NEWSLETTER

Operational Research Society of New Zealand (Inc.)

MAY 1975 VOL. 11, NO. 4

Newsletter Editor - Kevin Hall

Material for the Newsletter should be sent to:

9 Fairview Cres.,
Kelburn,
WELLINGTON, 5.

Closing date for the next Newsletter - 24th July, 1975.

COUNCIL NOTES

Notes of the Council meeting held on the 17th March.

1. T. V. and Radio Programmes

The Royal Society has been forwarding to programme producers suggestions for scientific topics. At their invitation we have now provided the Royal Society with a list of suitable O. R. topics and hopefully some of these might be considered for broadcasting.

2. Non-financial Members of O. R. S. N. Z.

Council was aware that there were a number of long-standing non-financial members of the Society. It was decided to delete their names from the mailing list.

3. Calculator display in Auckland

Arrangements have been made for the Auckland Branch to run a calculator display in Auckland this year jointly with the Statistical Society. This should be a good revenue earner.

4. Other Societies and O. R. S. N. Z.

There are now a number of other societies and groups that have interests closely allied to O. R. There was some inconclusive discussion regarding the role of O. R. S. N. Z. and the relationships we should have with these groups. This will be taken up at a later Council meeting. Some information was obtained from the membership questionnaire, but in the meantime we would still like to know more what you think. Both Council and the Newsletter Editor would be only too pleased to receive your views.

5. Tax Deductions

A tax deduction on the membership subscription would come in handy for that extra O. R. book! Unfortunately we have received no reply from our enquiry to the Commissioner of Inland Revenue. Thus unhappily there seems little we can do at the present time.

Notes from the Council meeting held on the 6th May.

1. International Federation of Operational Research Societies (I. F. O. R. S.) Conference, Japan

Hugh Barr reported that it seems increasingly unlikely that he will receive a travel grant either from his employer or the Royal Society. Sadly this could mean that he will be unable to personally present his paper and that O. R. S. N. Z. will be unrepresented at the I. F. O. R. S. Business Meeting. However, Hugh is still exploring one or two avenues in the hope of finding a sponsor.

2. Overseas Visitors to N. Z.

With both The Institute of Management Science (T. I. M. S.) and I. F. O. R. S. Conferences being held in Japan this year a large number of eminent O. R. people will be in the Pacific. Enquiries are being made to see if any of them can be attracted to visit N. Z. to give talks.

3. Articles for the Journal

Hans Daellenbach wondered in view of the shortage of material for the Journal what the criteria for accepting articles should be - for example would purely statistical material be suitable. Council agreed that for inclusion articles should be clearly of an O. R. nature.

4. Student Paper Prize

There was discussion of the format of the competitions. It was suggested that papers should be presented at the Annual Conference. However, this could in general present difficulties for the students and in particular not enough notice could be given to students for them to present papers at this year's Conference. It was therefore decided that, while in the future the form of the competition may be changed, this year's competition will be run similarly to last year's.

Andrew Smith.

BRANCH NEWS

WELLINGTON BRANCH MEETING

The Annual General Meeting of the Wellington Branch was held at the Midland Hotel on Tuesday, 22nd April. The meeting was followed by a talk on "Modern Selling Techniques" by Owen Steel of Shell Oil Co. Most O. R. practitioners are involved with presenting their proposals for approval, and the message given by Mr Steel on how to do this effectively was a timely one.

COMMENT

Operations Research can fairly be claimed not to have fulfilled the heady claims for it made when the profession had just shed its military origins and had become a small group of enthusiasts in a few major companies. The claims were based on acknowledged successes in dealing with operational and logistic problems in World War II. They were backed up by a small number of successful industrial applications to inventory, supply and transport problems. Many of these early successes did not appear in the literature until someone recounting history told of them as a significant development in the organisation with which they were connected. The successes were not of sufficient theoretical importance or seen to have a sufficiently general application to be recorded elsewhere in the literature.

One of the reasons they were "successes" was because they took fragments of information and brought them together in a new way which was clearly helpful in determining new approaches for a unit or company's activities. Often they provided new operational goals. During war time, the problems and solutions were only relevant for a short period of time. The operations research staff were continuously looking for new ways to exploit the changing situation. The whole operation was their oyster, and they closely examined any irritants to see if they might become pearls.

Is the failure in O. R. to fulfil the claims made for it at least in part due to a change in vision of the profession? Has it become too concerned with using known tools (often over periods of many months) to 'solve' a standard kind of 'problem' rather than concerning itself with timely approaches to the changing constraints and circumstances of the organisations and community to which it belongs? Such a change would radically alter the impact of the profession, the nature of training for it, the links between the profession and management, and our society and its activities.

Fraser Jackson,
President O. R. S. N. Z.

O. R. S. N. Z. 1975 STUDENT PAPER PRIZE

The Student Paper Prize competition for 1975 will be similar to that of last year. Conditions of entry are as follows:-

CALL FOR ENTRIES

The O. R. S. N. Z. student paper competition is to encourage students to carry out O. R. projects and present their results. A prize of $50 will be awarded to the winning entry.

Entries may be on any O. R. project in which the student was a major participant, but must be prepared wholly by the student. (Any O. R. contribution by others involved should be clearly acknowledged).

An oral and written presentation of the paper is required. The oral presentation can be to a local or national meeting of the Society, and must take place prior to the closing date. Two typewritten copies of the written paper should reach the Secretary of the Society, Box 904, Wellington by the closing date, September 30, 1975. It is suggested that the written paper be of 2,000 to 3,000 words.

Entries will be marked on both the oral and written presentation. Factors to be taken into account in the judging will include:-

(i) Content, including originality of the paper and understanding of the topic.

(ii) Clarity and structure of the presentation including understandability to the non-specialist.

(iii) Usefulness of the project.

(iv) Complexity of the student's task in the project.

All students who are student members of the Society are eligible to enter.

It is hoped to announce the winner by the end of the year.

Hugh Barr,
for Student Paper Prize Committee.

NOTICES

1. A REMINDER - The closing date for abstracts of papers to be presented at the O. R. S. N. Z. Annual Conference 21 - 22 August 1975 in Wellington was the 22nd May. If you haven't sent your abstract yet, do it now! Send to:

The Secretary,
Wellington Branch,
O. R. S. N. Z.,
P. O. Box 904,
WELLINGTON.

2. The N. Z. Statistical Association invites members to a display of desk and pocket electronic calculators in the Lion and Unicorn Rooms on the 1st Floor, Hotel St. George, Willis Street on:-

Monday, 7th July, 10 a. m. to 5 p. m.

Tuesday, 8th July, 10 a. m. to 4 p. m.

14 Firms will be exhibiting a wide range of equipment. Tea and coffee will be served free at lunch time.

CONFERENCES

1. Statistical Society of Australia - N.S.W. Branch. "The Design and Analysis of Sample Surveys".

   It is planned to hold the Annual Symposium on the above subject on Thursday, 28th August, and Friday, 29th August, 1975. Currently the Council is organizing speakers and venue. Further information can be obtained from:-

   C. H. Gray,
   C.S.I.R.O. Division of Mathematics & Statistics.

2. A.S.O.R. - Second National Conference. 25 - 27th August, 1975. Theme - "Models for Modern Management".

   This Conference will be held in Sydney. Registration $A60. Further information from:-

   The Secretary,
   A.S.O.R. Conference 1975,
   Box 458,
   Wentworth Building G01,
   University of Sydney,
   N.S.W. 2006,
   AUSTRALIA.

BOOK REVIEWS :

PROGRAMMING FOR SPECIALISTS

"The Elements of Programming Style" by
B. W. Kernighan and P. J. Plauger.
McGraw-Hill Book Company (1974) ($3.25)

"Program Style, Design, Efficiency, Debugging
and Testing" by Dennie Van Tassel.
Prentice-Hall, Inc. (1974) (About $6.00)

"Why do we never have time to do it right, but always time to do it over?" If you have ever written a computer program and asked yourself this question, these two books should interest you.

Kernighan and Plauger try to teach a good programming style as concisely as possible. The authors develop a list of rules by analysing a series of finished programs written by experienced programmers. The programs are chosen for their LACK of style - they are verbose, obscure and tangled. Would you use the following FORTRAN statement

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V (I, J) = (I/J) * (J/I)
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to initialise V as an identity matrix? Perhaps not, but you may use unnecessary branches, temporary variables, or meaningless variable names. I do.

Each of the book's six chapters ends with a summary and a set of exercises; and the rules are grouped at the end of the book. It is difficult to choose the outstanding rules. The chapter on Input and Output tells us to "test for validity ... identify bad input ... recover if possible". Another chapter deals with Efficiency. Here we are told "make it right, fail-safe, and clear before making it faster". We should improve efficiency by finding better algorithms, not by diddling code and destroying clarity.

Van Tassel writes for those who "wish to increase their programming proficiency", and so deals with debugging and testing as well as readability. This book is not as concise as the above, but it does contain more exercises, and extensive reference lists at the end of each chapter.

Although Van Tassel says "completing a readable program is more important than an efficient program", he spends 30% of his book on efficiency - presumably for the programmer whose own time is not the most valuable commodity. Loop organisation, temporary variables, subscript calculations, and optimisation of arithmetic operations, etc., are discussed in some detail. I think writing A * * 4 as (A * A) * (A * A) is going too far. However, he does show the most productive way to improve efficiency.

Van Tassel has two lengthy chapters on debugging and testing. One lesson is to allocate enough time for these two stages (up to three times the period spent in writing). Another is to anticipate bugs and to plan future tests while programming. I liked the quotes he used, such as Dijkstra's "Testing shows the presence not the absence of bugs."

What impressed me most about Van Tassel's book was his appendix by Daniel H.H. Ingalls. Entitled "FETE : A FORTRAN Execution Time Estimator", it described a system which inserted counters automatically, ran the modified source code, then printed out the executable statements with the exact number of executions and the approximate computation time for each. As 3% of a typical program used 50% of the execution time, Ingalls argued that only 3% of the code needs to be efficient, the rest remaining in the easy-to-understand form it was first written in. Using FETE, he claimed, cut programming time by a third, improved efficiency and yet left the program comprehensible. Has N.Z. got any system which produces execution time profiles automatically?

The two books cover different topics so comparison is difficult. Kernighan and Plauger could have given more references, and Van Tassel perhaps a set of rules to highlight his important points. Both books could supplement programming courses but I think experienced programmers would benefit more than students. I shudder now when I review my old programs. Van Tassel's chapters on debugging and testing are valuable, but if you want to learn programming style, Kernighan and Plauger's book will be hard to beat for some time. Because we must debug our programs, and our heirs must modify them, it pays us to remember Kernighan's favourite maxim: "Write clearly and don't be too clever".

Bruce Benseman,
Applied Mathematics Division,
D.S.I.R.

L.P. FOR MANAGERS

"Linear Programming Models in Business" by
Derrick Smith, Polytech Publishers Ltd,
Stockport. 215p. Price about $6.00.

There are already many books on Linear programming (L.p.). This book is worthwhile because it describes, in very readable text, "the ways Linear programming can be applied to business problems, and the process whereby L.p. models can be unstructured". Here is a book that explains without mathematics, (the simplex method is not mentioned till 3/4 way through), the perspective for L.p., how to use it, and why it is a useful tool. Managers should find this book readily understandable, and practitioners will find interesting ideas on breadth of application in the later chapters. It provides a good basis for a practical course on L.p. The author has been associated with O.R. in I.C.I. for the last eight years, and his practical learnings are most refreshing.

Chapter 1 discusses the model building philosophy. Chapters 2 to 5 discuss formulation, solution and interpretation. There is a detailed description of applying L.p. to flows through two bakeries, which should appeal to most practitioners. Of the remaining chapters I found Chapter 8, about applications to short, medium and long-term planning, and Chapter 10 on the nuts and bolts of integrating L.p. models into other business systems (including the accounting system), the most interesting as checklists to consider. Once you've done this once, its obvious what to consider, but for those who haven't there are some interesting points to think about.

The book emphasises that L. p. is most appropriate for continuous processing industries, where there is a range of production options. The strength of the method is in its ability to model interactions between subsystems. To quote from Chapter 8: "The importance of the interactions between different areas (of the firm) becomes apparent (from L. p. modelling) in several ways. The idea that marketing plans should be determined not only by commercial factors, but also by production considerations, may be a new one in some environments. A (L. p.) model is an extremely good communication medium and focus for attention." Problems of models representing too large a system are also discussed, as is the idea of hierarchies of models based on time (long, medium and short range) and on areas of the firms.

When one thinks of the continuous processing industries in New Zealand e. g. meat works, wool processing, food processing, dairy, forestry and oil, one wonders whether we are making full use of the potential of L. p. models. Perhaps this book will encourage managers to take a closer look at the possibilities, especially given the ready availability of sophisticated L. p. packages (e. g. on the Universities' Burroughs systems).

From a practitioner's viewpoint, the book is not as strong on how to formulate L. p. problems as one might have hoped, and there are no exercises given. Experience and practice may be the only way to jump this hurdle. However, in my opinion, this is a minor fault, and I would recommend the book to anyone starting on a L. p. modelling exercise.

Hugh Barr,
Applied Mathematics Division,
D. S. I. R.

NOTE: The Newsletter welcomes book reviews from members.

Ed.

VACANCIES - O.R. OFFICERS

An experienced operational research scientist with project leadership ability is required. The vacancy is with the Applied Mathematics Division, Department of Scientific and Industrial Research, based in Wellington.

The Division undertakes a broad and interesting range of Mathematical work from assignments with other Government departments to advisory and consultant work for industry. An active O.R. group is developing and future O.R. projects are likely to be in the transport, manufacturing and distribution sectors.

Applicants should have the equivalent of a masters degree or higher in a relevant subject, with at least three year's experience, including project leadership experience. Salary is according to qualifications and experience to $NZ 9,682 or $NZ 11,562.

Please address enquiries to:

The Director,
Applied Mathematics Division,
D.S.I.R.,
P.O. Box 8030,
WELLINGTON.

Enquiries are also welcome from graduates who have recently completed degrees, or who will complete them this year.