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**A PROPOSAL FOR AN "INSTITUTE FOR OPERATIONAL RESEARCH"**

**(Recommendations of Joint Working Party)**

**1. General.**

The Operational Research Society support a proposal that an "Institute for Operational Research" be formed within the matrix of the Tavistock Institute of Human Relations. This document sets out the details of this proposal.

**2. Operational Research.**

Operational Research is a scientific approach to the complex problems that arise in the direction and management of large systems of men, machines, materials, and money in industry, business, government and defence. A model of the system is developed, incorporating measurements of factors such as chance and risk with which to predict and compare the outcomes of alternative decisions, strategies or controls. The purpose is to help management determine policy and actions scientifically.

Operational Research, it should be stressed, is concerned with whole organisations, and seeks policies which are best for the whole rather than for the individual parts of an organisation.

**3. Present State of O.R. in U.K.**

Operational Research in the U.K. is largely industry based, and in particular associated with certain industries: steel, coal, transport and electricity. The number of fully-trained professional O.R. workers is not high, of the order of 300. The notable achievements of O.R. since the war have been in such fields as control of stocks, production planning and scheduling, distribution, automation and control, and the study of congestion in industrial and transport systems. Often the problems have been concerned with the efficient working of routine systems in large organisations, rather than with matters of higher policy. Operational Research has penetrated only very slowly into the fields of higher executive policy making.

Two pertinent comments may be made:

3,1.) Operational Research has been slow in penetrating the broad social and economic sphere, where policy decisions affect the life of the ordinary man profoundly.

3,2.) There is an overall need to tackle problems of a strategic kind, as well as to study the bases of O.R. methodology. Existing O.R. groups, although keenly aware of this deficiency, have not the time or resources to devote to long-term projects which may not even be successful.

**4. The Object of the Research Institute.**

It is intended that the Institute for Operational Research should extend the field of usefulness of the science, bring it into closer relationship with the social sciences, carry out fundamental research, and help to set a standard of training.

To extend the field of usefulness of operational research, it will be necessary to explore the application of O.R. in new problem areas, developing new methods as required, and demonstrating the value of such applications. The Institute will particularly explore those areas, of growing importance, in which the social sciences and O.R. may help each other. It will also carry out fundamental research aimed at developing more efficient methods for use in established O.R. studies and consider other ways in which existing O.R. groups can be more effective. This could include, for example, studies of the criteria for selecting problems, studies by O.R. of the most effective make up of O.R. teams, and of the extent and type of formal O.R. training needed by O.R. staff. The Institute and these other O.R. groups would serve each other and might well work together on particular problems.

This work will require close liaison with O.R. groups and with O.R. teaching and research activities at universities as well as with social scientists in Tavistock Institute and elsewhere. Above all it will require ready access to practical problems over a wide field. It is therefore proposed that one of the Institute's functions should be to provide a general consultative service. This service may take the form of problem diagnosis, or full scale operational research studies when the problems discovered show features of general scientific interest.

**5 Possible Research Fields.**

There are many fields in which the Institute could do useful work. The following is not a research programme, but a set of examples illustrative of the scope that exists.

5.1.) Fundamental Aspects of Decision-making Processes

Since Operational Research is basically concerned with decision making, both by the individual and the group, this topic must be the concern of an Institute whose interest is fundamental research. The O.R. scientist is nowadays well aware that the quantitative bases he provides are only one of the many variables entering into actual decision-making both by the individual and - to an even greater degree - by the group. He is also vitally interested in the other variables which may have come into play. The association with the Tavistock Institute should be of particular value since it should bring in knowledge from other fields, group dynamics being a case in point.

5.2.) Studies in the development and design of organisation

Much of Operational Research presupposes a social environment as an unalterable factor or one only susceptible to deliberate change on an essentially common sense basis. It is necessary for the development of operational research as a scientific study of whole organisations that an active partnership with social scientists be promoted. Further the participation of operational research workers in many of their studies would be of undoubted benefit to social scientists.

In this field there is scope for fundamental studies of both a practical and theoretical kind, on the interaction of organisation structure with information content and flow. Such work bears an important relationship to the study of adaptive changes in organisations and the problem of group decision-making. Apart from the study of live organisations there is the possibility that such an experimental approach as operational gaming used in operational research may lead to increased knowledge in this field.

A problem area that deserves special mention as a possible field of collaborative study for operational research and social science is that of ‘conflict resolution' where a good deal of work has been done in the United States but very little, so far, in this country.

It is fair to say that much of this work will initially have little impact on real life. This is because the work is fundamental: observations have to be made, basic concepts clarified and hypotheses tested. But it is a reasonable hope that ultimately it could affect decisions of a critical and recurring kind in the administration of large concerns. The well-known problem of 'centralisation versus decentralisation' is a good instance. The need for a scientific approach to such problems is becoming ever more apparent.

5.3.) Application of Operational Research to problems of national policy

Many of the problems of social and economic policy on a national scale are of a kind where decisions in one area affect those in another - the nature of the interaction not being wholly understood or the sheer existence of interaction not being appreciated. An Institute for Operational Research not tied to any particular industry or other field of activity would again appear to be the appropriate place for initiating and, in some instances, for carrying out investigations showing the nature of the contribution that operational research might make in shaping national policies. By turning its attention to these wider problems, the Institute would undoubtedly encourage thinking on broader lines on the part of the national policy-makers themselves, in addition to helping the development of new techniques the attack of such problems would require. Some of the sectors of national policy-making, the kind of problems that arise there and towards a solution of which operational research can significantly contribute, are referred to in the appendix.

5.4.) Problems of commercial operations

This paper has emphasised the fundamental aspects and untried possibilities of Operational Research which an Institute of this kind should explore. It is necessary that its activities should also include more conventional fields, particularly if it is, at some stage, to set a standard for training. The problems that arise are too diverse for individual mention. Many of them, however, fall within the description 'study and design of advanced systems of control'. There are decisions within organisations which are of repetitive routine kind, but which, nevertheless, have a considerable bearing on the efficiency of .the whole – such decisions as relate to the buying of raw materials and the planning and scheduling of production. The increasing use of e1ectronic computers in industry make it possible to operate systems of much greater sophistication than ever before, but the design of such systems often gives rise to difficult mathematical problems. There is thus adequate scope for the Institute to help industry and the operational research community generally by including such problems in its work.

**6. Initial Requirements.**

The initial size of the Institute must be sufficient to ensure early success and further growth. It is estimated that the minimum requirement is six qualified people preferably drawn from different disciplines with some supporting staff. The Tavistock Institute already possesses sufficient accommodation for a staff of this size.

**7. Finance.**

The sum required to support the minimum initial establishment of six plus any assistant staff is of the order of £32,000 per annum. It would be the policy of the Institute to recover some costs from contract work fees, but an untied grant would give the security that is required in the early years.

**8. Organisation.**

8. 1) The Institute for Operational Research, led by its Director and advised by a Panel (see para. 8.3.), will be responsible for the selection and progress of its own programme of work. The Director will be appointed by the Tavistock Institute after agreement with the Operational Research Society, and will operate under the general supervision of the Council of the Tavistock Institute.

8,2) Formal relations with the Council and the other operating units within the Tavistock Institute would be established through the Joint Standing Committee of Council which would include Institute for Operational Research representatives.

8.3) An Advisory Panel to be set up consisting of Operational Research Society and other appointees to assist the Director in meeting the stated objectives of the proposed Institute.

8.4.) Operational Research Society representatives will be invited to join the Council of the Tavistock Institute.

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*(drafted by Neil Jessop, and later approved by the Councils of the Tavistock Institute and the Operational Research Society)*