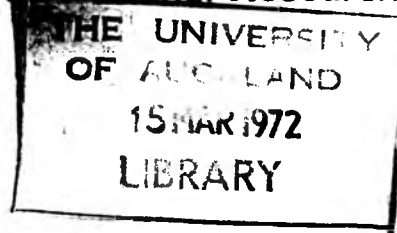




NEWSLETTER

Operational Research Society of New Zealand (Inc.)



MARCH 1972
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VOL.8 NO.1

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ANNUAL REPORT

NEW MEMBERS

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 :-

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

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.

CHRISTMAS DINNER OF THE AUCKLAND O.R. SOCIETY
HELD WAIPUNA LODGE - 13 DECEMBER

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.

OPERATIONAL RESEARCH COURSES IN NEW ZEALAND 1971

Results of a recent survey conducted by the ORSNZ Education Committee are tabulated below.

<u>COURSE</u>	<u>RUN BY</u>
Applied Operations Research	University of Canterbury
Systems Engineering	" "
Micro Economics	" "
Managerial Economics	" "
Managerial Economics	" "
Operations Research	" "
Linear Programming Appreciation	University of Otago (Extension)
Paper 13.30 Managerial Economics	University of Auckland
Paper 13.40 Operations Research for Economics	" "
Paper 70.90 Quantative Techniques	" "
Paper 54.33 and 54.41 Systems Analysis	" "
Paper 54.65 Studies in Systems Analysis	" "
Optional Paper 6591 Operations Research	Victoria University, Wellington
Information Science for MA or MCS or MSc	" " "
Optional Paper 6596 A special Topic in OR	" " "
Optional Paper 6593 Simulation	" " "
Linear Programming	IBM World Trade Corp.
Critical Path Scheduling	" " " "
Simulation (Discrete and Continuous)	" " " "
Inventory Simulation	" " " "
Statistical Methods	" " " "
Business Models	" " " "
PERT (1900 Series)	International Computers (NZ) Ltd.
Inventory Control	" " "
Linear Programming	" " "
PROSPER	" " "

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 M. Kimble (NZIM)
Mr A.R. Kirkham Mr L. Evans
Mr J. Latimer

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)

	Wellington	Other
Full	\$6	\$5
Assoc.	\$4	\$3
Student	\$1	50c

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).

	Wellington	Other
Full	\$4 + IFORS	\$3 + IFORS
Associate	\$4	\$3
Student	\$1	50c

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:

	Wellington	Other
Full	\$5 + IFORS	\$4 + IFORS
Associate	\$4	\$3
Student	\$1	50c

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 (Jameson/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

	<u>Names</u>	<u>Nominator/Secunder</u>
President:	Professor Vignaux	Campbell/Cook
Vice President:	Professor Jackson	Cook/Wheeler
Hon. Secretary:	Mr Campbell	Tarrant/Jackson
Hon. Treasurer:	Mr Milkop	Campbell/Walker
Council:	Mr Cook	Milkop/Campbell
	Mr Jordan	Wheeler/Kaiser
	Dr Barr	Campbell/Konig
	Mr Tarrant	Walker/O'Dea
	Mr Kaiser	Cook/Wheeler
	Mr Wheeler	Milkop/Campbell

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.)



Operational Research Society of New Zealand (Inc.)

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

APPENDIX TO THE 8TH ANNUAL REPORT

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:	Dr H. Barr	15M	13P	2L	
	Prof. A.D. Brownlie	3M	0P	3L	(co-opted 71 Aug)
	Mr D.C. Cook	15M	13P	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 B.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 B. 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.B.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 I.D. Dick: A Survey of O.R. Applications with General Conclusions on O.R. Work Drawn from Experience.
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.
- Jun 30 Cocktail Party (with the N.Z. Statistical Assn).
- Jul 19 Combined meeting with the Work Study Society on Simulation.
Mr L.E. O'Brien.
Mr I.P. Bielecki.
(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.)
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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.
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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.)	"
Mr. B.K. Campbell	Applied Mathematics Division	"
Mr. B.S. Campbell	BP (N.Z.)	"
Mr. E.A. Christiansen	Philips Electrical Industries of N.Z.	"
Mr. D.C. Cook	N.Z. Electricity Dept.	"
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	Mines Dept.	"
Mr. P.J. Dohrn	P.E. Consulting Group	Egham, England
Mr. L. Evans	Victoria University	Wellington
Mr. R.N. Ford	Associated Container Transportation	"
Dr. J.F. Gabites	Meteorological Service	"
Mr. J.A. George	University of Canterbury	Christchurch
Mr. J.A. Gibson	P-E Consulting Group	Auckland
Mr. G.S. Holmes	University of Auckland	"
Prof. L.F. Jackson	Victoria University	Wellington
Dr. I.J. Jeffery	Health Department	"
Mr. J.A. Jordan	ICL (N.Z.)	"
Dr. G.H. Jowett	Department of Agriculture	Invermay
Mr. B. Kaiser	Consultant	Wellington
Mr. L.F. Kenna	Building Research Bureau	"
Mr. R.J. Latimer	Dept. of Statistics	"
Mr. N.G. Major	Roading Division	"
Mr. M.S. McInman	Research Analysis (N.Z.)	"
Mr. A.H. Milkop	Energy Resources Comm.	"
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	"
Prof. G. Tate	Massey University	Palmerston North
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.	"

ASSOCIATE MEMBERS

Mr. R.L. Allen		Overseas
Mr. A.M. Ameye		Wellington
Mr. J.R. Anderson		U.K.
Mr. R.T. Andrew	General Foods Corpn.	Auckland
Mr. K.W.J. Angwin	Union Steamship Co	Wellington
Mr. B. Atkinson	Philips Electrical Industries	Naenae
Mr. N.R. Banfield	Union Steamship Co	Raumati South
Miss J.E.H. Barker	Shell Oil	Wellington

Dr. H. Barr	Applied Mathematics Division	Wellington
Mr. P.D. Bearsley	A.N.Z. Banking Group	"
Mr. D.M. Beggs		"
Mr. S.R. Blair	Fisher and Paykel	Auckland
Prof. A.D. Brownlie	University of Canterbury	Christchurch
Mr. H. Bulder	Ministry of Works	Wellington
Mr. D.J. Bull	N.Z. Electricity Dept.	"
Mr. M.D. Camden	Statistics Dept.	"
Mr. A.H. Carr	Health Dept.	"
Mr. C.P.E. Chenoweth	ICL (N.Z.)	"
Mr. B.H. Clapcott	Building Industry Management Consultants	Auckland
Mr. R.A. Clements		Christchurch
Mr. J.C. Cocker		Overseas
Mr. J.H. Collins	Building Research Assn.	Wellington
Mr. N. Cooper	N.Z. Gas Council	"
Mr. J.P.M. Cornwall	State Advances Corp.	"
Mr. D.M. Cosgrove	Insurance Assn. of Auckland	Auckland
Mr. E.A. Cottingham	Wellington City Corp.	Wellington
Mr. R.M. Creswell	N.Z. Post Office	"
Dr. R.B. Davies	Applied Mathematics Division	"
Mr. B.L. Davison		Auckland
Mr. G.E. Dickinson	Applied Mathematics Division	Wellington
Mr. M.G. Dodgson	Fletcher Industries	Auckland
Mr. R.S. Ducat	N.Z. Post Office	Wellington
Dr. A.R. Edmunds	Wool Research Organization	Christchurch
Mr. R. Elder	Alex Harvey Industries	Auckland
Mr. D.G. Elms	University of Canterbury	Christchurch
Dr. D.A. Evans		Wellington
Mr. R.G. Evans	Fisher and Paykel	Auckland
Mr. C.G. Evatt		
Mr. R.W. Everett		Wellington
Mr. H.S. Fairburn	Forest Research Institute	Rotorua
Mr. M.B. Ferguson	Govt. Actuary's Office	Wellington
Mr. C.K. Fong	Auckland Technical Institute	Auckland
Dr. P.K. Foster	N.Z. Pottery and Ceramics Research Assn.	Lower Hutt
Mr. W.P. Foster	N.Z. Post Office	Wellington
Mr. J.A. Gibson	University of Canterbury	Christchurch
Mr. P.C. Gini	State Services Comm.	Wellington
Mr. P.J.P. Goldstein	W.D. Scott and Co	Auckland
Mr. C.A. Gollop	Waitemata County Council	Auckland
Mr. I.T. Gordon		Wellington
Mr. R.K. Grant	Forest Research Institute	Overseas
Mr. B.R. Greenslade	Armaghdown Motors	Palmerston North
Mr. D.M. Guthrie	Winstone	Auckland
Mr. R. Hadfield	IBM	Wellington
Mr. P.C. Haines		Dunedin
Mr. D.M.M. Hall	IBM	Wellington
Mr. K.R. Hall	attending the University of Lancaster	Lancaster, U.K.
Mr. J.A. Harraway	University of Otago	Dunedin
Mr. P.D. Hasselberg	Govt. Printing Office	Wellington
Mr. J.S. Hickman	Meteorological Office	"
Mr. R.L. Hodge		Auckland
Prof. G.A. Hookings	University of Auckland	"
Dr. J.J. Hunter	University of Auckland	"
Miss P. Hyman	Victoria University	Wellington
Mr. D.R. Jack	BP (N.Z.)	"
Dr. M.B. Jameson	ICL (N.Z.)	"
Mr. C.F. Jamieson	Shell Oil (N.Z.)	"
Mr. R.A. Jessup	Provident Life Assurance	"

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.)	"
Dr. P. Konig	Swissair	Zumikon, Switzerland
Mr. R. Laing	Dominion Life Insurance Co.	Wellington
Mr. A.S. Lock	IBM	"
Prof. F.P.S. Lu	University of Otago	Dunedin
Mr. N.H.F. Lubeck	Statistics Dept.	Wellington
Mr. C.B. Lusk	N.Z. Electricity Dept.	"
Mr. T.A. Lusk	attending the University of Canterbury	Christchurch
Mr. A. MacCormick	attending Yale University	New Haven U.S.A.
Wing Comdr R.D. MacDonald	N.Z. Inventions Development Authority	Wellington
Mr. W.G. Marriott		Auckland
Mr. A.T.G. McArthur	Lincoln College	Lincoln
Mr. J. McGrory		Overseas
Major B. McWilliams	N.Z. Army	Wellington
Dr. M.M. Metwally	Victoria University	"
Mr. J.H.G. Milne		U.K.
Mr. H.B. Moore	N.Z. Forest Products	Kinlieth
Mr. A.J. Morris	Auckland University	Auckland
Mr. W.F. Moxon	N.Z. Electricity Dept.	Wellington
Dr. C. Nieuckerke	Auckland City Council	Auckland
Mr. B.J. Noyce		Timaru
Mrs. J.E. Nutsford	Computer Consultant	Auckland
Mr. K.C. Nutsford	ICL (N.Z.)	"
Mr. D.J. O'Dea		Overseas
Mr. H. Offenberger	Wellington Polytechnic	Wellington
Mr. D.P. Page	Computer Bureau	Christchurch
Mr. C.J. Patterson	Alex Harvey	Auckland
Mr. L.M.R. Paver	IBM	Wellington
Prof. B.P. Philpott	Victoria University	"
Mr. M.D. Purdie		Auckland
Mr. L. Read	Fisher and Paykel	"
Mr. K.A. Reay	N.Z. Forest Products	Kinlieth
Mr. M.G. Road	Henderson and Pollard	Auckland
Mr. W.M. Robertson	Lane Walker Rudkin	Christchurch
Mr. B.F. Ross-Murphy	Unilever (N.Z.)	Petone
Mr. P.H. Rudkin	Lane Walker Rudkin	Christchurch
Mr. G.R. Saunderson	Auckland Harbour Board	Auckland
Dr. W.R. Schroder	Massey University	Palmerston North
Mr. D.J. Scothern	Fisher and Paykel	Panmure
Mr. J.L. Scott	N.Z. National Airways Corp.	Wellington
Mr. J.P. Scott	Databank Systems	"
Prof. C.M. Segedin	University of Auckland	Auckland
Mr. J.C. Silvester	Wellington Hospital	Wellington
Mr. P.V. Sim	N.Z. Railways	"
Mr. D.M. Simons	N.Z. Forest Products	Kinlieth
Mr. R.J. Simpson	N.Z. Forest Products	Kinlieth
Mr. L.A. Sinclair	ICL (N.Z.)	Auckland
Mr. J.A. Skurr	N.Z. Post Office	Wellington
Mr. S. Slater	Victoria University	Wellington
Mr. B.R. Slocombe	Fletcher Holdings	Auckland
Dr. M.B. Spencer	General Foods Corp. (N.Z.)	"
Mr. N. Spencer	Grace Bros.	Wellington
Mr. J.F. Spring	N.Z. Motor Corp.	Auckland
Mr. G.T. Stallknecht III	Victoria University	Wellington
Mr. C.A. Struthers		Perth W. Australia
Mr. M.J. Tarrant	BP (N.Z.)	Wellington

Mr. J.B.C. Taylor	University of Canterbury	Christchurch
Wing Cmdr. R.F. Thrush	Defence Department (Air)	Wellington
Mr. M.D. Turner	N.Z. Electricity Dept.	"
Mr. A.J. Van Zijl	N.Z. Institute for Economic Research	"
Prof. D. Vere-Jones	Victoria University	"
Mr. C.W. Walker	Shell Oil	"
Mr. A.R. Wallace	Applied Mathematics Division	Lincoln
Mr. C.J. Wallace	Victoria University	Wellington
Miss K.M. Watson	Applied Mathematics Division	"
Mr. G. White	Computer Bureau	Christchurch
Cdr. W.R. Williams	Consultant	Wellington
Mr. T. Winiata	N.Z. Dairy Board	"
Mr. M.F. Wright	N.Z. Breweries	Wellington
Mr. Y. Yagyu	Applied Mathematics Division	"
Mr. S.P. Yoong	Social Security Dept.	"
Mr. V.A.W. Youl	Registered Architect	Auckland
Mr. W. Younger	Fisher and Paykel	"

STUDENT MEMBERS

Mr. C.G. Beath	University of Canterbury	Christchurch
Mr. J.F. Boshier	"	"
Mr. P.M. Cashin	"	"
Mr. D.A. Cater	Victoria University	Wellington
Mr. G.E. Coombes	University of Canterbury	Christchurch
Mr. G.A. Cox	"	"
Mr. R.W. Gibbard	"	"
Mr. D.J. Gilbert	Victoria University	Wellington
Mr. D.J. Green	N.Z. Electricity Department	"
Mr. J.F. Lowinger	University of Canterbury	"
Mr. T.W. Marks	University of Canterbury	Christchurch
Mr. M.R. Mayson	"	"
Mr. A.I. McKerchar	"	Invercargill
Mr. S.F. Miller	N. Z. Post Office	Auckland
Mr. R. Podmore	University of Canterbury	Christchurch
Mr. B.A. Robson	"	"
Mr. J.R. Rogan	University of Auckland	Auckland
Mr. R.J. Simpson	University of Canterbury	Christchurch
Mr. P.H. Trac	"	"
Mr. M.J. Turnbull	University of Canterbury	Christchurch
Mr. D.R. Wood	Roading Division	Wellington

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

<u>RECEIPTS</u>		<u>70/71</u>		<u>69/70</u>
Balance at BNZ @ 1/10/70	420.18		427.67	
less cheques not presented	<u>-45.05</u>	375.13	<u>-20.00</u>	407.67
Cash on hand @ 1/10/70		1.82		7.80
Subscription income	701.00		286.00	
Adjustment for subs not banked @ 30/9/70	<u>+29.00</u>		<u>-29.00</u>	
Subscription receipts		730.00		257.00
Bellman Dinner receipts		462.50		-
Bellman Lunch receipts		37.60		-
Cocktail party receipts		42.00		-
Interest		10.87		11.81
		<u>1659.92</u>		<u>684.28</u>
TOTAL RECEIPTS				

Note: Subscriptions 70/71=166,69/70=121.

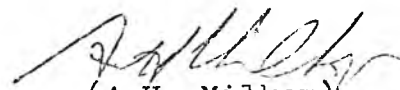
PAYMENTS:PART A.

A. Secretarial		60.93		30.80
B. Treasurer		19.67		8.65
C. Public Relations		25.00		20.50
D. Publications		35.61		163.75
E. Programme (Wgtn)		77.67		108.43
E2. Annual Conference Expenses (incl. cocktail party)		67.40		72.13
F. International		29.50		34.61
G. Membership		105.50		33.25
J. Bellman Dinner and Lunch		580.70		-
TOTAL EXPENDITURE		<u>1001.98</u>		<u>472.12</u>
Adjustment for outstanding creditors @ 30/9/70		<u>+164.79</u>		<u>-164.79</u>
TOTAL PAYMENTS		<u>1166.77</u>		<u>307.33</u>
Cash on hand @ 30/9/71		7.59		1.82
Balance at BNZ @ 30/9/71	500.22		420.18	
less cheques not presented	<u>-14.66</u>	485.56	<u>-45.05</u>	375.13
TOTAL		<u>1659.92</u>		<u>684.28</u>

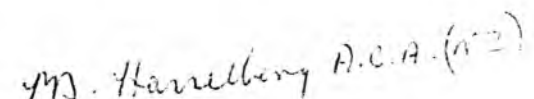
Note: Outstanding subscriptions 70/71 \$120.00 (\$26 owed for previous years)
69/70 \$54.00

PAYMENTS: PART B.70/7169/70

Bellman Lunch Expenses		37,55	-
Bellman Dinner Expenses		455.27	-
Travel		95.50	78.40
NZ Statistician		17.00	26.00
Cocktail Party		50.40	-
Stationery: Paper		59.42	132.27
Addressed Envelopes		22.94	25.40
Envelopes		16.55	1.60
Postage		70.02	33.68
Addressograph Plate Changes		15.08	12.99
Copying		1.05	11.96
Forms		12.65	-
Notices of Meeting		36.42	-
Lecture Prize		20.00	20.00
P.O.Boxes		11.64	6.00
Miscellaneous		32.99	35.44
Membership fees: NZIM(Wgtn)		25.00	25.00
IFORS		22.50	22.61
IFORS Abstracts		-	<u>40.77</u>
TOTAL EXPENDITURE		1001.98	472.12
Adjustment for outstanding creditors @ 30/9/70		+164.79	-164.79
TOTAL PAYMENTS		1166.77	307.33
Cash on hand @ 30/9/71		7.59	1.82
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less cheques not presented	<u>-14.66</u>	<u>485.56</u>	<u>-45.05</u> <u>375.13</u>
TOTAL		<u>1659.92</u>	<u>684.28</u>


(A.H. Milkop)
Hon. Treasurer

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