



## O.R. VACANCY

### Justice Department

The Justice Department have a vacancy for a new graduate in their research section in Wellington.

The appointee will work as a member of a project team involved in policy evaluation and review of areas of our court, penal and justice systems. (including queueing systems).

Qualifications required are a University degree in O.R. and/or other quantitative disciplines and an interest in working with people.

If interested please contact:

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## O.R. IN ENERGY

The Energy sector provides a wide variety of opportunities for the application of O.R. techniques and these have provided a natural focus of attention since the 'energy crises' of the seventies.

Applications range from the modelling of natural systems to the optimisation of purely commercial objectives and from the instantaneous control of individual machines to the modelling of the world ecosystem. Large complex systems abound and will be providing challenges to analysts for decades to come.

The proceedings of the 'Energy Modelling Symposium' held in Wellington in 1979 (MOE Technical Publication #7) provides a fairly representative sample of the breadth of modelling activity in New Zealand to that time. Since then, despite the lack of a comprehensive national energy model, O.R. has had a significant impact in the energy sector and on energy planning in particular.

It may be that the most important influence has been the impact of the O.R. philosophy on the general approach taken to planning. A specific example is the use of fuel 'resource costs' as shadow prices to decompose the production of the annual Energy Plan into several sector plans.

However there have also been several significant modelling efforts in various sectors. A linear programming model of the refinery and gas processing options has been used in several studies by the LFTB, DSIR and MoE. Stochastic Dynamic Programming has been used extensively for reservoir scheduling, oil stockpiling and coal stockpiling policy. Electricity planners have also made extensive use of large simulation models in recent years.

Personally, I consider that the most promising area for development over the next few years will be the continued development of 'smart' simulation models covering particular sectors. Such models should simulate optimal operation of proposed systems under uncertainty but leave the decision-maker where he/she wants to be - in control of the major (integer) decision variables. Thus the primary emphasis should be on producing solutions which are credible to decision-makers in the sectors, rather than on black box 'optimal' solutions to hypothetical simplified problems.

However we aim to produce models which go further by advising decision-makers as to how to search for an improved solution. Hopefully this will result in a process of 'creeping optimisation', with decision-makers gradually finding that the models give good advice and so leaving them to do more of the optimisation. Hopefully, too, we can produce a compatible set of sectoral models which can be co-ordinated using 'resource costs' either heuristically (as at present) or in a formal decomposition framework.

E. Grant Read

# 1984 ORSNZ CONFERENCE

The 20th Annual ORSNZ Conference was held at the University of Auckland on 21-22 August. It attracted 80 people from all parts of the OR profession and treated them to an interesting variety of practical cases and theoretical papers.

The conference keynote speaker was Professor Harvey Wagner from the University of North Carolina. With his long experience as a consultant, Professor Wagner turned out to be warm and approachable - always ready to listen. His tutorial on Inventory Models and Practice showed how a good approximation to the optimal (s,S) policy could be expressed in terms of purchase, holding and stockout costs. He went on to show how inventory costs were affected by service-levels and depot-consolidation. ORSNZ owes him and Alastair MacCormick from Auckland University a big vote of thanks. It was Alastair who persuaded Professor Wagner to come to New Zealand.

I thought 1984 was a well balanced conference - but maybe the papers could have been arranged differently. We lost 20 or so business people early in the conference, perhaps because the practitioners were kept until later. Analysing the conference papers, I find 80% of the speakers came from the universities - the rest from government departments and private companies. The universities play a vital role in our profession. Professor Tony Vignaux started the conference well, talking about scheduling communicators in Police Controlrooms. Chris Patterson made a good case for teaching practice-oriented OR. The student papers all grappled with real world problems. Two other university speakers demonstrated software (for constrained critical path and two dimensional packing.)

However I thought the organisers left the better papers until later. Linda Wannan-Edgar talked about Air New Zealand rostering. Graeme Edwards from DSIR talked about speeding up arrivals through Auckland International Airport. Grant Read from Ministry of Energy explained a new simulation model used in electricity planning. If you want big payoffs, you obviously should tackle big problems.

Members of a small society like ours must keep in touch with one another.

Only by talking about our own work, can we learn from each other's experiences. I enjoy listening to other people. If they are enthusiastic, well-prepared and can get their message across in 15 minutes or so, it does not matter what their fields or achievements are. Most speakers forget that only 20% of their audience is still interested after 30 minutes.

Conferences of course are more than attending papers. We found well-stocked smorgasboards for lunch and the Conference dinner was again in the palatial senior common room. Noel Vautier, Company Secretary for Feltex NZ, was after-dinner speaker. He was halfway through a Harvard management course and talked about his experiences. He was entertaining and he was brief.

I think the Auckland Branch of ORSNZ made an excellent job of the 1984 conference. Only those who have organised a large conference can really appreciate how much effort goes into one. Thank you Jeff Hunter for managing all the accounts and our biggest thanks go to David Ryan as Conference Organiser.

## Manufacturing & Distribution Workshop

The ORSNZ Conference was preceded, on Monday 20 August, by a Manufacturing and Distribution Workshop. It attracted an impressive audience of about 180 business people, mostly members of the NZ Production and Inventory Control Society and the NZ Physical Distribution Management Association. Arriving breathless from our Wellington flight, we found a full lecture room listening to Professor Wagner. Using full colour slides (by McKinsey & Company), Harvey Wagner explained how Blue Bell (Wrangler Jeans etc) cut inventory levels by \$115 million - in just 21 months. Success was achieved by a combination of OR methods and involving top management. Wagner said get management attention by focusing on tangible end-balance - and keep it by delivering results quickly.

Ian Simpson started the series of NZ case studies by outlining Precision Engineering's new stock control system. Tim Edney showed how Fisher and Paykel managed without inventories at all

and demonstrated their new Retailer Data Network (via Videotext). Using a promotional video, Harry Tollenaar showed how a simple computer system improved Fletcher Steel customer service and reduced their calculations and errors. Bronwyn Malthus gave a well-illustrated talk on General Motor's new inventory system. Wattie Canneries and NZPO were also represented.

I think the main points from the workshop were:

\*take the overall system view - avoid suboptimisation at local levels.

\*assume nothing is fixed - anything can be changed.

\*every inventory control situation is different.

\*perfection does not exist - concentrate on the major problems.

\*forget sophisticated OR techniques - try a simple computer system.

The workshop was well organised by Alastair MacCormick from the University of Auckland and generously sponsored by Air New Zealand. ORSNZ is very grateful to both for making this day so successful.

Bruce Benseman  
Vice-President

## Efficiency Scrutiny in the UK Civil Defence

There's a lot of it about at the moment, especially in the Ministry of Energy - talk of managerial accountability, information systems and commercialisation. So it was partly out of interest, partly out of a sense of duty that I went to listen to Brian Morris, a British civil servant who, according to the programme, was involved with efficiency improvements in the UK Government machine and was now (as a result?) seconded to the NZ State Services Commission. Sure enough, no slide projector, no blackboard, no posters .. oh dear.

How delightful then to have an enthusiastic, lucid talk with the vicarious thrill of hearing about the exposure of inefficiency in the UK civil service. The setting was provided by a quote from a senior bureaucrat, along the lines that any idea for change in the civil service was either wrong or would create a dangerous precedent. Mrs Thatcher however decided to risk it and started a campaign in 1979 to improve the

value for money yielded by the administration. She appointed Lord Rayner, a top executive from Marks & Spencers, to organise a review which had as one target a 14% reduction in the overall number of civil servants. 'Rayner scrutinies' were soon revealing tragic, amusing and appalling aspects of the system. The conclusions summarised by the speaker best illustrate the type of improvement being sought. The concern was not so much whether to sell off some department but rather to ask why one Ministry was holding a 70 year stock of prepaid envelopes. The scrutinies found:

1. A general lack of cost awareness, leading to all sorts of over-provision including an agency which recovered £2 million per year in unpaid traffic fines at an administration cost of £3 million.

2. Diffusion of responsibility meaning that individuals can't institute improvements. This is especially likely with common services (computing, vehicles, etc).

3. These two have produced a lack of drive and enterprise to achieve better cost effectiveness. Departments get ripped off by suppliers and millions of pounds in interest are lost by mis-handling cash surpluses.

4. Lack of responsiveness to the public, especially with irrelevant, out of date or unintelligible forms.

5. Bureaucracy grows of itself. e.g. stocktaking procedures may be far more expensive than warranted by the value of the items themselves.

6. Inspections help. Contact through all levels of a department help reveal anomalies. A jury officer was found who admitted that he would never appoint to a jury a woman called Lucy.

Despite the unpopularity of the reviews and even with the £500m yearly savings so far, the best outcome, Brian Morris suggested, was a change in awareness. The next step being taken is in administrative reform with more delegated budgetary control and responsibility and greater use of farming-out for tasks that can be done better elsewhere. It was gratifying to hear someone who had been through all this, being optimistic about the permanence of the new attitudes in the bureaucracy. Well, now he's in New Zealand, firing up the Policy Development unit at SSC so watch out for the slashed sign of this civil servant Zorro on your door.

Stephen Gale.

# Tenth IFORS Conference

## Washington

This was held in early August and was a stimulating affair. Some 400 people from around the world attended including John Scott (University of Waikato) and myself. The theme was "Co-operation - the Culture for O.R. Success", an attempted return to the founding ideal that O.R. is interdisciplinary in nature. Unfortunately, this ideal seems an illusive one for O.R. people nowadays to grasp, and by and large, the papers were rather narrow, mathematically oriented and needing further development. There were also some rather inward facing plenary sessions. This possibly reflects the difficulty of carrying out interdisciplinary projects.

However, with twelve streams and some 400 pages of workshops to choose from there was no shortage of things to do. Two papers stood out to me as memorable. The first, by Hugh Miser, on the craft of Operations Research. By 'craft' Miser means the professional experience involving elements of judgment, skill, exposition, and how to work effectively with both clients and other professionals. These practice considerations, along with the body of knowledge on techniques etc, makes up our profession. Miser lists fifteen topics that are craft related including, how to: approach a problem; gather facts; evolve and assess goals, objectives, constraints, choose variables, draw the boundary between the problem and its environment and how to design and use effective forms of communication with clients and other interested persons. He also promotes the idea of elegance. His stimulating paper sketched the need for more attention by whispered conscience at O.R. conferences. There was a need, he said not only to assess studies by their monetary outcome, but also by the quality of the process. There was also a need to have a body of craft knowledge sufficient to stop younger practitioners relearning the lessons.

A second thought provoking paper came from Sam Eilon, on types of research workers and specifically, on types of O.R. workers. He contrasts the idealised role of the O.R. analyst as diagnostic, searching for "truth",

and "objective" and the manager, who has to assess risk, feasibility and acceptability - the politician. Empirical research shows seven main archetype approaches - the chronicler, the dialectician (devil's advocate), puzzle-solver, (takes the specification as given) empiricist, classifier (Eilon himself?), iconoclast (challenges current theories) and the charge agent. Practitioners may tend to one or more of these archetypes. Eilon points out the potential conflict between the detachment of scientific involvement with the active involvement required of the charge agent role. He strongly believes, however, that the role of charge agent is tolerable, and honourable, and that where O.R. has failed is in not understanding the importance of this charge agent role. Such a role carries with it much heavier responsibilities in terms of liaison with management and with successful implementation. Eilon urges much less emphasis in O.R. on puzzle solving, which he sees as the professions current apparent pre-occupation and more on strategic problems. He also urges concern with unstructured as well as structured problems and more discussion on how constraints and objectives are determined. One of the implications of his approach is that we should accept greater mobility between O.R. and the other functions of management.

A number of papers were given on O.R. practice, by younger practitioners. Use of an approximate model and successively improving it with use, as understanding develops over time, appears to be the way of the more effective practitioners.

Micro-computer displays were much in evidence, running l.p.'s., doing colour simulations (though the cost of \$US45,000 including micro is still high) and analysing data.

The Conference also provided the opportunity for representatives from the Asia-Pacific O.R. Societies (Japan, China, Hong Kong, Korea, India, Malaysia, Singapore, Australia, New Zealand), to meet and form the Asia-Pacific O.R. Societies within IFORS (APORS). There is now considerable O.R. activity emerging within the fast developing Asia-Pacific region.

Finally, the Conference was a success on the social aspect, of being able to discuss problems and swap experiences with other practitioners, in different environments. It's well worth attending if you can make it. Next Conference is in 1987 in Buenos Aires.

Hugh Barr  
Applied Maths Divn. DSIR

P.S. Miser and Eilon's papers available on request.

#### UKORS MEMBERSHIP

Our society has arranged a 'deal' with the UK OR Society, whereby members of NZORS can get 33% discount on UKORS membership subs. Contact Vicky van den Broek-Mabin, PO Box 904, Wellington for further details.

## I.F.O.R.S.

### INTERNATIONAL FEDERATION OF OPERATIONAL RESEARCH SOCIETIES

*letter from the president*

#### OPERATIONAL RESEARCH AND ACCOUNTING

No. 22, October 1984

Very little has been published on OR and accounting. It seems as if these fields have very little in common. However, the opposite is true.

To some extent OR and accounting are similar. In either field, models of the firm play the central role. A balance sheet is a model of the firm as much as a linear production programming model. Both kinds of models serve the purpose of transforming quantitative information of the firm and of providing insight into the firm.

OR and accounting do not only have such features in common. In addition, they depend upon one another. For most of the OR models data of accounting and cost accounting have to be made available. On the other hand, data like opportunity costs which are necessary for advanced cost accounting can in many cases only be provided through OR models, in particular of the LP type.

Nevertheless, OR and accounting are fundamentally different in other respects. The accounting community has only a few types of models, we have a large variety of many ones. Their models are comprehensive and cover the whole firm while many of our models are specialised and refer to details. Their models have simple structures, our models tend to be complex and fancy. Their models are past, our ones future oriented. Their models are applied in practically every firm, ours in a few only. They employ plenty of personnel, we only a few. They are heard before almost every decision of major importance, we only in selected cases. - However, are we not convinced that we do have concepts which are superior over the accounting concepts? Are we only less efficient in marketing our products?

I firmly believe that there is a great potential demand for integrated concepts based upon the solid foundation of accounting models and upon the power of OR models. We need solid bridges between OR and accounting - for their sake and for ours. Joint research projects, joint conferences, joint education programmes and other types of co-operation could have stimulating effects on either field. In particular, experts of both fields could in close co-operation design comprehensive models of the firm, be they called "corporate models", "decision support systems", or "information systems" of any kind. The experts of either field can learn a lot from those of the other. Why are there not more joint activities?

Heiner Müller-Merbach  
President of IFORS

# FORTHCOMING CONFERENCES

1985

- |              |       |   |
|--------------|-------|---|
| March        | 12-14 | IFAC Workshop on AI & Pattern Recognition in Economics & Mgmt (Zurich)                          |
| Apr 19 - May | 1     | TIMS/ORSA semi-annual national meeting: 'OR/MS and High Tech.' (Boston)                         |
| June         | 17-20 | EURO VII: Annual European Congress (Bologna, Italy).<br>'Tools & Models for Mgrs & Consultants' |
| July         | 3- 7  | 7th IFAC/IFORS Symposium: 'Identification & System Parameter Estimation' (York Uni, UK)         |
|              | 9-11  | Control '85: 'Theory & Practice of Automatic Control' (Cambridge, UK)                           |
|              | 29-31 | 5th International Conference on Mathematical Modelling (California)                             |
| July 31 Aug  | 2     | 3rd IFACE Symposium on Computer Aided Design in Control & Engineering Systems (Denmark)         |
| August       | 5- 9  | IMACS 11th World Congress: 'Systems Simulation and Scientific Computation' (Oslo, Norway).      |
|              | 20-22 | IFAC Regional Conference on Control & Technology for Development (Beijing, China)               |
|              | 27-30 | Advances & Computer Applications in Production Management (Budapest, Hungary).                  |
| September    | 10-12 | 2nd IFAC Conference: 'Analysis, Design & Evaluation of Man-Machine Systems' (Vares, Italy).     |

Further details are available from Vicky van den Broek-Mabin, PO Box 904, Wellington.

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## N.Z CONFERENCES

While most of us would like to attend overseas conferences, it is not to be. - Which makes the forthcoming conference file an article of interest at most. But why? Where are the NZ Conferences that might be of interest to members? I DON'T KNOW: please drop me a line if you hear of any and I'll see what I can do.

## Felicity Ferret's Gossip Column

This year's annual conference provided more than enough in amusing asides. Don McNickle captivated his audience with a most enlightening (or truthful?) overhead:

### Some Thoughts on Simulation

Just hope Don has a few more thoughts if he's to help those Canterbury students to pass final exams.

In a talk dedicated 'The F.Baird/H.Barr Memorial Lecture' (Fred & Hugh both being absent this year), it was asked:

"Will Barr be bared?

Or will Baird be barred?"

The debate this question started must make this talk the most controversial of the conference!

## NEW MEMBERS

New members since the last newsletter are:

- |                  |   |   |
|------------------|---|---|
| Mr N.H. Ismael   | - | Mauritius                                 |
| Kevin Rogan      | - | Dept Mineral Technology, Otago University |
| Garth Brinsbury  | - | Auckland University (student)             |
| Channa Jayasinha | - | MAF, Wellington                           |
| Philip Almond    | - | Kinleith                                  |
| Stuart MacKenzie | - | Avon Cosmetics, Auckland                  |
| Mr M. Judson     | - | UEB, Auckland                             |