

# THE NEW ZEALAND MATHEMATICAL SOCIETY



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	Dr G M Thornley (1978-1981)	Department of Mathematics Wellington Polytechnic WELLINGTON 4
	Mr D C Harvie (1978-1981)	Mathematics Department Victoria University of Wellington Private Bag WELLINGTON
Co-opted Member:	Dr D J McCaughan (1978-1979)	Mathematics Department University of Otago P O Box 56 DUNEDIN

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

This Newsletter was compiled for the Council of the New Zealand Mathematical Society by Dean Halford, typed by Marie Tokori and Gail Tyson, and printed by the Massey University Printery.

The Editor is grateful to the typists and to those who contributed copy. Contributions to future Newsletters are invited from anyone with items of interest to the New Zealand mathematics community, and may be sent to the Editor (C/- Department of Mathematics and Statistics, Massey University, Palmerston North, New Zealand) or to one of the following Honorary Correspondents:

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N Z MATHEMATICAL SOCIETY PRESIDENT'S ANNUAL REPORT 1978

The following is the Annual Report presented by Professor G. M. Petersen to the Society's Annual Meeting on 16th May, 1978:

As you may well imagine most of my attention during this year as well as that of the Secretary, Dr Wilson, has been taken up with the necessary preparations for this Convention. A great deal of work had to be done in the preparation of notices and in corresponding with scholars in different parts of the world. Many of our hopes for sponsors did not come to fruition and in some cases the disappointment was considerable and came fairly late in the proceedings. Most of the members of the Mathematics Department of Canterbury University were obliged to work very hard in order to bring this event about and also we had support from Mr Gale and others of the Canterbury Mathematics Associations. We were fortunate in securing this year, two Erskine Fellowships from the University of Canterbury and the services of a third Erskine Fellow, Professor Peck who is visiting the Department of Computer Science. The invited lecturer of the Society to the Convention is Professor P.A.P. Moran of the Australian National University, who is currently President of the Australian Mathematical Society. Sponsors for this Convention include besides the Erskine Foundation, the Mitsubishi Corporation, the British Council, the C.S.I.R.O., American Mathematical Association, Bank of New South Wales and the Service des Affaires Culturelles. We are grateful to all of these for making the meeting a success. In addition to such outstanding financial support, we have also had support in other ways, for example, in the form of films which have been loaned by the National Film Library and others.

Your Society has also continued to expand its other activities. The Newsletter continues to be a great success and there has been a wide demand for the employment brochure produced by Dr Davies and Dr Wake for the Society. During the year we also produced an eight page booklet collating the titles of all of the research reports published in New Zealand and a booklet of historical information on theses in mathematical sciences. We also continue active as a member body of the Royal Society of New Zealand and have urged that the Royal Society make some approach to opening up relations with the different scientific bodies in Japan. Similar steps were taken last year by the Australians and it is time that New Zealand takes the same steps. The Society successfully initiated a scheme of visiting lecturers by sponsoring Dr I. Grattan-Guinness, a noted mathematical historian, editor of "Annals of Sciences" and a principal lecturer at Middlesex Polytechnic. He toured New Zealand during October-November giving talks on the historical aspects of mathematics and this was also the occasion for the publication and circulation of abstracts for the visiting lecturer.

Because of the sharp rise in travel cost since the foundation of the Society it has become necessary to restrict our meetings of full Council to a single meeting each year to be held at the time of the Colloquium. To compensate, Council have agreed to try

holding regional meetings which will have to be co-ordinated by post. We have enjoyed a greater exchange of information with the Australian Mathematical Society. I have attended two of their annual meetings and found them very informative and stimulating.

There have been suggestions that this Society seek a closer relationship with the annual Colloquium. This is a matter which will require your careful attention since the Colloquium is one of the important ways in which the mathematical community is put in touch with those who are users and teachers of mathematics. If the Society is to have a closer relationship with the Colloquium it is important that this is not done in such a way as to harm this developing relationship or restrict the independence of those who organise the annual meetings. Council believes that the Society can make a contribution to the continued success of Colloquium by offering various services such as the preservation of archival material.

Membership of the Society continues to grow and the Society itself as a recognised member body of the Royal Society and in other ways, plays an increasingly important part in representing mathematicians in the community and in giving its opinion on matters affecting mathematicians. Some approaches have been made to industrial and commercial organisations, inviting them to take up institutional membership, and suggestions from members as to further approaches would be welcome. Much has been achieved by the hard work of the members of your Council and others interested in the well-being of the Society. We hope that the future will continue to carry on the developments so very well begun.

RESEARCH MEDAL WON BY MATHEMATICIAN

Dr Bruce Calvert (Department of Mathematics, University of Auckland) has been awarded the New Zealand Association of Scientists Research Medal for 1978. The award is made for outstanding research work in the fields of natural, physical, or social sciences by a person less than 40 years of age. Dr Calvert won the Medal for his contributions to functional analysis, in particular on a theory of nonlinear operators which has applications in mathematical physics.

INTERNATIONAL MATHEMATICAL UNION - EIGHTH GENERAL ASSEMBLY

The IMU Assembly was held in Helsinki 11 - 13 August 1978 in conjunction with the International Mathematical Congress. On the recommendation of the New Zealand National Committee of Mathematics, the Royal Society of New Zealand appointed Dr Graeme Wake, President of the N Z Mathematical Society, as the N Z Delegate to the Assembly. (See the August issue of this Newsletter, No. 12, page 11). The Royal Society provided financial support for Dr Wake's attendance at the meeting.

The following is an edited version of Dr Wake's report to the Royal Society of New Zealand. *Your attention is drawn to the recommendations at the end of the report.*

General Comments on the I.M.U.

The I.M.U. now has 47 member countries, 5 of which have joined since the last General Assembly (Arab Republic of Egypt, Cameroon, Iran, Republic of Singapore, and Republic of the Philippines). (NOTE: N.Z. joined just prior to 1970). These 47 member countries are in 5 groups of adherence, Groups 1 - 5, and are arranged as follows:

Group Number	No. of Membership Units Paid by Members in this group (set at 600 Swiss Francs)	No. of Member Countries
1	1	16 (NZ included here)
2	2	13
3	4	10
4	7	2
5	10	6
(Note: 600 S. Frs = \$NZ355)		(total = 47)

The I.M.U. is administered by an Executive Committee which is elected for 4 years at each Assembly. The main activities of the I.M.U. which are reviewed at the Assembly include:

- Organising the 4 yearly International Congresses
- Sponsoring symposia and conferences
- Arranging I.M.U. Lecture Series
- Supporting an I.M.U. Fellowship for a Mathematician from a developing country
- Support of and involvement in activities of the International Commission on Mathematical Instruction (I.C.M.I.).
- Arranging for exchanges of mathematicians and materials especially between the developed and developing countries. (There is a separate commission for this purpose, designated as the "Exchange Commission").

Publication of the World Directory of Mathematicians (W.D.M.)  
 Maintenance of relationships with the International Council of Scientific  
 Unions (I.C.S.U.) - a parent body - and UNESCO.

These activities are sustained from a basic annual income of 93,600 Swiss Francs (156 units x 600 S. Fr) (= \$NZ55,400) which is supplemented by grants from I.C.S.U. - UNESCO and sales of the W.D.M.

The Eighth General Assembly at Helsinki

Ninety delegates, together with the Executive Committee, met in closed session for 2 days (which means some countries were either not represented or had delegations at less than full strength). It was pleasing to note that many countries included in their delegations young mathematicians as well as more established figures.

The meeting proceeded through the agenda over two days until a consensus emerged on most issues and then a series of resolutions were passed in the final session. I will now list these with comments as appropriate. In the main they are self-explanatory and give a fair indication of the business conducted.

Resolution 1

The General Assembly thanks the Government of Finland and the (local) Organising Committee for the great help they provided for the attendance at the Congress of 47 young mathematicians (selected and partially supported by the I.M.U.) from Developing Countries or from Countries with severe currency regulations, by waiving fees and by providing free accommodation. The General Assembly hopes that similar actions will be taken by the authorities of the country where the next I.C.M. will take place.

(Passed Unanimously)

Resolution 2

The General Assembly recommends to the Executive Committee (that they) draw the attention of I.C.S.U. (the International Commission of Scientific Unions - to which I.M.U. belongs), and COSTED, to the exceptionally large attendance attracted by I.C.M. and to the very great efforts made by I.M.U. and the Organising Committee of I.C.M. to help Mathematicians from developing countries to attend I.C.M. and emphasize that under such circumstances much more significant contribution from I.C.S.U. to the next I.C.M. (than the one made for Helsinki) would be justified.

(The goal is to achieve a larger subvention from I.C.S.U. than at present - 35,000 S.Fr per annum).

Resolution 3

The General Assembly endorses the view that the I.C.S.U. recommendation to consider the introduction of a tax of \$US5 on scientific participants at Union Congresses and

Conferences at which a registration fee is charged, is against the policy of I.M.U. (Passed Unanimously). (This was the I.M.U.'s response to the I.S.C.U. suggestion. Generally, it was thought that it would be difficult to administer and would have the effect of further increasing conference fees - which are already too high!).

#### Resolution 4

The General Assembly does not propose an increase in I.M.U. dues, but proposes a special appeal for contribution to finance development activities, beginning with the allocation of not less than \$US20,000 for the quadriennium 1979 - 1982.

(This holds the fee at the present level of 600 S. Fr. per year for each unit of membership - NZ at present holding one unit of membership. The special appeal is crucial to the budget as adopted and hopes are high for its success. It remains to be seen, but some countries seem to be ready to contribute to the I.M.U. to an extent that is greater than their dues. The French delegation gave notice of their Government's intention to contribute to the appeal).

#### Resolution 5

The next General Assembly will be called at about the same time and place as the next I.C.M.

(This puts it in Warsaw, Poland in August 1982 - as the offer of Poland to host the next Congress was successful over that of three other countries).

#### Resolution 6

The General Assembly resolves to establish a "Commission on Development and Exchange" with the following new terms of reference:

- a. Change title to: COMMISSION ON EXCHANGE AND DEVELOPMENT.
- b. Change Section 3 of the terms of reference in I.M.U. Bulletin - Special Number - August 1978:
  3. Acting in accordance with the Statutes and By-laws of the Union, and the administrative policies of the Union, as determined by the Executive Committee, the Commission shall:
    - (a) support and encourage the growth of mathematics in developing countries and co-operate with appropriate bodies to that end;
    - (b) support the exchange of visits with member countries of the Union in which, for one reason or another (e.g., non-convertible currencies), such exchanges are not easy to arrange;
    - (c) advise and assist existing agencies working towards the same objective with due regard to the non-governmental and non-political nature of I.M.U. and its

administrative policies, and without duplicating or prejudicing the work of other Commissions and Committees of I.M.U. at points of common interest.

c. Change Section 4:

At the end delete: "subject to approval of the Executive Committee of the Union".

d. Change Section 5:

Replace by:

5, The Commission shall report annually to the Executive Committee on its activities and provide a financial statement.

This Commission shall come into existence on 1 January 1979 and the present "Commission on Exchange" shall be dissolved from that date.

(The activity of the Exchange Commission has greatly increased, thanks largely to the interest and strength of Professor A.J. Coleman's (Canada) contribution. It has been active in the fostering of mathematics particularly in Africa and helped in the formation of the Pan African Mathematical Union).

Resolution 7

The budget as tabled was adopted.

(This provided for an annual expenditure of S.Fr.160,000 of which only S.Fr.93,600 will come from dues. Hence the dependence on the special appeal, I.C.S.U. etc).

Resolution 8

The General Assembly urges the Executive Committee of the Union to take positive steps towards the adherence of the Peoples Republic of China to our Union.

(As N.Z.'s delegate, I supported this motion put forward by the French delegation. How it is implemented is left to the Executive Committee. China - Taiwan is at present a member of the I.M.U. There were no votes against this motion).

Resolution 9

The general Assembly thanks Professor B. H. Neumann for the production of the Canberra Circular.

(This is produced in Canberra by Professor Neumann at no cost to I.M.U. It contains news of visitors to Australia and New Zealand, Conferences etc. We in New Zealand use and value it highly).

Resolution 10

The General Assembly resolves that the recommendation for the location of the 1986 Congress



be made by a Committee appointed by the Unions and having on it 2 representatives of the Organizing Committee of the 1982 Congress.

#### Resolution 11

The General Assembly of the I.M.U. authorizes the next Executive Committee to study effective ways to further improve the system of selection of invited speakers to the I.C.M. To this end, the National Committees are invited to send in writing detailed proposals, remarks and comments to the Secretary of the Union, within the next year.

Any recommendations by the Executive Committee resulting from this study shall be submitted for approval to the member countries of the Union.

(Comments: This resolution and the debate concerning it took a long time. It arose mainly because of the concern expressed by the Russian delegation that "not always the right people were being invited to speak at the I.C.M." To be invited to speak at the Congress is an honour and is recognition of significant contributions to Mathematics. At present speakers are selected by an I.M.U. Committee. It is important to note that many of the invited speakers from Russia did not attend the 1978 Congress, presumably because they did not obtain exit visas from the Soviet Union .

Academician Pontrjagin from USSR, originally moved that "National Committees be empowered to select invited speakers from their own countries", but this was withdrawn in the light of the foreshadowed resolution above. The Russian motion would have been heavily defeated anyway in my opinion. The resolution above was an acceptable but diluted compromise which capped a rather bitter debate, which was related to that on Resolution 12 below. I believe the impact of Resolution 11 above will be small in practice).

#### Resolution 12

The Eighth General Assembly of the I.M.U. endorses the resolution of the 15th General Assembly of I.C.S.U. on free circulation of scientists, and requests the Executive Committee, elected at this Assembly, to do their best to implement the spirit and the letter of this resolution, paying special attention to the attendance of invited speakers and other participants at the I.C.M. and other scientific gatherings sponsored by I.M.U.

The President-elect of I.M.U. is respectfully requested to report to the next General Assembly on this matter.

(This was moved by the U.S. delegation and adopted with no voiced dissent. The I.C.S.U. resolution provides for, among other things, "National adhering bodies to urge the Authorities in their countries to facilitate the delivery of attendance and exit visas. for scientists to attend such meetings, that applications for visas where necessary should be made to the appropriate authorities not less than three months before the date of the symposium or meeting, and if these visas are not granted or promised in writing one month

before the date of the event, sponsorship should be withdrawn, and arrangements for future meetings in any country found unable to comply with these principles should be suspended until more satisfactory circumstances permit". I believe New Zealand should observe the observance of this resolution. The full details appear in the I.M.U. Bulletin, Special Number, August 1978, p.18-19).

Elections for Office 1979-82 Executive Committee - I.M.U.

President:	L. Carleson (Sweden)
Vice-Presidents:	M. Nagata (Japan)
	Y. Prohorov (USSR)
Secretary:	J. L. Lions (France)
Members:	E. Bombieri (Italy)
	J. W. S. Cassels (U.K.)
	M. Kneser (Federal Republic of Germany)
	O. Lehto (Finland)
	C. Olech (Poland)
Past President:	D. Montgomery (U.S.A.)

(This occupied more time than anticipated by the existing Executive Committee, who had brought forward the above as a "slate of candidates". Clearly many delegates, myself included, felt that the I.M.U. Executive is not sufficiently representative of smaller countries, is dominated by Europeans and by countries with membership in Groups 3-5. The Canadian delegation, led by Professor A. J. Coleman, asked that the nomination of Professor Hogbe-Nlend of Cameroon be included. After much debate this was agreed, but he was defeated in the ballot. In drawing up the slate of candidates, other nominations were considered, including my nomination of Professor Neumann from Australia. This too was not accepted by the existing Executive Committee. Clearly the procedure is being increasingly brought under criticism and, I believe, with justification. Clearly a more democratic procedure is needed).

Commission on Development and Exchange 1979-82

Professor Atiyah	(U.K.)
Coleman	(Canada)
de Figueiredo	(Brazil)
Hogbe-Nlend	Chairman (Cameroon)
K. Ito	(Japan)
Mostow	(U.S.A.)
B. Szokefalvi-Nagy	(Hungary)
M.S. Narasimhan	(India)
Pogorelov	(USSR)

(Clearly Professor Hogbe-Nlend from the Cameroons, was nominated by the Chairman (of the E.C.) to be Chairman of the Commission because of the feeling expressed during the

debate on the Executive Committee).

International Commission on Mathematical Instruction (I.C.M.I.)

(10 members at large)

From a field of 13 candidates the following were elected:

Professor Whitney	chairman	(U.S.A.)
Barner		(F.R.G.)
Castelnuovo		(Italy)
Halberstam		(U.K.)
Hilton		(U.S.A.)
Kawada		(Japan)
Kudrjavcev		(U.S.A.)
Malgrange		(France)
Neumann		(Australia)
Semadeni		(Poland)

Miscellaneous Comments

The publication of the next World Directory of Mathematicians has been delayed another year (until 1979) because of the death of Professor Otto Frostman about 12 months ago. Professor Nagata of Kyoto, Japan has taken over the editing of the 1979 edition. Proceeds from the sale of the Directory are all paid to the I.M.U. and used to finance their activities.

Recommendations

a. Change of Group of Adherence

As a result of my experience as N.Z.'s delegate and from what I now know of the I.M.U., I believe N.Z. should consider taking out another unit of membership of the I.M.U., that is, to change its adherence to Group II from Group I. This would double our annual subscription to S. Fr 1200, but the nature of the I.M.U. activities makes it very good value for money. This would enable us to have 2 delegates at the Assembly Meetings and would make for easier consultation with a colleague during the meeting. (I felt rather isolated at the meeting itself, being the sole N.Z. delegate). Our level and depth of mathematical activity seems to be most comparable to the other Group II countries which are Austria, Brazil, Bulgaria, Denmark, Finland, Iran, Ireland, Israel, Pakistan, Rumania, South Africa, Spain, Yugoslavia. It seems best for the N.Z. Mathematical Community to consider this recommendation and, if there is support for this, an application to join Group II should be sent to the I.M.U. (Likewise I firmly believe N.Z. should join the International Union of Theoretical and Applied Mechanics (I.U.T.A.M.) which we have not yet done. This is being pursued elsewhere). (Editorial Note: Countries in Group I are Argentina, Camerouns, China (Taiwan), Cuba, Egypt, Greece, Iceland, Korea (Demo. Rep) Mexico, New Zealand, Nigeria, Norway, Portugal, Singapore, Turkey).

b. I.M.U. Support for Meetings in the Australian/N.Z. Region

It appears that we could get moral and financial support from the I.M.U. for meetings in the region, provided that:

- (i) the meetings are of an "international character";
- (ii) the meetings "have a theme" - i.e., some area within mathematics and its applications is emphasized;
- (iii) they are not held in the same year as an International Congress (1978, 1982, 1986...)
- (iv) the application is made sufficiently far ahead (at least two years).

The financial support from the I.M.U. would probably be not large, possibly around \$US2,000, but the fact of I.M.U. support would imply a greater obligation on Governments and the adhering organisations to support the meeting as well.

Concluding Remarks

I have made this report somewhat lengthy with a view to giving some background to the I.M.U.

I would like to thank the Royal Society of N.Z. for their financial support to enable me to attend this meeting as N.Z.'s delegate (and thus the I.C.M. as well) and for the support of the whole N.Z. Mathematical Community in my role as that delegate.

G. C. Wake.

\* \* \* \* \*

N.Z.M.S. VISITING LECTURER 1979

Professor George Andrews of Pennsylvania State University is to be the New Zealand Mathematical Society Visiting Lecturer for 1979. He is currently spending a sabbatical leave at the University of New South Wales.

Reputed to be able to speak well on a wide variety of interesting topics, Professor Andrews has written a large number of papers (mainly in number theory and combinatorial mathematics) as well as books on "Number Theory" and "The Theory of Partitions".

Dr Gloria Olive, Mathematics Department, University of Otago, is coordinating the details and those interested in Professor Andrews' visit should write to her. An itinerary will be published in the April issue of this Newsletter.

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"I have found you an argument but I am not obliged to find you an understanding"

(Samuel Johnston)

\* \* \* \* \*

N.Z. ASSOCIATION OF SCIENTISTS

The aims of the Association include:

- \* to secure the widest application of science and scientific methods for the welfare of society
- \* to extend the free and open interchange of scientific knowledge
- \* to advance the status of scientists in the community

The Association publishes N.Z. Science Review every two months, and from time to time the Directory of N.Z. Science - both are free to members.

Each year it awards a Research Medal, the Sir Ernest Marsden Medal for Services to Science and a Technician Medal. The Research Medal is awarded to New Zealand scientists under the age of 40 for outstanding research work in the fields of natural, physical or social science. In making an award, the work of the nominees during the three years prior to their nomination is considered. Up to two awards, either joint or individual, may be made in any one year. In 1978 two awards have been made:

to Dr B. D. Calvert (Mathematics Department, University of Auckland),  
and jointly to Dr A. Wolfenden (PEL, DSIR) and  
Dr C. M. Adam (Department of Chemical and Materials Engineering,  
University of Auckland).

Full membership of the Association is open to persons with a degree or equivalent qualification in science. There is also provision for associate, student, dual and corporate membership. Subscriptions, which are tax deductible, are currently:

Members and Associates:	\$14, reducible to \$12 if paid by 31st October
Student members:	\$8, reducible to \$6.
Married couples:	\$18, reducible to \$16.
Corporate members:	\$32, reducible to \$30.

Information and applications for membership are available from the Hon. Secretary, N.Z. Association of Scientists, C.P.O. Box 1874, Wellington, New Zealand. Regional branches of the Association have been, or are being, set up in Auckland, Wellington and Christchurch.

A short history of the Association has been prepared by Dr F. B. Shorland (Biochemistry Department, Victoria University of Wellington). The following notes are based on that work.

The concept of a N.Z. Association of Science was formulated by Newman in the N.Z. Journal of Science Vol. 1, No. 4, 145-150 (1892), but it was not until 1941 that such a body was formed, with the title N.Z. Association of Scientific Workers. A similar body was formed in Australia at the same time, and in 1946 the World Federation of Scientific Workers was founded with 17 members. New Zealand joined in 1947 but when it was discovered that the World Federation had political overtones to which the N.Z. Association could not subscribe, all connections were severed and the name of the Association changed... to N.Z. Association of Scientists".

The first President of the Association was Dr W. B. Sutch, a distinguished and controversial economist. When the first issue of Science Review appeared in December 1942, it listed the Council as: President, Dr W.R.B. Oliver; Vice-President, Dr L. R. Richardson; Council members, Dr E. Beaglehole, Mr N. T. Clare, Dr L. I. Grange, Mr A. E. Hefford, Mr O. H. Keys, Dr J. Marwick, Mr J. W. Matthews, and Mr E. E. Suckling; Secretary, Mr J. T. Salmon; Treasurer, Dr C. O. Hutton; Auditor, Mr C. S. Plank.

"Oliver and Hefford were Directors of the Dominion Museum and Fisheries respectively. Later, Grange was successively Director, Geological Survey and then of Soil Bureau. Richardson and Salmon were to occupy in succession the Chair of Zoology and Beaglehole that of Psychology at Victoria University. Hutton became Professor of Mineralogy at Stanford, California and our first life member. Marwick at Geological Survey became a Hector Medalist, and Clare Chief Biochemist at Ruakura Animal Research Centre".

In Science Review 3, No. 3, 6 (1945) the Association Committee on Science in Secondary Schools reported that boys of that time were taught mainly chemistry and girls home science. "Biology in relation to human, social, political and genetic considerations required for good citizenship was neglected".

The two publications of the Association continue to be significant features. The N.Z. Science Review, first published in 1942, aims to cover all science in a form suitable for the intelligent layman. The first Directory of Science, edited by Dr L. Bastings, appeared in 1948. It listed names and addresses of scientists and gave detailed information on scientific establishments and societies in New Zealand.

The Association's Research Medal was first awarded in 1952 to Charles Fleming (now Sir Charles, FRS)" at a luncheon held at the British Sailors' Society Rooms in Wellington. More than 100 attended. No social scientist has been thus recognised even though the medal is also available for the social sciences".

Under the heading "Twenty Years of Sustained Struggle for Survival", Dr Shorland describes the 1950's and 1960's as "years when the few supported the many" and refers to "a lack of interest and of a willingness to work even in Council". However, Association activity occurred in the form of successful negotiations with Government on the determination of salary increases for scientists, and a substantial contribution to the National Development Conference (1969), resulting in the appointment of Professor Duncan to the National Development Council.

Since then the Association has continued its interests in topics and topical events such as the Education Development Conference, marine mining in New Zealand, energy, environmental problems, fishing potential, women in science, and the Commission for the Future. There is evidence of a renewed vigour in the Association. The matter of secrecy in science and industry has been actively pursued recently.

N.Z.M.S. SUB-COMMITTEE ON MATHEMATICS' EDUCATION

Mr J. C. Turner writes: "I have been asked to breathe life into the Society's sub-committee on Mathematics Education, and I am not sure how to begin. I seem to be the sole member of the sub-committee, so perhaps I should start by shaking myself vigorously; or at least shake up my rag-bag of ideas on Mathematics Education to see if some sample of its contents will indicate how I can proceed.

I begin with the presumption that all members of the Mathematical Society are interested in at least some aspects of mathematics education. To declare a total lack of interest in the subject would be tantamount to a declaration of indifference to the process of reproduction of our species. And surely an interest in reproduction is present in us all! My problems arise when I try to decide which aspects of mathematics education the Mathematical Society should interest itself in, and to what degree. What can the Society do for its members that isn't already being done for them by libraries and education journals, by departments of education in Universities and Teachers' Colleges, by the Mathematics Associations, and by specialists in mathematics education working in the various departments of mathematics throughout the country? If the answer to this question is 'nothing', then I must not convene a sub-committee and waste a large number of mathematician man-hours. However, I cannot arrive at an answer to the question without having a lot of knowledge that I do not possess. I propose, therefore, to carry out a fact-finding exercise in the time-honoured way - by asking questions; or rather by asking you to ask questions. I will publish a summary of the answers you send me in our next Newsletter; and I will convene the sub-committee on Mathematics Education to discuss the answers and decide whether anything further should be done.

QUESTIONNAIRE

Answering the following questions will involve you in a small amount of effort, for which I apologise. I would be grateful to have answers to them, however. Any additional thoughts you may have on the matter will be welcome too. My aim is to get a quick appraisal of what research into mathematics education is being done in New Zealand, and to find out how involved and interested our members are in it.

1. Are you experimenting with any teaching methods or equipment? (Give brief details; e.g. Keller plan with course so-and-so; use of computerized projects/overhead projector/slides/graphics terminal with course such-and-such).
2. Are there any projects in Mathematics Education being carried out 'in your ambit'? Do these projects interest you specially? Have you any comments to make about them? (Please ring up your local Department(s) of Education, Professors of Education or specialists in Mathematics Education, and ask for abstracts of objectives and methods of the projects).

## 3. Which Journals in Mathematical Education

- (a) do you read (state names of journals, and indicate depths of interest in contents);
- (b) are available locally in School, College or University (please ring your librarian: he/she will supply a list on request)?

4. Do you think the Mathematical Society should concern itself with Mathematics Education any more than with, say, Mathematical Physics, or Statistics, or with any other particular aspect of mathematics? If so, please give your ideas as to how that concern should be expressed.

The 1979 Colloquium

Graham French, Brian Stokes and I are conferring on ways and means to feature Mathematics Education in next year's Colloquium. If you have any special interests or requests in this direction, please write to me, John C. Turner, Department of Mathematics, University of Waikato, Hamilton. Please forward your responses as soon as possible.

ROYAL SOCIETY OF N.Z. AWARDS

The Royal Society of New Zealand administers several award funds in areas of science in this country. Generally the awards made from these funds are for work in stated research areas; for example the Hutton Memorial Medal and Prize is aligned with zoology, botany, or geology.

Mathematicians are eligible for two of the Society's awards:

- (a) Hamilton Memorial Prize.

This is awarded annually for the encouragement of beginners in scientific research in New Zealand (or in the islands of the South Pacific), for work published within the last five years, such publications to include the first investigation published by the candidate.

*Candidates for the 1979 award are required to send an 'intimation of candidature' and two copies of each of the publications concerned to the Executive Officer of the Royal Society before 31 December 1978. Any Fellow or Member of the Society also may nominate one or more candidates for the prize.*

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SIXTH EDITION OF THE DIRECTORY OF NEW ZEALAND SCIENCE

Compilation of the above Directory is being undertaken by the New Zealand Association of Scientists. If you wish to be listed in this publication and have not previously received an application form, please contact the Secretary, NZ Association of Scientists, PO Box 1874, Wellington.

\* \* \* \* \*



## (b) Hector Memorial Medal and Prize.

This prestige award is made annually, in rotation, in the fields of plant sciences, chemical sciences, human sciences, solid earth sciences, physical/mathematical/engineering sciences, and animal sciences. It was the turn of plant sciences in 1978, and the group physical, mathematical and engineering sciences next comes up for award in 1982.

The award is made 'to that investigator who, working within the Dominion of New Zealand, shall... have done most towards the advancement of that branch of science....'.

There are two other awards for which mathematicians whose research has strong contact with physics or engineering may be eligible:

## (c) T.K. Sidey Medal and Prize.

This is awarded at irregular intervals, always advised publically at least six months in advance (as the increase of the fund allows); the last four awards were in 1959, 1966, 1973, 1977.

The rules for the award are very general, requiring applicants to submit either theses especially prepared for the award or copies of published works, or both. However, the Proceedings of the Society indicate that this prize is awarded 'for the promotion and encouragement of scientific research in the study of light visible and invisible, and other solar radiations in relation to human welfare, or, at the discretion of the Society, of research on radiations of any kind'.

## (d) E. R. Cooper Memorial Medal and Prize.

Awarded every two years (the next award being in 1980) for the encouragement of research in fields of physics or engineering.

The award is made 'to the person or persons who..... have published the best single piece of research work.... in New Zealand in physics or engineering. Preference is given to contributions to the development of the natural resources of New Zealand, treated in the widest sense.

In addition it may be noted that the terms of the Captain James Cook Fellowship admit geophysics as one of the appropriate fields for that award.

The above information is taken from the Rules of the Royal Society, and the Proceedings of the Society, Volume 106, July 1978 but is incomplete. For full details consult these documents or write to the undersigned or directly to the Executive Officer, Royal Society of New Zealand, 11 Turnbull St., P.O. Box 12249, Wellington.

D. C. Harvie, N.Z.M.S. Members Bodies Representative.

R.S.N.Z. SUPPORT FOR ATTENDANCE AT INTERNATIONAL  
CONGRESSES OF I.C.S.U. ORGANISATIONS

This matter was raised in the last Council meeting of the N.Z. Mathematical Society (see Newsletter No.12, page 11). Members had expressed their interest in the possibility of obtaining some financial support for N.Z. mathematicians attending the I.C.M. meeting in Helsinki. The Society has since taken the matter up with the Royal Society of N.Z. The following statement is abstracted from the Royal Society Fellows Newsletter, with permission:

The R.S.N.Z. has been informed that the Government grant will be \$20,000 less than the Society had budgeted for. This will entail cutting back on some major budget items for 1978/79 including overseas travel.

A small sub-committee of Council (of R.S.N.Z.) is looking at several aspects of possible Society support for scientists attending overseas conferences. R.S.N.Z. policy at present is to use what funds are available to support attendance at business meetings of the International Unions (affiliated to I.C.S.U.). The principle behind this policy is that while government departments and universities will support attendance at scientific meetings to some degree, only R.S.N.Z. can assist with attendance at business meetings of the Unions and their subdivisions. The sub-committee is considering:

- (1) to what extent R.S.N.Z. might support attendances at overseas technological conferences;
- (2) the amount of additional funding that would be required annually to support the attendance at meetings of New Zealand members of Commissions, etc., or other major subdivisions of Unions (a matter raised both at the Member Bodies Annual Meeting and the Fellows Annual Meeting).

The Royal Society President, Dr R. K. Dell, has handed a letter from Dr Wake on to the R.S.N.Z. sub-committee, with the assurance that at least the principle behind the N.Z. Mathematical Society's request for support will be given full consideration in attempting to develop a further policy.

\* \* \* \* \*

A geographical problem resolved:

Some readers of this Newsletter have occasionally received letters addressed to "New Zealand, Australia". The International Postal Union showed remarkable perspicacity recently in delivering to Ivan Reilly an item addressed to: Prof I L Reilly, Dept of Math, University of Auckland, Auckland, U S A.

\* \* \* \* \*

EMPLOYMENT BROCHURE

Ray Littler and John Turner (Waikato) report as follows:

The Employment Brochure Committee is stirring from near hibernation with plans for producing a 1979 edition of the brochure *Employment Opportunities in Mathematics*. We would be most grateful for any suggestions for improvements based on experience with using the present brochure. We plan a number of changes. For example there is now rather more comprehensive information available on the destinations of mathematics graduates based on the Vice-Chancellor's Committee surveys which will be reflected in the related section in the brochure.

One of the mysteries of life is whether the pattern of job destinations found by the Vice-Chancellors Committee survey, based as it is on first jobs, gives an accurate picture of the 'job distribution' likely after say 5 or 10 years. Here at Waikato, we are beginning a follow-up exercise designed to keep up with the job history of as many of our Mathematics graduates as possible; maybe this will provide useful information in the future. We would be interested to hear of any similar schemes in other institutions.

There continues to be a significant number of overseas students majoring in Mathematics. Many of these students would prefer to gain some job experience in New Zealand before returning home. Members of the Society may not be aware that this is possible under a Department of Labour provision for extending student permits for up to two years to enable people to 'gain practical experience related to studies'. It appears that such students completing their degrees this year will have until the end of March (1979) to find suitable jobs.

Please forward suggestions and reports to Dr R. Littler, Department of Mathematics, University of Waikato, Hamilton as soon as possible.

\* \* \* \* \*

4th INTERNATIONAL CONGRESS ON MATHEMATICS EDUCATION

This will be held at the University of California, Berkeley on August 11-16, 1980. If you wish to be placed on the mailing list for detailed announcements about this Congress, please send your name and address by the end of January 1979 to J K Goldhaber, National Research Council/Math, 2101 Constitution Ave NW, Washington DC 20418, USA.

\* \* \* \* \*

MATHEMATICS SYLLABUSES FOR UNIVERSITY ENTRANCE, BURSARIES AND SCHOLARSHIPS

The following report from the Steering Committee in Mathematics may be of interest to members of the Society. It forms part of a recent Universities Entrance Board newsletter to secondary school principals. Revised syllabuses for Seventh Form Mathematics are currently in preparation, and the Subject Convener, Professor David Vere-Jones, would be glad to receive comments or criticisms on the existing syllabuses and suggestions as to ways they might be amended, both in the short and long term.

*A Report from the Mathematics Steering Committee*

The Steering Committee was set up by the Universities Entrance Board some 10 years ago to oversee the introduction of new Form 6 and 7 syllabuses in mathematics. Working in conjunction with the subject convener for mathematics, it continues to exercise the main responsibility for reviewing and advising on the syllabuses of the mathematics examinations administered by the Universities Entrance Board. A slightly revised membership of the Committee was recently approved by the Board (for information the current membership is listed below), and the Committee has met twice this year to consider questions related particularly to the Form 7 applied mathematics syllabus. This report is intended to give some indication of the Committee's views on current problems, the directions in which it is trying to move, and the time schedule for the modifications it has in mind.

Form 7 Courses in Mathematics

The Committee started by considering several proposals which have recently been put forward for revision of Form 7 applied mathematics syllabus. In the main these have emanated from university departments and have been concerned to remove some of the difficulties created by the present system of options within the applied mathematics syllabus, and the choice of material within those options. The alternatives suggested include reducing or eliminating the mechanics component, developing a course centered on the concept of mathematical modelling, and strengthening and expanding the work on computer programming.

The Committee has come to feel that, despite the merit in some of these suggestions, they would give rise to difficulties and controversies if there was an attempt to implement them in the short run, while in the long run they still fail to resolve some of the underlying problems in this area. The short term difficulties arise from the facts that there is a strong point of view in favour of retaining mechanics as still one of the most effective areas for demonstrating the nature and power of applied mathematics, that a number of schools still face difficulties in implementing the statistics, computing and numerical parts of the syllabus, and that there is still no alternative place in the school programme for any study of computers and computing. The Committee feels that a prerequisite for any major change in the applied mathematics syllabus should be some clarification of the future place of computing in the overall school programme. It has invited the NZ Computer Society, the Mathematics Associations and the NZ Society of

Accountants to put forward suggestions as to how computing might develop in the schools, with specific reference to the possibility of a Sixth Form Certificate course in computing as an alternative to the existing situation. Its own view at present is that computing is not best treated as part of a specialised paper in mathematics at Form 7 level but should interact with the school programme at several stages: in an elementary, descriptive way within a science or perhaps a social science course in the lower forms of the secondary schools; and in a more technical way as an alternative to a straight mathematics course at Form 6 level.

Another long-term problem which the Committee feels should be extensively discussed before major changes are introduced concerns the nature of the basic course at Form 7 level. At present the pure mathematics course still functions as the basic course, being taken by the great majority of students taking any mathematics in Form 7 (about 300 candidates out of 6,000-odd taking mathematics took applied without pure; the rest took pure only or both). To this extent, the hope that the applied mathematics programme might form an acceptable alternative to the pure mathematics programme for non-specialists has not been realised, and indeed it is hard to see how it could be when the basic mathematical tools are still taught within the pure mathematics programme. The present situation is unsatisfactory on two counts: it limits the development possible for the mathematics specialist, while discouraging and alienating the non-specialist.

The question therefore arises as to whether or not the situation could be improved by examining the Form 7 programme in mathematics as a whole and suggesting alternative ways of dividing up the material. Here the Committee has given some attention to a suggestion from Christchurch that one course might consist of basic material in calculus and statistics, with some computing, while the other course contained further topics in pure mathematics with some numerical mathematics. It has invited the Canterbury Mathematics Association to prepare some detailed suggestions along these lines for wider circulation and discussion.

In the meantime the Committee sees an urgent need to look at the detail of the existing applied mathematics syllabus and to rectify various anachronisms, and other defects, which are particularly apparent in the statistics section of the syllabus but are present to some extent in the other sections also. It therefore envisages a two-pronged attack: an immediate tidying up of the existing syllabus without altering its basic structure; and a longer-term review, timed to tie in with the current review of the Form 6 programme, which will address itself to the basic structural difficulties. Both aspects can proceed together, and the Committee has asked the Mathematics Associations for their assistance both in bringing to its attention difficulties which have been experienced with the existing syllabuses and in forwarding suggestions and comments for the longer-term review. The Committee would also be pleased to hear directly from teachers if they have particular points they would like the Committee to consider, especially in relation to difficulties encountered with the applied mathematics syllabus. The Committee hopes to circulate an updated version of this syllabus early next year with a view to its

incorporation in the University Grants Committee Handbook for 1980 so comments should be forwarded as soon as possible.

#### Form 6 Courses in Mathematics

A major uncertainty here surrounds the future of the University Entrance examination. The Committee is on record as favouring the movement of the main UE exercise to Form 7 but fears that progress on this issue may not be rapid. In the meanwhile it has a responsibility to oversee the present UE syllabus in mathematics and is concerned to safeguard the interests of students preparing for a course of university study which may include some elements of mathematics. The Committee is more than sympathetic to the need to broaden the Form 6 programme to cater for the wide range of students now passing through it and in the past has encouraged the development of alternative Form 6 syllabuses. As mentioned above, it is currently exploring the possibility of developing a Form 6 course in computing. It feels, however, that the Form 6 programme must retain a course for university-bound students which does not differ very greatly from the type of programme envisaged in the present UE syllabus. If a system with a wider range of options comes into being, as envisaged in the recent proposals from the Department of Education's Working Committee, it will be necessary to select from these options a few clearly spelled-out combinations which are appropriate for students in this group, if not for all students proceeding to Form 7. The existence of such a planned route is likely to influence the choices of students not necessarily proceeding to further study, and will certainly affect the organisation of teaching in Form 6. Such factors need to be borne in mind in considering any proposals for a wide range of options.

The Committee hopes that the question of co-ordinating the proposals for Form 6 with proposals for revisions of Form 7 courses will be raised both with the Working Committee itself and at the next meeting of the National Consultative Committee on Mathematics. If such a co-ordinated series of proposals is put forward it may be possible to envisage some move to a system of options in Form 6, even before UE is moved to Form 7, with the UE syllabus being based on a course with a restricted number of options.

Any comments, reactions and suggestions which arise from this report will be considered at future meetings of the Steering Committee and used as the basis for a final report to the Universities Entrance Board. *Please send comments to the Mathematics Steering Committee, C/- Universities Entrance Board, Box 12348, Wellington.*

#### Mathematics Steering Committee membership

R. L. Broughton, University of Canterbury  
 B. Werry, Department of Education  
 D. C. Harvie, Victoria University of Wellington  
 J. O'Neill, St Patrick's College, Wellington  
 S. F. Papps, Papanui High School, Christchurch  
 P. J. Watson, Glenfield College, Auckland.

D. Vere-Jones

Subject Convener for Mathematics

LOCAL NEWSUniversity of Auckland: Department of Mathematics

Associate-Professor Alistair J. Scott, of the Statistics Unit in the Department of Mathematics, has been awarded a Personal Chair in Mathematics.

Dr Bruce Calvert has been awarded the Research Medal for 1978 by the New Zealand Association of Scientists, in recognition of his many papers on mathematical analysis.

Visitor

Dr N. I. Fisher, a statistician from C.S.I.R.O. (North Ryde) visited the Department from August to December 1978. In addition to lecturing in Statistics, he was preparing arrangements for a combined meeting of the Biometrics Society and the Mathematical Sciences Section of ANZAAS 49.

Leave

Professor John Kalman has returned from leave at Oxford and Imperial College.

Dr M. J. J. Lennon has returned from many places.

Associate-Professor Peter J. Lorimer is at Universität Kaiserslautern.

Dr David Gauld is at the University of Helsinki, and later will be at the University of Michigan.

Professor A. J. Scott is at the University of Wisconsin.

The recent International Congress of Mathematicians at Helsinki was attended by:

Professor John Kalman, who spoke on "Application of computers in the study of sentential calculi",

Associate-Professor Peter J. Lorimer who spoke on "Sets of permutations with connections to projective planes, loops, block designs, Latin squares and permutation codes",

Dr David Gauld, who spoke on "Quasiconformal extensions in  $n$ -space",

and Dr Ivan J. Reilly, who spoke on "Topological Anti-Properties".

Also our former students Mike Dowling and Ralph Fox both attended the ICM, coming from England where they are both working for their Ph.D.

Dr Reilly also gave papers at the International Colloquium on Topology at Budapest and the International Conference on Categorical Topology in West Berlin.

Seminars

Mr G. J. Tee (Auckland) spoke on: "Strassen's recursive algorithms for matrix multiplication and inversion",

Dr C. P. Chang (Auckland) spoke on "Mean value points of analytic functions",

Professor Yoshiko Ogata (Institute of Statistical Mathematics, Tokyo) spoke on: "Information theory and statistical model building",

Professor N.U. Prabhy (Cornell) spoke on "Queuing systems with earliest due date discipline",

Professor V. P. Bhapkar spoke: "On matched proportions", and on "Hypotheses and tests of marginal symmetry and quasi-symmetry in multidimensional contingency tables".

Professor Sidney Michaelson (Department of Computer Science, University of Edinburgh) spoke on "The education of computer scientists", and on "Stylistic analysis",

Dr Wayne J. Walker (Auckland) spoke on "Bivariate interpolation",

Professor A. S. Douglas (London School of Economics) spoke on: "Programming languages: past, present and future",

Dr N. I. Fisher (CSIRO, Sydney) spoke on "Clusters of geological roses (A branching process of circular data problems)", and on "Graphical techniques in nonparametric Statistics",

Dr R. G. Herriot (University of Washington) spoke on "What can natural language tell us about programming language design?".

#### Report Series

The following Departmental Reports have been published in 1978:

127. I. L. Reilly & M. K. Vamanamurthy, "Some Topological Anti-Properties".
128. P. J. Lorimer, "A method of constructing mutually orthogonal Latin squares",
129. P. J. Lorimer, "Maximal sets of permutations constructed from projective planes",
130. B. Hutton, "Compactification theory for fuzzy topological spaces, Part 1",
131. A. J. Lee, "Closed sequential plans for testing a binomial hypothesis",
132. G. A. F. Seber & J. R. Pemberton, "The line intercept method for studying plant cuticles from rumen and faecal analyses",
133. C. P. Chang, "Mean value points of analytic functions of a complex variable",
134. K. King, "Unified field theories and the origin of life".

G.J.T.



University of Waikato

Planning for the new maths-computer science building is well under way; we have seen the second sketch plan and are talking to the architect. 1984?

Leave

Dr Sneyd is visiting Bristol for a year, and passed through New York on his way there. Unofficially, Prof. Zulauf has returned from Helsinki and Germany, and will soon give us a talk about his experiences, we hope. Shortly, Mr Turner leaves for San Francisco, to attend the DECUS conference and unravel the American Dream. Next year, I am to go away and hide for a term (but I don't know where yet) while Mr French organises the Colloquium. On my return he has a year's leave to recover in.

Seminars

Dr J. A. John (Southampton) spoke on 'Cyclic Designs' and Prof. E. M. De Jager (Amsterdam) on 'Singular Elliptic Perturbations of Elliptic Operators'. Profs D. M. and A. H. Stone (Rochester) surveyed 'Some Aspects of Measure Theory' and 'Borel Theory and Analytic Sets' respectively. Dr A. McNabb (AMD, DSIR) described 'Recent Research in Applied Mathematics'. Mr A. Swift (Massey) had 'Some Thoughts on Solving Non-Linear Equations'. Mr D. Ryan (Auckland) discussed 'The Numerical Recovery of Ventilation/Perfusion Distributions from Inert Gas Data'. Dr N. I. Fisher (CSIRO) presented 'Graphical Techniques in Non-parametric Statistics'. Prof. J. R. M. Radok (Horace Lamb Institute of Oceanography) discussed 'Non-estuarine Inshore Waters' and Dr A. Barnett (MWD) spoke on 'Perturbation Analysis of Channel Hydraulic Profiles'.

In addition, there were several home-grown seminars: Dr E. Kalnins talked about 'Special Functions and Group Representations', Dr A.D. Sneyd and M.S. Bundock (a graduate student) discussed 'The Aerodynamics of Flexible Wings', Dr M. Schroder misunderstood some 'Linear Algebra with Variable Constants' and Dr R. Littler showed us a 'Computer Graphics Program for Population Genetics'.

Massey University: Department of Mathematics and Statistics

Howard P. Edwards has been appointed to a lectureship in statistics. He takes up this post at the end of the year after completing his Ph.D. thesis at the University of Canterbury.

Sam Choy has resigned to take up an appointment in the Department of Mathematical Studies at the Hong Kong Polytechnic.

Robert Pringle has been promoted to Senior Lecturer, to take effect next year.

Leave

Dick Brook will be on leave for 12 months from January 1979, dividing his time between the U.S.A. and Australia.

Dean Halford is spending two months in Australia from January next year, mostly in Melbourne.

Adrian Swift is going on leave in August 1979 to England.

### Visitors

Associate Professor Robert Heverly from Mansfield State College, Pennsylvania is visiting the Department from August 1978 until May 1979. His interests are primarily in mathematics education and in particular the teaching of applied mathematics.

Dr John Gamlen, Associate Professor of Mathematics at the University of Alberta, is spending the year September 1978 - September 1979 here. A Junior Lecturer in this Department in 1965-66, he took his Ph.D at Monash University before moving to Alberta. He taught at Yale for two years. His current interests include semi-groups of operators with applications to Markov processes and perturbations of DEs and the rate of approximation of diffusion by discrete stochastic processes.

### Seminars

Our seminar series continued with

Mr G. C. Arnold on "Are blocks obsolete?"

Mr P. Hanlon (Cal. Tech.) on "The enumeration of unlabelled interval graphs".

Mr N. Jeans on "Units in algebraic number fields".

Mr M. Hannagan on "A class of time series processes",

Dr W. Müller (CSIRO-DMS) on "Vegetation community preference of cattle by principal component analysis".

Dr N. Fisher (CSIRO-DMS) on "Graphical techniques in nonparametric statistics".

The University Grants Committee has given approval for a pilot programme of extramural 300-level mathematics and statistics courses to be introduced in 1979. The Department will be offering two papers: 60.302 Algebraic Structures and 60.311 Statistical Inference.

W.D.H.

### Manawatu Statistics Group

A successful year of operation concluded with a talk on October 10 by Brian Murphy (National Research Bureau) on the topic "Predicting the Political Future - the Art and Science of Polls". The talk was well attended and generated a lot of discussion.

The President for 1979 is Professor Ron Munford (Physiology and Anatomy, Massey) who takes over from Dr Dick Brook. Dr Peter Thomson (Mathematics and Statistics, Massey) has been re-elected as Secretary-Treasurer.

P:J.T.

Victoria University of Wellington

Mr Ross Renner has now rejoined the staff of this University as Applied Statistician in the Institute of Statistics and Operational Research. Members with long memories will recall that he was a Junior Lecturer and then Lecturer in Mathematics here from 1960 to 1967 before going to the University of the South Pacific as Head of the Mathematics Department; from there he went to the Open University (U.K.) for two years. When he first returned to N.Z. he was with the Government Department of Statistics, but we are very pleased to have him back in the University.

Mr Mick Roberts has had his Junior Lectureship in Mathematics confirmed for a further year.

Visitors

Mr Robin Milne (graduate and ex-Junior Lecturer, V.U.W.) will be here as a temporary lecturer in statistics in the second term of 1979. He is currently a Lecturer in Statistics in the University of Western Australia.

Dr Wojciech Wojtyński (University of Warsaw) will be a Visiting Fellow from 5 May to 5 July 1979. His field is functional analysis and Lie groups; it is hoped to arrange a mini-conference in analysis in the week beginning 18 June.

Leave

The following will be going on sabbatical leave in 1979:

Professor Wilf Malcolm; January - April; principally to Berkeley,

Mr Doug Harvie; June - February; Aberdeen, Manchester and Essex,

Ms Thora Blithe; July - February; Surrey,

Mr Ken and Mrs Shirley Pledger; October - June; Warsaw and Sussex,

Professor David Vere-Jones will be chairman of the department while Wilf is away;

Wilf will then resume that position until August 1980.

Professor Terence Nonweiler has had to postpone his sabbatical leave for a year.

J.F.H.

Applied Mathematics Division, DSIR, Wellington

Several staff changes have taken place at AMD. Karen Garner from Christchurch has joined the OR section. John Depont has transferred to the Auckland Industrial Development Division of DSIR. Kate Hatherton and Liam Casey are transferring to the Computer Research Section of PEL, DSIR. Francis Sutton is leaving to join the Health Department.

R.B.D.

Populations Section, Fisheries Research Division, Ministry of Agriculture & Fisheries,  
Wellington

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Two new scientists, Dave Gilbert and Christine Ryan joined the section this year. Dave is working with Kevin Sullivan to develop in-depth estimates of the basic population and fishing parameters of the west coast North Island snapper stock. In addition he is setting up the computerized data base of foreign fishing vessel log books as well as helping Peter Roberts in an assessment of the dynamics of the squid fisheries in New Zealand waters. Christine is working with Don Jellyman on an analysis of eel-elver movement in the Lake Pounui area. In addition she has done routine population dynamics analyses (yield per recruit and stock production model) for the Bay of Plenty trevally fishery, the Lake Ellesmere eel fishery and the Hauraki Gulf snapper fishery.

The section is presently handling several sets of fisheries statistics, compiling and processing them on the PDP-11 computer. These include the foreign deep water trawl and bottom line, skipjack tuna, Bluff oyster, North and South Island scallop, and Gisborne rock lobster pilot data collection scheme.

The echo counting project of Roger Coombs, Chris Francis, Aspi Surti and Nigel Millar has made some progress although it has been plagued with a lack of vessel time as well as severe hardware problems. At present the group is looking for a good species and area to study in depth using the echo counting gear.

Bob Francis and Keith Fisher have spent most of their time producing an assessment of the status and potential of the New Zealand deep water fishing resource.

Aspi Surti, in addition to working on the echo counting project, has been carrying out research and development of electronic hardware to aid fisheries research programmes. In particular he has been working to develop electronic aids which may be used for scanning and reading otoliths.

Don Purnell resigned his position from the section and has floated up the hill to a position in the meteorological service.

R.C.F.

[Extracted from: N.Z. Marine Sciences Society Newsletter, December 1978]

University of Canterbury

Dr I. D. Coope has been appointed to a lectureship in numerical mathematics and should arrive in February. A graduate from Leeds and a specialist in Numerical Optimization, he is at present holding an S.R.C. Post-Doctoral Fellowship at the University of Dundee.

John Hannah has taken up his Research Scholarship at Melbourne University. Andrew Laing is now a meteorologist in Wellington.

Leave

Derrick Breach and David Robinson attended a combinatorics conference held at the University of New England, Armidale in August.

Roy Kerr has returned from leave via the World Bridge Olympiad in New Orleans.

Frank Gair is back from Murdoch University. He reports that at Murdoch, nearly all Physics courses are taught by the Keller Plan, and that a basic Calculus course is offered using a modified Keller Plan (with optional lectures).

Peter Bryant has left for San Diego for his study leave. Gordon Petersen went on leave on the 17th November. His itinerary includes visits to England, Germany, Poland and Hungary.

P.F.R.

University of Otago

Dr R. K. Beatson (who has been a Post-Doctoral Fellow) is now an instructor of Mathematics at the University of Texas in Austin.

Visitor

Professor W. H. McCrea, F.R.S., world famous cosmologist and theoretical astronomer will be a William Evans Visiting Professor in our Department from mid-March 1979 for about 6 months. Professor McCrea is Professor Emeritus at the University of Sussex and was the first Director of their Astronomy Centre. At present, his chief research interests are some particular extragalactic problems.

Leave

In 1979, four members of the Department will be on Refresher Leave. Dr R.L. Enlow will spend the entire year at the University of Michigan, Dr D. J. McCaughan will spend two terms (December-August) at the Mathematics Institute, University of Warwick. Mr J.C.W. Rayner will be on leave for 12 months, starting in May, 1979, and will spend most of it with the Mathematics and Statistics Division of CSIRO in Sydney. He also plans to visit the University of New England in Armidale and Flinders University in Adelaide. Dr J.A. Shanks will spend two terms (January-August) at the Oxford University Computing Centre in the Numerical Analysis Section headed by Professor L. Fox. He also plans to visit some other universities.

Professor W. Davidson and Dr J. H. Harris have returned from their Refresher Leaves. Professor Davidson spent his leave in England at the Astronomy Centre, University of Sussex, and the Institute of Astronomy, Cambridge. He also visited the University of Manchester Radio Observatories at Jodrell Bank, the Astronomy and Applied Mathematics Department at the University of Cardiff, and the Mathematical Institute of the University of Oxford - - - and attended meetings of the Royal Astronomical Society and the Royal Society on Recent Developments in General Relativity. Dr Harris spent most of his leave in the USA and England at Princeton and Cambridge Universities. He also made

brief visits to the Universities of Washington, Colorado, Illinois, Toronto, and Western Ontario; Boston University; Carleton University; and the London School of Economics - - and attended the International Conference on Logic and Epistemology of Scientific Change in Helsinki in December 1977.

Seminars

- "Statistical Aspects of the Fluoridation - Cancer Controversy" (Mr B. F. J. Manly)
- "Sequences, Cycles, and 2-adic numbers" (Dr D.G.B. Hill)
- "Examining Procedures" (Dr T. Crooks of HERAC)
- "Information Theory" (Dr G.F. Liddell)
- "Apparent Velocities Faster than Light" (Professor W. Davidson)
- "Whimper Singularities in Cosmology" (Dr A.B. Evans)

G.O.

PROFITS FROM THE 1st AUSTRALASIAN CONVENTION

Professor G M Petersen, Chairman of the Organizing Committee, reports as follows:

On 4 October 1978 the Committee for the 1978 Australasian Mathematics Convention had a final meeting to determine the disposal of funds. The people attending the Committee gave full representation to the New Zealand Mathematics Association, the New Zealand Mathematical Society and the Colloquium in the persons of the Mathematics Department of the University of Canterbury. A large attendance of at least 475 people at the Convention meant that there was a considerable profit. While it was felt that some of this money should be passed on to the next Colloquium it was also felt that some of the money should go toward some sort of assistance to the next Convention. The following decisions were made:-

- 1 That some of the profit from the 1978 Convention go towards augmenting the float for the next Colloquium and that of the remainder, half should go to the Association of Mathematics Teachers and half to the New Zealand Mathematical Society to be held by them for the purpose of assisting New Zealand speakers overseas or international conventions.
- 2 That the sum of \$1200 should be transferred to the next Colloquium (this includes over \$800 received from the previous Colloquium).

The result of these two resolutions is that the Society and Association will each receive approximately \$1500 to be held for the purposes indicated.

NOTES AND NOTICES49th ANZAAS CONGRESS

The Congress will be held at the University of Auckland, 22-26 January 1979 on the theme "Directions for the Future", focussing attention on some areas of moment to Australia and New Zealand at a time when new paths must be sought and new objectives established.

There will be 37 sections ranging from Physics to Oenology. *Section 8, Mathematical Sciences*, is offering the following programme:

Monday, 22 January

From 9.00 Registration

2.30-3.30 Biometric Society Presidential Address (Mr R L Sandland, CSIRO-DMS, Sydney)

3.30-5.30 Statistics in the Life Sciences - addresses

Tuesday, 23 January

9.00-10.00 Presidential Address (Dr H R Thompson, DSIR-AMD, Wellington)

10.00-12.30 Addresses on statistical applications to genetics and cell biology

2.00- 5.30 Multivariate applications and Time Series models

5.30- 6.30 Sectional Wine and Cheese function

Wednesday, 24 January

9.00-10.30 Population studies

11.00-12.30 } Symposium on Regression Models  
2.00- 5.30 }

Thursday, 25 January

9.00-12.30 Applications to insect populations

2.00 No scheduled talks. Combined meeting of DSIR-AMD and CSIRO-DMS .

Friday, 26 January

9.30-1.00 Sessions on Industrial Mathematics

(Note: The proposed Symposium on Mathematics Education will not now be held).

The aim of the Friday Symposium on Industrial Mathematics is to provide a "shop window" to present industrial applications of mathematics. The Symposium will take the form of a series of short presentations of 20-30 minutes, each based on a particular case study. The emphasis will be on the results obtained rather than the mathematics involved. Topics likely to be covered include Quality Control, Inspection Sampling, Probability, Response Surfaces, Operational Research and Automatic Control. Offers to present case studies should be sent to the Section 8 Secretary. The Symposium will be open to people not attending the Congress as a one-day seminar with a fee in the range \$10 - \$15.

The Biometric Society (Australasian Region) is holding a meeting jointly with ANZAAS, on the theme "Statistics in the Life Sciences : A Significant Interaction?". The Secretary for Section 8 is Mr D. P. Alcorn, Department of Mathematics, University of Auckland.

#### FOURTEENTH NEW ZEALAND MATHEMATICS COLLOQUIUM

The XIV NEW ZEALAND MATHEMATICS COLLOQUIUM will be held at the University of Waikato from the evening of Sunday, May 6, to midday Wednesday, May 9, 1979. The Colloquium is held in conjunction with the Annual Meeting of the New Zealand Mathematical Society.

THE PROGRAMME is expected to begin on Sunday evening with an opening session followed by a social get-together. There will be sessions of contributed and invited papers on Monday to Wednesday. The Annual Meeting of the NZ Mathematical Society will be held on Monday and the Colloquium Dinner on Tuesday evening.

CONTRIBUTED PAPERS (of 25 minutes duration) in any topic in mathematics or with a substantial mathematical content from other disciplines may be submitted for inclusion in the programme, and suggestions for special interest sessions and invited speakers will be welcomed.

Sessions on Mathematical Education are being arranged in collaboration with the Waikato Mathematical Association. Poster sessions in appropriate topics will be arranged if there is sufficient demand.

ACCOMMODATION has been reserved in the University Halls of Residence (single rooms only at a daily rate of \$14.60 for full board. Motel (or hotel) accommodation at higher rates (e.g. about \$20 for twin unit) can be arranged.

ENQUIRIES should be addressed to: The Colloquium Secretary, Department of Mathematics, University of Waikato, Private Bag, Hamilton, New Zealand.

#### VISIT OF PROFESSOR POWELL

Professor Michael J. D. Powell of Peterhouse, Cambridge, an eminent numerical analyst who has worked for some time at AERE (Harwell) is visiting New Zealand and Australia for 8 weeks in 1979. His itinerary in New Zealand is

April 15	Auckland - Queenstown by air	April 23-24	Wellington : VUW-AMD, seminars
16-18	Queenstown	25	Massey University, seminar
19	Otago University, seminar	26-27	Auckland University, seminars
20	University of Canterbury, seminars	28	Tauranga/Rotorua
21-22	Christchurch/Mt Cook/Wellington	29	Depart for Australia

Details of seminar times may be obtained from respective departmental heads.



VACANCIESD S I R - Applied Mathematics Division (2 positions)1. Statistics

The Applied Mathematics Division of DSIR has a vacancy in its Wellington headquarters for a mathematical statistician.

The statistics section has a staff of 11 and does servicing work and projects for DSIR divisions, research associations, Government departments, industry, local bodies, Universities etc. The successful applicant would be expected, in addition to doing his share of consulting, to engage in supporting research in mathematical statistics. Qualifications desired: honours degree and/or PhD with statistics. Some computing experience is desirable.

Starting salary would be up to \$15,324 depending on qualifications and experience, but an exceptionally well qualified applicant could be appointed at a higher level. To help in assessing prospects: an applicant with a first class honours degree and PhD but no experience would be appointed at \$9000-9500; one with 5 years experience at around \$13,000. Promotion is by merit, and the maximum for scientists is \$22,178.

2. Operations Research

We are seeking an operational research professional to join our group in Wellington during early 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 who has 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 to \$17,000).

Please address enquiries for either position to: Dr Hamish Thompson, Director, Applied-Mathematics Division, DSIR, Box 1335, Wellington.

CONFERENCES 1978-80

\*\*\* 1978 \*\*\*

December 5-8  
(Wellington) Asian-South Pacific Regional Meeting in Astronomy  
Details from Dr B. M. Lewis, Secretary IAU Regional Meeting,  
P.O. Box 2909, Wellington, New Zealand.

\*\*\* 1979 \*\*\*

January 15-Feb 9  
(Sydney) Summer Research Institute of the Australian Mathematical Society  
Details from Professor A. McIntosh, Mathematics Department,  
Macquarie University, North Ryde, NSW 2113, Australia.

January 22-26  
(Auckland) 49th ANZAAS Congress  
Details from Dr D. P. Alcorn, Department of Mathematics, University  
of Auckland, Private Bag, Auckland, New Zealand.

January 22-26  
(Auckland) Biometric Society Regional Meeting (Australasian Region)  
Details from Dr N. I. Fisher, C/- Department of Mathematics,  
University of Auckland, Private Bag, Auckland, New Zealand. (To be  
held in conjunction with the 49th ANZAAS Congress).

February 4-8  
(Leura) Australian Mathematical Society Applied Mathematics Conference  
Details from Professor R. I. Tanner, Department of Mechanical  
Engineering, Sydney University, NSW 2006, Australia.

February 13-16  
(Sao Paulo) Fifth Interamerican Conference on Mathematical Instruction  
Details from Fifth CIAEM, Cidade Universitária, UNICAMP, Caixa  
Postal 6063, 13.100 Campinas, Sao Paulo, Brazil.

May 6-9  
(Hamilton) 14th New Zealand Mathematics Colloquium  
Details from the Colloquium Secretary, Department of Mathematics,  
University of Waikato, Private Bag, Hamilton, New Zealand.

May 14-18  
(Canberra) Australian Mathematical Society Annual Conference  
Details from Dr E. Seneta, Academic Secretary, Department of  
Statistics, SGS, Australian National University, P.O. Box 4,  
Canberra, ACT 2600, Australia.

May 14-31  
(Singapore) First Franco-Southeast Asia Mathematics Conference  
Details from Franco-SEA Conference Department of Mathematics,  
Nanyang University, Jurong Road, Singapore 22.

May 19-26  
(Blażejewko) International Conference on Functional-Differential Systems and  
Related Topics  
Details from D. Przeworska-Rolewicz, Mathematical Institute, Polish  
Academy of Sciences, Śniadeckich 8, 00-950 Warszawa, Poland.

June 20-22  
(Bethlehem, Penn.) Third IMACS International Symposium on Computer Methods for  
Partial Differential Equations  
Details from R. S. Stepleman, David Sarnoff Research Centre,  
Princeton, New Jersey 08540, USA.

June 25-29  
(Grignano) International Symposium on Information Theory  
Details from M. Pursley, Department of Electrical Engineering,  
University of Illinois, Urbana, Illinois 61801, USA

- July 16-20  
(Graz) Sixth International Colloquium on Automata, Languages and Programming.  
Details from A. H. Maurer, Institut für Information-verarbeitung, Techn. Universität Graz, Steyrergasse 17, A-8010 Graz, Austria
- August 13-17  
(Adelaide) CSIRO-DMS Divisional Conference  
Details from L. Veitch, CSIRO-DMS, Private Bag No 2, Glen Osmond, SA 5064, Australia.
- August 22-29  
(Hanover) International Congress for Logic, Methodology and Philosophy of the Exact Sciences.  
Details from Sekretariat des Internationalen Kongresses für Logik, Methodologie und Philosophie der Wissenschaften, Welfengarten 1, D-3000 Hanover, Federal Republic of Germany.
- September 4-9  
(Warsaw) Ninth IFIP Conference on Optimization Techniques  
Details from K. Tracki, Systems Research Institute, Polish Academy of Sciences, ul. Newelska 6, 01-447 Warszawa, Poland.
- \*\*\* 1980 \*\*\*
- 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.
- May 12-16  
(Adelaide) 50th Jubilee ANZAAS Congress  
Details from Dr D. L. Clements, Department of Applied Mathematics, University of Adelaide, GPO Box 498, Adelaide, SA 5001, Australia. (Incorporating the Annual Meeting of the Australian Mathematical Society).
- October 6-17  
(Tokyo & Melbourne) International Federation for Information Processing Congress  
Details from IFIP Congress 80, GPO Box 880 G, Melbourne, Vic 3001, Australia.

RECIPROCITY AGREEMENTSAustralian 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 AMS for \$10 a year. They should obtain a note of authentication and an application form from our Treasurer and send both to the AMS secretary (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 AMS (see above). Current subscriptions and prices are as follows:

- (1) Membership subscription (including newsletter): \$15
- (2) Canadian Journal of Mathematics: \$14
- (3) Canadian Mathematical Bulletin: \$10

Thus members of the NZMS may join for \$7.50.

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 AMS (see above). The current subscription is US\$5.00, and privileges of membership include a quarterly newsletter and members' rates for conference, 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 AMS (see above) 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 PUBLICATIONSMathematical 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, PO 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, PO 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, PO 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.

APPLICATION FOR ORDINARY MEMBERSHIP IN THE NZ MATHEMATICAL  
SOCIETY

Name:

Address: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Institutional Affiliation:

Position:

Send this completed form to the Treasurer, Dr Ivan L. Reilly, Mathematics Department, University of Auckland, Private Bag, Auckland, New Zealand, together with a remittance of this year's subscription (\$7.00 ordinary members, \$1.00 student members).

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RECIPROCITY WITH AMERICAN MATHEMATICAL SOCIETY

The NZ Mathematical Society has just successfully arranged a reciprocity agreement with the American Mathematical Society, which will be effective from January 1979.

Briefly, the terms allows for our members to join the AMS at a much reduced rate (\$US18 p.a.) which will entitle you to all rights of ordinary members except the right to vote. This means that for the reduced rate you will get free copies of the *Notices* of the AMS, the *Combined Membership List*, the *Bulletin* (New Series), and also substantial price reductions on other publications.

Applications forms for reciprocal membership of the AMS can be obtained from our Treasurer, Dr Ivan Reilly, who will endorse your application provided you are a paid-up member of the NZ Mathematical Society.

OFFICE OF THE  
UNIVERSITY OF OTAGO

# THE NEW ZEALAND MATHEMATICAL SOCIETY



## NEWSLETTER

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DECEMBER 1978

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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 Australian, South East Asian, London and Edinburgh Mathematical Societies and the Canadian 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 (Dr I.L. Reilly, Department of Mathematics, University of Auckland). An application form is printed in this Newsletter.