to its success.

G.O.

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"Researchers have already cast much darkness on the subject, and if they continue their investigations we shall soon know nothing at all about it". (Mark Twain)

* * * * * * * * * * * *

problem section

Readers are invited to contribute to make this a regular feature of the Newsletter. *Please send problems to Brent Wilson (address below).*

Attribution of the sources should be provided for problems that are not original and it would be helpful if some indication could be given of how a problem has arisen and whether a complete solution is known. Attempts at solutions should be sent to the setter of the problem or to Brent Wilson, Mathematics Department, University of Canterbury, Private Bag, Christchurch.

Problem 1 *(Firing squad problem)*

This problem was devised by John Myhill in 1957, and first appeared in print in Moore, "Sequential Meeting" 1964.

Consider a finite line of n machines, called "soldiers", all exactly alike except the ones at each end, a "general" and a "corporal". At each integer time each machine is in one of a finite number of "states"; the state of any machine at time t + 1 being a function of the states of itself and its two neighbours at time t.

The problem is to specify this function, the state transition function.

The goal is that at some time, all the machines must move to a particular state, "fire", simultaneously for the first time each. One of the states must be a "quiet" state, such that if a machine and its two neighbours are quiet at time t, the machine must remain quiet at time t + 1.

Initially, t = 0, all the machines are quiet except the general who is in state "begin operation". Each machine must have the same transition function, except the general and the corporal whose transition functions must be different, due to having one less argument. The number of states and the transition functions must be independent of n, (the number of machines); i.e. the soldiers cannot "count" very far.

Easy problem: Solve the problem as stated. (There is a fairly simply solution, where the time at "fire" is approximately 3n).

More difficult: Solve the problem using the minimum possible number of states. This minimum is unknown, but is conjectured to be six, including states "quiet", "begin" and "fire".

Extremely hard: Solve the problem so that the time at "fire" is 2n - 2. (This is clearly the minimum possible time).

Bill Taylor, Canterbury.

CONFERENCES 1979-1980

****1979****

August 20-25
(Ottawa)

Second International Conference on Representations of Algebras
Details from V. Dlab, Department of Mathematics, Carleton University, Ottawa, Canada K1S 5B6.

August 22-25
(Amsterdam)

International Symposium on Christiaan Huygens (1629-1695)
Details from Dr H.J.M. Bos, Secretary Committee Huygens 1629-1979, Mathematical Institute, Budapestlaan 6, Utrecht, The Netherlands.

August 22-29
(Hanover)

Sixth International Congress for Logic, Methodology and Philosophy of Science
Details from Sekretariat des Internationalen Kongresses für Logik, Methodologie und Philosophie der Wissenchaften, Welfengarten 1, D-3000 Hanover 1, Federal Republic of Germany.

August 26-Sept 1
(Sydney)

Second Australian Number Theory Conference
Details from J. Loxton, School of Mathematics, University of New South Wales, Kensington, NSW 2033, Australia.

August 26-Sept 1
(Quebec)

Canadian Mathematical Society Summer Research Institute on Mathematical Methods in Continuum Mechanics
Details from J. Heywood, Department of Mathematics, University of British Columbia, Vancouver, British Columbia V6T 1W5, Canada.

August 27-31
(Szeged, Hungary)

Colloquium on Finite Algebra and Multiple-Valued Logic
Details from Bela Csakany, Bolyai Institute, Szeged, H-6720 Hungary.

August 27-31
(Montreal)

Tenth International Symposium on Mathematical Programming
Details from Symposium Secretariat, Tenth International Symposium on Mathematical Programming, 772 Sherbrooke St West, Montreal, Quebec, H3A 1G1, Canada.

September-October
(Pavia, Italy)

Intensive Seminar on Free Boundary Problems
Details from E. Magenes, Laboratorio di Analisi Numerica, Consiglio Nazionale delle Ricerche, 27100 Pavia, Italy.

September 3-7
(Varna, Bulgaria)

Twelfth European Meeting of Statisticians
Details from Organising Committee, Twelfth European Meeting of Statisticians, P.O. Box 373, 1000-Sofia, Bulgaria.

September 4-9
(Warsaw)

Ninth IFIP Conference on Optimization Techniques
Details from K. Iracki, Systems Research Insitute, Polish Academy of Sciences, ul. Newelska 6, 01-447, Warszawa, Poland.

September 5-7
(Arcata, Cal.)

West Coast Conference on Graph Theory, Combinatorics and Computing.
Details from Phyllis Chinn, Department of Mathematics, Humboldt State University, Arcata, California 95521, U.S.A.

September 9-13
(Edinburgh)

Symposium on Trends in Applications of Pure Mathematics to Mechanics
Details from R. J. Knops, Mathematics Department, Heriot-Watt University, Riccarton, Currie, Edinburgh EH 14 4AS, Scotland.

September 16-21
(Swansea)

Lambda-Calculus Conference
Details from R. Hindley, Lambda-Conference, University College, Swansea, SA2 8PP, Great Britain.

September 17-23
(Blazejewko, Poland)

Second Conference on Probability Theory in Vector Spaces
Details from A. Weron, Department of Mathematics, Southern Illinois University, Carbondale, Illinois 62901, U.S.A.

October 2-6
(Newark, Delaware)

Symposium on Ill-posed Problems: Theory and Practice
Details from M.Z. Nashed, Symposium Director, Department of Mathematical Sciences, University of Delaware, Newark, Delaware 19711, U.S.A.

October 20-21
(Clayton)

Australasian Association for Logic Annual Meeting
Details from J. N. Crossley, Philosophy Department, Monash University, Clayton, Victoria, Australia 3168.

October 22-24
(Madison, Wisconsin)

Advanced Seminar on Dynamics and Modelling of Reactive Systems
Details from Mrs Gladys Moran, Mathematics Research Centre, University of Wisconsin, 610 Walnut St, Madison, Wisconsin, 53706, U.S.A.

November 8-11
(Aachen)

International Christoffel Symposium
Details from P.L. Butzer, Lehrstuhl A für Mathematik, Aachen University of Technology, 5100 Aachen, Federal Republic of Germany.

November 11-13
(Storrs, Connecticut)

Conference on Mathematical Logic
Details from M. Lerman, Department of Mathematics, University of Connecticut, Storrs, Connecticut 06268, U.S.A.

December 17-21
(New York)

International Symposium on Nonlinear Dynamics
Details from R.H.G. Hellemen, School of Physics, Georgia Tech, Atlanta, Georgia 30332, U.S.A.

****1980****

January 7-11
(Las Cruces, New Mexico)

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

January 8-12
(Austin, Texas)

International Symposium on Approximation Theory in Honor of George Lorentz
Details from E. W. Cheney, Department of Mathematics, University of Texas, Austin, Texas 78712, U.S.A.

January 14-18
(Canberra)

Eighth Biennial Conference of the Australian Association of Mathematics Teachers
Details from Ms Lois Boyd, Conference Co-ordinator, P.O. Box 20, Civic Square, Canberra, ACT 2608, Australia.

January 14 - Feb 9
(Canberra)

20th Summer Research Institute of the Australian Mathematical Society
Details from Dr J. Gani, Director-Elect 20th SRI, Division of Mathematics and Statistics, P.O. Box 1965, Canberra City, ACT 2601, Australia.

February 10-14
(Cowes)

Australian Mathematical Society Applied Mathematics Conference
Details from Dr F. Barrington, Department of Mathematics, University of Melbourne, Parkville 3052, Australia.

May 12-16
(Adelaide)

50th Jubilee ANZAAS Congress (incorporating the Annual Meeting of the Australian Mathematical Society)
Details from Dr D. L. Clements, Department of Applied Mathematics, University of Adelaide, GPO Box 498, Adelaide SA 5001, Australia.

May 18-21
(Auckland)

15th New Zealand Mathematics Colloquium
Details from the Colloquium Secretary, Department of Mathematics, University of Auckland, Private Bag, Auckland New Zealand.

August 10-16
(Berkeley)

Fourth International Congress on Mathematics Education
Details from ICME IV, Mathematics Department, University of California, Berkeley, CA 94720, U.S.A.

August 18-22
(Brisbane)

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

October 6-17
(Tokyo & Melbourne)

International Federation for Information Processing Congress
Details from IFIP Congress 80, GPO Box 880 G, Melbourne, Vic 3001, Australia.

NOTES AND NOTICES

HUMAN RIGHTS

Further to our information in the April 1979 issue of the *Newsletter* (pages 1-3) we report the appearance of several articles on Soviet mathematics and mathematicians, and the situation regarding Jewish mathematicians in the USSR, in particular, in the Notices of the American Mathematical Society, Volume 26, No. 4, pages 230 - 231 (June 1979) and Volume 26, No. 5, pages 305-308 (August 1979).

N.Z. MATHEMATICAL SOCIETY LAUNCHES COMPETITION

The Council of the New Zealand Mathematical Society has announced the holding of a competition for predoctoral thesis students. The competition will be first run in 1980 and the winners will be announced (and hopefully presented) at the Mathematics Colloquium in Auckland during May of that year.

Briefly the details of the scheme (which will be announced in full later) are that each N.Z. University Mathematics Department will be invited to forward (with the consent of the authors concerned) to the examining committee established by the Council up to three theses presented and examined in their Department in the two years from January 1978 until December 1979. Just which theses are sent is up to each Department to decide.

The number and value of prizes awarded will be decided by the Council on the recommendation of the examining panel. The prize money fund has been created by a grant of $150 (per year) from I.B.M. (N.Z.) Ltd. and the prize(s) are to be known as the "I.B.M. - N.Z. Mathematical Society Prizes".

INTERNATIONAL UNION OF THEORETICAL AND APPLIED MECHANICS (IUTAM)

The Royal Society of New Zealand has now established a National Committee of IUTAM, consisting of Dr I.G. Donaldson (Convenor), Professor C.M. Segedin, Dr P. Bryant and Messrs A.C. Andrews, R. E. Chilcott and P.C. Spearman.

MATHEMATICS EDUCATION RESEARCH IN NEW ZEALAND

The recently formed New Zealand Association for Research in Education is to hold its first National Conference at Victoria University, Wellington, from 7 - 10 December 1979. Within the Conference programme there will be streams, or sets of special interest activities, consisting of individual reports on current or recently completed research in a particular area together with a 'state of the art' paper describing the present state and future prospects for research relating to that area.

The conference Committee has decided to include Mathematics Education as one of the streams and has asked Gordon Knight to prepare the state of the art paper and to encourage other

workers in the field to give reports on their individual projects.

Mathematics Education Research takes place at a number of different levels and the projects have varying degrees of sophistication. At one extreme there is the New Zealand involvement in the International Association for the Evaluation of Educational Achievement Second Study of Mathematics, and at the other individual teachers 'trying something new' in their classrooms. Between these extremes there are regional projects on Certification, school involvement in individualised programmes and studies undertaken at Teachers Colleges or Universities as part of a formal course requirement. Mr Knight adds:

"I believe that a state of the art paper should reflect activity at each of these levels but only a very limited proportion of the research is ever published. Consequently I will need considerable help if I am to present a reasonable summary of this activity.

I would be most grateful if associations, schools or individuals who know of any activity in this area over a period of about the last five years, or currently underway, could let me have brief details.

Information might include:

(i) Name of persons or organisation involved and where the project took place

(ii) Dates of the project

(iii) Brief description

(iv) Whether the results were communicated to others, either by publishing or other means.

A good response to this request should enable me to produce a useful summary document which might stimulate further interest and involvement in the improvement of mathematics teaching in this country".

Please send information to Gordon Knight, Department of Mathematics and Statistics, Massey University, Palmerston North.

FELLOWSHIPS IN THE ROYAL SOCIETY OF NEW ZEALAND

There are currently four Fellows of the Royal Society of New Zealand who are New Zealand mathematicians. They are Professors W. Davidson, H.G.Forder, R.P. Kerr and G.M. Petersen.

In 1979 the New Zealand Mathematical Society nominated two more New Zealand mathematicians for Fellowship in the RSNZ and prepared supporting cases.

The NZMS is desirous of continuing to exercise this role and invites suggestions from members for the next nominations. Please forward suggestions to the NZMS President, Mr John Turner, Department of Mathematics, University of Waikato, Hamilton, as early as possible.

PROPOSED SIXTh FORM MATHEMATICS COURSE

In 1978 the Sixth Form Working Party circulated a draft course to all schools for comment, and in the light of the comments received has now drawn up a detailed course structure.

The four major objectives set for a Sixth Form mathematics course are:

(a) The course must be one in which all students achieve success and perceive the course to be a worthwhile contribution to their general education.

(b) The course must extend and enrich the students' general knowledge of the use of mathematics in everyday life.

(c) The course must provide students with skills, techniques and understandings required for studies in other subject areas.

(d) The course must prepare students for further mathematical studies, whether at Form 7, university, technical institute, or in special courses.

The syllabus permits a variety of courses. There is a minimum course called General Mathematics which is intended for those students whose backgrounds are insufficiently sound to pursue a mathematically sophisticated course. The full course is termed Continuing Mathematics and is for those students who expect to study mathematics at Form 7 or at a tertiary institution. It is possible for students to take a course intermediate between General and Continuing Mathematics. Each course contains Options which should allow the teacher and students freedom to pursue areas of need and interest.

The course has been constructed in full knowledge of the University Entrance Board Steering Committee's plans for changes to Form 7 mathematics prescriptions. It is assumed that the University Entrance qualification will continue to be awarded in the Sixth Form in the foreseeable future.

Implementation of the course, if approved, would not be before 1981.

Copies of the proposal in full detail have been widely circulated, and more are available from Mr B. W. Werry, Curriculum Department Division, Department of Education, Private Bag, Wellington. Comments are sought from all with an interest in the course, and should be sent to Mr Werry.

RECIPROCITY AGREEMENTS

American Mathematical Society

Members of the NZMS may join the AMS at a much reduced subscription rate (currently $US18 a year) which entitles you to all rights of ordinary members including the right to vote for officers of the AMS. A reciprocal member receives free copies of the *Notices* of the AMS, the *Combined Membership List* and the *Bulletin*, and is entitled to substantial price reductions on other publications of the AMS. Application forms for reciprocal membership can be obtained from our Treasurer who will endorse your application provided you are currently a financial member of the NZMS.

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*): $25 (with a remission of $5 for early payment)

(2) *Journal* - Series A: $12

(3) *Journal* - Series B: $3

(4) *Bulletin:* $12

Thus members of the NZMS may join the Australian Mathematical Society for $10 a year. They should obtain a note of authentication and an application form from our Treasurer and send both to the Australian Mathematical Society (D.G. Hurley, Department of Mathematics, University of Western Australia, Nedlands, Western Australia 6009, Australia).

Canadian Mathematical Congress

The same terms apply as for the Australian Mathematical Society. Current subscriptions and prices are as follows:

(1) Membership subscription (including newsletter) varies with annual income (I) according to the scale (Canadian dollars):
$0 \leq I < \$10{,}000$ ($5 subscription), $\$10{,}000 \leq I < \$20{,}000$ ($20)
$\$20{,}000 \leq I < \$30{,}000$ ($25), $\$30{,}000 \leq I$ ($30).

(2) *Canadian Journal of Mathematics:* $20.00

(3) *Canadian Mathematical Bulletin:* $12.50

(4) *Applied Mathematical Notes:* $6.00

Members of the NZMS may join for half the appropriate subscription fee. Applications should be addressed to the Secretary, Canadian Mathematical Congress, 3421 Drummond, Suite 15, Montreal, Canada H3G 1X7.

Edinburgh Mathematical Society

Members of the New Zealand Mathematical Society may join the Edinburgh Mathematical Society on payment of the reciprocity member's subscription. This is £5.00 for the current session (against £7.50 for a full member). A reciprocity member receives the *Proceedings of the Edinburgh Mathematical Society*, but does not have voting rights. Anyone wishing to become a reciprocity member should write to the Secretary, Edinburgh Mathematical Society, James Clerk Maxwell Building, Mayfield Road, Edinburgh EH9 3JZ, Scotland.

Southeast Asian Mathematical Society

The same terms apply as for the Australian Mathematical Society. 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.

London Mathematical Society

The same terms apply as for the Australian Mathematical Society except that reciprocal members do have the right to an LMS vote. Current subscriptions and prices are as follows:

(1) Membership subscription: £3.00
(2) *Journal:* £6.00
(3) *Proceedings:* £6.00
(4) *Bulletin:* £3.00

Reciprocal members are also entitled to a discount on the *Journal of Applied Probability*, LMS Monographs and LMS Lecture Notes. Members of the NZMS may join the LMS for £1.50 a year. Application forms may be obtained from our secretary.

OTHER NEW ZEALAND 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, Dr G.D. Dixit and Dr D.M. Ryan. The subscription is $10.00 per volume of three issues, with a reduced rate of $5.00 for individual subscribers and a further reduction to $4.00 for members of the New Zealand Mathematical Society. The Chronicle welcomes contributions of short research articles and mathematical notes by New Zealand mathematicians.

Mathematics Magazine

is published by the Auckland Mathematical Association, P.O. Box 6855, Auckland 1. The annual subscription for individuals is $5.00 and three issues are published each year. A reduced rate is available for students.

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.

New Zealand Operational Research

is published by the Operational Research Society of New Zealand, P.O. Box 904, Wellington. The editor is Dr H.G. Daellenbach. The annual subscription for individuals is $6.00 and two issues are published each year.

New Zealand Statistician

is published by the New Zealand Statistical Association, P.O. Box 1731, Wellington. The editor is Dr D. Rhoades. The annual subscription for individuals is $6.00 and two or three issues are published each year. A reduced rate is available for students.

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VACANCIES

DSIR: EXPERIENCED PRACTITIONER OR RECENT GRADUATE

We are seeking an operations research professional to join our group in Wellington during mid to late 1979.

Applied Mathematics Division has an active OR group of five people out of a full professional mathematical and statistical staff of 30. The group carries out a varied range of assignments, from projects with other government departments to advisory and consultant work with industry groups. Much of the work has been in the areas of transport, distribution, manufacturing and energy. Future projects are also likely to be in those areas.

Applicants should have a good honours degree, and be either an experienced practitioner or a recent graduate. They should have taken courses in one or more of: operational research, engineering, statistics, economics, mathematics or psychology. They should also be effective at oral and written communication, and be interested in problem solving and working with other people.

The position is a challenging one with good prospects for further experience and advancement. Starting salary is dependent on qualifications and experience and is according to the government scientific scale (initial maximum up to $17,050). Please address enquiries to: Dr Hamish Thompson, Director, Applied Mathematics Division, DSIR, P.O. Box 1335, Wellington.

MASSEY UNIVERSITY: LECTURER IN MATHEMATICS

A vacancy exists from 1980 for a Lecturer in Mathematics. The applicant should be qualified to teach in the general area of mathematics and be interested in the application of mathematics to industry or social science. Specific research interests in some area of operations research may be an advantage. Duties would include teaching extramural (distance) courses. Salary: $NZ11,894 - $NZ14,615. Further details of the position, conditions of appointment and the University may be obtained from the Registrar, Massey University, Palmerston North. Applications should be made as soon as possible.

DSIR: OPPORTUNITY IN COMPUTING

The Applied Mathematics Division is seeking a staff member to work in the computing applications field.

The Division, situated at Victoria University of Wellington, comprises Computing, Mathematical Statistics, Mathematical Physics and Operations Research sections.

The Computing Section is a group of 5 and has interactive access to various computers (HP21ØØ, B67ØØ, IBM37Ø/168) and comprehensive libraries. The Section's main service and research activities are:

(i) The provision of computing advice and assistance to other DSIR scientists. This assistance can include applications programming

(ii) Development, implementation and support of applications packages

(iii) The provision of data communications and interactive terminal services

(iv) Systems programming

Applications are invited for appointment to a position in which the primary tasks will be: advising and assisting computer users; the support of numerical and statistical packages; scientific application programming. Note that this is not a statistical consulting position.

Qualifications: degree (preferably honours) with numerical or statistical mathematics and computing. Particular interest in numerical mathematics or programming languages would be welcome. An important attribute will be a keenness to keep up-to-date so as to be able to encourage the use of computing in the Division in the most appropriate future directions. Students graduating this year will be considered. Training will be given and there are opportunities for further study.

Salary: $7,633 to $14,338 according to qualifications and experience. An increase is anticipated which may change this range to approximately $8,700 to $16,500.

Please address enquiries or applications to the Director, Applied Mathematics Division, DSIR, P.O. Box 1335, Wellington.

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"The mere fact that mathematics has been taught for centuries is no assurance that it will be retained". (Morris Kline, from his book *Why the Professor can't Teach: Mathematics and the Dilemma of University Education. St Martin's Press, N.Y. 1977.* Reviewed by E.H. Luchins in SIAM News Vol. 11, No. 5, page 2, October 1978).

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BOOK REVIEWS

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

Mathematical Analysis by M. D. Hatton. Hodder and Stoughton, London, 1977. 242 pp. $7.30 retail in N.Z.

This book was a great disappointment to me. I teach introductory real analysis to a class which includes many students who are not pure mathematics specialists. Accordingly, I wanted a text which was fairly classical in spirit and relatively inexpensive; Hatton's book satisfies both criteria. It has other good features. There are plenty of worked examples and exercises. Answers and hints for solutions are provided for most of the exercises. The level of treatment is rigorous without being unnecessarily pedantic.

The only serious complaint I have about the general plan of the book is that, in my opinion, too much space is devoted to complicated techniques for proving "obvious" limit statements concerning rational functions, from first principles. I believe this approach tends to reinforce the belief often held among students that analysis exists only to make simple things seem difficult. It would be better, I feel, to prove some basic limit theorems much earlier and devote more space to "non-obvious" questions such as the behaviour of nasty functions like $\sin \frac{1}{x}$.

However, the book is entirely spoiled by a profusion of errors and inaccuracies. One can forgive a few misprints (especially in a first edition), but it is much harder to forgive wrong or incomplete proofs, wrongly stated theorems and unintelligible solutions to problems - all the symptoms, in fact, of careless writing.

Two typical examples: On p. 62 we find the following "theorem" stated: "If $f'(a) > 0$, then f is strictly increasing in a neighbourhood of $x = a$" (!). On inspecting the alleged proof of this, it becomes clear that the author meant something quite different, namely that if $f'(a) > 0$, then there exists $\delta > 0$ such that $f(x) < f(a)$ for $a-\delta < x < a$ and $f(x) > f(a)$ for $a < x < a + \delta$. This is the sort of mistake that will inevitably confuse a beginning analysis student. On p. 48, the author proves that a function continuous on a closed interval is bounded on that interval. In the course of the particular method of proof used, the author needs the fact that the supremum of a particular set of real numbers is a member of that set. He does not prove this, indeed he does not even consider the point at all, but writes as though the supremum of any set of real numbers were automatically a member of the set. Again, this is just the sort of mistake that will lead an inexperienced reader astray.

As an example of an unintelligible solution to a problem, consider the following: Question 5 on p.40 asks the reader to "prove that if, as $x \to a$, $f(x) \to \ell$, $g(x) \to \ell$, and $f(x) < g(x)$ in

a neighbourhood of $x = a$, then $\ell \leq L$". The hint for solution (given on p.219) is: "$\ell - \epsilon < f < \ell + \epsilon$, $|x-a| < \delta_1$ and $L - \epsilon < g < L + \epsilon$, $|x-a| < \delta_2$. If $\ell > L$, then $0 < \ell - L < (f + \epsilon) - (g - \epsilon)$ and so $f - g > -2\epsilon \geq 0$ [sic!], a contradiction".

I must therefore conclude by saying that I cannot recommend Hatton's book in its present form, though it would be a useful addition to the list of analysis texts if the errors were corrected. As it stands, a student reading it without assistance would probably succeed only in confusing himself, while as regards class use, it is most unsatisfactory for a lecturer to have to continually point out mistakes in a text and stress its unreliability.

(M.R. Carter, Department of Mathematics and Statistics, Massey University).

Fisheries Mathematics Edited by J. H. Steele. Academic Press Inc., London 1977. 198 p. $16.65

This book represents a joint effort, by the Marine Laboratory (Aberdeen) of the Department of Agriculture and Fisheries for Scotland and by the Institute of Mathematics and its applications, to make a broad survey of fisheries mathematics. It is intended to be equally of value to fisheries scientists concerned with modern quantitative methods of analysis and to mathematicians interested in studying the applications of mathematics to fisheries. The book contains 11 articles by 18 authors (17 from the UK and 1 from Denmark).

The contents of the book can be divided into four sections. The first is concerned with the dynamics of natural populations and contains chapters on oceanic primary production, stock and recruitment and growth of gadoid fish. The second section focuses on the population dynamics of fisheries as such and contains chapters on the estimation of fishing mortality through the use of catch by age statistics, estimation of mortality from capture-recapture experiments, and a highly comprehensive total system model used in the analysis of North Sea fisheries management problems. The third section contains two chapters on quantitative approaches to fishing technology, one being on the efficiency of trawl designs and the other on the charting of fishing grounds using a computer "databank" which can be regularly updated and yields graphic output. The book ends with three chapters on aspects of fish behaviour significant in relation to fish catching. All three chapters are concerned with the mathematical representation of the relationship between fish form and swimming performance and behaviour.

I found the book to be encouragingly packaged but rather lacking in relevant substance. In many cases the direct meaning of the reported work to practising fisheries scientists is lost in the jargon, if it is there at all. This book should be most helpful to mathematicians looking for possible fields of application. However, there is little here of direct interest to the fisheries scientist.

(R. C. Francis, Fisheries Research Division, MAF, Wellington).

THE NEW ZEALAND MATHEMATICAL SOCIETY

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