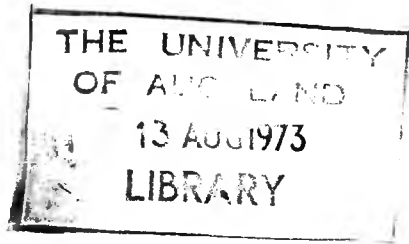




NEWSLETTER

Operational Research Society of New Zealand (Inc.)



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COUNCIL NOTES

From the meeting of March 20, 1973.

1. Dr Bruce A. Murtagh, Senior Lecturer in O.R. at Victoria University, Wellington was elected to Full Membership.
2. Conference 73 will be held in Wellington in the Spring.
3. Past President Vignaux will very shortly be visiting the Canterbury Branch to give an address. (This has since taken place - Ed).
4. The Treasurer spoke of the new sub rebate system saying that 65% of subs had been received by 6 weeks after billing compared with 50% last year.
5. Mr Gary Dickinson resigned from Council and hence from his position of Convenor of the Public Issues and Awareness Sub-Committee. Council expressed its thanks to Gary for the work he had done. The new Convenor will be Mr Bill Foster.

BRANCH NOTES

1. Auckland

A meeting of the Auckland Branch was held on Tuesday 8 May. The speaker was Mr Alistair MacCormick, Dean of the Commerce Department at the University of Auckland.

Mr MacCormick returned last year from the U.S.A. where he had been studying at Yale University. The theme of his talk was the structure of educational courses up to PhD level, mainly at Yale, and impressions of the state of O.R. in the U.S.A.

The subjects included in courses did not vary from those in classical O.R., i.e. techniques of model building, concepts in simulation, decision analysis etc; these being placed with some overlap into four main areas:

- (a) Mathematical programming,
- (b) Decision making under uncertainty,
- (c) Organisation and economics of complex enterprises,
- (d) Applications.

In general professional vacancies in O.R. type positions in Industry and Education are now harder to come by. The Journals

in O.R. are tending to become more theoretical because of the sophisticated mathematics being used. I.e. as in Gaming theory. Some of this is justified for the more complex models such as multitiered inventory systems considering the Producer, the Wholesaler and the Retailer.

In O.R. theory no major theoretical breakthrough has been made within the last 10 years, and at present the most effective practical work is being done with the more acceptable techniques such as

Mathematical programming,
Simulation,
Financial models.

The use of Simulation is going hand in hand with the development of computers.

O.R. practitioners in industry are making the mistake of presenting an optimal solution to a problem, instead of showing the results of varied decisions, and letting the responsible manager pick the solution for himself.

It was also pointed out that the O.R. conferences were well patronised with large representations by academics and practitioners. A good selection of theoretical and applications papers were generally available.

The evening finished with questions followed by coffee.

2. Canterbury

On the 10th April, Dr R.M. Newnham, research scientist at the Canadian Forest Management Institute, Ottawa, at present on visit at Lincoln College gave a stimulating presentation on a simulation project of which he was the senior analyst. He described the methodology employed and the complicated logic developed to simulate the passage of a timber harvester through a forest stand that is being thinned. The purpose is to study the effect of machine size and configuration and operating speed on productivity of the machine with a view to evaluating the maximum potential productivity of various machine designs and sizes. The programme developed generates random forest stands of any desired age and growth distribution, simulates the sequence in which trees are felled, and hauled in to the processing unit where they are delimbed, cut and stacked. The presentation gave rise to a lively discussion. About 25 people attended.

Wellington

On the 10 April the first Annual General Meeting of the Wellington Branch was held. This was followed by a paper delivered by Mr Neil Kane, an Engineer at the M.O.W. Systems Laboratory entitled: A Planning Aid for Architects.

The planning aid is in the form of computer support for the building design process. Neil opened his paper with an outline of the processes involved in building construction from the clients decision to build through to the construction phase. He pointed out that as 92% of the cost of the organisation using a building is in salaries, a building which increases productivity through aesthetic appeal and which minimizes time spent travelling through the building is well worth having.

The planning aid devised fits activities to zones within the building so that the costs (primarily of people having to move through the building) are minimized. It turns out to be a non-convex quadratic programming problem where the constraints are:

- (i) a certain amount of all essential activities must be allocated to the zones.
- (ii) the amount of optional activities allocated cannot exceed the supply.
- (iii) interactivity relationships.

As all optimal quadratic programming solutions are for convex regions the steepest descent method used to solve the model can produce local minima.

A problem orientated language has been developed for direct interaction with the model by architects.

An attempt is being made to extend the model to include "aesthetic appeal" and to constrain the interaction of flows of people (e.g. judges and convicts).

ADDITIONAL BRANCH NOTES

Auckland Branch

A meeting of the Auckland Branch was held on Thursday 7 June at the Auckland University School of Engineering. The speaker was Mr. G. List and his topic was "The Operational Research Approach to Marketing a Product".

The Product under Question was assumed to be a new product, and the main aim was to predict the purchasing level at which the product reached equilibrium (sales) (i.e. final market share) after the initial sales boom.

3 models were described, all requiring knowledge of initial sales or test markets, or acquired knowledge of sales characteristics of similar products.

The first two models used information from a consumer panel, which was randomly selected households keeping diaries of all products purchased. Information could be size, date, place, price special, etc. Basic statistics of the household were also used for analysis (i.e. religion, location, family size, etc.).

Model 1 used the information as gross estimates, model 2 used individual results and set up a simulation using the panel as items and purchases as events. The summation of purchases was used to estimate equilibrium market share.

Model 3, an analytical model, used information from previous surveys, and studies on similar products as well as expert experience in marketing. This information and experience was used to formulate input for a step-wise regression to obtain equations for market share predictions. The benefits gained from this model is that the marketing behaviour can be estimated before a product hits the market and could even be used to assist in advertising programs, marketing expenditure, packaging, etc. Mr Lists's address was well received and his replies to tricky questions afterwards was admirable. The meeting finished with coffee.

Canterbury Branch

A Dinner Meeting was held by the Branch on April 30. The after-dinner speaker was Professor Vigneaux who spoke on the function of O.R. in decision-making. Drawing from his own experience he illustrated how O.R. should be used and how, on the other hand, it could be used unfruitfully on unimportant problems. He saw O.R. as making its major impact on large systems rather than small sub-systems, and suggested that this was possibly the best emphasis for the future.

A lively discussion followed the talk. About 30 people attended the address.

CLASSIFIED ADVERTISEMENT

Alex Harvey Industries require an O.R. Officer for their Operational Research Department. The Department is involved in a wide range of problems and applications including stock control, production planning, distribution, simulation and capital expenditure appraisal.

The appointee will be working on individual projects or as a member of a team on larger or joint OR-DP projects, and will be based in Auckland. The position would suit a graduate in Science, Commerce or Engineering, interested in applying Operational Research to industrial problems. Previous experience would be an advantage.

Those interested in the position should apply to:-

The Operational Research Manager,
Alex Harvey Industries Ltd.,
P.O. Box 12-051, Penrose,
AUCKLAND.

AUSTRALIAN O.R. SOCIETY NATIONAL CONFERENCE

August 20th - 22nd 1973

Registrations are now invited for the 1973 National Conference of the Australian Society for Operations Research. This is being held at MONASH UNIVERSITY, MELBOURNE. The objective is to review progress in the use of planning models and to discuss the role of these models in the future. The theme is:

THE PURSUIT OF THE BEST SOLUTION

Further details and registration forms from:

Chairman,
1973 Conference Cte.,
Australian Society for O.R., Inc.,
3rd Floor, 332 Albert St,
East Melbourne,
Victoria 3002,
AUSTRALIA

LIST OF O.R. PRACTITIONERS

The Productivity Centre (Dept. of Trade and Industry) has begun compiling a directory listing sources of advice and assistance available to manufacturing and servicing industries on all topics related to productivity.

O.R. has naturally been included. The Society has undertaken to provide a list of O.R. practitioners and the Directory will mention that this list will be available freely, on request, from the Society.

Would those members who wish to be included on this list please supply their names and contact addresses; fields of expertise and interest; whether available full or part-time and whether acting individually or on behalf of a principal. (If the latter, name the principal, in which case the contact address will be the principal's address).

The list will give the membership class of each member and will provide a statement of the qualifications required for admission to each of the membership classes, together with the comment that the Society infers nothing regarding the quality of the work of members by their inclusion on, or omission from, this list.

Members should submit details either to the Society,
P.O. Box 904,
Wellington

Or to me,

C/- Engineer-in-Chief's Office,
Post Office Headquarters,
WELLINGTON 1.

Bill Foster.
Convenor,
Public Issues & Awareness Sub-
Committee.

IS OR/SA RELEVANT?

Extracted from the Editor's Column, OR/SA Today

"In the last year or two a number of eminent OR scientists have addressed the slowdown in growth of the profession and evidence that it is less effective with top level decision makers. The fact that the membership of the Society has not continued to grow is not necessarily a reflection of the lack of growth of the profession, but could be the result of lack of satisfaction derived from membership or inadequate consideration of the needs of the "new generation."

With respect to the change in the OR analyst's relationship to the decision maker, one can reflect that, when OR was born and developed during World War II and the years thereafter, the operations analyst truly sat at the right hand of the decision maker dealing in hemibel thinking (see Morse and Kimball) with problems in the virtual or complete absence of real data, few clues on cause and effect relationships, but working on real, immediate operational problems. In the period since then, the analyst has become part of separate study houses, bound to the decision maker by loose, impersonal contractual ties. As OR "matured" into a more exact science, analysts have become more concerned with developing intricate models and converging algorithms, as well as producing voluminous studies, which rarely affect significant decisions. Today, very few decision makers find OR analysts right at their side. There may be a number of reasons for that, but they all boil down to the fact that the decision maker does not feel that the OR man at his side can help him. This could be the result of ignorance of OR in general or it may have resulted from past inability of OR to satisfy his needs.

A few weeks ago the American Association for the Advancement of Science held a most successful meeting in Washington which virtually vibrated with discussion of major issues facing the scientific (all types) community, including man and his environment, assessment of the future of technological growth, science and the social needs, research in support of national needs, the development of a science policy, and others. These topics vitually reek with OR/SA types of problems. Yet not only did the OR section fail to sponsor a single session but the attendance by OR practitioners appeared very meager indeed. Why are OR/SA types not involved in developing important policy decisions in these vital areas? One cause for this deficiency may be that an insufficient number of good experienced and imaginative analysts venture out into the new socio-environmental problem areas, the world where unquantifiable and judgmental factors are all important, where problems are difficult to define and impossible to isolate, where there are no neat operationally useful benefit measures which can be supported by either existing or collectable data, where heuristic approaches are the only available methods. (An excellent article on the relationship between OR and applied mathematics by Tom Saaty is found in the December 8 issue of SCIENCE). With the advent of environmental impact statements, technology assessment and limited resource allocation problems at all levels of government, a long list of areas can be compiled that is in

bad need of the multidisciplinary, analytical, broad thinking that OR and management scientists have developed. To be sure, OR has contributed to analyses of urban problems, to analyses of transportation problems, some aspects of the penal system and a few others. But we still have many broad, critical areas in which we should contribute.

There are a number of questions that should be raised. What is ORSA doing to encourage OR efforts in these vital, but difficult areas? Are our meetings adequately structured to provide for discussions between decision makers, who must describe the problems as they see them, and the practitioners to air their bag of tricks? Can ORSA help in determining from the decision maker why the profession is not helping him? Does ORSA provide any mechanism for timely publication of successful OR studies that lead to real decisions, even though the methodology may not have been sufficiently esoteric? Are our young analysts made sufficiently aware that finding the best answer in time to affect the decision process is much more satisfying to the true OR analyst than the intricacies of the formulas employed?

If the OR/SA profession is to be revitalized and start growing again it must go where the action is, and it must convince top-level decision makers that it can help them. Can ORSA help the profession?

- John G. Honig, Associate Editor".

Our American brothers might be technically far more advanced than we are but their problems in the area of applied OR have a familiar ring to them. - Ed.

NEW MEMBER

Only one new member has been registered in the last few months:

Colin Stichbury of Auckland. Colin is an Industrial Engineer with General Foods where he is developing control systems in the distribution of G.F.C. products throughout New Zealand.
