NEWSLETTER

Operational Research Society of New Zealand (Inc.)

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Newsletter Editor - Kevin Hall

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COUNCIL NOTES

Meeting on 31 May, 1976:

1. There was some discussion as to whether it would be suitable for Branches to receive a copy of the IFORS (International Federation of Operational Research Societies) Abstracts for circulation to their members. This would save individual members having to purchase their own copies. However, it was felt that this would not encourage proper use of the Abstracts and also would tend to conflict with our agreements with the publishers whereby we obtain copies for members at a discounted rate.

   Notwithstanding, there was nothing to prevent members interesting their libraries from subscribing.

2. The interim Branch operating grants were increased from 50c per member to $1 per member. Additional grants could be made if a Branch presented a reasoned case for more funds.

Points arising at 5 July meeting:

1. Council approved the appointment of David Boland as acting Chairman of the Wellington Branch in place of John Boshier who is off to the U. S. A. for two years to study the formulation of energy plans and policies. Everyone wishes John a successful two years.

2. Mike Murray presented an income and expenditure account which indicated that the Society would have approximately zero balance by the end of its financial year (30 September). As a result this will probably be the last issue of the Newsletter before October. As the Society's income is mainly dependent on the number of members it was agreed that Hugh Barr should write to the Branches emphasizing the need for them to encourage new membership.

3. With regard to unpaid subscriptions Mike Murray will be sending out reminder notices. After a suitable lag for response he will then bring those still unpaid to the notice of Council with a view to them being removed from the mailing/membership list.

4. John Scott presented an Education Sub-Committee Programme which was approved by Council. The main elements were as follows:-

   For 1976:

   Carry out a survey into the use of OR in Wellington. The results will be published in the Newsletter and will form the basis for a forum to be held by the Wellington Branch.

   Other areas which may be studied in the future:

   i. The relevance of an OR analyst's education to his/her career path

   ii. The relevance of an OR education offered in N. Z. from an employer's point of view

   iii. The type of OR courses being offered in other countries.

Andrew Smith.

WELLINGTON BRANCH MEETINGS

Forum: The State of the Art of OR in Wellington

John Scott began by outlining the Information Science department's survey on OR work done in Wellington over the last 5 years. The aims of the survey were firstly to find out about recent projects, categorize them and publish them in the hope that people in similar fields, including those not already using OR, may use the ideas; and secondly to give OR students an opportunity to meet OR practitioners. Members of ORSNZ were used as contacts, so firms without members were not surveyed. Of the 39 firms and government departments surveyed, the distribution of members in firms was as follows:-

Number of members in firm, etc.	1	2	3	4	5	6	7	8
Public Sector	7	7	3		1			2
Private Sector	4	4		2				
				Shell	MOT			AMD
				IBM				NZED

Results

1. Of the 115 members contacted, 71 worked in OR-using firms though not all of these 71 members practise OR. University students and staff were excluded. Overall, little OR work appears to have been done, especially in private firms (only 20 members). Many of these private firms have strong overseas influences and often applied ideas from overseas either directly or with some adaptation to the New Zealand environment.

2. Problem areas (common first): Forecasting, production planning and scheduling, personnel, supply, financial, location. These are in line with results from other surveys carried out in Stockholm, Australia, and one for the whole of N. Z. Few problems had great significance.

3. Techniques used: Simulation, Linear programming, forecasting, heuristics ... notable exceptions were critical path, transportation and assignment programming. This was due to (a) the survey's exclusion of large industrial areas like Auckland, and (b) overseas transport problems differ from N. Z. 's.

Mr Roger Kirkham, Assistant General Manager of N. A. C. chaired the discussion that followed. Major points raised about N. Z. firms:

1. Face unique location and economic situations requiring new approaches.
2. Lack of finance for research.
3. Are unaware of what their problems are and of OR's potential.
4. Are scared of the term operational "research".
5. Cannot keep any OR staff they train themselves.

Conclusions:

1. OR education should be practical, and include communication skills.
2. OR success stories could be published in "Management".
3. Society should provide a well-defined set of criteria to define OR-type problems, in non-technical terms.

4. Society should perhaps emphasise one main purpose of OR as that of quantifying risks and values of alternatives to management.

5. Practitioners should estimate people-time requirements for OR projects, and keep to deadlines they set themselves.

B. Benseman,
V. Mabin.

A full report of this survey has been prepared by John Scott and will be circulated to members shortly - Ed.

June 2

Mr W. J. Frith, a traffic engineer with the Ministry of Transport gave an interesting address on some aspects of bus scheduling which he had worked on as part of a Masters course at Newcastle-upon-Tyne. His study concerned an investigation into factors affecting the regularity of urban passenger bus services. He began his talk by describing the work he had done and its applicability to New Zealand circumstances. His study centered around the production of a mathematical model of the bus service, relating the variation from timetables to the causual factors. His discussion however was non-technical and covered the various factors that affect regularity, and control measures that could be used to counter them and hence produce better service.

The factors could be classified into four broad categories:

(a) differences between drivers (b) control procedures
(c) organisational, and (d) external.

Differences between drivers amounted to such things as different driving speeds, passenger handling rates, etc. Lack of proper control procedures resulted in buses leaving early or late. This proved to be fairly significant, as once started, a disturbance from timetable tended to propagate, seriously affecting the following buses. If a bus leaves early then the next bus will run late, having to pick up the extra people the first bus missed. Organisational factors were poor timetabling and poor siting of bus stops. Poor timetabling was very significant as the timetable run time was very much shorter than could actually be achieved. This led drivers to try to leave early in order to arrive back 'on time'. The timetable was very out of date and needed altering. External factors were changing congestion levels causing differing speeds, varying numbers of passengers, etc. This could be quite significant and caused much of the delay to the run, but little could be done to control these.

Discussion then turned to various methods by which these factors could be controlled or alleviated. Measures used by overseas administrations were described together with their relative merits and successes. Control measures varied from using inspectors to space out buses, radio control and even a very elaborate on-line computer control system. General traffic control measures to reduce congestion were also an important aspect.

On a more local level, efforts being made in Wellington to cope with this problem also came under discussion. Various proposals were made by the members of the audience, based on their own experiences. Members of the Transport division of the City Council, also present, were able to highlight problem areas and potential and attempted measures of solution.

July 8

Mr John Foster a traffic engineer with the Ministry of Works and Development and representative on the National Roads Board discussed certain aspects of town planning and the use of models to determine optimal arrangement of facilities.

He began by giving a definition of the aim and purpose of town planning. Its emphasis on placing amenities and activities in their best position, an optimal arrangement giving maximum benefit to the users. Mr Foster remarked that the assessment of benefits and costs was a subjective judgement and there was not always agreement between users and town planners. However, he stressed that planning should be directed at achieving the objectives of the people involved.

He then introduced the various types of models used in town planning. The simple empirical models, using basic relationships between employment, population, economy, etc. to decide on the requirements of various service facilities (e.g. size of sewer, no. of schools, etc). This approach could be enhanced by including the transport facet and thus solve for location as well as size and/or number.

Closer to the OR approach are optimisation models. Here an L.P. model using a payoff function of costs and benefits is used, constrained by activity and locational requirements. Packaged programs, such as TOPAZ have been developed and used with some success in Australia and elsewhere. Mr Foster noted that the major benefit of these type of models was in the understanding that it gave to the planner, rather than the pure solution obtained. Some mention was made of dynamic simulation models, but these were generally large cumbersome models, unmanageable for real problems. Some work had been done in this area in the production of elaborate models, but very little implementation achieved as yet. The talk ended on a pragmatic note with the remark that with existing towns the planner had little scope for change. That developers and industry being in a position of initiative and hence control had a greater influence on the shape of a city or town than the planner.

The address was interspersed with discussion and questioning with a high level of active audience participation.

REPORT ON THE 12th ANNUAL CONFERENCE

August 26, 27 1976

Pattern

As in 1975, it was decided to hold a 2-day Conference this year. This form of programme, although increasing the cost to conferees, carries with it several distinct advantages. These include the feasibility of a dinner/social evening (a valued feature of the two recent conferences) and the chance to hear a greater selection of papers with reasonable presentation and discussion time.

Special Sessions

The Conference opened with a short address by Mr Ken Seal of Ceramco, an "elder statesman" of OR in New Zealand. His theme was a plea for continuing simplicity in OR and the maintenance of a strongly practical base in useful applications. A short Council business session was held following Thursday's afternoon tea. The National President, Dr Hugh Barr, spoke of some of Council's recent activities and problems and

called for questions and comments from the floor. Discussion centred on a suggestion that Council may well gain an infusion of new ideas by rotating round the three main centres on, say, a three-yearly basis.

The pre-dinner speaker on the Thursday evening was Professor Alan Titchener, Dean of the School of Engineering at Auckland. His quick-fire delivery and blend of humour with perceptive comment kept his audience at an attentive peak not often achieved in such comfortable surroundings. The talk provided a most stimulating filling between the more sensual pleasures of the sherry party (hosted by the University and its Registrar, Mr Dave Pullar) and the dinner, all held in the relaxing surroundings of Old Government House.

The pre-lunch session on Friday featured a panel discussion on the ever-present but ever-difficult problem of identification and quantification of non-numerical goals. Examples of such goals were given by four speakers, touching on the areas of transportation, energy, timetabling and environment. This was perhaps the least positive session of the Conference; the nature of the topic defies succinct summary just as it defied the emergence of a breakthrough in analytical definition. The planning committee originally had alternative ideas for this session, one or two of which could have led to a more fruitful result, had the organisational time and inspiration been available.

Papers

Presentation of papers provides the raison d'etre of most scientific conferences. The 12 papers presented were of high quality and tended to allay many of the fears expressed by Ken Seal in his opening address. A wide spectrum of ideas emerged: papers covered theory, technique and application in such diverse fields as librarianship, pasture management, factory plant layout and goal programming. Resource utilisation (the underlying theme of the Conference) was represented by a survey of hydro-electric plans in three overseas countries, a consideration of city water supply control, and the estimation of useful timber in a stand of trees. Economics was represented by a study of pricing in inventory systems and an industrial investment model, and facets of OR philosophy emerged in papers on multiple criteria and a framework for heuristic methods.

Overall

It is not for us to comment on the success of the 12th Conference, but it was a friendly group of 40+ that met in the air-conditioned comfort (brrrr!) of the Engineering lecture theatre, and that conferred even more effectively over coffee/tea and lunch. We would urge those who could not come this year to make 1977 a "must", and to consider presenting a paper for the interest (and enjoyment?) of others. The two-day pattern seems to suit our Society well and we would recommend this to continue. Good luck, Wellington, for next year.

M. S. Rosser,
Auckland Branch Chairman,
ORSNZ.

VISITORS, NEWS OF MEMBERS, ETC.

PROMINENT OPERATIONS RESEARCHER ON VISIT TO NEW ZEALAND

Professor C. West Churchman has been on a visit to New Zealand from July 25 to August 23 as an Erskine Fellow to the Economics Department of the University of Canterbury. Professor Churchman gave a number of staff/student seminars dealing with topics on implementation of OR, ethics and morality of planners, managers, researchers and scientists and education in OR.

Professor Churchman joined the staff of the School of Business Administration at the University of California in Berkeley in 1958 from the then Case Institute of Technology, where he was associated with R. L. Ackoff. Although he published the first comprehensive text in OR, Professor Churchman's main research efforts have been in problems of implementation and more generally in particular aspects of the philosophy of science where he has made the greatest impact. During the course of his visit to New Zealand he has also spent some time at the University of Auckland.

AUCKLAND GRADUATE IS APPOINTED TO CANTERBURY

Dr M. McNickle, a graduate from the Mathematics Department of the University of Auckland has been appointed to the fourth OR position in the Economics Department of the University of Canterbury. Dr McNickle wrote his dissertation on aspects of queuing and his work is considered a significant contribution to queuing theory. He is currently on a post-doctoral fellowship at the Department of Industrial and Operations Engineering of the University of Michigan in Ann Arbor. He will commence his duties in August 1977.

ADDENDUM

In the report in the last Newsletter on the OR text by H. G. Daellenbach and J. A. George, to be published by Allyn and Bacon, it was regretfully omitted that John Rodgers, with the Department of Agricultural Economics and Marketing at Lincoln College, contributed a delightful chapter on Heuristic Problem Solving. This is a topic that so far has been neglected by most authors of OR texts and represents thus an added attraction of the Daellenbach/George text.

DUDLEY FOSTER

Dudley is currently carrying out research in the areas of Multiple objective linear programming and statistical decision theory. He would be interested in hearing from anyone with an interest in either of these two problem areas - especially from those who might have an application for these techniques. For further information write to Dudley at:-

Dept of M. Q. C. S.,
University of Otago,
Box 56,
DUNEDIN.

NEW OPERATIONS RESEARCH PROGRAMME AT CANTERBURY

The Science and the Commerce Faculties at the University of Canterbury have recently approved the introduction of a full undergraduate and graduate programme in operations research, starting with the 1977 academic year.

Up to now, OR at Canterbury was offered in the form of course options within the economics curriculum. Over the years, the number of courses offered gradually increased to four under-graduate and two graduate courses. Starting next year, OR will have the status of an independent discipline, separate from economics. Undergraduate and graduate students will have the possibility to pursue a major in OR. The department will offer B. Sc., B. A., B. Com., B. Sc. (Hons), and M. Com. degrees in OR, as well as providing subsidiary courses to other disciplines.

The teaching staff in OR will continue to reside in the Economics Department. The department has allocated five full-time teaching positions to OR, four of which are currently held by Dr H. G. Daellenbach, Mr J. A. George, Dr C. A. de Kluyver, and Dr M. McNickle, a recent appointee.

The Economics Department has prepared a detailed brochure about its OR programme, copies of which can be obtained from:-

Hans G. Daellenbach,
Economics Department,
University of Canterbury,
Private Bag,
CHRISTCHURCH 1.

The programme attempts to strike a balance between the theory underlying various OR techniques and the practical application of these techniques. The B. Sc. (Hons) and the M. Com. programme both require the student to undertake a practical OR project in industry, business, government or agriculture.

The Economics Department hopes to be able to attract, on a regular basis, overseas scholars in OR as visitors to the department for periods of three to nine months. This will give the students the unique opportunity to be exposed to "overseas practice", as well as allow the OR staff at Canterbury to maintain a continuous valuable dialogue with overseas colleagues. The OR group in the Economics Department also will strive to maintain close contacts with staff of other departments interested in OR, particularly those in the Mathematics Department.

COMMENT

The number of newsletters this year has been somewhat curtailed for two main reasons, finance and copy. Rising costs are a problem for a society such as ours but hopefully this problem will only be a short term one.

Ever since I have been editor of this newsletter my major problem has been one of obtaining good copy. The newsletter should be the medium through which members of this society can express their opinions on matters relevant to the society. Very few of you have made use of this opportunity.

A comment made at the recent Annual Conference in Auckland indicated that perhaps it may be a good idea if the editorship of the newsletter was rotated amongst the branches - in this way the Wellington dominance of news would be broken! Do I have any takers?

Editor.

8th INTERNATIONAL CONFERENCE ON OPERATIONAL RESEARCH - CALL FOR PAPERS

This is the next triennial conference of the International Federation of OR Societies (IFORS), and is to be held in Toronto on June 19-23, 1978.

The aim of the conference is to:-

(a) Appraise the latest achievements in practice and theory

(b) Improve the contribution of OR to decision making

(c) Anticipate the direction of future developments.

ORSNZ has been asked to select one national paper on a topic in line with the above stated scope. Anyone wishing to have a paper considered should write to the IFORS representative, Hugh Barr, Box 1335, Wellington, by 30 November, 1976, giving a brief synopsis of the paper proposed. Applicants should also have some prospect of obtaining funding to attend the conference.

NOTICES

1. 1976 Student Paper Prize: A prize of $60 is offered this year. If you have not got your entry in yet, please contact your Branch chairman.

2. The 3rd National Conference of the Australian Society for OR will be held in Adelaide, 28 to 31 August, 1977. Abstracts by November 30, 1976. Enquiries to:-

   R. A. Stevens,
   Organising Sec.,
   3rd A. S. O. R. Conf.,
   P. O. Box 143,
   Rundle St,
   Adelaide,
   STH AUSTRALIA 5000.

3. 8th IFIP Conference on Optimization Techniques, Wurzburg, Germany. September 5-10, 1977. Abstracts by March 1, 1977. Conference language - English. Enquiries to:-

   8th IFIP Conference,
   Am Hubland,
   D-8700 Wurzburg,
   GERMANY.