MARCH 1972
CONTENTS

NEW MEMBERS

BRANCH ACTIVITIES

O.R. COURSES

FORTHCOMING EVENTS

ANNUAL REPORT
The society membership is increasing encouragingly and large gains have occurred in Auckland and Christchurch due no doubt to the activities of the newly formed Branches. Recent additions to the membership list are:

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
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</thead>
<tbody>
<tr>
<td>Ian Hampton</td>
<td>Alex Harvey</td>
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<tr>
<td>Patrick Courtney</td>
<td></td>
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<tr>
<td>Peter Goldstein</td>
<td>W.D. Scott</td>
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<tr>
<td>Phil Scott</td>
<td>Data Bank</td>
</tr>
<tr>
<td>Gerry Dickinson</td>
<td>D.S.I.R.</td>
</tr>
<tr>
<td>Bernard Clapcott</td>
<td>Building Management Consultant</td>
</tr>
<tr>
<td>Robert Taylor</td>
<td>Kaipoi Textiles</td>
</tr>
<tr>
<td>Martin Spencer</td>
<td>General Foods</td>
</tr>
<tr>
<td>Graham Saunderson</td>
<td>Auckland Harbour Board</td>
</tr>
<tr>
<td>David Scothern</td>
<td>Fisher and Paykel</td>
</tr>
<tr>
<td>Khen Fong</td>
<td>Auckland Technical Institute</td>
</tr>
<tr>
<td>Stuart Blair</td>
<td>Fisher and Paykel</td>
</tr>
<tr>
<td>David Cosgrove</td>
<td>Insurance Association</td>
</tr>
<tr>
<td>Leonard Read</td>
<td>Fisher and Paykel</td>
</tr>
<tr>
<td>James Rogan</td>
<td></td>
</tr>
<tr>
<td>Gordon Hookings</td>
<td>Auckland University</td>
</tr>
<tr>
<td>Graham Whyte</td>
<td>Canterbury University</td>
</tr>
<tr>
<td>Colin Papps</td>
<td>N.Z.T.C.I.</td>
</tr>
<tr>
<td>Vincent Gray</td>
<td>Building Research Assn.</td>
</tr>
<tr>
<td>Marion Sergent</td>
<td>Motor Specialties</td>
</tr>
<tr>
<td>Peter Sergent</td>
<td></td>
</tr>
</tbody>
</table>
BRANCH ACTIVITIES

CANTERBURY BRANCH

Two lecture meetings were held by Canterbury Branch in the later months of 1971. These were a talk on inventory control by Dr Hans Daellenbach and the application of Operations Research to Artificial Breeding.

Unfortunately no further details are available.

AUCKLAND BRANCH

Mr Frank Coulter addressed the Branch on various applications of O.R. in the Forest Industry and included details of :-

1. Linear Programming - applied to paper trimming and cutting (see N.Z. O.R. Vol. 1 No. 1 - Minimising Paper Trim loss - C.D. Johanson). This is a combined Company supplied - locally written program. Log cutting is also being studied.

2. Simulation - used in planning of a new Paper Mill, Vehicle planning and logging has been solved using the H.O.C.U.S. language.

3. Scheduling - Programs are used for forward planning of paper machines. Six paper machines will be operational in the near future.

Mr Coulter attributed much of the success of O.R. in N.Z. Forest Products to -

1. Good management communication and co-operation.

2. Direct involvement in management problems.

3. Ability to assist in all departments.

4. Good computer facilities.

5. Highly qualified staff.

A second meeting in form of a panel discussion was conducted on the topic of Education for O.R. On the panel were - Mr I. Turner, Mr M. Rosser, M.R. Carter, Mr T. Naylor.

The panel decided that there was a need for courses to provide for -
1. Education of O.R. Specialists in sophisticated mathematical techniques.

2. Education of O.R. Technicians in less rigorous techniques.

3. Education of Managers in the existence of O.R. disciplines.

4. Provide non-practitioners interested in learning O.R. with suitable opportunities.

The O.R. team should contain members from 1 and 2 with the technician presenting data in the form necessary for a more rigorous analysis. O.R. must be able to co-exist with disciplines such as commerce, market research etc which is the function of education at level 4.

It was also felt that education of O.R. practitioners should cover the often neglected area of communication with others in non-technical language.

WELLINGTON BRANCH

Although no formal Wellington Branch Committee has been established as yet a successful meeting was held during November addressed by Mr Stratton, the Principle of the U.K. Defence Operations Establishment. He spoke of application of O.R. techniques, to problems involving both social and economic factors and illustrated his talk with the example of the siting of the fourth London International Airport.
Guest Speaker

Brian Brooks

Industrial Relations Manager

Alex Harvey Industries

Mr Brooks speech began with a friendly attack on Operational Research and on several of the people present.

A precise, formal definition of O.R. was quoted and reference to an extract "How to Use O.R." written by Patrick Rivett was made.

The main theme of the speech was on the advantages and disadvantages of O.R. on Industry from the view of a practitioner in Industrial Relations. The general effects of Management Sciences on Industry now and in the future were discussed, including the closing of the era of the "self generated" or "traditional" manager. The new manager would have to be versed in Management Science disciplines (i.e. Industrial Engineering, Personnel, Industrial Relations, O.R. etc.) and be able to use these to optimise resources. Resources meaning men as well as machines and money.

The benefits of a multi disciplined specialist in a Management Sciences team was referred to the near future and his role in industry was the closing topic.

As a general remark on the evening, the Dinner was enjoyed by all and the practical as well as social value presented by Mr Brooks was appreciated.
Results of a recent survey conducted by the ORSNZ Education Committee are tabulated below.

<table>
<thead>
<tr>
<th>COURSE</th>
<th>RUN BY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applied Operations Research</td>
<td>University of Canterbury</td>
</tr>
<tr>
<td>Systems Engineering</td>
<td>&quot;</td>
</tr>
<tr>
<td>Micro Economics</td>
<td>&quot;</td>
</tr>
<tr>
<td>Managerial Economics</td>
<td>&quot;</td>
</tr>
<tr>
<td>Managerial Economics</td>
<td>&quot;</td>
</tr>
<tr>
<td>Operations Research</td>
<td>&quot;</td>
</tr>
<tr>
<td>Linear Programming Appreciation</td>
<td>University of Otago (Extension)</td>
</tr>
<tr>
<td>Paper 13.30 Managerial Economics</td>
<td>University of Auckland</td>
</tr>
<tr>
<td>Paper 13.40 Operations Research for Economics</td>
<td>&quot;</td>
</tr>
<tr>
<td>Paper 70.90 Quantitative Techniques</td>
<td>&quot;</td>
</tr>
<tr>
<td>Paper 54.23 and 54.41 Systems Analysis</td>
<td>&quot;</td>
</tr>
<tr>
<td>Paper 54.65 Studies in Systems Analysis</td>
<td>&quot;</td>
</tr>
<tr>
<td>Optional Paper 6591 Operations Research</td>
<td>Victoria University, Wellington</td>
</tr>
<tr>
<td>Information Science for MA or MSc</td>
<td>&quot;</td>
</tr>
<tr>
<td>Optional Paper 3596 A special Topic in OR</td>
<td>&quot;</td>
</tr>
<tr>
<td>Optional Paper 6593 Simulation</td>
<td>&quot;</td>
</tr>
<tr>
<td>Linear Programming</td>
<td>IBM World Trade Corp.</td>
</tr>
<tr>
<td>Critical Path Scheduling</td>
<td>&quot;</td>
</tr>
<tr>
<td>Simulation (Discrete and Continuous)</td>
<td>&quot;</td>
</tr>
<tr>
<td>Inventory Simulation</td>
<td>&quot;</td>
</tr>
<tr>
<td>Statistical Methods</td>
<td>&quot;</td>
</tr>
<tr>
<td>Business Models</td>
<td>&quot;</td>
</tr>
<tr>
<td>IINF (1900 Series)</td>
<td>International Computers (NZ) Ltd.</td>
</tr>
<tr>
<td>Inventory Control</td>
<td>&quot;</td>
</tr>
<tr>
<td>Linear Programming</td>
<td>&quot;</td>
</tr>
<tr>
<td>PROSPER</td>
<td>&quot;</td>
</tr>
</tbody>
</table>

2/...
FORTHCOMING EVENTS

25 March (Saturday all day)

In conjunction with the Wellington Branch of N.Z. Computer Society O.R. Society members are invited to participate in a Business Management Game. Members will be formed into groups of 4-6 and be in active competition with other groups. Full use will be made of the ICL 1900 computer in controlling the game.

Time: 9 a.m. sharp (briefing)
Place: Shell House Theatrette.
Registration: Name and Address together with $1.50 must be forwarded in advance to J. Flavell
N.Z. Computer Society,
P.O. Box 3247,
Wellington.

This fee includes morning and afternoon tea and lunch.

29 March (Wednesday)

Canterbury Branch lecture meeting. Professor H. McCallion will speak on "An Adaptive System for materials control and Machine Shop Scheduling".

Time: 8.00 p.m.
Place: Room E2 Canterbury University School of Engineering.

Operational Research Society of New Zealand. Annual General Meeting.

Time: 7.30 p.m.
Place: State Service Commission Training Room - WELLINGTON.

UNIVERSITY EXTENSION COURSE IN
ENGINEERING ECONOMICS

Beginning March 29th and running each Wednesday throughout the year, the above course covers the following topics.

Section 1 - General Economics
- N.Z. Economy, cost and supply structure,
  Allocation of resources and distribution of income.

Section 2 - Linear Programming
- Introduction to models, simplex algorithm,
  Sensitivity analysis.

Section 3 - Managerial Economics
- Cost analysis, fixed variable and Marginal Cost,
  discounted cash flow, taxation and depreciation.
  Cost minimisation and profit maximisation decisions.

Fee $40 Further information and enrolment contact
W.C. Cook - Phone 758-677
This list is not complete. Further courses in OR techniques are believed to be planned in various organisations. Business science courses more specially related to supported and supporting activities (e.g., Computer Systems Analysis) are omitted but may be included in a later compendium.

Some of the courses listed are for limited audiences.
MINUTES OF ANNUAL GENERAL MEETING OF OPERATIONAL RESEARCH SOCIETY OF N.Z. (INC.) HELD ON MONDAY 23 NOVEMBER 1970 AT THE CONFERENCE ROOM 2ND FLOOR, MANCHESTER UNITY BUILDING LAMBTON QUAY, WELLINGTON

1. Present 18 Members

2. Apologies
   Dr H. Barr
   Mr A.R. Kirkham
   Mr J. Latimer
   Mr M. Kimble (NZIM)
   Mr L. Evans
   These apologies were sustained.

3. Minutes of last Annual General Meeting
   The minutes were taken as read, and were then agreed to be a correct record of the matters arising.

4. Matters Arising
   Nil

5. President's Annual Report
   The report was taken as read. In moving the annual report, Professor Vignaux emphasised his appreciation to members of Council and Committees for their services during the past year.
   Mr Wheeler spoke of the continuing difficulty of arranging Speakers for meetings. Suggestions made were:
   a. A talk to the Society should be a pre-condition of full membership.
   b. Full scale after-work meetings could be held with dinner as well.
   c. Some members are in firms, where the ignorance of competitors is desired.
   Mr Campbell explained that he had sent out a questionnaire to a sample of members of the Society to gauge their opinions of the newsletter but the analysis had not yet been completed. Articles of a more general level e.g. at the managerial level, might be suitable for publication in newspapers of N.Z. Institute of Management publications. Proposals have been put forward in the past for a O.R. Journal and the new Council will be having another look at this. The newsletter is now being distributed free to several overseas societies, the General Assembly Library, and University libraries.

   The Annual Report was then adopted (Vignaux/Gabites).
6. **Financial Statement**

The Society spent $474, net receipts were $298, so our loss for the year was $176, whereas the Council had budgeted for a loss of $143. The bulk of the additional expenditure was

a. The newsletter

b. Speakers travel costs

c. IFORS subscription

d. "International Abstracts".

We have several choices:

i. Cut services

ii. Increase subscriptions

iii. Run Seminars as a source of revenue as well as to inform Managers.

iv. Recruit corporate members.

The financial statement was adopted (Walker/Campbell).

7. **O.R. Society Lecture Prize**

President Vignaux presented the O.R. Society Lecture Prize to M.J. Tarrant. Mr Tarrant was awarded the prize for the best paper presented to the Society by an Associate or Student member during the last year.

8. **Subscriptions**

Professor Jackson presented a paper to the meeting to demonstrate the effect of the increase in subscriptions that he proposed would have on the financial situation of the society. Our deficit last year of $174 might reasonably be expected to increase to $194. He therefore proposed a table of new subscription rates that would bring in an extra $227 which would mean an expected surplus in the current financial year of $33.

Proposed membership dues (Jackson/Walker)

<table>
<thead>
<tr>
<th>Wellington</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>$6</td>
</tr>
<tr>
<td>Assoc.</td>
<td>$4</td>
</tr>
<tr>
<td>Student</td>
<td>$1</td>
</tr>
</tbody>
</table>

The differential for Wellington members was proposed because Wellington members have the opportunity to benefit far more from the activities of the Society.
Messrs Campbell and Tarrant considered that full members were no more than covering their incremental costs i.e. subscription to IFORS, and their copies of the International Abstracts. Mr Campbell also considered that full members should be covering a greater proportion of the running costs of their own professional society and leaving a lower proportion to associate members who may have a fringe interest, a general interest, or a developing interest in the Society and needed to be encouraged further.

An increase of $1 in the full member subscription was then proposed.

(Campbell/Tarrant).

Mr Wheeler expressed that he was not satisfied that other methods of raising more finance had been adequately explored e.g. corporate members, seminars. After further speakers, both these proposals were withdrawn. Revised membership dues as follows were proposed (Jackson/Walker).

<table>
<thead>
<tr>
<th></th>
<th>Wellington</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>$4 + IFORS</td>
<td>$3 + IFORS</td>
</tr>
<tr>
<td>Associate</td>
<td>$4</td>
<td>$3</td>
</tr>
<tr>
<td>Student</td>
<td>$1</td>
<td>50c</td>
</tr>
</tbody>
</table>

Where IFORS is the cost of (the IFORS levy for each full member + Abstracts). The Abstracts to be compulsory for Full Members, optional for others at a price to be set by Council.

(Sec. note: IFORS is therefore at present (Nov. 70) $2.11)

An amendment which added $1 to the subscription of Full Members was then proposed (Campbell/Tarrant) giving the following subscription structure:

<table>
<thead>
<tr>
<th></th>
<th>Wellington</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full</td>
<td>$5 + IFORS</td>
<td>$4 + IFORS</td>
</tr>
<tr>
<td>Associate</td>
<td>$4</td>
<td>$3</td>
</tr>
<tr>
<td>Student</td>
<td>$1</td>
<td>50c</td>
</tr>
</tbody>
</table>

The amendment was carried 11-5. The amendment then became the motion and was carried. A suggestion of a 10% surcharge for late payment was left for Council to investigate. It was then moved that the corporate members' subscription be set at $50 in the interim with the incoming Council having power to amend (Jackson/Kaiser). Mr Cook informed the meeting that government departments were not able to become corporate members, but one might be able to interest them in supporting the visits of top O.R. men. Similarly private enterprise companies might be more interested in contributing towards the visits of high quality O.R. professionals. Corporate membership could also lend to the loss of private membership.

The motion was carried.
### 9. Election of Officers

<table>
<thead>
<tr>
<th>Office</th>
<th>Names</th>
<th>Nominator/Seconder</th>
</tr>
</thead>
<tbody>
<tr>
<td>President:</td>
<td>Professor Vignaux</td>
<td>Campbell/Cook</td>
</tr>
<tr>
<td>Vice President:</td>
<td>Professor Jackson</td>
<td>Cook/Wheeler</td>
</tr>
<tr>
<td>Hon. Secretary:</td>
<td>Mr Campbell</td>
<td>Tarrant/Jackson</td>
</tr>
<tr>
<td>Hon. Treasurer:</td>
<td>Mr Milkop</td>
<td>Campbell/Walker</td>
</tr>
<tr>
<td>Council:</td>
<td>Mr Cook</td>
<td>Milkop/Campbell</td>
</tr>
<tr>
<td></td>
<td>Mr Jordan</td>
<td>Wheeler/Kaiser</td>
</tr>
<tr>
<td></td>
<td>Dr Barr</td>
<td>Campbell/Kaiser</td>
</tr>
<tr>
<td></td>
<td>Mr Tarrant</td>
<td>Walker/O'Dea</td>
</tr>
<tr>
<td></td>
<td>Mr Kaiser</td>
<td>Cook/Wheeler</td>
</tr>
<tr>
<td></td>
<td>Mr Wheeler</td>
<td>Milkop/Campbell</td>
</tr>
</tbody>
</table>

As the number of nominations equalled the number of vacancies, the above members were declared elected.

### 10. Election of Auditor

Mr P.D. Hasselberg was re-elected as Honorary Auditor

(Wheeler/Walker)

### 11. General Publicity

Mr Kaiser suggested that photographs of the President and the Vice-President should be obtained for use in a press statement on the elections for Council. Mr Campbell and Mr Kaiser were asked to attend to this.

The meeting closed at 9.14 PM.

A.H. Milkop
(Hon.Sec.)
EIGHTH ANNUAL REPORT
FOR THE YEAR 1970 OCTOBER 1 TO 1971 SEPTEMBER 30

The most significant development for the Society during this period has been the inauguration of two active and energetic branches in Auckland and in Christchurch. This development has been fully supported by the Council although some modifications to the Constitution are seen as necessary so that the Society can be run efficiently.

The Auckland Branch had an initial meeting on June 3 and an inaugural meeting on September 9. The Canterbury Branch held an organisational meeting on July 13. Mr. B. Slocombe and Professor A.D. Brownlie were co-opted to Council upon their elections as chairmen of Auckland and Canterbury Branches respectively. Both Branches have been formally approved by Council.

Since it was founded in Wellington in 1964, the Society has had a preponderance of members from that area and activities, meetings and conferences have naturally been held in Wellington. Past Councils have been conscious of the desirability of wider national involvement but have been reluctant to form branches until there was a distinct impetus from local groups indicating that the branches would be truly self-activating and self-sustaining. Council warmly welcomes the new branches as an important step in the growth of the Society.

Another notable step was the publication of the initial issue of 'New Zealand Operational Research', intended to serve the Society and others as a means of communication and recording of OR activities that is more formal than the Newsletter.

Membership. A phenomenal increase of 42% occurred during the year. The membership subcommittee gives credit for this to the recruiting efforts of the two new branches. The membership at September 30 totalled 204 including one Honorary member, 38 Full members, 141 Associate members, 23 Student members and one Collective member.

Dr. R. Bellman was elected to the position of Honorary member on the occasion of his visit to New Zealand.

The membership structure has been of continuing concern and in addition
to examining the role of 'Full membership', Council has decided to recommend the introduction of the class of 'Corporate Sponsors' to replace present 'Collective Members'.

Having organisations as members is felt to be incompatible with the view of the Society as a collection of individuals; it was, however, considered desirable to establish and encourage their role as sponsoring bodies.

Finance. The present financial position is described in some detail in the Financial Report which is presented as an appendix to this report. The balance at September 30 was $485 which is reasonably satisfactory in view of the greater expenditure anticipated now that the Society is more truly national and can contemplate a more intensive, and expensive, interchange of visiting speakers.

International. The Society has maintained its contact with the International Federation of O.R. Societies (IFORS) and has participated in the postal ballots held by that body. It is arranging for all members of the Society to have access to the IFORS Abstracts service. Details are being finalised at the date of writing.

Public Relations. Some publicity was obtained on talks given by members of the Society and on Professor Bellman's address.

Education. This subcommittee sponsored the initial meeting in Auckland which resulted in the organisation of the Auckland Branch. It has conducted a survey on Education in O.R. and has, in cooperation with the U.K. O.R. Society Education Committee, started to issue an O.R. reading list, (including N.Z. prices) in the Newsletter.

Programme. The inauguration of the two new branches has meant an increased service for members in those areas and programmes have been arranged by the Branch Committees. The National Programme Subcommittee has responsibility for arranging for special National Seminars, the Annual Conference and, in this period, the meetings held in Wellington. It is at the moment the interim Wellington Branch Committee.

A list of meetings held by the Society is given in the Appendix.
The most memorable event in the year was the visit of Professor R. Bellman. The opportunity was taken to arrange an Operational Research Day in association with the Mathematics Colloquium and this day replaced the annual conference as usually organised. Professor Bellman gave one of the papers on this day and also addressed a special dinner organised for members of the Society and others. Council was disappointed by the relatively small attendance of members of the Society. The total attendance was 89.

Council anticipates that future annual conferences will be held in different branches now that the new structure of the Society provides an organisational basis for this.

Publications. The Publications Subcommittee is responsible for publishing the Newsletter and now as well: 'New Zealand Operational Research'. 5 copies of the Newsletter totalling 60 pages with a circulation of about 190 were prepared during the year and one copy of New Zealand Operational Research was issued.

Council. The council met 13 times during the year; further details will be found in the appendix.

Acknowledgements. On behalf of Council I would like to thank all our speakers for their contributions, the State Services Commission and B.P. (N.Z.) for the use of accommodation.

I would like to thank the Conveners and members of the various Council Subcommittees and in particular the members of the Branch Committees for the enthusiastic work they have done in the organisation of the two new Branches.

May I personally thank the Vice-President, Secretary, Treasurer, Editor and remaining members of Council whose hard work has made it such a successful year for the society.

G. A. Vignaux
President
COUNCIL

15 Council meetings have been held since the last A.G.M.

The first number following a person's name is the number of Council meetings held while that person was a member, the second number is the number of presences and the third is the number of meetings for which leave of absence was granted.

President: Prof. G.A. Vignaux 15M 10P 4L
Vice-President: Prof. L.F. Jackson 15M 12P 3L
Hon. Sec.: B.K. Campbell 15M 15P 0L
Hon. Treas.: Mr A.H. Milkop 15M 12P 3L
Council Members:
  Prof. A.D. Brownlie 3M 0P 3L (co-opted 71 Aug)
  Mr D.C. Cook 15M 12P 2L
  Mr J.A. Jordan 15M 10P 5L
  Mr B. Kaiser 4M 2P 1L (resigned 71 Apr)
  Mr L.E. O'Brien 9M 6P 1L (co-opted 71 Apr)
  Mr P.R. Slocombe 5M 1P 4L (co-opted 71 Jun)
  Mr M.J. Tarrant 15M 10P 3L
  Mr R.C. Wheeler 15M 5P 7L

Hon. Auditor: Mr P.D. Hasselberg

COUNCIL SUBCOMMITTEES

Education
Convener: Mr J.A. Jordan
Members: Mr B. Kaiser (resigned), Dr P. Konig (resigned), Mr T. Lever-Naylor (resigned), Mr B.R. Slocombe, Mr J.B.C. Taylor

Programme
Convener: Mr D.C. Cook
Members: Mr T. Lusk, Mr A.H. Milkop, Mr M.J. Tarrant

Publications
Convener & Editor: Mr M.J. Tarrant
Members: Dr H.G. Daellenbach, Mr R. Elder, Mr C. Kirkham

International
Convener: Prof. L.F. Jackson
Members: Mr C.D. Johanson, Prof. G.A. Vignaux

Membership
Convener: Dr H. Barr
Members: Mr M.G. Dodgson, Mr J.A. Harraway, Mr T. Lusk, Mr R.C. Wheeler

Public Relations
Convener: Mr R. Kaiser (resigned), Mr L.E. O'Brien
Member: Dr H.G. Daellenbach
BRANCH COMMITTEES

WELLINGTON (Interim Committee)

Chairman: Mr D.C. Cook
Members: Mr A.H. Milkop, Mr M.J. Tarrant

AUCKLAND

Chairman: Mr B.R. Slocombe
Hon. Sec.: Mr M.G. Dodgson
Hon. Treas.: Mr I.K. Hampton
Members: Mr R.J. Elder, Mr J.A. Gibson, Mr G.S. Holmes,
         Mr C.D. Johanson, Mr K.C. Nutsford, Mr M.S. Rosser

CANTERBURY

Chairman: Prof. A.D. Brownlie
Hon. Sec.-Treas.: Dr H.G. Daellenbach
Members: Mr T.A. Lusk, Mr A.T.G. McArthur, Mr J.R.C. Taylor
MEETINGS 70-71

WELLINGTON

Nov 23 7th Annual General Meeting.
Mr A.H. Milkop: 'Economics, Engineering or O.R.'

Mar 8 Miss V. Steward: 'O.R. at the Australian Gas Light Coy.'

Apr 19 Mr R. Anderson: 'Experiences with Box-Jenkins Forecasting.'

May 20 Operational Research Day at the 6th Mathematics Colloquium.
Dr H.G. Daellenbach: 'Optimal High-Speed Runway Exit Location.'
Dr R.E. Bellman: Address on the Applications of D.P. to Combinatorial Problems.
Mr J.A. George: 'An Iterative Procedure for the Decomposition of an Integer Programme.'

May 20 Dinner Function.
Dr R.E. Bellman: Address on the Future.


Jul 19 Combined meeting with the Work Study Society on Simulation.
Mr L.E. O'Brien,
Mr I.P. Bieleski.
(Computer time provided by I.B.M.)

AUCKLAND

Jun 3 Preliminary meeting.
Prof. G.A. Vignaux: 'O.R.'
Election of Steering Committee.

Jul 22 Four short papers:
Mr B. Murphy: 'Application of Linear Programming to Advertising Scheduling.'
Dr R.R. Allan: 'Simulation in Urban Studies.'
Mr C.D. Johanson: 'The Paper Trim Problem.'
Mr W. Sinclair: 'O.R. in Capital Investment.'

Sep 9 Branch inaugural meeting.
Election of Branch Committee.
Mr F.A. Coulter: 'O.R. in New Zealand Industry.'

CANTERBURY

Jul 13 Organisational meeting.
Panel: 'Survey of O.R. Teaching in Various University Departments.'
Election of Branch Committee.

Sep 21 Dr. H.G. Daellenbach: 'An Aspect of Production and Inventory Control.' (Workshop-seminar.)
OPERATIONAL RESEARCH SOCIETY OF NEW ZEALAND (INC.)

LIST OF MEMBERS

as at 1971 October 1

HONORARY MEMBER

Prof. R.E. Bellman
University of Southern California
Los Angeles U.S.A.

FULL MEMBERS

Dr. R.R. Allan
Beca, Carter, Hollings and Ferner Wellington

Mr. A.M. Anderson
A.M. Anderson and Associates Dunedin

Mr. I.P. Bieleski
IBM Wellington

Mr. G.J. Bowler
BP (N.Z.) Wellington

Mr. B.K. Campbell
Applied Mathematics Division Wellington

Mr. B.S. Campbell
BP (N.Z.) Wellington

Mr. E.A. Christiansen
Philips Electrical Industries of N.Z. Wellington

Mr. D.C. Cook
N.Z. Electricity Dept. Wellington

Mr. F.A. Coulter
N.Z. Forest Products Kinlieth

Dr. H.G. Daellenbach
University of Canterbury Christchurch

Dr. J.H. Darwin
Applied Mathematics Division Wellington

Mr. I.D. Dick
Miners Dept. Wellington

Mr. P.J. Dohrn
P.E. Consulting Group Egham, England

Mr. L. Evans
Victoria University Wellington

Mr. R.N. Ford
Associated Container Transportation Wellington

Dr. J.F. Gabites
Meteorological Service Wellington

Mr. J.A. George
University of Canterbury Christchurch

Mr. J.A. Gibson
P.E. Consulting Group Auckland

Mr. G.S. Holmes
University of Auckland Wellington

Prof. L.F. Jackson
Victoria University Wellington

Dr. I.J. Jeffery
Health Department Wellington

Mr. J.A. Jordan
ICL (N.Z.) Wellington

Dr. G.H. Jowett
Department of Agriculture Invermay

Mr. B. Kaiser
Consultant Wellington

Mr. L.F. Kenna
Building Research Bureau Wellington

Mr. R.J. Latimer
Dept. of Statistics Wellington

Mr. N.G. Major
Roading Division Wellington

Mr. M.S. McInman
Research Analysis (N.Z.) Wellington

Mr. A.H. Milkop
Energy Resources Comm. Wellington

Mr. L.E. O'Brien
Unilever (N.Z.) Petone

Mr. M.R. Palmer
Road Transport Division Wellington

Mr. M.S. Rosser
University of Auckland Auckland

Mr. K.E. Seal
Amalgamated Brick and Pipe Palmerston North

Prof. G. Tate
Massey University Wellington

Dr. H.R. Thompson
Applied Mathematics Division Wellington

Mr. J.C. Turner
University of Waikato Hamilton

Prof. G.A. Vignaux
Victoria University Wellington

Mr. R.C. Wheeler
State Services Comm. Wellington

ASSOCIATE MEMBERS

Mr. R.L. Allen
Overseas Wellington

Mr. A.M. Ameye
Wellington U.K.

Mr. J.R. Anderson
Auckland Wellington

Mr. R.T. Andrew
Naenae Raumati South Wellington

Mr. K.W.J. Angwin
Union Steamship Co Wellington

Mr. B. Atkinson
Philips Electrical Industries Wellington

Mr. N.R. Banfield
Union Steamship Co Wellington

Miss J.E.H. Barker
Shell Oil Wellington

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<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Location</th>
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<tr>
<td>Dr. H. Barr</td>
<td>Applied Mathematics Division</td>
<td>Wellington</td>
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<td>Mr. P.D. Bearsley</td>
<td>A.N.Z. Banking Group</td>
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<tr>
<td>Mr. D.M. Beggs</td>
<td>Fisher and Paykel</td>
<td>Auckland</td>
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<tr>
<td>Mr. S.R. Blair</td>
<td>University of Canterbury</td>
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<tr>
<td>Prof. A.D. Brownlie</td>
<td>Ministry of Works</td>
<td>Wellington</td>
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<tr>
<td>Mr. H. Bulder</td>
<td>N.Z. Electricity Dept.</td>
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<tr>
<td>Mr. D.J. Bull</td>
<td>Statistics Dept.</td>
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<td>Health Dept.</td>
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<tr>
<td>Mr. A.H. Carr</td>
<td>ICL (N.Z.)</td>
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<tr>
<td>Mr. C.P.E. Chenoweth</td>
<td>Building Industry Management Consultants</td>
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<tr>
<td>Mr. B.H. Clapcott</td>
<td>Building Research Assn.</td>
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<td>Mr. R.A. Clements</td>
<td>N.Z. Gas Council</td>
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<tr>
<td>Mr. J.C. Cocker</td>
<td>State Advances Corp.</td>
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<tr>
<td>Mr. J.H. Collins</td>
<td>Insurance Assn. of Auckland</td>
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<td>Mr. N. Cooper</td>
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<tr>
<td>Mr. J.P.M. Cornwall</td>
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<tr>
<td>Mr. D.M. Cosgrove</td>
<td>Applied Mathematics Division</td>
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<tr>
<td>Mr. G.E. Dickinson</td>
<td>Fletcher Industries</td>
<td>Auckland</td>
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<td>Mr. M.G. Dodson</td>
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<tr>
<td>Mr. R.S. Ducat</td>
<td>Wool Research Organization</td>
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<tr>
<td>Dr. A.R. Edmunds</td>
<td>Alex Harvey Industries</td>
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<tr>
<td>Mr. R. Elder</td>
<td>University of Canterbury</td>
<td>Christchurch</td>
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<tr>
<td>Mr. D.G. Elms</td>
<td>Wellington</td>
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</tr>
<tr>
<td>Dr. D.A. Davies</td>
<td>Fisher and Paykel</td>
<td>Wellington</td>
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<td>Wellington</td>
<td>Auckland</td>
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<tr>
<td>Mr. C.G. Evatt</td>
<td>Rotorua</td>
<td>Wellington</td>
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<td>Mr. R.W. Everett</td>
<td>Govt. Actuary's Office</td>
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<td>Mr. H.S. Fairburn</td>
<td>Auckland Technical Institute</td>
<td>Wellington</td>
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<td>Mr. M.B. Ferguson</td>
<td>N.Z. Pottery and Ceramics Research Assn.</td>
<td>Lower Hutt</td>
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<td>Mr. C.K. Fong</td>
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<td>Dr. P.K. Foster</td>
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<td>Mr. W.P. Foster</td>
<td>State Services Comm.</td>
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<td>W.D. Scott and Co</td>
<td>Auckland</td>
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<tr>
<td>Mr. P.C. Gini</td>
<td>Waitemata County Council</td>
<td>Auckland</td>
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<tr>
<td>Mr. P.J.P. Goldstein</td>
<td>Forest Research Institute</td>
<td>Wellington</td>
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<tr>
<td>Mr. C.A. Gollop</td>
<td>Palmerston North</td>
<td>Auckland</td>
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<tr>
<td>Mr. I.T. Gordon</td>
<td>Armaghdown Motors</td>
<td>Wellington</td>
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<tr>
<td>Mr. R.K. Grant</td>
<td>Winstone</td>
<td>Wellington</td>
</tr>
<tr>
<td>Mr. B.R. Greenslade</td>
<td>Attending the University of Lancaster</td>
<td>Lancaster, U.K.</td>
</tr>
<tr>
<td>Mr. D.M. Guthrie</td>
<td>University of Otago</td>
<td>Dunedin</td>
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<tr>
<td>Mr. R. Hadfield</td>
<td>Govt. Printing Office</td>
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<tr>
<td>Mr. P.C. Haines</td>
<td>Meteorological Office</td>
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</tr>
<tr>
<td>Mr. D.M.M. Hall</td>
<td>University of Auckland</td>
<td>&quot;</td>
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<tr>
<td>Mr. K.R. Hall</td>
<td>BP (N.Z.)</td>
<td>&quot;</td>
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<tr>
<td>Mr. J.A. Harraway</td>
<td>ICL (N.Z.)</td>
<td>&quot;</td>
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<tr>
<td>Mr. P.D. Hasselberg</td>
<td>Shell Oil (N.Z.)</td>
<td>&quot;</td>
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<tr>
<td>Mr. J.S. Hickman</td>
<td>Provident Life Assurance</td>
<td>&quot;</td>
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</table>
Mr. C.D. Johanson  N.Z. Forest Products  Kinlieth
Mr. M.T. Judson  Fisher and Paykel  Auckland
Mr. A.R. Kirkham  N.Z. National Airways Corp.  Wellington
Mr. C.J. Kirkham  BP (N.Z.)  Zumikon, Switzerland
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Mr. T.A. Lusk  attending the University of Canterbury  Wellington
Mr. A. MacCormick  N.Z. Inventions Development Authority  New Haven U.S.A.
Mr. W.G. Marriott  Lincoln College  Auckland
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Mr. J. McGrory  Victoria University  New Zealand Overseas
Major B. McWilliams  Wellington Polytechnic  Christchurch
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Mr. K.C. Nutsford  N.Z. Forest Products  Auckland
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Mr. L.M.R. Paver  Victoria University  Wellington
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Mr. K.A. Reay  Henderson and Pollard  Wellington
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Mr. W.M. Robertson  Unilever (N.Z.)  Auckland
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Mr. N. Spencer  Grace Bros.  Wellington
Mr. J.F. Spring  N.Z. Motor Corp.  Wellington
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Mr. J.B.C. Taylor  
Wing Cmdr. R.F. Thrush  
Mr. M.D. Turner  
Mr. A.J. Van Zijl  
Prof. D. Vere-Jones  
Mr. C.W. Walker  
Mr. A.R. Wallace  
Mr. C.J. Wallace  
Miss K.M. Watson  
Mr. G. White  
Cdr. W.R. Williams  
Mr. T. Winiata  
Mr. M.F. Wright  
Mr. Y. Yagyu  
Mr. S.P. Yoong  
Mr. V.A.W. Youl  
Mr. W. Younger  

University of Canterbury  
Defence Department (Air)  
N.Z. Electricity Dept.  
N.Z. Institute for Economic Research  
Victoria University  
Shell Oil  
Applied Mathematics Division  
Victoria University  
Applied Mathematics Division  
Computer Bureau  
Consultant  
N.Z. Dairy Board  
N.Z. Breweries  
Applied Mathematics Division  
Social Security Dept.  
Registered Architect  
Fisher and Paykel

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Mr. C.G. Beath  
Mr. J.F. Boshler  
Mr. P.M. Cashin  
Mr. D.A. Cater  
Mr. G.E. Coombes  
Mr. G.A. Cox  
Mr. R.W. Gibbard  
Mr. D.J. Gilbert  
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Mr. T.W. Marks  
Mr. M.R. Mayson  
Mr. A.I. Mc^erchar  
Mr. S.F. Miller  
Mr. R. Podmore  
Mr. B.A. Robson  
Mr. J.R. Rogan  
Mr. R.J. Simpson  
Mr. P.H. Trac  
Mr. M.J. Turnbull  
Mr. D.R. Wood

University of Canterbury  
"  
Victoria University  
"  
"  
Victoria University  
N.Z. Electricity Department  
University of Canterbury  
University of Canterbury  
N.Z. Post Office  
University of Canterbury  
University of Auckland  
University of Canterbury  
University of Canterbury  
Roading Division

COLLECTIVE MEMBER

The New Zealand Institute of Management Wellington Division (Inc.)

PLEASE SEND ANY CORRECTIONS OR AMPLIFICATIONS TO THE SECRETARY, P. O. Box 904 Wellington. (List as at 1971 October 1).
### Operational Research Society of New Zealand (Inc.)

#### STATEMENT OF RECEIPTS AND PAYMENTS FOR YEAR ENDED 30/9/71

<table>
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<tr>
<th>RECEIPTS</th>
<th>70/71</th>
<th>69/70</th>
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<tr>
<td>Balance at BNZ @ 1/10/70</td>
<td>420.18</td>
<td>427.67</td>
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<tr>
<td>less cheques not presented</td>
<td>-45.05</td>
<td>375.13</td>
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<tr>
<td>Cash on hand @ 1/10/70</td>
<td>1.82</td>
<td>7.80</td>
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<tr>
<td>Subscription income</td>
<td>701.00</td>
<td>286.00</td>
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<td>Adjustment for subs not banked @ 30/9/70</td>
<td>+29.00</td>
<td>-29.00</td>
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<tr>
<td>Subscription receipts</td>
<td>730.00</td>
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<tr>
<td>Bellman Dinner receipts</td>
<td>462.50</td>
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<tr>
<td>Bellman Lunch receipts</td>
<td>37.60</td>
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<tr>
<td>Cocktail party receipts</td>
<td>42.00</td>
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<tr>
<td>Interest</td>
<td>10.87</td>
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<td><strong>TOTAL RECEIPTS</strong></td>
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<td><strong>684.28</strong></td>
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**Note:** Subscriptions 70/71=166, 69/70=121.

#### PAYMENTS: PART A.

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<th>Category</th>
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<tr>
<td>A. Secretarial</td>
<td>60.93</td>
<td>30.80</td>
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<td>B. Treasurer</td>
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<td>C. Public Relations</td>
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<td>D. Publications</td>
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<td>163.75</td>
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<td>E. Programme (Wgtn)</td>
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<td>E2. Annual Conference Expenses (incl. cocktail party)</td>
<td>67.40</td>
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<td>F. International</td>
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<td>G. Membership</td>
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<tr>
<td>J. Bellman Dinner and Lunch</td>
<td>580.70</td>
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<tr>
<td><strong>TOTAL EXPENDITURE</strong></td>
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<td><strong>472.12</strong></td>
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Adjustment for outstanding creditors @ 30/9/70 +164.79 -164.79

**TOTAL PAYMENTS**

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<tr>
<th>70/71</th>
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<tbody>
<tr>
<td>1166.77</td>
<td>307.33</td>
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</table>

Cash on hand @ 30/9/71 7.59 1.82

Balance at BNZ @ 30/9/71 500.22 420.18

less cheques not presented -14.66 485.56 -45.05 375.13

**TOTAL**

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<thead>
<tr>
<th>70/71</th>
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<tr>
<td>1659.92</td>
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**Note:** Outstanding subscriptions 70/71 $120.00 ($25 owed for previous years)

69/70 $54.00
## PAYMENTS: PART B.

<table>
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<tr>
<th>Description</th>
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<tr>
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<td>Bellman Dinner Expenses</td>
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<td>NZ Statistician</td>
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<td>Cocktail Party</td>
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<td>Addressed Envelopes</td>
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<td>Notices of Meeting</td>
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<td>Lecture Prize</td>
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<td>P.O. Boxes</td>
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<td>Membership fees: NZIM(Wgtn)</td>
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<td>472.12</td>
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<td>Adjustment for outstanding creditors @ 30/9/70</td>
<td>+164.79</td>
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<td><strong>TOTAL</strong></td>
<td>1659.92</td>
<td>684.28</td>
</tr>
</tbody>
</table>

I hereby certify that I have examined the books and accounts of the Operational Research Society of New Zealand (Inc.). The above statement is in my opinion a true and accurate account of the transactions of the Society.

(P.D. Hasselberg)
Hon. Auditor