



NEWSLETTER

Operational Research Society of New Zealand (Inc.)

Registered at C.P.O., Wellington, as a magazine

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Editor

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↳ EDITORIAL ↳

All the OR News that's Fit to Print

The restructuring of our economy has wrought great changes throughout the land. Many people have ended up in jobs that they never imagined themselves doing, and the Council of the NZOR Society is no exception. Thus I find myself in this position, mainly because I missed the Council meeting that allocated portfolios.

When I was a student in the US, I had nothing better to do with my time than read the New York Times, This provided masses of information, albeit in a somewhat undigested form. I hope I can run the newsletter in a similar vein, publishing (almost) anything I can get my hands on. I am happy to receive any OR news, titbits, book reviews, scandal, upcoming conferences, branch news, etc. So keep all those cards and letters coming in folks!!

Jonathan Lermitt

New Members

A warm welcome to new members since the last newsletter.

Judith Archibald		Wellington
Robert Craig	Student, VUW	Wellington
David Craig	Student, Canterbury	Christchurch
Craig Groves		Tauranga
Matthew Hobbs	Student, VUW	Wellington
Arron Judson		Auckland
A.D. Macgregor	Student, Canterbury	Christchurch
Minoo Meimand	Department. of Statistics	Wellington
Richard Spence	Napier City Council	Napier
Adrian Swift	Lecturer, Massey University	Palmerston North
Liz Walker	Databank Systems	Wellington
Victoria Willis	Electricorp	Wellington
Karen Wong	Department of Statistics	Wellington


We can always do with more members. Why not get *your* friends (or better still your enemies) to join.

Message from the President

Hello! My name is Bob Cavana, Corporate Economist with the NZ Railways Corporation, and I would like to say a few words as the incoming President of the OR Society for 1989. Firstly, I would like to repeat the AGM's vote of thanks to Bruce Benseman for the splendid work he has done as President for the last 4 years, and as Vice President for 4 years before that. He thought it was time to move aside for a short while, and that is why I am here! Secondly, I would like to repeat their thanks to Andrew Smith and Gary Eng for their fine contributions in recent years as Vice President and Treasurer respectively. We are very fortunate that all three of our illustrious colleagues have been re-appointed to your Council, and will continue to be able to give the Society the benefits of their collective experiences.

I would also like to welcome back to the Council Vicky Mabin as vice President, Matthew Civil as Secretary, Hugh Barr and Jonathan Lermitt, and welcome onto the Council Rona Bailey as Treasurer and Frances Sutton. Also welcome to our Ex Officio Members: Branch Chair-persons Andy Philpott (Auckland), Cheryl McDonald (Wellington) and Grant Read (Christchurch) and to Hans Daellenbach and Don McNickle as Editors of APJOR. Council Portfolios have now been allocated and these are:

Abstracts and Back Copies	Bruce Benseman
APORS Representative	Hugh Barr
Circulation and Library	Vicky Mabin
Continuing Education and Professional Development	Frances Sutton
International Affairs	Andrew Smith
Newsletter	Jonathan Lermitt
Royal Society	Gary Eng
Student Paper Prize Convenor, Student Travel Grants and Student Affairs	Grant Read

If you have any enquiries, contributions or suggestions regarding these portfolios please contact the Secretary at the NZ Council address ( P.O. Box 904, Wellington). The ORSNZ 1989 directory with full addresses will be circulated soon.

A new portfolio, "Continuing Education and Professional Development" has been created, and we are grateful for Frances Sutton's interest in taking responsibility in this area. Frances will be arranging a workshop for later in the year on problem formulation in Operational Research, to be followed in subsequent years by 1 or 2 day workshops covering specialist topics. We feel that coverage of Operational Research/Management Science at University is very good these days but there have been so many developments in methodology, computer technology, and software

packages over recent years that those of us who have been in the workforce for a number of years probably need a little bit of help in catching up! Anyway the "professional" workshops are a well established concept, and we will all hopefully gain a considerable amount by either sharing our knowledge or receiving new ideas (tricks!), or just consolidating our understanding of the basic building blocks of our profession. Apart from our own members I am sure there will be many others from associated disciplines (e.g. Accounting, Engineering, Statistics and Economics) who will be keen to attend these workshops.

I would also like to remind you all that this year is the 25th Anniversary of our society, and we are hoping to celebrate it in style at the August Conference in Wellington. However the success of the occasion depends on your contribution and involvement either by submitting a paper or attending the conference and sharing your experiences with us. Operational Research/Management Science is a very worthwhile discipline, and our members have made some very important contributions to Business, the Economy, and Society both in New Zealand and overseas over the last 25 years. We should all be very proud to look back over their successes at our Silver Jubilee celebrations in August and look forward to even more in the next 25 years.

So I hope to see you all there!

Finally, I would like to thank the previous Newsletter Editor, David Whitaker, for his admirable work in running the newsletter from Auckland and to wish Jonathan Lermitt all the best with his "new look" Newsletter. Once again the success of this communication vehicle is dependent on your contributions so please don't let Jonathan down on his new venture.

All the best for now, and I hope to see you all at the Silver Jubilee Conference in Wellington in August.

Happy ORing!

Bob Cavana
President, ORSNZ

Lost Members

Some of our members seem to disappear without trace. Would anyone knowing the current addresses of the following members please pass them on to the Treasurer, Rona Bailey (✉ P.O. Box 1335, Wellington, or ☎ (04) 727-855)

Bill Armstrong	Australia
Owen Evans	Wellington
Mr L. R. Higgins	Auckland
Ms J.F. Lowrie	Wellington
Greg Mehrtens	Ashburton
Fiona Melton	Wellington
Jorge Ng	Wellington
Ian Twomey	New Plymouth

And *please*, whenever you change your (correspondence) address, send me your new new address. This ensures that you will receive Society mailings promptly.

Membership System

As you may have noticed from the "new-look" labels, the Society has a new membership and subscription system. The information we have looks like this:

Membership Number : 6718

Balance : \$x.xx

Name : Miss R N Bailey

{Rona }

Address : c/- AMD DSIR
P O Box 1335
Wellington

Phone : (04) 727-855
Employer : AMD DSIR
Notes : Treasurer and
Wellington Branch
Secretary/Treasurer

Branch : W Wellington
Membership Type : M CO Council Member
Date joined : Nov 83
IAOR : N

Billing Address :
(if any)

If you think that the information the Society has for you needs updating, please send corrections to the Treasurer at the above address.

(The Treasurer is of course always happy to receive subscriptions, especially those that are overdue).

Corporate Membership and Sponsorship

Have you thought of suggesting that *your* organisation become a corporate member or corporate sponsor of ORSNZ?

A corporate member receives one mailing of the Society's Journal (APJOR), newsletter, notices of meetings, conference and courses. Any employee may attend ORSNZ conferences and courses at member rates.

A corporate sponsor receives up to five copies of all the Society's mailings, which are sent to specified employees. Any employee may attend conferences and courses at member rates.

The current subscription is \$80 for a corporate member and \$200 for a corporate sponsor.

Personal

Congratulations to Terri Green of Christchurch on (finally) completing her Ph.D. Martin Rowe (ex-student from Auckland University) has joined AMD, DSIR. This is a break-away from the trend of employing Canterbury graduates!

Congratulations also to Linley and Grant Read on the birth of a daughter - a sister for Andrew.

Booklet Reviewlet

Career Guide

We have received a copy of the **Career Guide** booklet put out by the United Kingdom OR Society. This provides an excellent review of what OR is, who uses it, and the sorts of problems it is used for. Numerous examples from industry are given, everything from Banks to Coal to Schools to Medical Research. This would be a useful guide to anyone contemplating a career in OR. Vicky Mabin, ☎ (04) 727-855, or ✉ AMD/DSIR, P.O. Box 1335, Wellington, can make photo copies available to anyone who wants one.

Ex-Presidents Visit to Japan and Korea

Wellington branch began the year with a talk by Hugh Barr and Bruce Benseman, both well known to all of you.

Last August, Bruce and Hugh spent 2 weeks in Japan and Korea. Each presented a paper at the first APORS Conference, which was held in Seoul. (APORS is a group of OR societies from eight Asian Pacific Countries -- that seeks to promote the free exchange of new OR ideas and information, and to help countries understand each other's problems and cultures). Hugh got elected APORS Treasurer and Bruce got harassed by Itwaen street traders. Neither qualified or stayed for the Olympic Games.

Our two heroes also attended the Thirteenth International Symposium on Mathematical Programming, which was held the following week in Tokyo. Both conferences attracted hundreds of OR academics and lesser mortals. They found the OR people overseas tended to work in bigger teams, have larger computers, use newer languages, and enjoy more funding. However they still returned home -- inspired to try bigger and better things.

The APORS conference was largely sponsored by Korean Industry, very well organised, and attended by representatives from Korea, Japan, India, China, Singapore, Australia, New Zealand, and Hong Kong. The SMP was sponsored by the Mathematical Programming Society and the OR Society of Japan and was (not surprisingly) unashamedly mathematical.

Bruce entertained us with pictures and stories of Korea and Japan. Mt Fuji, cherry blossoms, Ginza and bullet trains. He mentioned the more industrial oriented papers from APORS -- the role of science and technology in developing countries, constraint managers, steel production planning, fertilisation, distribution, Taiwan evacuation planning, stochastic programming and fuzzy mathematical programming. He also outlined the MPS prizes and memorial lectures, and some of the modelling and optimisation packages (LINGO, GAMS, AMPL, MOMIX, KORBX) for linear, non-linear, mixed integer and multi-objective programming. He quoted Tomlin's "It is better to be smart than to be rich" but still envied Bell Labs' KORBEX system that uses 32 linked vector processors and solves models with 500,000 variables.

Hugh showed us the APORS supplement of the Korea Herald (with a picture of our heroes on the front page) and described the conference dinners and social functions. Hugh reported on papers from APORS that emphasised the importance of feedback loops and organisational validity in models, and one that compared Asia and the USA. Asians believe in education, with the emphasis on simplicity and frugality, the USA favours command and control, preferring capital over people. The conclusion was that Japan and Korea have grown rich and powerful through good strategies, good managers and engineers, hard-workers and cheap labour.

- Rona Bailey

Things to do, and Places to go.

☞ Not just another Conference,

our

* 25th ANNUAL CONFERENCE *

on 21 & 22 August, 1989
at Victoria University of Wellington

We, the Wellington Branch, are doing our best to ensure a range of interesting papers are presented. We are also preparing to perform a short, but we hope amusing, item during the conference dinner and we have invited the Council and other branches to also provide some entertainment.

Please come and help make this conference a rewarding and enjoyable celebration of our 25th year.



Euro X

We have a copy of the "Invitation Programme" for Euro X - The 10th European Conference on Operational Research - being held in Belgrade, Yugoslavia on June 27-30, 1989. (with a free day on the Thursday). 10 streams running concurrently with every OR topic you can imagine - something there for everyone. Post conference Sightseeing bus tours are also available. Sounds great? For more information contact Vicky Mabin, ☎ (04) 727-855, or ✉ AMD/DSIR, P.O. Box 1335, Wellington.



CHEMECA 1990 - Australian Chemical Engineering Conference

This will be held in Auckland 27-31 August 1990. For details contact Dr. J.J.J. Chen, CHEMECA 1990, Department of Chemical & Materials Engineering, University of Auckland, Private Bag, Auckland.



A seminar brought to you by the NZ Planning Council, NZ Institute of Management, NZ Futures Trust and NZ College of Management.

Planning **Does your Future Depend on it?**

Speakers: The Hon Roger Douglas, Mr Peter Shirtcliffe,
Dr Judith Aitken, Mr Ken Douglas, Prof Tony Rayner

Wellesley Club
2-8 Maginnty Street, Wellington

Friday, 12 May, 1989

Price \$12.00, including lunch

Futures Trust, Freepost 878, Box 67, Wellington. ☎ 737-737



Continuing Education

While OR is a very young science, there are an increasing number of practitioners in the field with several years experience who may be out of touch with the latest developments. There is a clear need for continuing education courses to enable members to keep up with the latest developments.

Even more noticeable is the lack of awareness among industry of the benefits of using OR, and we need to go beyond the boundaries of our current membership to encourage a wider use of OR techniques. Several universities have sent their students out into the wide world to look at real problems, and while this is a healthy trend, there are vast areas untapped.

The society is keen to develop a programme of continuing education, aimed at both improving the skills of its members, and widening the use of OR in the community. To this end it has been decided to institute a series of workshops.

The first of these is will be on problem formulation. The biggest stumbling block is often the inability to formulate practical problems in OR terms. Once formulated, the actual solution can be carried out using a standard package, using if necessary the services of a specialist practitioner in the field.

The Operational Research Society of NZ therefore has pleasure in announcing:

Workshop for Quantitative Analysts on Problem Formulation in Operational Research

Objective

On completing this workshop, participants should have the ability to formulate a variety of quantitative problems in an OR framework for which solution technology already exists, or which are known to be unsolvable.

Relevant for

The workshop would be relevant for quantitative analysts with little knowledge of most OR techniques.

Content

OR practitioners with both theoretical knowledge and practical experience would choose 5 or 6 standard OR techniques or areas. For each area they would:

- describe the kinds of situation where it would be useful.
- describe one or more mathematical formulations of it.
- indicate limitations on solution technology.

In small groups, participants would work on previously prepared problems described in words (rather than mathematics). Their task would be to formulate the problems as one of the standard ones, or to identify it as one that cannot be formulated.

The date has yet to be decided, but will be **October or November, 1989**, in **Wellington**. More details when they come to hand.

Wellington Branch Meetings

At the Wellington branch's September meeting Prof Tony Vignaux entertained us with a talk about simulation, the most widely used OR technique since it overtook LP in 1979. In particular he discussed the failure of simulation' models, (many big models were developed but never used), and suggested the use of Simscript and process-based models over come problems such as poor communication, use of the wrong language, and poor documentation. Ways to overcome some universal problems were outlined:

- a general purpose aim is not sufficient and a specific achievable goal must be defined.
- people who provide a combination of the essential skills are necessary.
- dont 'surprise' the user, involve them.
- the appropriate, rather than the most convenient, level of detail should be achieved.
- use the right tools and techniques to manage the development of large complex programs.
- dont be 'mysterious', present the user with 'real' results.

Other points that Tony made:

- Simulation on micros provides convenience, fast editing and interaction including graphics and animation. (A warning was sounded that managers may see and believe!)
- Simscript may be old but its English-like, large and powerful, and its corns and carbuncles provide additional features. It also has processes as well as events, is compiled, and is available on PCs.
- Processes may be harder to understand at first, but the payoff is easier, less error-prone, programming.
- Ada, C++, and C are the languages of the future.
- should there be auditing standards for Government sponsored models?

Cheryl McDonald

Reference: The ten most frequent causes of simulation analysis failure and how to avoid them.

J.S. Annimo & E.C. Russel - Simulation, June 1979, pp137-140.

Next Meeting:

Fred Hellier
 "Application of Queuing Theory to Production Line Systems"
 Rutherford House, Wellington
 3 May, 1989 at 5.00pm.

NEWS ITEM

QUANTITATIVE PROBLEM-SOLVING CONSULTANCY ESTABLISHED AT MASSEY UNIVERSITY

A quantitative problem solving consultancy has been established at Massey University, Palmerston North. The consultancy, the first of its type in New Zealand, provides the skills of mathematicians, statisticians, computer scientists and technologists. It is able therefore to assist with all three stages of a project: the collection and processing of data, the construction and solution of mathematical models, and the use of these models to predict how desired goals can be achieved in an efficient way.

In a community where it is almost a matter of pride to have no quantitative ability, managers and decision-makers are often unaware of the benefits these skills can offer. Examples of the problems which staff working with the consultancy have already tackled show how broadly applicable their skills can be, are

- * What is the rolling resistance of a car?
- * What caused the fire in a commercial laundry?
- * Predict future electrical energy consumption
- * Design an optimal controller for an industrial evaporator
- * Which babies are at risk of developing jaundice?
- * Do river levels affect recreational users?
- * How do the job aspirations of middle managers affect their satisfaction and feelings of stress?
- * What would the 1987 NZ election results have been under proportional representation?

Professor Graeme Wake of the Department of Mathematics and Statistics said that similar groups operated in North America, Europe and Australia and had proved highly successful in opening up university expertise to public and private sector groups.

"The benefits are two-way", he said.

"Industries, government agencies and business are able to tap into a pool of problem-solving talent, while university staff tackle the problems in a 'real world' context".

Leading American industrial mathematics expert, Professor Stavros Busenberg of the Claremont Mathematics Clinic has been appointed to spear-head the new Massey facility on a three-month secondment in mid-year supported by the United States Fulbright Visitor programme. Further annual support has also been approved. Professor Busenberg is a leading figure in the Claremont clinic and is known for his work in differential equations.

I. F. O. R. S.

INTERNATIONAL FEDERATION OF OPERATIONAL RESEARCH SOCIETIES

letter from the president

PRIDE IN OPERATIONS RESEARCH AND TOLERANCE FOR THE
BREADTH OF WORK OF OUR OR COLLEAGUES.

No. 1 - First Quarter 1989.

Many leaders in operations research nationally and internationally have written excellent thoughtful articles on the needs and major opportunities for operations research worldwide. This is an important theme and I and others will return to it many times in the coming years.

What I would like to address in this first letter as President are two related themes:

- I. Pride in being an operations researcher doing operations research
- II. Tolerance for the work of other operations researchers and a building of their pride in their work.

Operations research is difficult to define and describe. There have been many attempts. From the early history of OR we have often read something like "OR is a science that is devoted to describing, understanding and predicting the behavior of man-machine systems operating in organizational environments" to the current implicit definitions in the tables of contents of introductory OR textbooks and the many OR journals throughout the world. The range of these "definitions" is immense from very mathematical and theoretical conceptualizations of what is OR to the very practical frequently non-mathematical implementations of OR.

Why is OR so hard to define? We all know reasonably well what mathematics, physics, economics, finance, marketing and other disciplines and knowledge areas are. I suggest OR is hard to define because OR is three different but related concepts: OR is a discipline, OR is a profession and OR is a process.

OR is a discipline. OR has an archival cumulatively growing foundation of basic theory and science which, to a greater or lesser degree, is known by an operations researcher. This theory and science is based in the theory of optimization (mathematical programming), applied stochastic processes, decision analysis and simulation. Furthermore, it continues to grow rapidly and to incorporate other areas.

OR is a profession. There are thousands of persons in companies, government agencies and other institutions who are hired as operations researchers and who are expected to solve important OR problems in a professional manner - with insight, skill, competence and honesty.

OR is a process. Although I frequently teach the "discipline" of OR, OR is a process. I describe OR to my students as the process of:

1. Defining and understanding the problem (not just taking it as stated by a decision maker or manager).
2. Determining what goals are being pursued by the decision maker or the organization.
3. Engaging in a mutual learning process with the decision maker and others in the organization so all persons have a common understanding.

p.t.o.

4. Defining the system to be studied and its interrelationships with other systems/organizations.
5. Critically studying or knowing the literature to assess how others have studied this system.
6. Designing a plan or procedure for proceeding with the modelling, data gathering, analysis, validation and implementation.
7. Modelling the system in which the variables, coefficients and goals are clearly related.
8. Specifying the criteria and methodology for choosing among alternative solutions.
9. Analyzing the validity of the data, the model and the solutions.
10. Implementing the results of the study.
11. Critically evaluating the limitations, qualifications, contributions and successes of the entire project.

Because OR in reality is this triplet and not just one or two of these concepts as is the case with mathematics or economics and because very few operations researchers perform all three concepts simultaneously (although many do all three over their lifetime), we have many operations researchers toiling in the three somewhat separate concept regions. It is in this regard that tolerance for the work of other operations researchers and a building of their pride in their work is vital for the future success of OR. We have operations researchers creating beautiful and elegant theory and science. We have operations researchers creatively applying the process of OR to solve important difficult messy real problems. We have OR professionals building and keeping many systems functioning efficiently and effectively.

In all of these activities, the successes are legion and the quality is very high. We have a right to be justly proud of our work as operations researchers. We have a responsibility as operations researchers to be tolerant and proud of the work of our fellow operations researchers especially those who work in the other concept regions or OR. None of us will survive well without the others - the discipline builders, the creative difficult problem solvers and the daily professionals. It is IFORS and our regional groupings and our national societies duty to promote this pride of being an operations researcher and tolerance for our colleagues.

William P. Pierskalla
President.

OVERSEAS EVENTS CALENDAR 1989-90

1989		
11-13 January	Second International Workshop on Artificial Intelligence in Economics and Management	Singapore
16-18 January	IIASA Event – Policy Responses to Large Accidents	Laxenburg, Austria
16-18 February	6th Symposium on Theoretical Aspects of Computer Science	Paderborn, Germany
10-13 April	IFORS Specialized Conference on Operational Research and the Social Sciences	Cambridge, England
12-13 June	NOAS '89 (Nordic OR Societies)	Linköping, Sweden
27-29 June	IFAC/IFORS/IFIP/IIASA/UNIDO/SEDC World Bank Conference on Dynamic Modelling of National Economies	Edinburgh, Scotland
27-30 June	EURO X	Belgrade, Yugoslavia
3-7 July	14th IFIP Conference on System Modelling and Optimization	Leipzig, Germany
3-7 July	Symposium on Advanced Information Processing in Automatic Control	Nancy, France
10-14 July	Fifth World Conference on Transport Research	Yokohama, Japan
11-14 July	14th Conference of System Dynamics Society	Stuttgart, Germany
23-26 July	TIMS XXIX – Osaka '89	Osaka, Japan
24-27 July	Summer Computer Simulation Conference	Austin, USA
14-18 August	ALIO/EURO Workshop on Practical Combinatorial Optimization	Rio de Janeiro, Brazil
28-31 August	IFAC/IFORS Symposium on Large-Scale Systems	Berlin, Germany
28 August-1 September	Eleventh World Computer Congress	San Francisco, USA
12-14 September	Fourth Conference on the Analysis, Design and Evaluation of Man-Machine Systems	Xian, China
18-21 September	IFAC/IFORS/IFIP Workshop on Decisional Structures in Automated Manufacturing	Genoa, Italy
19-21 September	Control, Computers, Communications in Transportation	Paris, France
29 September-1 October	INCOM '89 – 6th IFAC/IFIP/IFORS/IMACS Symposium on Information Control Problems in Manufacturing Technology	Madrid, Spain
2-5 October	Third IFIP International Conference on Computer Applications in Production and Engineering	Tokyo, Japan
25-27 October	IFAC Symposium on Energy Systems, Management and Economics	Tokyo, Japan
1990		
25-29 June	12th IFORS Triennial Conference on Operations Research	Athens, Greece