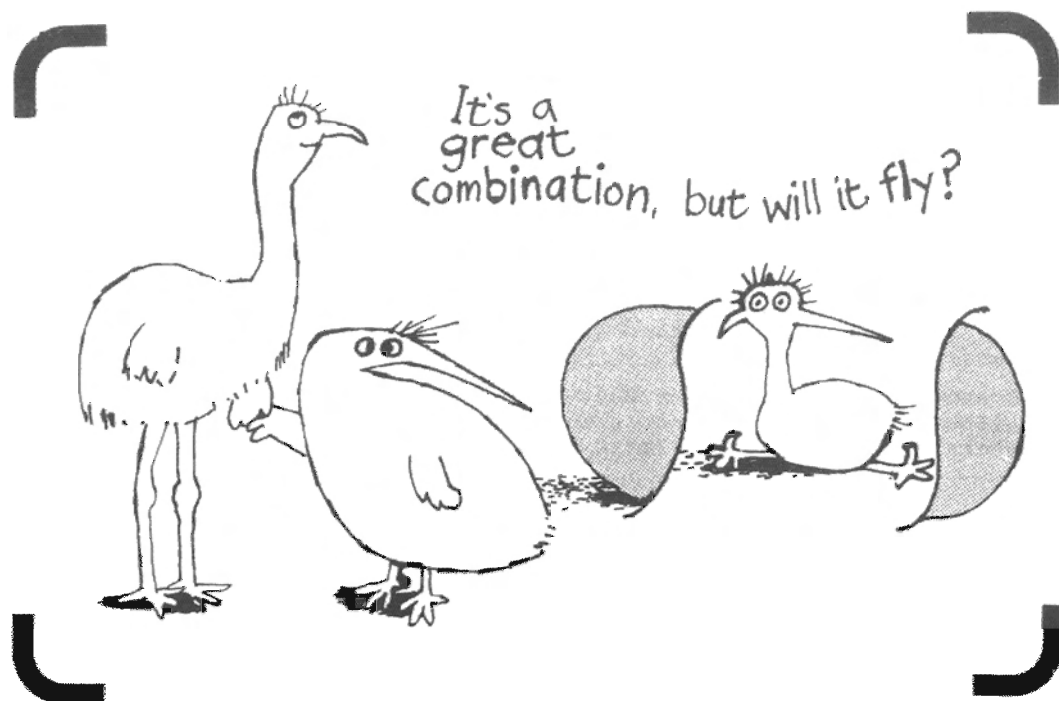




# NEWSLETTER



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## Editorial

Regular readers of this rag will have noticed a steady increase in its size, and the more perceptive would have discerned a recent compaction of type density. To those who regret these trends I offer the consolation that you have an ally in a key position to arrest this behaviour.

The use of a smaller type format with less space between the lines is designed to improve the over-all appearance and makes obvious financial sense. The growth in the number of pages makes no such sense and the present Editorial crew intend to control it.

The Newsletter is, after all, a newsletter and not a de-facto journal. It must therefore go for variety, immediacy, even entertainment. (In this regard I again thank Maurice Askew for his cheerful readiness to work up a rudimentary idea into a professional drawing.)

That is not to say that we don't welcome substantial contributions: shorter articles are preferred, but not exclusively. Original contributions exclusive to us are the most desirable, but we are grateful for relevant material gleaned from sources not normally seen by our members. The greater the variety of material submitted to us, the more interesting will be the Newsletter.

We are now a Registered Publication. This confers cheaper inland postage rates, but commits us to four mailings per year. Pressure on typists and printers from the Seventh Form Booklet project has delayed this issue slightly.

We are pleased to enclose with this issue, by arrangement with David Gauld of the New Zealand Mathematical Chronicle, a reprint of the paper

*"The Spread of Epidemics"*

by Dr J. Gani.

Joe Gani was the 1980 N.Z.M.S. Visiting Lecturer and the paper is the basis of one of the talks he delivered.

The copy date for the next issue is mid-June. Meanwhile, for New Zealand mathematicians, IT'S SYDNEY OR THE BUSH.

*Brent Wilson*

### ANNOUNCING THE PUBLICATION BY THE NZMS OF MATHEMATICS SYLLABUS SERIES: SEVENTH FORM APPLIED MATHEMATICS

PROBABILITY and STATISTICS..... J.C. Turner and R.M. Cornwell, Waikato  
COMPUTING and NUMERICAL MATHEMATICS.. R.L. Broughton & A. Ramsey, Canterbury  
MECHANICS ..... J. F. Harper, Wellington

Each booklet supplies definitions, formulae, worked examples, problems and historical notes, together with tables and selected questions (with answers) from past examination papers.

The price will be \$5 per booklet. A separate teachers' booklet is being published to accompany the probability and statistics booklet (price \$1).

Orders to: Dr. G. C. Wake, Mathematics Department,  
Victoria University, Private Bag, Wellington.

## News and Notices

### POST-DOCTORAL FELLOWSHIP IN MATHEMATICS

University of Canterbury, Christchurch, New Zealand

Applications are invited for a University Post-Doctoral Fellowship in Mathematics.

1. The emolument will be a fixed fee of between \$NZ15,652 and \$NZ18,200. A part of the emolument may be designated as a travel allowance.
2. The appointee will be required to take up the Fellowship at a time to be arranged.
3. Applicants must possess a Ph.D. or equivalent degree, preferably followed by some research experience.
4. The appointee may be asked to undertake a limited amount of teaching in addition to contributing to the current research programme in his or her particular field.
5. A Fellowship will be tenable for one year.
6. The successful applicant will be required to supply a satisfactory medical certificate as to sight, hearing and general health.
7. Applications close with the undersigned on 3 July 1981.

Further details concerning the fellowship may be obtained from the Registrar, Mr. W. Hansen, University of Canterbury, Private Bag, Christchurch, New Zealand.

### 51st ANZAAS CONGRESS - BRISBANE - 1981

The 51st Australian and New Zealand Association Congress will be held jointly at the University of Queensland and Griffith University, Brisbane from 11-15 May, 1981. Speakers for the Mathematical Sciences Section are:

G. Veronis,	<i>Modelling of Ocean Currents</i>
C.W. Rose,	<i>Mathematical Analysis of Soil Erosion</i>
J.-Y. Parlange, R.D. Braddock,	<i>Solutions of the Nonlinear transport Equation</i>
D.E. Smiles,	<i>Mathematical Modelling of Swelling Materials</i>
R.A. Wooding,	<i>Stratified Porous Reservoir</i>
A.J. Peck,	<i>Analysis of Salt Distribution in Soil Profiles</i>
A.M. Watts,	<i>Solutions of the Reaction-Diffusion Equation</i>
S. Marcelja,	<i>Theory of Vision</i>
J. Rickard,	<i>Mathematical Models of Tax Evasion</i>
M. Diesendorf,	<i>Integration of Wind Power into Electricity Grid.</i>
P. Saffigna, J.-Y. Parlange,	<i>Solute Transport</i>
A.J. O'Connor,	<i>Random Difference Equations</i>

Further details available from Dr. P. Saffigna or Dr. R. Braddock, School of Australian Environmental Studies, Griffith University. We hope that you and your colleagues will be able to attend.

### OPERATIONAL RESEARCH SOCIETY OF NEW ZEALAND

17TH ANNUAL CONFERENCE

27 - 28 AUGUST 1981

This year the conference will be held at Shell House in Wellington and will feature a number of guest speakers as well as various aspects of O.R.

Intending speakers should submit summaries by May 15 and final typed manuscripts by July 1. A Conference Proceedings will be published.

Further information from: Conference Secretary, O.R.S.N.Z.,  
P.O. Box 904, Wellington.

## MATHEMATICS - A UNIVERSAL LANGUAGE

The Australian Association of Mathematics Teachers will conduct a conference on the above theme, to be held at the University of Sydney, 17-21 January, 1982.

A wide range of speakers, from Australia and overseas, have been invited to participate. The following have already accepted invitations:

Dr. Alan Bell, Shell Centre for Mathematical Education,  
University of Nottingham, U.K.  
Dr. Murray Klamkin, Chairman of the Department of Mathematics,  
University of Alberta, Canada.  
Dr. Lennart Rade, Chalmers Institute of Technology,  
Gothenburg, Sweden.

Further information from: Mr. W.T. Akhurst, C/- Curriculum Division,  
Department of Education, Box 33, G.P.O. Sydney 2001, Australia.

## GENDER AND MATHEMATICS

A request has been received from the International Mathematics Committee, Second International Mathematics Study for assistance in preparing an international review of *Gender and Mathematics* (! Ed) as part of the ERIC series in mathematics education. They are seeking a contribution to the proposed volume which will reflect how the topic is viewed in New Zealand.

It would be greatly appreciated if any reader who has opinions, material or information relevant to this topic or who is engaged in any research involving any aspect would contact me at an early date. I have agreed to be responsible for the preparation of the New Zealand section and any assistance would be most welcome.

Mrs. Helen M. Wily, Department of Mathematics Education,  
Christchurch Teachers College, P.O. Box 31-065, Christchurch 4.

## ABSTRACTS OF AUSTRALASIAN PH.D THESES

Ph.D. students and their supervisors are reminded that the BULLETIN of the Australian Mathematical Society endeavours to publish abstracts of all accepted Australian and New Zealand Ph.D. theses in mathematics. One restriction however is that the abstract must be received by the Editor within 3 months of the degree being approved. Probably the best time to send the BULLETIN the Ph.D. abstract is when the thesis is submitted for examination. When the thesis is approved, the Editor can then be so advised. Advice on preparation of manuscripts for the BULLETIN can be found in any recent volume and authors are strongly advised to consult this. In particular, the following information is required:

The name of the university which is awarding the degree, the date of submission of the thesis, the date of approval of the degree, the supervisor(s), and the appropriate 1980 Mathematics Subject Classification numbers(s). The abstract submitted to the BULLETIN will usually be the abstract included in the thesis itself. However, this is not necessary as the BULLETIN will accept abstracts rather longer than usually included in theses. (No longer than three typed pages, please.) Remember also that the abstract in the BULLETIN can also include some references.

Dr. Sidney A. Morris, Editor, Bull. Austral. Math. Soc.,  
Dept. of Pure Mathematics, La Trobe University, BUNDOORA, Vic. 3083, AUST.

# Local News

## AUCKLAND UNIVERSITY

### DEPARTMENT OF MATHEMATICS

Dr. Lee Kaiser, a Statistician from Colorado State University, is here as a post-doctoral fellow.

Professor John Hunter, a Statistician from Glasgow University, is a visitor for the first term.

Mike Paulin has been appointed a Junior Lecturer.

Moise Frontz has been appointed as a tutor for the Problem Clinic.

Dr. Bruce Calvert is on leave at USC.

Dr. Ganesh Dixit is on leave at the University of Calgary.

Enrolment figures (for the end of enrolment week) indicate around 1300 students taking Stage 1 courses, 100 taking Stage 2 courses, and 70 taking Stage 3 courses.

The Department has acquired three Z89 microcomputers.

### Seminars:

Dr. C.R. Withers (DSIR):

"The selection of a population better than a standard".

Dr. Michael Stenzel (Bielefeld University):

"On the embedding of topological rings into quotient rings".

Dr. Jeff J. Hunter (University of Auckland):

"Filtering of Markov renewal processes".

Prof. G. Pilz (Johannes Kepler Universität):

"Near rings and their applications", and "Some applications of algebra".

Dr. Nick I. Fisher (CSIRO, Sydney):

"Clustering of geological roses".

### DEPARTMENT OF COMPUTER SCIENCE

Professor Graeme J. Cooper, a numerical analyst from the University of Sussex, is spending a sabbatical year here.

John Hosking and Warwick Mugridge have been appointed Junior Lecturers for 1981.

Enrolments for this second year of the Department have increased markedly from 1980; with around 570 students taking Stage 1 papers, 100 taking Stage 2 papers, 50 taking Stage 3 papers, and with 4 M.Sc. students.

*G.J.T.*

### DEPARTMENT OF THEORETICAL AND APPLIED MECHANICS

Dr. David Ryan spent a profitable period of leave, for much of 1980, in the Operations Research Group of the Atomic Energy Research Establishment, Harwell, and the Department of Computer Studies, University of Leeds. During that time he also visited other centres in the UK and the USA, and presented papers on scheduling problems connected with bus and air fleet operations.

Dr. Mike O'Sullivan returned at the end of 1980 from a year's leave at the Lawrence Laboratories of the University of California at Berkeley. There he worked on the solution of problems in geothermal modelling, and attended several symposia concerned with the utilization of geothermal resources.

The major event of early 1981 was an evening in honour of the retirement of Professor Cecil Segedin, foundation Head of the department. Just over 100 students have graduated in Engineering Science since the first group completed the new course in 1968, and many of these with their wives joined staff of the department in a dinner function held at Grafton Hall of Residence on January 30. Professor Segedin (about whom more is said elsewhere in this issue) was presented with a hand-crafted book listing staff and graduates in the department, and also with a tenth-scale model of a circular glass-house to be erected on his home section. The Auckland String Quartet provided music and the evening was rounded off with a speech of reminiscences and thanks from Cecil Segedin himself.

*M.S.R.*

## CANTERBURY UNIVERSITY

The entire Mathematics Department was photographed in celebration of its twenty-sixth member, Dr. D.J.N. Wall. (Dr. Chacko, the only member on study leave is also in Christchurch.)

### Seminars:

Prof. F. Hampel (Zurich, Switzerland). "Rejection of Outliers"

Dr. R.E. Rosenthal (currently a visiting lecturer in Operations Research in the Economics Department). "A nonlinear network flow algorithm for maximization of benefits in a hydroelectric power system".

David Wall, "Elastic Wave Scattering from Surface-Breaking Cracks" (to the Physics Department).

A continuing departmental seminar offers topics in Numerical Analysis.

David Robinson has been re-elected president of the Canterbury Mathematics Association. He gave the annual M.A. Bull memorial address, entitled 'Rectanguloid curves'. During the second term, Dr. Robinson will attend the Combinatorics Conference at Swansea and the Combinatorial Optimisation Conference at Stirling.

During the second term, Ian Coope will present papers at a meeting of the NATO Advanced Research Institute on Non-linear Optimization at Cambridge and at the University of Dundee on Numerical Analysis.

Mr. T.J. Hills has joined the department as our first technician-programmer.

A Post-Doctoral Fellowship is being offered for tenure in the department.

Two of our former Ph.D. students have been heard from. Dr. Rick Beatson has joined the staff at Connecticut University, Storrs. Rod Ball will complete his Ph.D. in June at Princeton (I am anticipating) and will be a visiting lecturer at Purdue University for two years.

*Big G.*

## MINISTRY OF AGRICULTURE AND FISHERIES

With the break-up of the former Biometrics Section into local units (reporting to the Regional Directors of Agricultural Research Division and a Head Office group within Management Services Division) the Annual Biometrics Meeting has become an important time for sharing experience, information and gossip. This year's meeting was held at Ruakura from March 10-13.

Rob Pringle, Chris Dyson and Dave Saville presented papers on aspects of experimental design and analysis. Mick Roberts, recently appointed to Wallaceville from MWD, spoke on Deterministic models in Epidemiology. Geoff Jowett presented a detailed analogy between non-parametric methods and sample survey statistics. Aspects of robust and non-parametric statistics were discussed in a paper by Murray Jorgensen and a tutorial by Graeme Winn.

Several speakers discussed hardware and software development on MAF computers. (This last emphasis was of great interest coming at a time when the first four nodes of the Ministry's PRIME computer network were just being commissioned. Namely: Levin (P750), Evans Bay (P750), Head Office (P550), and Wallaceville (P450).)

The next Annual Meeting will be at Invermay.

*M.A.J.*

## OTAGO UNIVERSITY

Professor S.P.H. Mandel resigned in December, 1980 in order to take up a position at the University of Minnesota in the U.S.A. His position is being advertised and it is hoped that a new professor of statistics will take office on 1 February 1982.

Ms Petronella de Roos has been appointed to a temporary Assistant Lectureship in statistics and Mr. Geoff Murdoch has been promoted to a temporary Lectureship in statistics, both for 1981.

Two of last year's Honours Graduates (Stephen McPhail and Peter Zoontjens) have been appointed to Senior Demonstratorships.

The Department now has an Apple microcomputer that was bought with University Grants Committee funds "for the replacement of equipment" - - and has generated a great deal of interest and use.

The "weekly" seminars have included:-

Dr. Marston Conder (our Postdoctoral Fellow):

"The Group of Runik's 'Magic Cube'".

Professor R.C. Jennison (of the University of Kent at Canterbury):

"Why are Newton's Laws - Is the Inertial Force Cosmological or Local?".

(This was a joint seminar with the Physics Department).

*G.O.*

## MASSEY UNIVERSITY

Douglas Stirling has joined the Statistics section of the department after four years at Queen Mary College, London, as research assistant and lecturer. He takes up a three year contract lectureship. His main research interests are in linear models. He and his wife are also hoping to sample some New Zealand tramping tracks during their stay here.

David Johnstone and Stephen Joe have been appointed as demonstrators, in mathematics and statistics respectively.

At the Massey Open Day on March 21, the statisticians in the department put probability theory to a severe practical test by challenging all comers to games of chance. A full report on this should appear in the next issue of the Newsletter. Also on display were newspaper clippings showing common misuses of statistics in public statements, and posters giving information on employment opportunities for mathematics and statistics graduates.

It seems that the total enrolment in mathematics and statistics papers this year will be much the same as in 1980. The three new mathematics and statistics papers for the B. Ed. degree (reported in Newsletter No. 16) are now in full swing, and seem to have had the desired effect of encouraging more B. Ed. students to include mathematical studies in their degree.

Part of the summer was fruitfully used by having Paul Austin of Massey's Department of Industrial Management and Engineering give us (with assistance from other members of the group) a series of talks on control theory as seen from an engineering viewpoint. The first two seminars in our regular series have arisen out of this:

Tim Hesketh (Dept. of Industrial Management and Engineering):

*"Self-Tuning Control"*.

Claudio Michelin (Dept. of Economics):

*"Adaptive Control and its Applications in Econometric Analysis"*.

M.R.C.

## VICTORIA UNIVERSITY

Wilf Malcolm is now the Academic Pro-Vice-Chancellor, but still has some time left for mathematics (see below).

Ken Pledger is now a half-time Senior Lecturer, having resigned the other half.

Megan Clark has rejoined us from England, being now a Lecturer in Statistics.

Doug Jones has been appointed to a part-time Lectureship, having earlier been a Junior Lecturer in the Department.

Mark Gosnell and Roger Young are now part-time Junior Lecturers.

Brian Dawkins is on sabbatical in London.

Ivan Stakgold, a world authority on bifurcation theory and non-linear differential equations, will be in New Zealand for two months from mid-June. He is to be a Visiting Fellow at V.U.W. for 6 weeks and NZMS Visiting Lecturer for the rest of his time in the country.

James Graham-Eagle will depart for Oxford in July to do a D.Phil. in applied analysis, with the nowadays rare overseas tenure for his Post-Graduate Scholarship.

Wilf Malcolm is coordinating a seminar for secondary school teachers on Mathematics at Work in Other Subjects on Wednesday 29 April with the help of several mathematicians, an anthropologist, a psychologist, an architect, a chemist, a geophysicist and an economist under the auspices of the V.U.W. Centre for Continuing Education.

David Spence (Oxford) will be a Visiting Fellow for a month or so in 1982, working with Graeme Wake and John Harper on biharmonic boundary value problems, probably immediately before taking up his Erskine Fellowship at Canterbury.

Ian Angus, at present doing his M.Sc. in applied mathematics after a brilliant undergraduate career in mathematics and physics, has been offered the Feynman Fellowship in Physics at Caltech. This is their most prestigious award for a graduate student; he intends to do his Ph.D. in theoretical physics.

J.F.H.

\* \* \* \* \*

## MARGINAL NOTE

Whereas  $n^a = n^b + n^c$  has infinitely many solutions for  $n = 2$ , it is Tamref's conjecture that it has no solutions for any  $n > 2$ .

## ICTAM TORONTO

IUTAM General Assembly and XVth International Congress  
17 - 23 August 1980, University of Toronto

New Zealand has just affiliated to the International Union of Theoretical and Applied Mechanics and it was planned that the Chairman of the Royal Society National Committee for IUTAM - Ian Donaldson of PEL, DSIR - would represent the country at this meeting. But this proved impossible and, at short notice, I, who was then to be passing through America, was appointed as official delegate. I was granted \$350 (augmented later by \$200) by the Royal Society towards the cost of the travel diversion.

The General Assembly (the business meeting) was a very tame affair, with few delegates beyond a core of long standing (and toothed) members making any contribution. Sensitive issues of political import are arranged beforehand by the Bureau - the executive committee. However, there are pressures to democratise the organization and delegates resisted a USSR request that the General Assembly be presented with alternative slates to vote for, and not individuals. The new President is Professor Daniel C. Drucker of the U.S.A. and Professor Jan Hult remains as Secretary General. China was admitted as a member.

The main business was deciding which, among proposed Symposia, should go ahead in the next couple of years. IUTAM supports each symposium with \$5000 but requires a strong scientific organizing committee and an international attendance. New Zealand should take advantage of the good will occasioned by its recent joining and consolidate its reputation by hosting a Symposium as soon as possible - say on earthquake engineering or geothermal utilization.

The XVth International Congress (the scientific part of the meeting) was a rather mixed affair. Attendance was only half that envisaged, partly because the U.S.A. contingent was relatively small and partly because of the stringent criteria applied to contributed papers. Out of 868 submitted, 508 were rejected! Even so, the standard of the papers was very variable and I was disappointed with the old fashioned tone of some of the invited discourses (especially given that the registration fee was \$150). The fields which seem to be making real progress at present are physiological and environmental fluid mechanics, magnetohydrodynamics, non-linear elasticity and the formation of cracks.

I have provided detailed reports of the meeting to the Royal Society National Committee for IUTAM, who should be contacted by anyone seeking more information or who may wish to attend a future meeting. The current membership is Mr. A.L. Andrews, Dr. P.J. Bryant (Acting Convenor), Mr.R.E. Chilcott, Dr. I.E. Donaldson (Convenor, Secretary and Chairman), Prof. C.M. Segedin and Mr. P.C. Spearman.

W. Brent Wilson, Canterbury

### FUTURE IUTAM SYMPOSIA

Participation in IUTAM symposia is by invitation: people wishing to attend should contact the National Committee.

5-8 May 1981	<i>Unsteady Turbulent Shear Flows</i> , Toulouse, France.
15-19 June 1981	<i>Mechanics and Physics of Gas Bubbles in Liquids</i> , Pasadena, Cal.
31 Aug. - 4 Sep. 1981	<i>Stability in the Mechanics of Continua</i> , Nümbrecht, BRD.
14-18 September 1981	<i>High Temperature Gas Dynamics</i> , Prague, Czechoslovakia.
29 March - 1 April 1982	<i>Three-dimensional Turbulent Boundary Layers</i> , Berlin - West.
May 1982	<i>Fundamental Aspects of Material Sciences</i> , Ottawa, Canada.
16-19 August 1982	<i>Mechanics of Composite Materials</i> , Blacksburg, Virginia.
August 1982	<i>Non-Linear Deformation Waves</i> , Tallinn, USSR.

Peter Bryant, Convenor.



## Problems

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

FOUR CUBES (Problem 2). Solution by the proposer.  
(The problem is posed in Newsletter 18, it is to find the points of intersection on a face of one of four unit cubes making the solid of figure 1.)



Figure 1

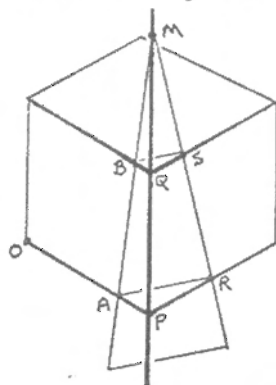


Figure 2

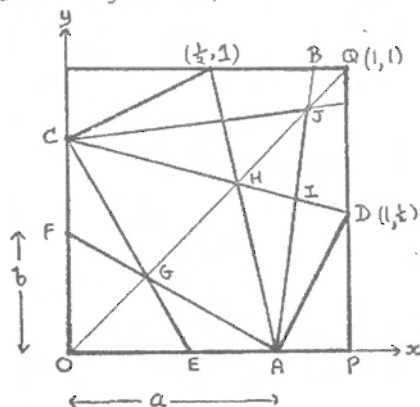


Figure 3

Figure 2 is an isometric diagram of the intersection of one of the cubes with one face of a second cube, the plane of this face being produced. Two faces of the cube, defined by the planes OABPQ and PQRS, meet along an edge PO and since any three mutually non-parallel planes meet at a point, PQ produced passes through M the point common to the planes OABPQ, PQRS and ABR. Then by similar triangles  $BQ/AP = QS/PR$ . By the symmetry of the configuration of all four cubes  $PR = \frac{1}{2}$  and  $AP = QS$  so  $BQ = 2(AP)^2$ .

Figure 3 represents the face OABPQ in more detail. Let  $OA = a$  and  $OB = b$ . Note that  $FA = AJ = JC$ , and  $FG = GE = IJ$ . Then from the similar triangles BQJ and OAJ we have  $x_J = y_J = a/[2(a-1)^2 + a]$ . Then by Joachimsthal's formula

$$x_I = \frac{(ax_J + bx_A)}{(a+b)} = \frac{1}{(a+b)} \cdot \left[ \frac{a^2}{2(a-1)^2 + a} + ab \right].$$

$$\text{and } y_I = \frac{(ay_J + by_A)}{(a+b)} = \frac{1}{(a+b)} \cdot \frac{a^2}{2(a-1) + a}.$$

For I to lie on the line CD, whose equation is  $y + x(a - \frac{1}{2}) - a = 0$ , we must have  $b(2a-3)[2(a-1)^2 + a] = a(2a-1)(2a-3)$ .

But  $\frac{1}{2} < a \leq 1$  so  $(2a-3) \neq 0$  and may be cancelled from both sides, so  $b = a(2a-1)/(2a^2 - 3a + 2)$ .

Then  $(FA)^2 = (JA)^2 = a^2 + b^2 = (x_J - x_A)^2 + (y_J - y_A)^2$  which leads to  $(2a-1)(4a-3) = 0$  and as  $a \neq \frac{1}{2}$  we have

$$a = 3/4 \quad \text{and} \quad b = 3/7.$$

The coordinates of G, H, I, J are then all obtainable as rational numbers. In view of the complexity of the compound of four cubes it is perhaps surprising that these points should have such simple rational values. Furthermore the prime numbers 7 and 11 are not naturally associated with symmetries in three dimensions. It would be interesting to have a derivation using group theory.

## THE FLIGHT FROM MATHS

John Field, the Editor of the *DMS Newsletter*, has commented upon a series of articles published in *The Australian* recently. We reprint it with his permission.

"The future of commerce and industry is directly threatened by a generation of high school students virtually without mathematical skills. This is the conclusion of a massive report on high school graduates just published in Victoria".

The report is the second to be compiled under the title STEP. STEP stands for secondary tertiary education planning. Covering every high school in Victoria from 1975 until the end of 1979 the report was sponsored principally by Shell Australia, supported by BHP, General Motors-Holden's, Comalco, Myer, the AMP Society, ICI, CSL and Conzinc Rio Tinto of Australia. It was compiled by "a team of mathematics and science academics" from Monash University, led by Mr Barry Walsh.

The first STEP report (for the years 1975-77) indicated very clearly the trend away from maths between years 11-12 (11th and 12th year of school, not 11 and 12 years old), particularly for girls. This information had previously not been known. The current STEP data shows that there has been no improvement and, in many respects, the flight away from maths has increased. Over the period 1976-79 at least 44% of the students who proceeded to tertiary institutions had no mathematics. The figure for girls is 60%. Only 8% of girls have passed in two mathematics subjects while the figure for boys is 25%. Sixty three percent of high school graduates who go straight from school seeking employment do not have mathematical skills.

"The choice for those entering institutions with zero maths appears to be a negative one", says the report. "The options open to them are limited teaching, commerce or humanities. Many are disqualified from humanities because they also lack a foreign language. Now that teacher demand is significantly reduced, the only 'choice' is commerce ... The number of young women in commerce faculties has jumped from 26 percent to 36 percent in four years ... The over-riding concern for those who choose commerce with no maths must be as to the adequacy of this background with a commercial world demanding increasing analytical prowess and numeracy".

The report summarises some of the issues as follows. "A decline both in mathematics and foreign languages is a matter of concern as it implies a decreased exercise of the rigorous intellectual discipline traditionally regarded as an essential component in the development of innovative, adaptive and self reliant members of the community.

"In a complex and technologically-based society the erosion of mathematical studies is doubly worrying. Not only will there be fewer people able to undertake the rigorous studies required to maintain a high technology economy, but there will also be a growing proportion of people who will never gain the quantitative self-confidence that is so necessary if they are to comprehend and handle the increasing complexity and the accelerating rate of change in our society.

"With the flight from maths in year 11, career counselling in year 12 is too late to provide any real expansion of choice for students: an earlier beginning is needed.

"In the sciences and technologies, unless effective remedial courses are offered, there must be concern about the erosion of standards and the eventual suitability of graduates for employment, particularly in engineering.

"The decline in the number of students graduating in engineering and physical sciences is exacerbating the already high and mounting demand by Australian manufacturing and resource-based industries for such skills. It is also having the effect of draining tertiary institutions of many of their best candidates for postgraduate study - a development that must adversely affect not only future research in science and technology but also the quality of teaching available to future science and engineering students".

On the likely reception of the report, Richard L'Estrange comments "*Teacher union critics of the STEP report are expected to attack it on the grounds that it was confined to Victorian high schools. The experts involved in the compilation of the report are quite certain, though, that it tells the story for all of Australia. In fact, the business people involved, all with companies with national ramifications, say what the report has done is confirm the worst possible fears of commerce and industry about what has been going on in schools - a teacher-inspired flight from mathematics and anything else thought to be 'too hard'.*"

## NATIONAL CONSULTATIVE COMMITTEE ON MATHEMATICS

The National Consultative Committee on Mathematics was formed in 1976 with the following aims and functions:

1. To help determine the future direction of mathematics education in New Zealand from Infants to Form 7.
2. To consider curricular developments occurring at different levels of the school system with particular reference to the effects of these developments on the system as a whole.
3. To identify areas of concern in mathematics education from local, national and international literature.
4. To consider research findings and to suggest areas for further research.
5. To recommend the formation of working parties of revision committees to undertake specific tasks within the field of mathematics education.
6. To maintain contact with existing committees and examination boards.
7. To consider the relationship of school mathematics and the mathematics needed for tertiary education, commerce and industry, and effective citizenship.
8. To report to the Department of Education.

Meetings of the Committee are held on average twice a year in Wellington.

Membership:

Chairman: Director, Development Division, Department of Education

Curriculum Officers (2)	Teachers college lecturers - primary
Inspector of primary schools	secondary
Inspector of secondary schools	Technical institutes tutors (2)
PPTA (2)	University staff (2)
NZEI (2)	Vocational Training Council
Lay representative	representative

The current university representatives are:

Professor D. Vere-Jones, Chairman, Mathematics Steering Committee  
Mr. M. J. Murtagh, Secretary, University Entrance Board.

Among the topics discussed by the National Consultative Committee, the following have direct or indirect relevance to university mathematics courses:

Form 7 Pure and Applied Mathematics and the work of the Mathematics Steering Committee; the place of mechanics.

Form 6 Mathematics and the proposals of the Working Party to accommodate the needs of students of a widening range of abilities now seeking mathematics courses at that level.

Form 5 Mathematics, especially the internal assessment trials and the local certificate programmes.

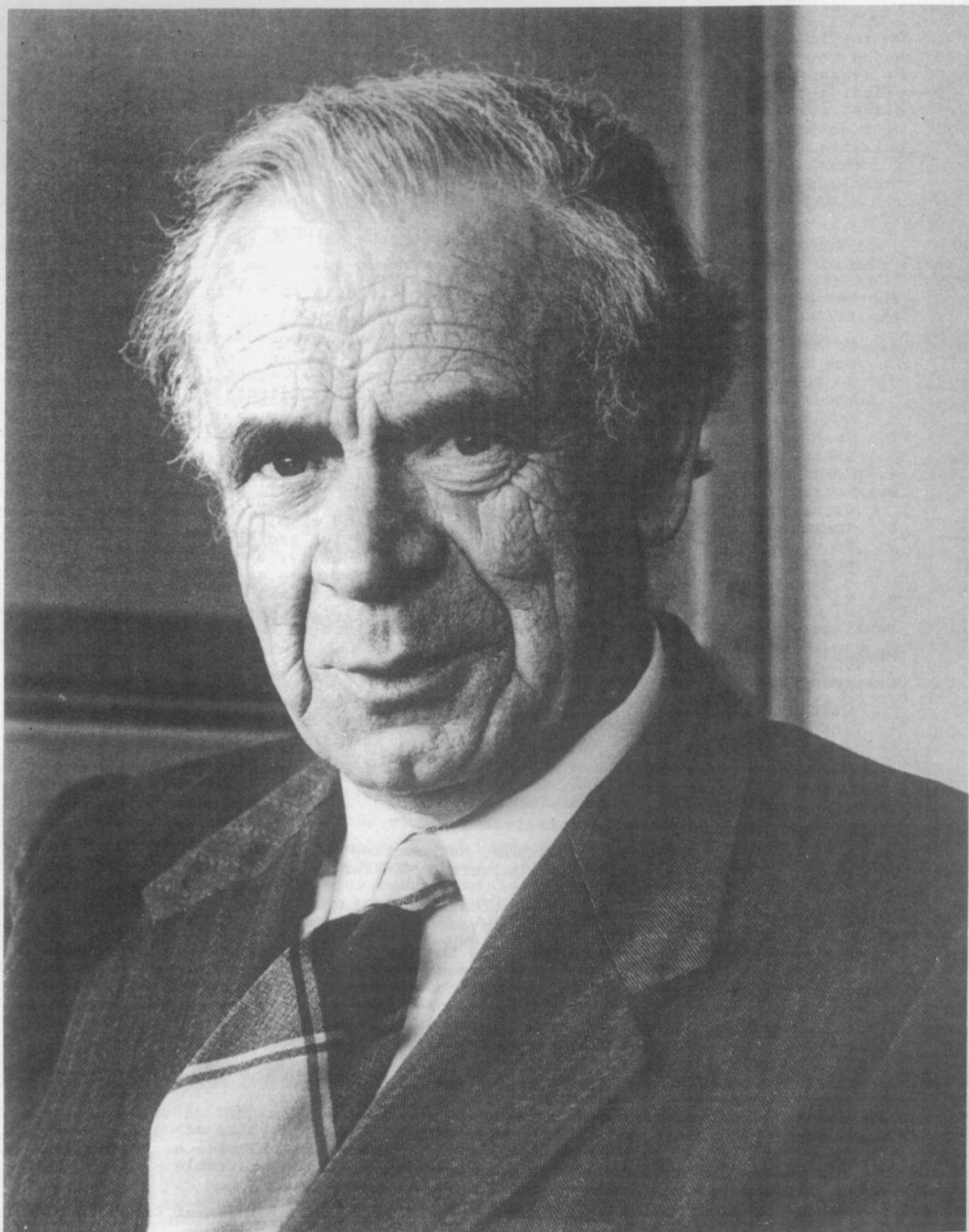
Secondary-Tertiary liaison, with particular reference to the technical institutes.

The supply of Mathematics teachers.

Research in mathematics education: survey of algebraic skills, of computational achievement, of sex differences in mathematics.

The place of computing in the curriculum, especially its desirable relationship to mathematics.

B.W. Werry, Education Officer: Mathematics, Curriculum Development Division for National Consultative Committee on Mathematics.



# Centrefold

## PROFESSOR CECIL SEGEDIN

Head of the Department of Theoretical and Applied Mechanics  
School of Engineering, University of Auckland

*A tribute on his retirement*

Cecil Marin Segedin retired in January 1981 after a lifetime devoted to Mathematics at the University of Auckland. He was born in the city and with high school education at Auckland Grammar he embarked in 1933 on his University training undecided on his future specialty - classics maybe, or perhaps chemistry. He eventually chose wisely and after completing a mathematics master's degree he joined the teaching staff of the Auckland University College under Professor H.G. Forder.

His career can be divided with reasonable accuracy into four decades, each of which brought with it a new challenge which kept him active in mind and young in spirit. The first, beginning in 1937, saw him as a vigorous lecturer closely associated both in class and in extramural activity (especially tramping and climbing) with students who were little younger than he. Those of us who were privileged to be taught by him can well recall small group tutorials, where integrals and partial derivatives flourished, but where more importantly the essential spirit of mathematics was developed along with the necessary techniques. It was during this time that he enlarged his interests in mathematical applications, particularly electromagnetism, fluid mechanics, and what was to be his main research field, elasticity. The first decade ended with promotion to Senior Lecturer, a bumper crop of masters students while Professor Forder was on leave, and the chance to study at Cambridge for a doctorate.

At about this time Engineering moved to Ardmore, and on his return from England Cecil continued teaching mathematics courses for engineers. This he did with customary verve, spending not a little time at Ardmore and identifying with a group of students which spawned Rhodes Scholars, world-ranking engineers, professors of several branches of Applied Science and at least two Vice-Chancellors. His interests in both fluid and solid mechanics developed widely during this time, and many students in Engineering benefited directly from his specialist lectures. The opportunity to supervise ME theses was also accepted, with notable success. The end of this decade, probably the one in which he derived his greatest teaching satisfaction, saw promotion to Associate Professor and the extension of interests not only in continuum mechanics but also in the development of numerical methods courses within mathematics degrees.

The third period was essentially one of planning for new responsibilities; first for marriage and family, and then for his rôle as the developer of a new department and its associated degree structure. This was made possible by the increasing size of the School of Engineering and by Cecil's continued enthusiasm for mechanics in its widest sense and its place at the foundations of applied science. The Department of Theoretical and Applied Mechanics was founded in 1963 and by the end of this third phase, in 1968, he had been appointed to the Chair, and the first Engineering Science graduates had completed their degrees.

The fourth decade has seen the blossoming of this new course established as an important addition to the range of engineering qualifications available in New Zealand. Its successful development was by no means accidental, for Cecil Segedin is a scholar and a man of vision. His first research dealt with crack and punch problems in elasticity, but this spread to wider fields and his interest steadily grew in the area of numerical techniques. He still enjoys few activities more than developing a new procedure for reducing the truncation error in a series sum or investigating an improved boundary integral method.

His identification with his subject of mathematics and his love for its teaching, especially within engineering, have made a lasting impact on the New Zealand academic scene and on Auckland in particular. His close attachment to the one University for nearly 50 years must establish a record for continuous and loyal service. But above all it is his warm humanity which shines through; it has endeared him to two generations of students, it has cemented friendships with hundreds of academic colleagues and it has gathered round him a wide group of friends in professional and cultural circles.

All who know Cecil Segedin wish for him a long and vigorous retirement with continued interest in mathematics and people.

*Mervyn Rosser*

*Photograph by Marti Friedlander*

### H.S. ROBERTS - RETIREMENT

Mr H.S. (Stan) Roberts has retired after almost 30 years with the DSIR's Applied Mathematics Division. He joined after graduating with honours in mathematics from Victoria University and spent his career with the division actively promoting the use of statistics in a wide range of applied fields.

A substantial part of his work has been for other divisions of DSIR, notably for the Fruit Research Division on the analysis of long term apple yield and storage trials, for the Soil Bureau on design and analysis of soil fertility experiments, and for the Chemistry Division on the statistical aspects of blood alcohol analysis.

He has played a leading rôle in the adoption of statistics in the secondary school syllabus, writing a popular booklet "Social Statistics" for the Education Department. He was prominent in the development of a Certificate in Statistics for the Technicians' Certification Authority, and for many years he has advocated greater use of statistics in public libraries as well as lecturing at the Library School.

Many Government departments, particularly those involved in "social" areas, have been advised by Stan Roberts on the use of statistics in their work. The Justice and Health Departments in particular benefitted from his meticulous attention to their problems in analysing and reporting on their statistics. He helped design the trials and analyse the results that led to the adoption by the Ministry of Transport of a 4 miles per hour tolerance in the application of the speeding infringement fees scheme in 1971.

He has been an active member of several professional societies. For the NZ Statistical Association, with which he has been associated for the whole of his career, he promoted many valuable ideas. He single-handedly organised calculator fairs at which manufacturers of electronic calculators displayed their wares to large numbers of actual and potential users from business, manufacturing, educational and research fields. More recently, he has just concluded terms as council member and treasurer of the NZ Mathematical Society.

We wish Stan a fruitful retirement and look forward to his continued association with our Society.

\* \* \* \* \*

Overheard on Radio New Zealand.

At first the Australians opposed us, but we went over there to explain our views and they changed their attitudes a full 360°.

## THE ROLE OF DMS IN CSIRO

Joe Gani

CSIRO Division of Mathematics and Statistics, Canberra

NZMS Visiting Lecturer 1980

### 1. THE CURRENT SITUATION

1979 marked the 25th anniversary of the foundation of the Division of Mathematical Statistics, which was formed in 1954 and first headed by Dr E.A. Cornish. The year 1980 therefore seems a particularly fitting time to discuss the rôle of the Division of Mathematics and Statistics (DMS) in CSIRO; perhaps I can provide a few useful facts, and possibly some new views on the rôle of the Division.

Applied mathematics and statistics are responses to the need for precise solutions of scientific problems (both physical and biological), as well as agricultural, environmental, industrial, mining, commercial and administrative problems. As these become more sophisticated, they tend to require more mathematical and statistical treatment. There is little to be gained from a list of examples, but I think it might be appropriate if I mentioned at least a few which illustrate this point in terms of work already carried out within the Division of Mathematics and Statistics.

In the scientific physical area, some DMS scientists deal with the solution of differential equations describing meteorological phenomena, and with the aerodynamics involved in the flow of gases in a blast furnace. In the scientific biological area they are concerned with a number of problems in mathematical genetics, as well as with the biological control of insect populations. In the agricultural area our statisticians design experiments for fertiliser treatments, and describe the growth curves of plants. In the environmental area, applied mathematicians model wind power for use in the generation of electricity, and discuss plant competition and the self-thinning of trees in forest plantations. In the industrial area scientists are working on queueing theory in road traffic and computer scheduling, and the damage caused to turbine blades by the collapse of cavitation bubbles. In the mining area they work on the appropriate angle of open cut tips, and on the weathering profile of bore holes to interpret mineral exploration data. In the commercial/administrative area DMS statisticians consider sampling for accounting audits (a problem presented by Peat, Marwick and Mitchell of Melbourne) and the modelling of recruitment and retirement within CSIRO (for Head Office).

This provides a fair cross-section of both statistical and mathematical expertise in DMS. Although the work has been described in terms of projects, it should be pointed out that because of the abstractness and universality of mathematics and statistics, the presentation of projects really makes little sense. DMS's contribution to these consists of a methodology, a way of describing scientific phenomena precisely, and of seeking analytic solutions to the problems that they present. To discuss mathematical and statistical work in terms of projects is a little like illustrating the virtues of logic by battenning on a single syllogism. The scope of logic is much broader; likewise, mathematics and statistics are far more universal than the projects where they are used to obtain solutions.

Since 1974, DMS has tried to expand its work into the areas of Applied Mathematics, Operations Research and Computational Mathematics. These are the fields into which we would wish to put more effort. We should like, for example, to discuss not just the analysis of road traffic, but to develop a general model for fuel consumption in Australia, and to describe a variety of scenarios for the transport of the future. This is an area of operations research, which has been sadly neglected in CSIRO up to date, and which could do with a great deal more support and forward planning. We should like to expand our applied mathematical work connected with engineering, in the modelling of industrial plants, in the analysis of engineering structures and building designs, in the problems of atmospheric physics and oceanography. We should also like to develop our computational mathematics, not only in the foregoing areas but also in the fields of management and organisation which are closely related to operations research. We would wish to put our mathematics to use in decision making.

### 2. CSIRO SCIENCE IN 1973 AND 1980

In Australia, until recently, the agricultural, biological and environmental (rather than the industrial and technological) aspects of science have been considered the more important. Of about 40 Divisions and 6 Units in CSIRO more than 17 (or just under one half)

are concerned with these areas. The growth of the Division of Mathematical Statistics between 1954 and 1973 bears evidence to the importance which agriculture and biology held for the Australian farmer and more generally for the Australian public of the time. In these, statistical analysis comes into its own, stochastic models must be developed, and agricultural experiments are designed. Sometimes, mathematical methods of a broader nature are also needed, but not as frequently as in the physical sciences, industry and mining, and the commercial and administrative sectors, where they are indispensable.

By 1973, therefore, the Division of Mathematical Statistics numbered 95 positions, mostly deployed in the biological, agricultural and environmental areas. When I first visited CSIRO in July 1973, it seemed clear that the areas of physical science, industrial and mining research, commercial and administrative development needed to expand. In these, both classical and more modern applied mathematical methods are required. I therefore asked for a change of name to the Division of Mathematics and Statistics, and have endeavoured since taking up the position of Chief in September 1974, to recruit applied mathematicians and computational mathematicians to the Division.

Some questions may be asked about our similarity of function with the Division of Computing Research (DCR). We are certainly interested in computational mathematics, both from the point of view of solving the numerical and mathematical problems which arise in this field, and more specifically of developing new areas of statistical computation (such as GENSTAT, for example). But we have found that our work does not in fact overlap in any serious way with that of DCR. The problems that DMS scientists are set by their colleagues in CSIRO have to do with the mathematics of numerical methods, with the solutions of certain types of integral, differential and difference equations which can be carried out computationally, and with the much broader interface of statistics and applied mathematics with computational methods. Thus, collaboration between DMS and DCR continued with minimal overlap, each having its own specialised areas of interest.

My general overview in 1980 is that CSIRO may not have fostered the development of mathematics and statistics sufficiently during the past 6 years, particularly when one realises that applied and computational mathematics, as well as Operations Research, need considerable support in Australia. My thesis is that if CSIRO saw the logic of 95 positions in Mathematical Statistics in 1973 to serve approximately half of its Divisions involved in agricultural and biological work, surely it must see the wisdom in 1980 of expanding its mathematical services to the remaining Divisions. If a national emergency were to arise, CSIRO could well be held responsible for not fostering adequate mathematical and statistical expertise in the areas outlined, to meet it.

DMS has been asked by other CSIRO Divisions for an expansion of its services in Darwin, Armidale, Sydney, Adelaide and Melbourne. We cannot provide them adequately with our present staff strength. DMS is unique in that it cuts across all Divisions and assists each of them with its mathematical and statistical work; it is, in a sense, a qualitative nerve centre of CSIRO, and needs to be kept up to reasonable strength to fulfil its function properly. This may sound like special pleading: but there is strong evidence that much work requires to be done in applied mathematics, operations research, and computational mathematics in order to make CSIRO more efficient.

I think there is agreement that the development of Australia will require an expansion of its industrial, mining, commercial and administrative strengths. It is precisely in these areas that applied mathematics, operations research and computational mathematics come into their own. By supporting an expansion of these activities, both CSIRO and the Australian community will benefit.

### 3. PLANS FOR DMS

Let me now review the plans and achievements of DMS over the past few years. From the start of my duties as Chief of the Division of Mathematics and Statistics, I have consistently put forward a plan to build up its professional staff so that its ratio to that of professional staff within CSIRO is 1:20. Thus one DMS consultant would advise and collaborate with 20 other CSIRO scientists. In other research establishments, the ratio lies between 1 in 12 and 1 in 15; but being a realist I believe that 1 in 20 would be adequate for the needs of CSIRO. In fact, in Cornish's day there were 50 scientists (20 Research Scientists (RS) and 30 Experimental Officers (EO)) in the Division catering to about half the scientific strength of CSIRO in the agricultural, biological and environmental Divisions.

My belief was that double this number of DMS scientists should cater to each of the 2200 other scientists spread throughout CSIRO. I therefore proposed to build up a Division



not consisting of double Cornish's number, namely 190, but more realistically of about 135, roughly 30 more than today. In this ideal Division of 135 there would be approximately 104 scientists, (say 70 RS's and 34 EO's), approximately 11 administrators (2 more than at present), and 20 technical assistants and officers (TA/TO), much the same as at present. There are currently 76 scientists (42 RS's and 34 EO's), already an increase of 50% over Cornish's number. And this despite the fact that we only have 9 more positions than the Division had in Cornish's day; this increase in the number of scientists has been achieved by converting TA/TO positions to RS/EO positions.

You may ask how one might distribute this number in terms of disciplines. The McLone Report in 1973 entitled "The Training of Mathematicians" reported an inquiry among 294 employers, which included employers from the Public Service, industry and commerce, as well as the public utilities in Britain. These employers ranked the subjects which they considered important in their work as follows: Statistics (97) first, Applied Mathematics (53) second, Computational Studies (45) third, Numerical Methods (37) fourth, Operations Research (36) fifth, and Pure Mathematics (26) last. Broadly speaking then, Statistics would rank first in their needs, Applied Mathematics second, and excluding Computational Studies which lie more in the realm of DCR, Numerical Methods and Operations Research roughly equal third.

To reflect this analysis, and to take into account the special needs of CSIRO, which contains 9 Divisions other than DMS in the physical sciences and 14 in the minerals and technology area, a reasonable final spread of scientists in DMS would be approximately 55% in statistics, 35% in applied mathematics and operations research, and 10% in numerical mathematics; or 57 statisticians, 36 applied mathematicians and OR specialists, and 11 numerical mathematicians. While the present statistics numbers are roughly correct, we would have another 30 staff to recruit for the applied mathematicians, OR specialists and numerical mathematicians, before they were built up to appropriate strength.

#### 4. DIFFICULTIES AND POSSIBLE SOLUTIONS

Although these figures may appear exaggerated, it should be noted that the half dozen applied mathematicians and the half dozen numerical mathematicians currently working in DMS are fully stretched with the problems presented to them by their colleagues in other Divisions of CSIRO. In addition, they must respond to the occasional demands on them from BHP and other industrial firms outside CSIRO.

Because of cuts in staffing, DMS has not been able to develop Applied Mathematics, Operations Research and Computational Mathematics adequately. These cuts have regrettably not been selective. While DMS considers itself fairly efficient, and is relied upon widely in CSIRO (including Head Office) and by outside firms, there remains a feeling among its staff that the importance of mathematics and statistics in the structure of scientific effort is not fully appreciated.

As an example of the needs that DMS responds to, it should be pointed out that the consulting projects in CSIRO and the number of DMS publications has risen by a factor of approximately 2½ since Cornish's day. And this despite the fact that our total staff has increased by only 10% and our scientists by 50%. Mathematics and statistics are relatively cheap disciplines; most of the workers in this area require paper, pencil, library facilities and a certain amount of computing time. Thinking is far cheaper to sustain than repeated and occasionally poorly thought out experimentation; DMS does not require large amounts of materials, nor many technical assistants; we require only data, discussion and a certain amount of computing time. Thus investment in mathematics and statistics is likely to be far more efficient than investment in the more experimental areas at a time when resources and positions are hard to obtain.

Against DMS, I should in fairness point out that its activities are not vote-catchers. We work mostly behind the scenes, ensuring accuracy in the data analysis of other Divisions, making certain that their quantitative statements are well-tested. We could of course go in for self-promotion; a recent article, for example, entitled "Can we Tap the Power of the Wind?" has reported the work of Dr Mark Diesendorf in Ecos of 19 February 1979. We could, as has the Melbourne Herald of 11 April, advertise the work of Dr John Blake in collaboration with Dr Gibson on the design of hydraulic machinery and the effect of cavitation bubbles on its destruction. We could equally point out that work has been done in the Division on the forces generated by ocean waves to wrench buried pipelines from the sea bottom.

But in the final analysis, DMS believes that whatever public relations may do for it, hard work, high quality and meticulous attention to detail are far more important. It is important to remember that when it comes to the crunch, this and not PR is what finally delivers the goods. I therefore suggest that the following three points need to be seriously

considered. First, the position of mathematics and statistics in CSIRO's scientific research must be more clearly understood. Second, DMS plans for development should be agreed upon and endorsed, and finally resources should be made available to the Division to carry out these plans. If this were possible, DMS could well become one of the leading international centres for applicable mathematics.

Joe Gani

## AN ARABIC MS AT OTAGO

Garry Tee, in a note in AAHPSSS News Information reports his findings on an Arabic MS of Euclid's *Elements* now in the University of Otago Library on long term loan from the Otago Museum.

The MS was given to the Museum about 1951 by Dr. Lindsay Rogers (1902-?), author of *Guerilla Surgeon* (1957) and Professor of Surgery at Baghdad (1945-1950). It was presented to him by one Muhammed Abuhassan (presumably in Baghdad) as recorded in an English inscription at the beginning of the MS: *To my dear Sir, Professor Dr. Rogers, as a memory of the help I received from him. Muhammad Abuhassan.*

The only other indication of ownership is an inscription on the last page, recording the presentation of the MS to Suleiman the Magnificent (Sultan of Turkey 1494 - 1566 AD) in 922 or 923 AH (c 1516 AD). There is an earlier date (not in the hand of MS) of 873 AH (c 1466 AD). No expert opinion of the date of MS is so far available.

The MS on paper contains the first three books of Euclid's *Elements* and although a page or two is missing at the beginning (the text begins in the middle of Definition 10), it probably never contained the later books, as a colophon at the end of book III and the position of the inscription to Sultan Suleiman seem to imply that it never contained more. The translation is that made c 900 AD by Ishāq ibn Hunayn and revised by Thābit ibn Qurra, which is the source of some of Mediēval Latin translations of Euclid.

Surprisingly this translation has never been critically edited until the present, when two Harvard Ph.D. students (G. De Young and J. Engroff) are working on a critical edition with Prof. A. I. Sabra. Mr. Tee has been in touch with these researchers who have expressed considerable interest in the Otago MS of which they hope to acquire a photocopy. It appears that they know of only 11 other MSS of the Ishāq-Thābit translation and consider, from photographs they have already seen, that the MS is a good one.

## UTILITAS MATHEMATICA

UTILITAS MATHEMATICA is a Canadian Journal publishing papers in combinatorics, statistics and applications of mathematics. The subscription, including shipping, is US\$21 per annum for two volumes with approximately 350 pages per volume. Back numbers are available at reasonable prices. For further information about this and other publications write to the Editor, Ralph G. Stanton, Department of Computer Science, University of Manitoba, Winnipeg, Manitoba, R3T 2N2, Canada. A specimen copy is available from the Editor of this Newsletter.

D.R.B.

## Conferences

\*\*\* 1981 \*\*\*

- April 7 - 11  
(Pullman, Washington) *Finite Geometries*  
Details from M.J. Kallaher, Department of Pure and Applied Mathematics, Washington State University, Pullman, Washington 99164, U.S.A.
- April 8 - 10  
(Alexandria, Virginia) *Environmetrics '81*  
Details from Hugh B. Hair, Society for Industrial and Applied Mathematics, 117 South 17th Street, Philadelphia, Pennsylvania 19103, U.S.A.
- April 10 - 11  
(Conway, Arkansas) *Sixth Annual Conference on Undergraduate Mathematics*  
Details from J.R. Boyd, Department of Mathematics, Guilford College, Greensboro, North Carolina 27410, U.S.A.
- April 21 - 24  
(Kuala Lumpur) *Second Southeast Asian Conference on Mathematical Education*  
Details from C.K. Lim, Department of Mathematics, University of Malaya, Kuala Lumpur, Malaysia.
- April 23 - 26  
(Plattsburgh, New York) *Recent Advances in Non-Commutative Ring Theory: A George H. Hudson Symposium*  
Details from P. Fleury, Chairman, G.H. Hudson Symposium, Department of Mathematics, State University of New York at Plattsburgh, Plattsburgh, New York 12901, U.S.A.
- April 30 - May 1  
(Pittsburgh, Pennsylvania) *Twelfth Annual Pittsburgh Conference on Modelling and Simulation*  
Details from William G. Vogt, Modelling and Simulation Conference, 348 Benedum Engineering Hall, University of Pittsburgh, Pittsburgh, Pennsylvania 15261, U.S.A.
- May 11 - 13  
(Milwaukee, Wisconsin) *Thirteenth ACM Symposium on Theory of Computing*  
Details from Walter A. Burkhard, Publicity Chairman, SIGACT-81 Symposium, Department of Electrical Engineering and Computer Sciences, University of California, San Diego, La Jolla, California 92093, U.S.A.
- May 11 - 15  
(Sydney) *Second Australasian Mathematics Convention*  
Details from T.M. Gagen, Department of Pure Mathematics, University of Sydney, Sydney, New South Wales 2006, Australia.
- May 16 - 23  
(Kozubnik, Poland) *International Conference on Functional-Differential Systems and Related Topics*  
Details from D. Przeworska-Rolewicz, Mathematical Institute, Polish Academy of Sciences, Sniadeckich 8, P.O. Box 137, 00-950 Warszawa, Poland.
- May 21 - 22  
(Washington, D.C.) *Third Symposium on Mathematical Programming with Data Perturbations*  
Details from Anthony V. Fiacco, Department of Operations Research, School of Engineering and Applied Science, The George Washington University, Washington, D.C. 20052, U.S.A.
- June 2 - 5  
(New Haven, Connecticut) *Conference in Algebra (in honor of Nathan Jacobson)*  
Details from George B. Seligman, Department of Mathematics, Box 2155, Yale Station, New Haven, Connecticut 06520, U.S.A.
- June 9 - July 3  
(Cape Town) *Symposium on Categorical Algebra and Topology*  
Details from K.A. Hardie, Department of Mathematics, University of Cape Town, Rondebosch 7700, South Africa.
- June 18 - 26  
(Montecatini, Italy) *Symposium on Free Boundary Problems: Theory and Applications*  
To apply for an invitation, send curriculum vitae and several recent publications to A. Fasano, Institute Matematica, Viale Morgagni 67/A, 50134 Firenze, Italy.
- June 22 - 27  
(Tübingen) *International Symposium on Stochastics and Analysis*  
Details from H. Heyer, Mathematisches Institut der Universität Tübingen, Auf der Morgenstelle 10, 74 Tübingen, West Germany.
- June 23 - 26  
(Dundee) *Biennial Conference on Numerical Analysis*  
Details from G.A. Watson, Department of Mathematics, University of Dundee, Dundee DD3 4HN, Scotland.

- June 28 - July 5  
(Weimar) *Ninth International Congress on the Application of Mathematics in Engineering*  
Details from H. Matske, President of the IX. IKM, Karl-Marx-Platz 2, 53 Weimar DDR, East Germany.
- June 29 - July 10  
(London, Ontario) *Current Trends in Algebraic Topology*  
Details from V.P. Snaith, Department of Mathematics, The University of Western Ontario, London, Ontario, N6A 5B9, Canada.
- June 29 - July 24  
(Iowa City, Iowa) *Research Workshop on Banach Spaces*  
Details from Bor-Luh Lin, Department of Mathematics, University of Iowa, Iowa City, Iowa 52242, U.S.A.
- June 30 - July 2  
(Bethlehem, Pennsylvania) *Fourth IMACS International Symposium on Computer Methods for Partial Differential Equations*  
Details from R.S. Stepleman, Computing Technology and Services Division, Exxon Research and Engineering Company, P.O. Box 51, Linden, New Jersey 07036, U.S.A.
- June 30 - July 2  
(Edinburgh) *Fourth Topology Symposium*  
Details from E.G. Rees, Department of Mathematics, James Clerk Maxwell Building, King's Buildings, Mayfield Road, Edinburgh EH9 3J2, Scotland.
- July 6 - 11  
(Budapest) *Sixth Hungarian Colloquium on Combinatorics*  
Details from E. Gyóri, J. Bolyai Mathematical Society, H-1368 Budapest, PF.240, Hungary.
- July 6 - 17  
(Rotterdam) *Advanced Study and Research Institute on Theoretical Approaches Scheduling Problems*  
Details from J.K. Lenstra and A.H.G. Rinnooy Kan, C/- Econometric Institute, Erasmus University, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands.
- July 13 - 24  
(Cambridge) *Nato Advanced Research Institute on Nonlinear Optimization*  
Details from M.J.D. Powell, DAMTP, Silver Street, Cambridge, CB3 9EW, England.
- July 19 - 25  
(Cambridge) *Summer Meeting in Category Theory*  
Details from P.T. Johnstone, University of Cambridge, Department of Pure Mathematics and Mathematical Statistics, 16 Mill Lane, Cambridge CB2 1SB, England.
- July 20 - 24  
(Swansea) *Eighth British Combinatorial Conference*  
Details from A.D. Keedwell, Honorary Secretary, British Combinatorial Committee, Department of Mathematics, University of Surrey, Guildford, Surrey GU2 5XH, England.
- August 3 - 7  
(Rio de Janeiro) *International Seminar on Functional Analysis, Holomorphy and Approximation Theory*  
Details from Guido I. Zapata, Instituto de Matemática, Universidade Federal do Rio de Janeiro, Caixa Postal 1835, 21910 Rio de Janeiro, Brazil.
- August 5 - 7  
(Snowbird, Utah) *1981 ACM Symposium on Symbolic and Algebraic Computation*  
Details from B.F. Caviners, Department of Mathematical Sciences, Rensselaer Polytechnic Institute, Troy, New York 12181, U.S.A.
- August 11 - 21  
(Berlin) *Sixth International Conference on Mathematical Physics*  
Details from R. Seiler, Institut für Theoretische Physik, Freie Universität Berlin, Arnimallee 3, D-1000 Berlin 33, Federal Republic of Germany.
- August 23 - 28  
(Brisbane) *Ninth Australian Conference on Combinatorial Mathematics*  
Details from S. McDonald, Mathematics Department, University of Queensland, St. Lucia, Queensland, Australia.
- August 23 - 28  
(Montréal) *Tenth Conference on Stochastic Processes and their Applications*  
Details from A. Joffe, Centre de recherche de mathématiques appliquées, Université de Montréal, Case postale 6128, Montréal, Québec, Canada H3C 1J7.

- August 24 - 27  
(Parkville,  
Victoria) *Conference on Numerical Solutions of Partial Differential Equations*  
Details from Dr. F.R. Barrington, Mathematics Department, University of  
Melbourne, Parkville, Victoria 3052, Australia.
- August 24 - 28  
(Prague) *Fifth Symposium on General Topology and its Relations to Modern  
Analysis and Algebra*  
Details from Josef Novák, Chairman, Organising Committee, Matematický  
ústav ČASV, Žitná 25, 115 67 Praha 1, Czechoslovakia.
- August 24 - 28  
(Szeged,  
Hungary) *Third International Conference on Fundamentals of Computation Theory*  
Details from F. Gecseg, Bolyai Institute, University of Szeged, H-6720  
Szeged, Hungary.
- August 30 -  
September 6  
(Kiev) *Ninth International Conference on Nonlinear Oscillations*  
Details from Organising Committee, Institute of Mathematics, Repin Str.  
3, 252--4, Kiev - 4, U.S.S.R.
- September 8 - 10  
(Austin, Texas) *International Symposium on Semi-infinite Programming and Applications*  
Details from James Vick, Mathematics Department, University of Texas,  
Austin, Texas 78712, U.S.A.
- September 8 - 11  
(Lindfield,  
New South Wales) *Australasian Symposium on Stereology, Image Analysis and Mathematical  
Morphology*  
Details from Dr. A.F. Reid, Symposium Chairman, ASSIA, Division of  
Mineral Chemistry, CSIRO, P.O. Box 124, Port Melbourne, Victoria 3207,  
Australia.
- September 13 - 20  
(Varna - Golden  
Sands, Bulgaria) *International Conference on Complex Analysis and Applications*  
Details from Conference on Complex Analysis and Applications, Institute  
of Mathematics, Bulgarian Academy of Sciences, 1090 Sofia, P.O. Box 373,  
Bulgaria.
- September 21 - 26  
(Metz) *Journées Arithmétiques*  
Details from Georges Rhin, Département de Mathématiques, Université  
de Metz, Ile du Saulcy, 87000 Metz, France.
- September 30 -  
October 2  
(Aachen, West  
Germany) *Fourth Aachen Symposium. Theory and Applications of Signal Processing*  
Details from H.D. Lüke, Institut für Nachrichtentechnik, Melatener  
Strass 23, D-5100 Aachen, West Germany.
- \*\*\* 1982 \*\*\*
- August 8 - 13  
(Sheffield) *First International Conference on Teaching Statistics*  
Details from Conference Secretary, Department of Probability and  
Statistics, The University, Sheffield S83 7RH, England.
- August 11 - 19  
(Warsaw) *International Congress of Mathematicians*  
Details from Czeslaw Olech, Institute of Mathematics, Polish Academy of  
Sciences, Sniadeckich 8, P.O. Box 137, 00-950 Warszawa, Poland.
- August 23 - 27  
(Bonn) *XI International Symposium on Mathematical Programming*  
Details from Math. Progr. Secretariat, C/- Institute for Operations  
Research, Nassestrasse 2, D-5300 Bonn 1, W. Germany.

M.R.C.

\* \* \* \* \*

In April 1926, C.E. Weatherburn wrote in the Preface to his "Differential Geometry of Three Dimensions" these words:

"Not having access to many mathematical journals I should be grateful to authors for copies of recent or future papers bearing on the subject"...

He was then Professor of Mathematics at Canterbury College, Christchurch.

# Secretarial

## RECIPROCITY AGREEMENT : MATHEMATICAL SOCIETY OF JAPAN

Members of NZMS may join the Mathematical Society of Japan as reciprocal members. Reciprocal members enjoy practically all the privileges of regular members except the right to vote. These privileges include:

Category A: Receiving Journal of the Mathematical Society of Japan (in European languages) at 50% of regular dues (ie. at 5,000 yen for 1981-82).

Category B: Receiving Journal of the Mathematical Society of Japan (in European languages) and Sugaku (in Japanese) at 60% of regular dues (ie. at 6,000 yen in 1981-82).

Applications together with dues should be sent to the Treasurer, NZMS by 30 June each year.

## CONSTITUTIONAL AMENDMENTS

(The Constitution is printed in Newsletter 15, August 1979). Notice is hereby given that the Council of NZMS will propose the following constitutional amendments at the 1981 annual general meeting of the Society.

### Article V. The Council

1. Lines 2-4. Delete "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" and substitute: "Elected members shall each serve for three years".
2. We recommend that we delete all reference to by-laws and produce a set of "working rules", distinct from the Constitution, to include items in the by-laws which are not in the Constitution. Copies of these working rules shall be distributed to all members of the Society. Delete paragraph 2 of Article V and substitute: The Council shall determine the policies of the Society and shall supervise the affairs of the Society".
3. Insert at the end of paragraph 5: "In the event of the Incoming Vice-President resigning during his/her term of office, the next President shall be elected at the following Annual General Meeting".

### Article VI. Officers

4. Paragraph 3, line 3. Delete "the records of membership", Paragraph 3, line 5. Insert "the records of membership and" so that line 5 reads "... to the Council for the records of membership and the management of the financial affairs of the Society in ....".

### Article VII. Meetings

5. Paragraph 4. Delete "The above regulations shall not apply to the Inaugural Meeting".

### Article VIII. Amendments

6. Paragraph 1. Delete "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".

Insert: "An amendment to the Constitution may be proposed by five members of the Society".

7. Paragraph 3. Delete "This regulation shall not apply to the amendments (if any) proposed and adopted at the time this Constitution is first ratified".

### Comments

1. Past experience has shown that the present clause is seldom adhered to - it is upset by a council member being elected Incoming Vice-President, early resignations etc.
2. The present constitution does not make clear what the status of a by-law is, for how long or on whom it is binding, whether a general meeting can change a by-law etc.

3. This is to cover the situation which arose in 1980. It ensures that the President shall always be elected (either as Incoming Vice-President or as President).
4. It seems easier for the Treasurer to keep records of membership as he/she collects the subscriptions.
5. This only refers to a proposed amendment. (a) seems unnecessarily restrictive and (b) unworkable.

## A.G.M. SYDNEY

The Seventh Annual General Meeting of the New Zealand Mathematical Society will be held on Thursday 14th May 1981 at the University of Sydney.

### Agenda

1. Apologies.
2. Minutes of the Sixth Annual General Meeting which were published in the Society's Newsletter, August 1980.
3. Matters arising therefrom.
4. The President's Report.
5. The Treasurer's Report.
6. Constitutional Amendments.
7. Election of Officers.
8. General Business.

The following nominations (and biographical notes) have been received:

For Incoming Vice-President:	Dr. J.H. Ansell, Victoria University
For Council:	Dr. J.L. Schiff, University of Auckland
	Dr. D.J. Smith, University of Auckland

#### Dr. J.H. Ansell

Jim is New Zealand born, a graduate of Victoria University with a Ph.D (Cantab). He is currently a Senior Lecturer at Victoria. His research interests are in mathematical and observational seismology. He was a NZMS Councillor in 1974-75 and inaugural editor of the Newsletter. In May 1980 he was re-elected to Council and has taken responsibility for selecting the Visiting Lecturer and arranging his itinerary. He also represents NZMS at the Member Bodies meeting of the Royal Society and is managing the distribution of the NZMS Syllabus Series books.

#### Dr. J.L. Schiff

Joel was born in Chicago and did his Ph.D at U.C.L.A. in the field of Riemann surfaces. In May 1971 he came to New Zealand as a Lecturer in the Mathematics department at Auckland University, where he is presently a Senior Lecturer. He has been a member of the New Zealand Mathematical Society for several years and will be happy to serve as its Treasurer.

#### Dr. D.J. Smith

David was born in Portland, Oregon and did his Ph.D at Washington State University. He came to Auckland in 1970 and is now a Senior Lecturer in Mathematics. He is Honorary Horologist at Auckland Museum, he was Secretary to the 15th N.Z. Mathematics Colloquium in 1980 and is Assistant Editor, N.Z. Mathematical Chronicle this year.

## FRATERNAL GREETINGS FROM THE IMU

The Secretary of the IMU has written to our Treasurer.

Dear Dr. Roberts,

Greetings also from the International Mathematical Union! and so many thanks for your efforts and success for the Special Development Fund.

The check was received some time ago and I apologize for leaving so much time without acknowledging receipt.

Could you please thank all our colleagues and members of the N.Z.M.S. for their contribution we will publicize in the next IMU Bulletin.

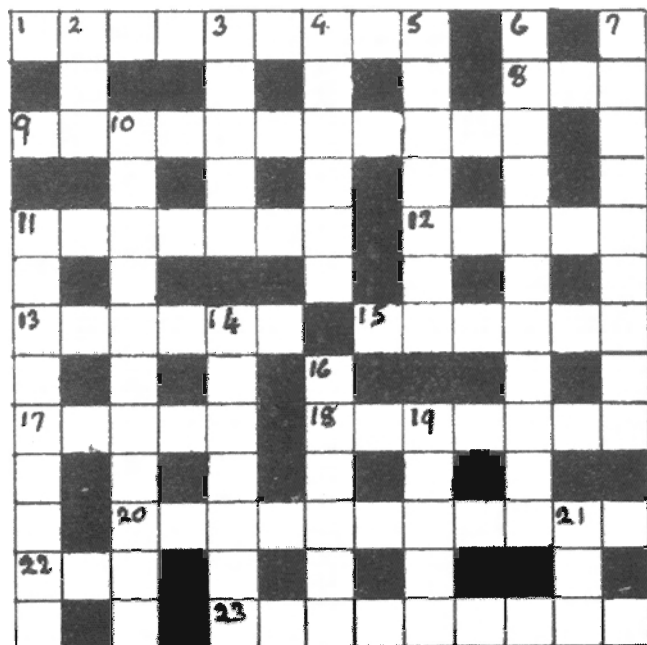
With best wishes, I am, Yours sincerely,

J.L. Lions

# Crossword

N<sup>o</sup> 3

by Matt Varnish



## CROSSWORD N<sup>o</sup> 2 SOLUTION

### Across:

1. A greek cross, 8. Boa,
9. C-HAS-TEN-ER, 10. Kisses,
12. A-VO-CET, 14. DO-W,S,E., 15. Rags,
16. Clue, 17. Relic, 19. Dashes,
20. Rounds, 22. Zinc oxide, 24. AN-N,
25. None the less.

### Down:

2. Road-signs, 3. Exceed, 4. C-HAT,
5. Octave, 6. S-IN, 7. First person,
8. Baker's dozen, 11. SOLE-S,
12. Astir (up and about), 13. Colonnade,
17. RE-NOW-N, 18. CO-HERE, 21. Fist,
23. NO-N.

## 7 DOESN'T AMOUNT TO MUCH

### Across:

- 1 and 6d. Enough to give an arithmetic maniac a pip. (9,11)
8. Beast of Euclid I,5.(3)
9. Horse's chest for the complement. (11)
11. Of greater but not higher dimension. (7)
12. Perfect mathematical concept. (5)
13. Dorian gain. (6)
15. Records. (6)
17. Weird canal to the east. (5)
18. Natural heaviest. (7)
20. Analyst of the sewer stairs. (11)
22. Fitting. (3)
23. Hardy collaborator. (9)

### Down:

2. Greek 17th. (3)
3. 1 cent for whale product. (5)
4. Take off. (6)
5. Eastern and fabulous. (7)
6. see 1a.
7.  $1 + 1 = 2$ . (1,5,3)
10. Stunting beneath the spanning trees? (11)
11. Uncoloured principal thinker. (9)
14. Shed tear about group man for workshop. (7)
16. Enough to go on with. (6)
19. A foot on the sweet flower of song. (5)
21. Once serpentine waters. (3)

\* \* \* \* \*

The Newsletter is the official organ of the New Zealand Mathematical Society (Incorporated). It is produced by Ann Tindall, Beverley Haberfield, Graham Wood, Ian Coope and Brent Wilson of the University of Canterbury Mathematics Department and printed at the University Printery. Contributions are solicited for subsequent Newsletters, the next dead-line being mid-June, 1981. Good Easter.