NEWSLETTER

Operational Research Society of New Zealand (Inc.)

AUGUST 1972 VOL. 8. NO. 3.

COUNCIL NOTES

Notes from Council meetings held June 1 and 15, July 13.

1. The following additional subcommittee appointments were made:

Education	Messrs J.A. Jordan, M.S. Rosser, J.B.C. Taylor, C.W. Walker.
International Affairs	Mr D.C. Cook, Dr H.G. Daellenbach, Mr J.A. Gibson.
Membership	Messrs M.G. Dodgson, T.A. Lusk, B.F. Ross-Murphy, Miss K.M. Watson.
National Events	Messrs I.K. Hampton, T.A. Lusk, P.J. McKenzie.
Public Issues & Awareness	Dr R.R. Allan, Messrs A.T.G. McArthur, B.R. Slocombe.
Publications	Dr H.G. Daellenbach, Messrs R. Elder, P.C. Gini.

2. The Society Budget was approved, total Council expenditure being estimated as $1,000 including grants to the branches based on their submitted budgets. Income was also estimated to be $1,000. The grants to the branches were Wellington $142; Auckland $80 ; Canterbury $69. They were made according to the formula $(40 + no. of members at 71 Sept.)

3. The date for the Society A.G.M. has been tentatively set at November 14.

4. Council commended the Auckland Committee on its organisation of the '72 Conference to be held on September 1 and expressed the hope that members would attend in large numbers.

5. The Public Issues and Awareness Sub-Committee is discussing the possibility of running some seminars on O.R. for N.Z. Institute of Management Members. (The Society is a corporate member of the Institute).

6. Council is going to reconsider the possibility of ORSNZ joining the Royal Society of N.Z.

7. The Society now has 240 members c.f. 204 on 71 September 30.

COUNCIL SUB-COMMITTEE NOTES

1. Constitution

The Chairman, Professor G. Vignaux, reports with disappointment that he has had no comments favourable, unfavourable or noncommittal about the amendments suggested by the Hon. Secretary, Mr B. Campbell, and Dr Daellenbach in the last issue.

He states: "..... I am proposing to the Constitutional Committee that we consider the following matters in order of urgency:

Branch Finance
Postal Elections of Council
Postal Balloting on Issues
Branch Constitutional Structure
Membership Structure, and the question of Professionalism.

If any member has comments on these matters I will be very happy to put them to the Committee or arrange to have them published in the Newsletter."

2. Public Issues and Awareness.

2.1. NZIM Wellington Branch

Discussions are being held with a view to the Society organising a course of three or four weekly seminars on the application of O.R. techniques to management problems. These would be given by members of the Society sometime in October or November and co-ordinated with regard to style and length.

NZIM have carried a brief mention of our activities in the May/June edition of Executive.

2.2. Public Issues

A proposal has been made that the Society organise studies into matters of public interest which have an O.R. content. Something along the lines of the recent Computer Society study into individual identification is intended. Such a study would be detailed and long term and as yet no fixed topics have been proposed.

Any suggestions would be welcome.

3. Education

O.R. courses approved by the Society.

Council is enthusiastic that courses be run to further education professionally and generally in O.R.. Council has asked that the Education Sub-Committee encourage and help members who are considering running courses and that, where they are of an appropriate standard, approval be given by the sub-committee to use the Society's name in conjunction with courses. Any members who are interested in running courses are asked to contact the Sub-Committee Chairman, Dr. H. Barr, if they require assistance or approval.

4. National Events

A membership survey is about to be carried out. Questions relating to the type of facilities members would like the Society to offer, the Constitution, publications, Overseas speakers and sponsorship etc.. will be asked.

DON'T FORGET OUR 72 CONFERENCE AT THE AUCKLAND UNIVERSITY ON SEPTEMBER 1ST.

Very few travel discount vouchers have been asked for to date. If the respons does not improve, the numbers travelling on bulk discount might not cover minimum requirements with full fares the consequence.

BRANCH NOTES

1. Auckland

1.1. The first lecture of the Auckland Branch was held on March 23 and featured a double presentation on multiple regression.

As an introduction, Mr Alistair Scott (Lecturer at the University of Auckland) briefly covered the theoretical aspects of multiple regression.

The main speaker was Mr Don Simon of Tasman Pulp and Paper Company. He centred his address around the use of regression in the design of a Digester and the related bleaching grades and qualities of paper produced under varying physical conditions.

1.2. Another meeting of the Branch was held on 27 June with a lecture on Critical Path Use.

The speaker was Mr H.B. Powell, who is Senior Planning Officer of H.M.N.Z. Dockyard at Devonport. His paper was entitled "Application of Pert to Refitting of Naval Vessels".

Preceding the paper was a short film "Basis for Decision", dealing with network and Critical Path techniques used in British Industry, and featuring well known O.R. personality Patrick Rivett. Appropriately, Shipbuilding was illustrated.

The film, and the paper presented, covered varied views and ideals on Critical Path techniques and uses.

The film gave the impression that setting up and analysing a Critical Path System was relatively easy, and thence after Computer Processing was the answer to Project Control.

The Speaker, on the other hand, purported that detailed systems evolving from a computer were of little practical use and he wanted documents, standardised and readily usable by supervisors. The paper therefore went on to explain the modifications that were made to existing I.C.L. Software.

The ensuing talk revealed some real problems in Critical Path use, the main one being the order of sorting work items. This can give false impressions, especially when analysing Resource (Labour or Trade) Allocations. Another is changing a Network to follow a Dynamic Environment. The example stated was "Removing a stove and finding corroded backing plates which were previously not realised".

Particular emphasis was placed on reports being simple and related to actual events or "Reality of the Job". Noted was the gap between Computer Technology and Practical Users, and the necessity of giving users (Supervisors) credit for being intelligent and experienced enough to perform relatively complicated tasks without instructions in minute detail.

The system as explained on the selected Software Base and using an I-J or Nodal Technique did appear to be somewhat binding, especially to a user of the "PRECEDENCE METHOD" of a Project Control System.

To sum up, the evening was of immense interest and very well presented.

2. Canterbury

For their June function, the Canterbury Branch sponsored a joint meeting with the local branch of New Zealand Institute of Engineers.

Tim Lusk, a senior engineer in N.Z.E.D., currently with the Electrical Engineering Department at Canterbury University spoke on "Management of Hydro Reservoirs in the New Zealand Power System".

Approximately 65 people attended; the Engineering and O.R. professions being about equally represented.

In a Hydro-Thermal power system, large scale economies can be realised if hydrogeneration is controlled in the face of an uncertain inflow future in a way which minimizes the long term expected cost of thermal generation.

A high level of security of energy supply is of paramount importance and it is desirable that the variation in operating cost with the level of energy security be available to management. The talk was concerned with the use of O.R. techniques as a management aid in this area.

The New Zealand power system was described in detail from an energy production point of view and an account of the application of O.R. techniques by overseas power authorities used to underline the difficulties involved, particularly with Dynamic programming in the development of a suitable management tool.

The most promising aid for the New Zealand power system is based on an optimizing algorithm which systematically connects an initial release policy until equal monthly incremental costs are achieved over the future considered.

The algorithm is used in a multi reservoir simulation process to generate long term expected cost of thermal generation and expected energy deficiency as functions of the immediate release decisions over all reservoirs. Such cost sensitivity information is the most suitable form of information where many other subjective considerations have to be weighed before a release decision is finally made.

3. Wellington

3.1. The B.P. House conference room provided an ideal setting for the May meeting. Mr M.J. Tarrant, a Distribution Superintendent with B.P., addressed the group on their automatic Stock Control for Packaged Goods (mainly lubricants).

The Control System consists of 4 parts. The first forecasts the sales of each product at each location using least squares on a sin/cos function and exponential smoothing to update the coefficients. The second part determines the optional provisioning pattern for the 27 locations needed to cater for the forecasted sales. Part three

attempts to smoothe the work load at the locations, while Part four produces the manufacturing plan needed to cater for the supply function determined in stage two.

3.2. Management Involvement in O.R. Techniques: "A Container Simulation Example" was the title of the talk given to a Wellington Branch meeting on 27 June by Dr. Pat Reilly of the P.E. Consulting Group.

Dr Reilly introduced himself as a management consultant with no O.R. expertise, but who had become aware of the benefits of an O.R. approach.

In the course of an assignment for a British Container Shipping operation he had become involved in charting the progress of a container through the system. Workers themselves had assisted in this exercise by specifying the possible activities of containers. The chart was finally modelled for analysis by HOCUS, the P.E. group's simulation language.

Although the chart was primarily designed for simulation purposes it also provided assistance to management in a number of other areas. Those present had the opportunity of identifying from the chart areas of responsibility for the containers, and the points during a container's journey at which information should be documented. This approach had been used by the administration in designing a system for the operation of the containers.

Dr Reilly returns to England this month, where he will later be involved in further investigations for the shipping line.

MEETINGS/CONFERENCES

1. The following two O.R. courses run by the Department of Extension Studies, University of Canterbury in association with ORSNZ,

1.1. A Survey of Operations Research Techniques.

Lecturers: Dr H.G. Daellenbach
Mr J.A. George,
Miss K. Steele

On Tuesdays from 1 August to 17 October. Ten lectures introducing the most important mathematical techniques of O.R.
Fee $6.00

1.2. Quantitative Techniques for Production Management.

Lecturers: Dr H.G. Daellenbach
Mr J.A. George
Mr M.L. Gimpl

August 22-23, 1972. A two day course discussing use of linear programming, queueing, and simulation in production engineering.
Fee $35.00

For further information contact:

Department of Extension Studies
University of Canterbury
CHRISTCHURCH 1.

2. The following course run by the School of Business, University of Otago may be of interest.

October 25-26: Standard Costs and Flexible Budgeting, for accountants in manufacturing organisations.

For further information contact:

Department of University Extension,
University of Otago,
P.O. Box 56,
DUNEDIN

3. The Mathematical Programming Society announces that the 8th International Symposium on Mathematical Programming will be held at Stanford University.

Contributed papers on theoretical computational and applicational aspects of mathematical programming are welcome.

Further information concerning the Symposium may be obtained from the Ed. or from Professor Richard W. Cottle at the Stanford University.

BOOKS/JOURNALS

1. We have received the following which are available to members, and are currently kept in the Applied Maths Division, D.S.I.R, Wellington Library.

"Boletim Tecnico da Petrobrás" - a journal (in Portugese) from Brazil, on oil industry problems.

Airline group, International Federation of O.R. Societies (AGIFORS). "Proceedings of the eleventh AGIFORS Symposium (1971)".
- These proceedings as well as back issues, are available from the Publications Officer, AGIFORS, Operations Research Division, American Airlines, 633 Third Ave, New York 10017. (NAC also holds back issues which it would be happy to lend to anyone interested. - Ed).

2. The NATO Advisory Panel on Operational Research sponsored a Conference on Reliability Testing and Reliability Evaluation in The Hague, Netherlands, September 4-8, 1972. A Proceedings of that Conference, comprising 437 pages and the full text of 27 papers is available. Copies may be purchased for $12 (postpaid) from the publisher:

Bureau of Business Services and Research
California State University
Northridge, California 91324 U.S.A.

Payment should accompany the order.

O.R. AND THE SYSTEMS APPROACH

Extracted from "The Systems Approach" by D.C. Dalton (an Information Science Student at Victoria University).

..... "It is my view that Operational Research is becoming more and more a branch of applied mathematics where techniques and not results are important. O.R. does not do what it preaches. It preaches a pragmatism that is quickly lost in the hurly-burly of "Academia". Operational Research seems to have forgotten the systems approach. The Systems Approach was what gave Operational Research its initial impetus but gradually it has become a mathematical technique for solving business problems. Important problems are ignored because no-one knows a technique which can be applied to them. O.R. is technique orientated instead of being problem orientated. What is needed is a general awareness that the systems approach can be applied to any system no matter how complex. The future of civilization is going to rest on the ability to analyse and optimise extremely complex systems. Most managers these days seem to have got the wrong idea about O.R. They seem to think O.R. is a branch of industrial engineering. While a lot of them are misguided I think a good proportion hold this belief because that is what O.R. seems to be. If all O.R. studies followed the systems approach there would not be any trouble convincing managers that O.R. is not just a 'Backroom' mathematical technique but an approach that can be successfully applied to helping the decision maker make a rational, well reasoned decision based on facts not guesswork. Thus in concluding this section I believe that the present 'image' (forgive the cliche) of O.R. is that of a technical advisory service for improving efficiency in a firm. O.R. must not be constrained to such narrow limits. O.R. must be thought of as an approach to decision making which analyses decisions in a scientific manner. O.R. must pay more than lip service to the systems approach. It must incorporate it into itself so that the two become indistinguishable. O.R. must be the Systems Approach."

ARGUMENTS FOR REPLACING FULL AND ASSOCIATE MEMBERSHIP CLASSES BY A SINGLE CLASS OF INDIVIDUAL MEMBERS

By Dr H.G. Daellenbach, Economics Department, University of Canterbury

1.1. The present requirements for full membership status are:

"(a) at least a University Degree or equivalent,

(b) not less than two years experience in O.R. and

(c) proposal by two full members of the society".

amended to also include:

"(d) any applicant for full membership who can show published work in O.R. of a nature satisfactory to council will be accepted as a full member".

1.2. Comments:

(a) A university degree does not guarantee any competence in O.R. For instance, would a B.A. in English or Psychology be acceptable? On the other hand, such a person might have great experience in computerized information retrieval, mathematical pattern recognition models or simulation, etc. Furthermore, the graduate of a technical institute or other specialized school without university status or the seasoned manager who made it to the top before university degrees became fashionable with extensive practical O.R. experience would be excluded without justification.

(b) What does two years of experience in O.R. signify? For instance, what percentage of his time would have to be devoted to O.R.?

(c) As I experienced personally, a potential full member may not know any full members of O.R.S.N.Z. and thus be discouraged or at least annoyed by this requirement.

Those criteria (including point (d)) are thus arbitrary, and not void of ambiguity. In most cases they will require an arbitrary decision by the Council. This may not have been a source of problems as long as most members were located in Wellington, but will become one increasingly as membership becomes more dispersed over New Zealand.

2. What purpose does the full membership category serve?

2.1. For the society: It is stated that the full membership category fulfills the I.F.O.R.S. requirement for qualified practitioners, and provides a basis for calculating I.F.O.R.S. levies. The U.K.O.R. Society has recently replaced all classes of individual membership by a single class without running into any trouble with I.F.O.R.S. Instead, the society now maintains a register of O.R. practitioners. I.F.O.R.S. requirements are thus not a valid reason.

2.2. To the community: Full membership is taken as a guarantee of minimum competence in O.R. Firstly, in its present administration, full membership does not guarantee this even at the time of admission, let alone several years after admission to full membership, particularly in a field like O.R. which is still evolving rapidly. Secondly, many members starting out as associate members may acquire such competence without ever bothering about changing their membership status, as was reported by the membership committee. On the other hand, a register of practitioners, updated annually by questionnaires could provide such a service.

2.3. To the members: Full membership is supposed to provide higher status. This is a myth. Full membership does not confer any tangible recognition in professional or academic societies. O.R.S.N.Z. is still largely unknown even in University circles (except maybe in Wellington). At present any professional recognition or status enjoyed by a full member is due exclusively to his credentials. The full membership is thus mainly a matter of personal satisfaction. Given the higher membership fees, full membership is nothing but a "tax on vanity".

3. The distinction between full and associate membership relegates the associate members to a <u>second-rate class member</u>. This has been expressed to me on several occations. This is a rather unfortunate result. Furthermore, I have seen from personal experience this connotation of second rate membership discourages potential candidates from joining O.R.S.N.Z. A small society like O.R.S.N.Z. cannot afford itself the luxury of losing potential members. The loss in revenue caused may well offset the additional revenue generated by the higher fees of the full membership class.

<u>Conclusion</u>

Admission to full membership is based on potentially ambiguous criteria and will give rise to arbitrary decisions. It does not fulfill the purposes for which it has been introduced and may, in fact, hinder rather than further growth of O.R.S.N.Z. For these reasons the categories of full and associate membership should be combined to one of individual membership. Instead O.R.S.N.Z should create and maintain a register of professional operations researchers. Subscription to I.A.O.R. could be attached to this register to cover the costs of both I.A.O.R. and maintaining the register.

WHAT IS THE SOCIETY FOR?

An address to the Annual General Meeting of the Operational Research Society of New Zealand, 1972 March 29.

G. A. VIGNAUX

The present position of the society is summarised in the Annual Report, this address hopes to treat what I consider to be more important - the future of the Society; about the ways that we might go in the future and about the decisions that have to be taken now or in the next few months. I am suggesting a systems analysis of the Society to look at its objectives and the design of suitable structures for achieving these objectives. This involves looking at what the society's functions are and how it can best carry them out.

THE PRESENT AND THE FUTURE

For some years the society has been able to grow and prosper at what many regarded as a reasonable rate under what might be termed the 'one party' or at least the 'one branch' system. Although there was membership in other centres the focus of Society activities was Wellington, the great majority of members were from this region and practically all the Society Officers, elected at an AGM held in Wellington, were from the area. Indeed in many ways this has been an efficient system, and the Society has run well and smoothly during its period of primary growth. It has functioned as a local branch and the only members who received any real service were the local Wellington members who were able to attend local meetings which were optimistically called "society meetings". The member outside Wellington joined, perhaps not because of the benefits he received but because he felt that he ought to support 'his' society.

The Society has been conscious from its early days of its duty to its non-Wellington members, indeed for several years representatives of such members were deliberately co-opted to Council. This expedient was not particularly effective since the co-opted members were usually unable to attend Council meetings and their influence was limited to writing letters in reaction to issues raised at meetings. They received copies of the minutes of course and this helped to ease the communication problem. In addition whenever one of them was able to visit Wellington on business, a Council meeting was quickly arranged: an example of the flexibility of a small society!

In a more practical way, the Newsletter was intended to provide some sort of service to members unable to attend meetings. This publication has had its ups and downs, its downs corresponding to those times when it was difficult to persuade speakers at Society meetings to write up their papers for subsequent publication. It is difficult to judge how valuable it has been but whenever the members have been polled at conferences they have always requested more frequent issues rather than less.

Now, within a year, the Society has developed so dramatically that we must rethink the Constitution, the purposes of Council, the reasons for its sub-committees and the sort of services to its members that it is now feasible to provide. It is now appropriate for us to consider in what new directions the Society should move, what services we can render the members and

increasingly more important as the Society grows and as quantitative techniques of various sorts are becoming more widespread: what services we can render the public and the country. By this I mean taking on the role of independent commentator on the uses and abuses of OR-like methods.

We must decide how the branches will function in the Society and how services to members can be improved.

We must take a new look at the question of professionalism and the role of full membership in the Society structure. We must decide if we wish the Society to become a professional body or a scientific society and evaluate the benefits and responsibilities of the alternatives. Above all we must look at the Society, decide what it is for and having decided this, develop a suitable structure which while retaining flexibility, will enable us to attain the objectives efficiently and effectively.

THE SOCIETY - A SYSTEMS APPROACH

What is the Society for?

To decide its structure we should ask ourselves what the Society is for. What are its functions, what should its objectives be? It is probably helpful to examine the objectives as engraved in the constitution but since we are accepting the possibility of changing that document, we should not assume that they are fixed and immutable. In these objectives there are going to be references to OR as a discipline, perhaps we should go a step more and ask ourselves what is OR for?

I do not intend to do this now; the sort of systems analysis I am suggesting might take a year or so and should involve all the members. I suppose I am suggesting we do what in the UK they called Marlow seventy (1). Perhaps we should call it Wairakei seventy two?

Nevertheless I would like at this time to raise some issues which should be discussed in such a re-evaluation.

THE BRANCH STRUCTURE

It has long been the view of the members that a branch structure was the appropriate one for this Society. Indeed it is difficult to imagine any other, strung out as we are along a long thin country. What effect will this have on the workings of the Society and how will it effect the future?

First there is the obvious advantage of providing a better service for members of more meetings and of co-operation with other local societies. I will expand on this particular advantage a little later.

The branch structure does have disadvantages though, they are already showing up in the very short time the new branches have been operating. There is difficulty in communication between Branches and Council, much more paperwork has to be done just to let everyone know what is going on and I am sure that this is already causing some difficulties within the Branches as well as within the secretariat. Communication is easy with a small society but becomes more and more difficult as it grows. There is nothing unique in this, it is just that we are now having to face up to it.

If Council members are to meet and Council is drawn, as it should be, from all members of the Society, then there is going to be greatly increased expenditure on travel. So far we have been able to get away without this, either by scheduling meetings for known visits by out-of-town Council members or by a much less efficient system of writing letters. We have had very little need to move speakers to and fro, one would expect that this requirement would increase as well.

It is natural that branches wish to have a degree of financial independence to allow them to get on with the job of running local activities without being hampered by National constraints. I can speak for the Council in stating that it wishes to support this as much as it can, with proper regard for the interests of the Society as a whole and within the legal constraints that it must apply; since in the last resort it is responsible for all Society money. Our view is that branches should be as autonomous as possible within these constraints.

Although some of the activities held by branches and by the Council will be partially or fully self financing an increase in activities is likely to lead to increases in subscriptions. What proportion of this income should be

allocated to branch activities and what to the national programme must of course be decided each year in the budget negotiations. No doubt it is likely to be a question of "sub-optimization"!

What then is the role of Council in this structure? It is apparent that it should restrict itself to purely national issues and to act as a co-ordinator between the branches where this is efficient. It should make national arrangements, cooperating with the local branches to organise annual conferences and arranging for tours of speakers to attend all branches. It could arrange for visitors from overseas to speak to each of the branches in turn paying for their trip with national funds. It should be responsible for international affairs, corresponding with IFORS and with other societies. Finally it should speak for the Society on national issues which affect the membership or on which we can comment.

SERVICES FOR MEMBERS

What sort of services do the members of the Society want it to provide? The answer to this question affects the design of the Society for the future. Perhaps I can make some guesses and appropriate comments.

Professional development

I believe that in the present state of OR in New Zealand there is indeed a demand for professional development in various ways. Most of the workers in O.R. have had very little training in OR techniques although an increasing number are entering the area with training in OR mathematics or economics. I will comment on general education in OR in a later section; here I am concerned with services to members who are already practising OR.

First the Society should make itself concerned with the provision of part-time courses in OR techniques, either organising and running the courses itself or encouraging educational institutions to do so. It is difficult for a society such as ours to run courses but the support of courses will involve the same sort of effort since (for example) lecturers must be provided from the Society members in both cases. This type of course has immense value, practitioners who are using the techniques lecturing to those who may

wish to use them. The sort of subjects that might be suggested are the usual techniques such as linear programming, inventory control and theory and simulation. It would however be valuable first to consider which of the traditional techniques are in fact useful and a market survey of demand could be made in this area.

Another important educational area is the provision of broader courses to ensure that the techniques knowledge is based upon a solid foundation. I am thinking of introducing only courses in the areas of economics, business administration, accounting and possibly politics and law. For some members computer methods might be useful although the vast majority of OR workers appear to be very well soaked in these already.

Meetings

It is possible that one of the major reasons for joining the Society is the ability to attend meetings at which papers are read. This might be debated since in practice the proportion of members attending is often small. In addition to any technical content these meetings are opportunities for social contact between fellow OR workers, perhaps this is a hint to organisers that the meetings could be made more social, including a meal and more time for conversation as well. Possibly the Society should go the next step further and arrange 'housie' evenings; or the next best thing management games!

The content of meetings has always been a problem to the Society, there are the twin difficulties of getting speakers and getting suitable topics. The main demand appears to be for case studies - descriptions of actual jobs undertaken emphasising the problems overcome and (hopefully) describing the eventual implementation. There is often some interest in the techniques employed but this is apparently overshadowed by the interest in the practical difficulties faced and the non-technical content. The problem is that it is hard to persuade people to give papers like this. It is even harder to persuade them to write them up for publication later. How can we encourage this type of paper? The branch committees will, I am sure, welcome any suggestions. Is the only answer money?

Conferences

Conferences are a sort of 'super' meeting which are worth travelling some distance to get to. With the advent of branches these should become more national in concept and more important Society occasions. I suggest that now we should increase the amount spent on conferences, paying for the travel

of speakers (which has been only infrequently done in the past) and charge a registration fee accordingly. The conference venue should be moved about the country, being organised by the branches in turn in conjunction with the national body. We should look at the desirability of holding joint conferences with other bodies as we have traditionally done with the NZ Statistical Association.

Journal

We have finally decided to produce a journal: 'New Zealand Operational Research', which is intended to reflect the technical OR scene in NZ. This, as a service to members is designed to document papers to the Society and perhaps some technical developments not first presented at Society meetings. The journal is designed to serve the non-branch members as well as those able to attend meetings.

Newsletter

Finally the Newsletter is meant to tell members what is going on and to publish non-technical papers which are of interest to members. We hope that it will also become a debating forum where an idea for improvement in the Society can be discussed and both viewpoints expressed before it is put to the membership for formal voting at Society meetings. It should take the place of the Annual General Meeting as a discussion arena since the latter is no longer appropriate with the membership now so spread. I hope during the next year that some of my suggestions may well be debated in this way and that the Society's Constitution will be modified only after such debate.

EDUCATION FOR OR

This section deals with one facet of education that the Society must consider - education for the members and for OR workers - the 'primal problem'. The next section will deal with the education of the users of OR, corresponding to the 'dual problem'. I wouldn't wish to push the analogy too far since this would imply an optimum solution of both which has an identical value for the objective function and I am not sure that this is so; but I feel that the two problems are inextricably connected much of the same way as the two aspects of a linear programming problem.

Education for OR, being an investment, implies that there is a future in OR itself. That raises a question in itself but should'nt we ask ourselves

what will OR look like in the future? OR itself is changing and not only must OR workers change with it but the education of OR must continually adjust. We need a feedback system which continually monitors what is required and helps us to change the design of courses appropriately. Let me hasten to add that I do not mean to imply that we are only looking for short-term results in our teaching, 'what is needed' can be long term development as well as what is popular at the moment; But we must be ready to change as OR changes.

Advice on Education

The Society must be prepared to advise the teaching institutions and other bodies on what is needed in courses at various levels and, just as important, what should be excluded. It could assist in course design but must remember the almost fanatical independence that universities insist upon as being their prerogative.

The Society should list courses that are advertised and publicise them in the Newsletter and elsewhere and it has already started in a small way . Perhaps some form of certification is also required or at least an analysis by content to give guidance in choice. Possibly advice to employers on appropriate courses would be possible.

Assistance with Education

At the moment the teaching institutions badly need help in teaching, both financially and technically. Although financial assistance would be a help, both in the form of the provision of lecturers and as bursaries for good students, the major problem is to get lecturers experienced in the various techniques of OR. The society could well encourage employers to allow time off to those staff members capable and willing to help in these areas.

Another way that the Society could help, or encourage others to help, is in the provision of NZ oriented case studies. These would provide in-depth analysis of real problems within general OR courses or on particular OR topics. Again the provision of 'apprenticeship' schemes, in which students are able to undertake practical work within firms under the guidance or experienced OR staff, would be invaluable in the production of real OR analysts. Research projects that could be undertaken by graduate students are always in demand as well.

In these areas, the Society would have, through its education subcommittee, a role of co-ordinator and encourager rather than providing the assistance itself. Nevertheless, this type of help would give a great boost to the development of OR education in this country.

EDUCATION OF THE USERS OF OR

The users of OR are the market to which we must sell our product, and our selling effort will mean the success or failure of OR as a discipline and as a useful tool or management in New Zealand. I need hardly add that over-selling will be as disastrous as the other extreme and that you cannot hope to make a long term success of a poor product.

By users I mean not only management but also, the eventual user, the public and therefore I classify general publicity in this heading as well as what is more commonly called 'education'.

Education of the public

The ordinary man in the street is the end user (or sufferer) of much OR work and should be able to understand the logic behind decisions made with its aid, just as much as the managers who make the actual decisions. Indeed it may be fair to guess that the more important future uses of OR will be found in the public sector and it is therefore even more important for public understanding and support of the methods used.

There is, in many Western countries, a significant trend against 'scientific' techniques which are firmly linked in many minds with military uses and more recently with pollution. The computer fraternity are bearing the brunt of the public antagonism at the moment and my judgement is that this unfortunate tendency will get worse before the bandwagon moves on to different arenas. However justified the anxiety of the public over the question of privacy and data-banks (and I am one who would argue in favour of the personal freedom school against the efficiency and 'it's all for your own good' school) I am very worried that the very use of quantitative and rational decision making will be called into question in the turbulence and often illogical rhetoric of public argument. We must be careful that OR is not, by its very association with computers, dragged into disrepute during this debate. We wish by persuasion and example to develop the use of rational analysis of problems that we believe can only do good. An this is good OR.

That, of course, raises the important issue. We must encourage good OR - and only good OR; Pseudo-OR should be roundly criticised publicly lest the better variety be tinged with the same reputation.

I would hope that the Society will comment on matters of general interest involving OR methods such as the cost-benefit analyses that are becoming increasingly popular at the moment and it should expose any shortcomings and faults if they are to be found.

Education of Management

There is a two way problem here; not only must managers be educated into using OR but OR staff must be educated in using management. The latter is a problem in the education of OR workers and has been covered above, the former is to some extent out of our control though we must be prepared to take the opportunities that are made available to us - something that we have been pretty slow in doing up to now.

Quantitative methods are all the rage in business schools at the moment, some courses are even given on OR usually at a horrifyingly naive level in terms of understanding what it is all about. I wonder that any graduate from such a school ever considers the use of OR at all after being exposed to such nonsense. It is not just the managers either, various other professional societies have an equally primitive idea about the use and value of OR.

One problem has already been mentioned, the lack of staff to give these lectures, once again the society may be able to help here. It is not a question of teaching OR techniques but of putting across the OR view of tackling problems, the much more difficult task of getting across a philosophy.

RELATIONS WITH OTHER SOCIETIES

There are many other groups concerned with quantitative ideas in decision making. With some, such as the statisticians, we have always had a very close and cordial relationship; with others our relations have been distant and perhaps cool. What attitude should the future Society have to cooperation with such bodies? A suggestion has been made that all the societies in this area should group together and become branches of a major Society, after all,

they say, is there room for so many individual societies in this small country? Most of us belong to more than one society of this type at the moment. The Management Services Council is an attempt to bring workers in these areas together and may increase future co-ordination at least. I believe that more can and should, be done to arrange joint meetings with a wider range of groups than at present, and this will be a step towards more rationality.

Computers

Most OR people use computers to a great extent and the great majority of members belong also to the computer society. At one time it was suggested that the OR Society should be 'merely' a sub group of the computer society. What should be our relationship with big brother? Or come to that are we even related?

The impact of computers is an important factor in the development of OR in this country. Users of EDP are becoming aware that there are other things to do with their machines than automated book-keeping and this may herald an era of increased OR activity. However it is also dangerous because of the tendency to equate the data processing man with an OR professional . The use of computer company packages could be either a boon or a blessing for the development of competent OR in this country depending on how we, and others, handle them.

The Institute of Management

The Institute of Management could be one of the best vehicles of publicity for OR that we have available to us; we have been pretty distant from them except for one or two attempts at joint courses. We should consider what our relationship should be and I am sure that they would be interested in co-operating further in the society. They represent access to our biggest market and it would be foolish to ignore them.

The Royal Society of New Zealand

The Royal Society is the most important scientific body in New Zealand and it is recognised officially by the Government as the proper channel of communication to the scientific community. We have looked at the possibility of affiliation and each time the proposal has not been recommended since it offered a distinct cash loss with no corresponding benefits. The only possible benefit would be recognition by the local scientific community. Whether this

is of any value depends on whether we think of ourselves as being a scientific society or alternatively a professional body more akin to the engineers. We have international recognition by IFORS, do we need the local recognition? Perhaps we should investigate the matter again now that we are re-evaluating the position of the society and its future.

A PROFESSIONAL SOCIETY?

If we are to be a professional rather than a scientific society how will this affect the preferred structure? The computer societies are raising the question of codes of good practice and recent developments in the USA OR Society (2) suggest that we should look again at the problem. It is not, easy since we come up against problems of enforcement, and if we cannot enforce a code then why have one?

More directly there is involved the issue of Full membership which is a recurring one in this Society's history. Whether done by having a group of Full members or by Registration (as in the UK), the development of professionalism implies the setting up and policing of standards as is done by the accountants, the engineers and other bodies. This means a different sort of society from that organised for scientific meetings and the suggestion must be considered very carefully.

This development would bring with it the idea of support for the profession of OR in the country. Perhaps this would arise without professionalism but we would be encouraged to speak out publicly on such matters as the use of local expertise rather than importing consultants from overseas every time a study is to be undertaken. To this extent the local software houses are likely to need our support (even though regrettably few of them have a large proportion of OR staff). It may be felt that this is not the right stand to take, if that is so then at least let us debate it, decide on the Society's attitude, if it has one, and then make it public.

CONCLUSION

This has been a hurried survey of some areas to be considered in looking at the future of the society at this significant time. The decisions about these matters should not be hurried though but they must be made or they will be taken by default. They will effect the future of the discipline in the country. Indeed if that we have to offer is as important and useful as

we believe, the decisions taken may well have an impact on the future of New Zealand itself.

REFERENCES

(1) Beer, Stafford, Marlow Seventy, Operational Research Society Ltd., London, April 1970.

(2) Guidelines for the Practice of Operations Research, Operations Research, vol 19, no 5, September 1971, pages 1123-1258.

NEW MEMBERS

1. Auckland

Gavin Apperley. B.E. (Mech.), M.S.N.A.M.E., F.R.I.N.A., C. Eng., Reg. Engineer (N.Z.). Constructive Manager at H.M.N.Z. Dockyard, Devonport.

Harry Caplen. B.E., M.I.C.E., M.I. Mech. E., M.N.Z.I.E., Sales and Engineering Manager.

Donald Gardiner. Second year University Student enrolled in a B.Sc/B Comm Course

Christopher Hardley B.E. (Hons) Student at Auckland University.

Michael Langton. B.Sc. D.P. Manager for Pacific Steel Ltd.

Graham Pooley B.Sc., Member of MTM (UK and N.Z.) Systems Engineer at Fisher & Paykel Ltd.

Michael Robinson. M.A. O.R. Officer with Alex Harvey Industires.

Vincent Long. B.Sc., Postgraduate Diploma in Science, O.R. Analyst with N.Z.F.P.

Warwick Leyland. M.Comm., O.R. Analyst with N.Z.F.P.

Peter Wood. Dip B.I.A. Management Services Officer at District Police H.Q.

2. Wellington

David Boland. B.Sc. Work Study Engineer with Feltex Plastics.

Wayne Cartwright. Ph.D. in Agricultural Economics (Purdue). Principal Market Research Officer at Massey University's Market Research Centre. Wayne has been accepted into the Society as a Full Member.

David Dalton. B.Sc. Studying Information Science at Victoria University (see extract published in this newsletter).

Richard Jeffery. B.Sc. Maths Teacher at Wellington College

Philip Kear. B.Sc. Studying Information Science at Victoria University.

Christopher Lewis. B.Sc. Working on the Economic Planning Project at Victoria University Economics Department.

Peter McKenzie. B.Sc. Senior Research Officer with N.Z. Railways.

Judith Reinken. M.A., Ph.D. Systems Analyst for Dulux (N.Z.) Ltd.

Russell Searle. B.Sc. O.R. Officer with B.N.Z.

Robert Tattle. B.Sc., M.E. Systems Analyst for Databank Systems Ltd.

3. Christchurch

John Baker. Teacher on a Teacher's University Studentship.

Bruce Benseman. B.Sc. (Hons), M. Comm (Hons). Assistant Lecturer and Postgraduate Economics Student at Canterbury University.

Geraldine Booth. Student in Economics and O.R. at Canterbury University.

Cheong, Sook Kum. Student at Canterbury University.

David Craig. B.E. (Hons). Economics Student at Canterbury University.

Heu Ah Lik. B.E. (Mech) and Technicians Diploma. Business Admin. Student at Canterbury University.

Ian Lienert. B.Sc (Hons). Student at Canterbury University.

Lok Sam Wah. Student at Canterbury University.

Eu Loon Loo. B.Sc., B.E. (Mech). Business Admin. Student at Canterbury University.

Sally Marriott. Economics Student at Canterbury University.

John McMillan. B.Sc. (Hons). Economics Student at Canterbury University.

John Mulligan. B.Sc. Student at Canterbury University.

Arthur Roberts. A.N.Z.I.M. Works Manager at Brown Bros. Engineers Ltd.

Kathrin Steele. B.Sc., M. Comm. Assistant Lecturer (Economics) and Ph.D. Student (Stats.) at Canterbury University.

David Stott. B. Sc. Studying for M. Comm. in Economics at Canterbury University.

Lieck Ing Teo. Student at Canterbury University.

4. Dunedin

Lorna McIntosh. B.Sc. Computer Programmer for Dunedin City Council.

Iain McIntosh. B.Sc. (Hons). Studying for M.Sc. in Mineral Technology at Otago University.