

COMPLEXITY

Its Constraints on Social Innovation

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Complexity: Its Constraints on Social Innovation

This paper reviews some general problems associated with innovation in a complex social environment. Specifically it is concerned with the vital importance of innovation in the structures and procedures used in support of social innovation - on the basis that there are characteristics of existing organizations, meetings and information systems which can be a major factor in hindering or even preventing the changes they are themselves supposed to be facilitating. These and related points are explored in more detail in the accompanying four papers:

- Presentation of information and its educational role in response to complexity
- Organizational forms in response to complexity
- Organization of meetings for the discussion of complex issues
- Institutional "games" and strategies as a response to complexity

Complexity: an overview

As the supporting papers make clear, many authorities are concerned at the increase in complexity of the social environment and mankind's apparent lack of ability to respond adequately:

What is significant of our present era is the emergence of a degree of social organizational complexity and a rate of coalescence of previously segregated populations that defy our current efforts at symbolic reductionism. Larger and larger parts of the lives of more and more people are being lived in conditions of environmental turbulence. (F E Emery and E L Trist. Towards a Social Ecology).

While the difficulties and dangers of problems tend to increase at a geometric rate, the knowledge and manpower qualified to deal with those problems tend to increase at an arithmetical rate. (Yehezkel Dror, Prolegomenon to policy sciences, AAAS symposium, Boston 1969).

Many of the problems we experience today have been with us for a long time and those of recent vintage do not seem insurmountable, of themselves, the feature that is wholly new in the problematic aspects of our situation is rather a frightening growth in the size of the issues and a tendency toward congealment whose dynamics appears to be irreversible. The congruence of events appears suddenly possessed of a direction and a total meaning which emphasizes the insufficiency of all the proposed solutions increasingly and reveals rigidities that are not stable or set, that do not confine the problems but enlarge them, while also deepening them. This suggests that our situation has an inner momentum we are unable fully to comprehend; or, rather, that we are trying to cope with it by means of concepts and languages that were never meant to penetrate complexities of this kind; or, again, that we are trying to contain it with institutions which were never intended for such use. (Hasan Ozbekhan. Toward a general theory of planning. In: Eric Jantsch (Ed). Perspectives of Planning. OECD, 1969, p. 144)

That these matters are of current international concern is illustrated by the fact that the World Future Studies Federation recently sponsored a post-graduate summer school on "How to cope with complexity; new trends and developments in humanities and social sciences" (Romania, 1976) which was the occasion for a Unesco symposium.

Complexity: the simplistic response

Of necessity there is increasing awareness that previously isolated matters are now interlinked and that every issue has to be examined in terms of its potential relationship to other issues. But in debate on any matter, there is seldom consensus on how issues should be distinguished and interrelated. One common response is to consider issues in isolation and assume there are no relevant interconnections.

Where there is consensus on the importance of interconnections, the only other response is to attempt to consider everything in every forum of date. ("Every issue in every context"). The impossibility of doing so is then used as an excuse for simplifying the issues and picking out those which are "most important".

Consequently whatever the macro-issue under discussion, debating points on any related topics are considered relevant. However, since the relative importance accorded to such points is based on changing political considerations rather than substantive ones, such debates are unable to converge on any implementable programme of significance which takes account of the manner in which the problems themselves are interlinked. Such debates then become arenas in which the desire to resolve the issues is merely reaffirmed and the participants blame each other or third parties for not coming to grips with a situation they are unable to focus upon.

An allied approach assumes that no particular remedial project is of significance unless the whole system is changed. ("Everything must be changed before anything can be changed.") This tends to focus resources on total change at some future time and diverts resources from the particular projects which are feasible at the present time. Perhaps this will prove to have been the best approach.

Ironically, the proponents of a particular form of change tend to perceive it as the only viable or significant form (e.g. to a political activist only political change is of significance). They are consequently unable to detect the manner in which their action is counter-balanced, checked, contained or even undermined by other forms of change. It is not yet possible to determine how different kinds of change strategy can be blended harmoniously together into a mix which is appropriately innovative. No body has a mandate to attempt this, and no integrative discipline exists to legitimate such an approach.

Complexity: the operation supports for innovative action

It is the argument of this paper that whatever the societal problem or the nature of the remedial project, such activity is at some stage (if not for its duration) dependent on the supportive operation of

- organizations
- information systems
- meetings

The question is whether the prevailing concepts underlying the use of such devices in fact ensure that they are structured so as to be able to function effectively as support mechanisms in the face of a certain degree of social complexity. The accompanying papers suggest that there is evidence that they are not adequate to the demands placed upon them.

What is the meaning of "adequate" in this context? Fortunately, this has been clearly established through a general law (Ashby's Law of Requisite Variety) which emerges from cybernetics and the mathematics of control in all systems:

"The abundance of alternative control actions (variety of control actions) which a control mechanism is capable of executing must be at least equal to the abundance of the spontaneous fluctuations (variety of fluctuations) which have to be corrected by the control mechanism, if the control mechanism is to perform its function effectively. In other words, only a greater amount of variety in a regulator can control the variety in a given system; only variety can destroy variety." (W R Ashby, Self-regulation and requisite variety. In: Introduction to Cybernetics. 1956)

This means that unless the organizations, meetings and information systems used to respond to a problem complex embody in their structure a degree of complexity equivalent to or greater than that of the problem complex in question, then their response will not be "adequate" as remedial action. In other words, for example, a simple organization structure cannot eliminate a complex problem.

This is intuitively obvious but its consequences for the manner in which support structures are conceived, designed and used are not so clear.

An interdisciplinary conference was held in 1968 on the effects of conscious purpose on human adaptation, under the sponsorship of the Wenner-Gren Foundation for Anthropological Research. The conference considered the ability of man and his institutions to recognize and respond to the complex of social problems. In her concluding remarks at the conference, the editor of the proceedings notes one conclusion on which there was some consensus and which helps to clarify the points above:

Each person is his own central metaphor...Any kind of representation within a person of something outside depends on there being sufficient diversity within him to reflect the relationships in what he perceives... The possibility of seeing something, the possibility of talking about it...depend in every case on arriving in yourself at a comparable complexity, which depends in turn on the kind of diversity existing within yourself. Another way to put that would be to say that if human beings were totally non-comparable in the degree of their internal complexity to what's outside, then there would be no chance of any kind of valid internal representation of what lies outside them...We can't relate to anything unless we can express its complexity through the diversity that is ourselves...Now, the question of consciousness brings up the fact that we have incomplete access to the complexity that we are. We've blocked out a great deal of it...by rejecting it...we're just not organized to be aware of it. (M.C. Bateson. Our Own Metaphor. Knopf, 1972, pp. 285-288).

Clearly this point is only made explicitly with regard to the individual, but it also applies to the social structures through which individuals work collectively. The chairman of the above conference, using the phrase "We are our own metaphor" (ibid, p. 304), implicitly acknowledged one participant's recognition of this with respect to the dynamics of that conference.

In a very real sense therefore a meeting, for example, through the way in which it is organized and functions

- (a) mirrors the participants' collective ability to represent the society about which they are concerned, and
- (b) mirrors any lack of integration between perspectives and priorities (in the external world) represented by participants, and the consequent ability of society to respond to that complex situation

The organizations and dynamics of the meeting itself may therefore represent very clearly, through its own defects, the defects of the society or social group whose condition it was convoked to alleviate. Similarly, an institution or an information system constitutes, through its structure and operations, a formalization of a perception of society and of any (in)ability to respond adequately to its problems.

For this reason it is important to look very carefully at the structure and dynamics of these operational supports for innovative action to determine whether they are in fact capable of

- (a) bringing into focus the problem complex on which they were designed to act, without distortion or oversimplification
- (b) interlinking the intellectual and other resources which can usefully be brought to bear on the problem complex.

An obvious corollary of Ashby's Law (cited in the Yearbook of World Problems and Human Potential) might read:

That any attempt to control a psycho-social system with a control system of less complexity (i.e. of less variety) than that of the psycho-social system itself can only be made to succeed by suppressing or ignoring the variety in the psycho-social system so that it is less than the relative simplicity of the control system.

Such "suppression" tends to lead directly to violence and the multiplication of other problems.

Complexity and the change agent

Although it is not the main concern of this series of papers, it is nevertheless important to link the perception that "Every person is his own central metaphor" to a point made in Appendix 1. It is a paradox of social innovation, whose intent is in some way to develop man and his condition, that the effectiveness and scope of the programmes to do so are necessarily bound and constrained by the degree of personal development of those involved in their conception and implementation. In addition, it is through their development and use of organizations, meetings and information systems that individuals provide themselves with "learning environments" and the necessary experiences to support their own personal development. It is for this reason that it is also important to look at the place of "games" played by people and institutions (see the fourth paper in this series) as a way of structuring their experience in such environments. Such games may actively oppose or hinder innovation, or possibly support it under conditions which remain to be determined. They are obviously also an important equilibrium-maintaining device in a society excessively sensitive to change.

The paradox, both with respect to the individual and to his operational supports, is that innovative responses have to be engendered by outdated structures and processes. The question is can the key innovative concepts specially needed at this time only be generated and delivered through innovative structures or are the outdated structures adequate to the task?

Interlinking operational supports for innovative action

The previous section discusses the ability of organizations, meetings or information systems to contain separately the complexity with which they were designed to deal. In practice, however, these operational supports are used in a mutually dependent fashion. (Organizations depend on information systems, meetings are used by organizations, etc.). Now, whilst one of these operation supports may contain the complexity with which it has to deal in an adequate manner, the other supports on which it depends may not, thus negating the effectiveness of the whole: In effect in order for a problem complex, handled adequately in a meeting (for example), to be "transferred" to an organization or to an information system, the latter must be of matching complexity (both to the meeting structure, and obviously to the problem complex) for the problem to remain "contained" during and after the transfer. In fact, it may be necessary to use the mutual reinforcement of meeting, organization and information system to keep track of an evolving problem complex, or even to use a number of carefully interlinked meetings, organizations and information systems to ensure containment. The design of such linked support structures has not been adequately considered in relation to problem complexity.

The situation may best be summarized by the diagram and commentary in Appendix 2. This shows, for example, the weakness in having an excellent meeting without adequate organizational follow-up. Although this is intuitively obvious, there is clearly a significant danger in assuming that a problem complex is contained because of the positive aura of highly successful operational support - which is usually all that is required as evidence of activity to suppress possible criticism in the political arena.

Clearly there are other forms of operational support which could have been considered here (and included in Appendix 2). Examples are legislation, funds, human resources, etc. These are, however, all a subject of much attention in organizations, meetings and information systems. The latter are therefore in one sense "more fundamental" but, as the accompanying papers show, nevertheless do not appear to receive the attention they merit (partly because of the embarrassing questions this would raise about the adequacy of the forum through which this was done).

Attention of this kind would ensure that an operational environment was created which would promote and support a multiplicity of mutually reinforcing innovative projects and approaches, rather than isolated, vulnerable "one-off" projects, as at present.

Interaction between social change and personal change

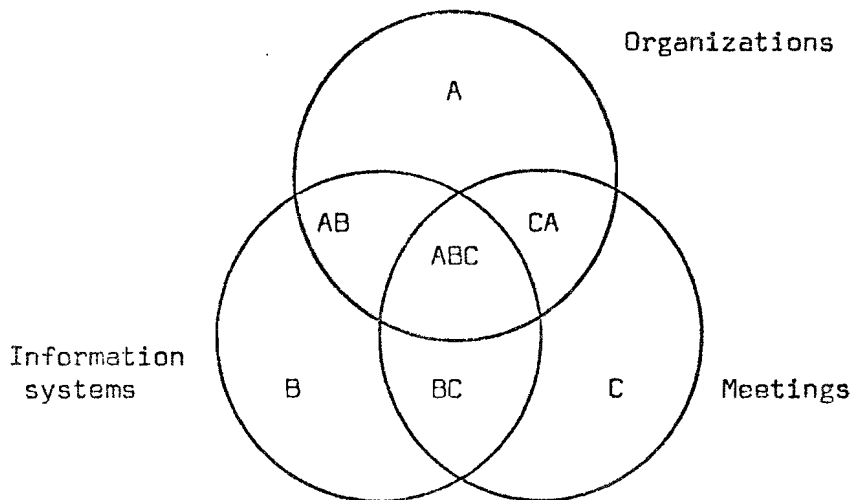
The following quotations indicate the importance of the relationship between innovation in society and the prerequisite changes in the individual for such innovation to ensue, and to be considered significant:

The fact which confronts us is that cultural change is limited by the restrictions imposed on change in individual human nature by concealed neurotic processes. At the same time there is continuous cybernetic interplay between culture and the individual, i.e. between the intrapsychic processes which make for fluidity or rigidity within the individual and the external processes which make for fluidity or rigidity in a culture. It would be naive to expect political and ideological liberty to give internal liberty to the individual citizen unless he had already won freedom from the internal tyranny of his own neurotic mechanisms...Therefore, insofar as man himself is neurotogenically restricted, he will restrict the freedom to change of the society in which he lives. This interplay is sometimes clearly evident, sometimes subtly concealed; but it is the heart of the solution of the problem of human progress. (Lawrence S. Kubie. The nature of psychological change and its relation to cultural change. In: Ben Rothblatt (Ed) Changing perspectives on Man, 1968)

We can either involve ourselves in the recreative self and societal discovery of an image of humankind appropriate for our future, with attendant societal and personal consequences, or we can choose not to make any choice and, instead, adapt to whatever fate, and the choices of others, bring along. (Center for the Study of Social Policy of the Stanford Research Institute. Changing Images of Man, 1974).

The relations between world culture and the unified self are reciprocal. The very possibility of achieving a world order by other means than totalitarian enslavement and automatism rests on the plentiful creation of unified personalities, at home with every part of themselves, and so equally at home with the whole family of man, in all its magnificent diversity... In brief, one cannot create a unified world with partial, fragmentary, arrested selves which by their very nature must either produce aggressive conflict or regressive isolation. Nothing less than a concept of the whole man - and of man achieving a consciousness of the whole - is capable of doing justice to every type of personality, every mode of culture, every human potential. At this point a further transformation, so far not approached by any historic culture, may well take place. (Lewis Mumford. The Transformations of Man, 1956).

Il faudrait que les mentalités évoluent avec les transformations du monde, mais l'esprit humain est naturellement conservateur et la résistance au changement, si elle se manifeste de manière éclatante dans les structures, existe d'abord dans les esprits...Le décalage permanent entre les situations et les mentalités qui résultent de cette résistance tend à augmenter puisqu'il y a accélération du changement...Cependant la résistance au changement est telle qu'il arrive que l'on se borne à greffer des structures complémentaires sur les structures anciennes, sans s'interroger sur leur compatibilité, ou même que l'on reproduise fidèlement les structures anciennes...Le problème central est donc bien celui des "structures mentales". Certaines d'entre elles ne correspondent plus aux réalités et nous encombrant: elles suscitent l'apparition d'un conflit de modèles, c'est-à-dire un divorce entre les représentations que nous a léguées le passé et celles qui sont nécessaires pour appréhender le monde d'aujourd'hui...Nous sommes inadaptés à la croissance et au mouvement. (Centre d'Etudes Prospectives. L'Homme Encombré. Prospective 15, Avril 1969, pp 48-49)

APPENDIX 2Interrelationship between operation support structuresComplexity contained by operational support structures

ABC Organizations, meetings and information systems effectively interlinked.

Complexity uncontained by operational support structures

- A Organizations unrelated to meetings or information system
- B Information system unrelated to organizations or meetings
- C Meetings unrelated to organizations or information systems
- AB Organizations effectively linked to information systems but unrelated to meetings.
- BC Meetings effectively linked to information systems but unrelated to organizations
- CA Meetings effectively linked to organizations but unrelated to information systems.

NOTE: This illustration is clearly an oversimplification, but it does show that only under "condition ABC" can the problem complex be in focus. Omitted from the diagram are:

1. other operational supports (e.g. legislation, technology, etc.)
2. the necessary integration between operational supports of the same kind (e.g. organizations), if several are required to contain the problem
3. the effect of the lack of integration under certain conditions or during certain periods of time

Presentation of Information and its Educational Role in Response to Complexity

It is obvious that with the increase in complexity of society and its problems, there is a much greater dependence on information. The point was recently made by Helmut Arntz, President of the International Federation of Documentation:

"Quiconque dans cette situation se hasarde à faire des pronostics sur l'avenir de l'humanité, ne peut pas ignorer l'antithèse entre le pouvoir inouï que nous confère la technique (y compris celui de nous détruire nous-mêmes), et la faiblesse de notre volonté, la médiocrité des moyens intellectuels dont nous disposons pour son application intelligente...Aujourd'hui, nous l'avons vu, l'information n'est plus en premier lieu l'étendard triomphal du progrès. C'est le seul moyen de garder suffisamment le contrôle de l'évolution pour que l'humanité, forte de ses connaissances et de ses expériences, tirant habilement parti de toutes les données de l'information, conserve toujours une avance sur la menace qui peut mener à la catastrophe."

A distinction must, however, be made between (a) the increasing quantities of information required, (b) the increasing quality and accuracy demanded, and (c) the improved structuring of the information necessary to facilitate its use.

In a social environment in which the problems may be considered relatively isolated and easy to place within the mandate or field of concern of a single organization or discipline, the methods of structuring that information can be simple (e.g. alphabetic order, hierarchically structured classification, etc.). Unfortunately, the social environment is now highly turbulent and information can no longer be adequately handled by such approaches, as the following quotations make clear:

"The problem is that in most, if not all spheres of inquiry and choice, quantities of raw information overwhelm in magnitude the few comprehensive and trusted bodies or systems of knowledge that have been perceived and elaborated by man... Where, for example, does the novice urban mayor turn to comprehend the dynamic inter-relationships between transportation, employment, technology, pollution, private investment, and the public budget; between housing, nutrition, health, and individual motivation and drive? Where does the concerned citizen or Congressman interested in educational change go for the best available understanding of the relationship between communications, including new technology, and learning?" (McGeorge Bundy, Managing knowledge to save the environment, US House of Representatives, 1970)

"Many of the most serious conflicts facing mankind result from the interaction of social, economic, technological, political and psychological forces and can no longer be solved by fractional approaches from individual disciplines...Complexity and the large scale of problems are forcing decisions to be made at levels where individual participation of those affected is increasingly remote, producing a crisis in political and social development which threatens our whole future." (OECD, Bellagio Declaration on Planning 1968)

"The most probable assumption is that every single one of the old demarcations, disciplines, and faculties is going to become obsolete and a barrier to learning as well as to understanding. The fact that we are shifting from a Cartesian view of the universe, in which the accent has been on parts and elements, to a configuration view, with the emphasis on wholes and patterns, challenges every single dividing line between areas of study and knowledge." (P.F. Drucker, The Age of Discontinuity; guidelines to our changing society. 1968)

In such a complex context a key issue is therefore how to select, structure and represent information in order to facilitate, rather than hinder, social innovation. And in a very real sense the ability to engender appropriate social innovation is directly dependent upon the innovative character of information delivery to the user. If the user is obliged to devote a considerable proportion of his available time, energy and resources to compensating for inadequacies in the nature of the information delivered, it is much less likely that the available information will provide a constant stimulus to innovation. It will also be much easier for some to adopt a strategy which denies the possibility of innovation.

The above problems of information delivery and the possibilities for their solution, can be usefully discussed in terms of the following interrelated areas:

1. Kinds of information

Information is mainly collected about

- a. "subjects" as distinguished in a variety of document classification schemes. A "subject" is a very general concept covering a hodgepodge of topics ranging from fields of knowledge and skill, through areas of experience and belief, to concern with a particular region, place or person. Classification schemes have not attempted to distinguish and interrelate the different kinds of "subject" important to social innovation. Documents on subjects are often only classified by author.
- b. "subjects" as identified in a population census, registers of companies, employment categories, economic sectors, etc. Because of its nature, such information tends to be mainly quantitative and of necessity mainly processed into an aggregated form in which the individual subjects cannot be either distinguished, interrelated amongst themselves or with subjects of a different kind.

Consider the following kinds of subject which are not generally distinguished as such and yet which would each appear to be important and distinct components of any information facility in support of social innovation.

- problems for innovative solutions are required
- organizational units acting in some way in response to problems
- intellectual disciplines relevant as a body of conceptual tools to the innovative resolution of a problem
- information sources on problems or their solution
- legal instruments relating to particular problems
- human values in terms of which problems are perceived and remedial action is undertaken.
- innovative projects applicable, as proven "blueprints" to the solution of similar problems in other locations.

Such different kinds of information need to be distinguished and interrelated in order to clarify the options for social innovation and resource allocation. So far this has only been systematically attempted at the international level through the experimental project resulting in the Yearbook of World Problems and Human Potential. Similar work remains to be done nationally. An international data bank on proven social innovation techniques and proposals does not yet exist.

2. Multi-purpose information system

Information relevant to social innovation is used in different ways by bodies having very different priorities and mandates. Generally these very differences are considered adequate justification for the establishment of distinct and unrelated information systems for purposes such as:

- research on problem/programme relationship
- education about programme
- policy-making to determine programme
- programme management
- public information on programme
- public participation and programme monitoring

The separation of these systems leads necessarily to lack of correspondence between the information they contain about the same problem area and consequently aggravates dangerously the discontinuities and delays in social change processes and their comprehension. As Sir Robert Jackson notes in the Capacity Study of the United Nations Development Systems, for example: "In short, there are now simply too many separate, inconsistent, incomplete information systems relating to some facet of development cooperation activities." (p. 223, vol II) and "The mere description of the present structure for development cooperation identifies its major shortcomings: it is far too fragmented, and has large areas of overlap which create major problems of coordination and an unnecessary degree of bureaucratic complexity." (p. 288, vol II).

The challenge is to design multi-purpose systems which can filter out information of excessive complexity (or simplicity) according to the requirements of the user. Such systems provide a guarantee that policy is based on the same information as research, for example. They also constitute a needed challenge to develop means of educating people to handle complexity rather than to deny or ignore it.

3. Flexible data structuring

Information on a complex dynamic environment is of limited value if it is collected and structured in terms of one organization's understanding of a particular problem domain in relation to a particular (short-term) programme obligation. Much information is handled in this way and cannot be adapted to new perceptions and later programme requirements. Typically the conceptual assumptions and simplifications about the way in which the problem complex is organized and handled by particular programmes are built into the structuring of the data (e.g. in computer files and software). The data is not structured to permit later inclusion of alternative relationships between data elements. Typically also the analysis tends to focus primarily on the

data elements in isolation rather than on the nature of the (changing) relationship between the elements - which is a prime characteristic of complexity. (This is one advantage of the network-orientation on which the Yearbook of World Problems and Human Potential has been based.) Much work has been conducted on the theory and design of flexible general data structures for computers. Unfortunately, this has not yet been applied to information relevant to social innovation.

4. Information representation

It is one thing to have physical access to information on all the component elements of a complex situation. It is quite another to be able to represent and display this information in a variety of forms according to the preferences and abilities of the user and his degree of tolerance of displays of different degrees of complexity. The conventional approach is either to deny the complexity and to produce a simplified diagram or metaphorical representation, or to accept the complexity and produce a matrix-type representation or equivalent data plot comprehensible to specialists only. The problems of representing complexity have only been systematically studied in relation to the layout of (airspace vehicle) instrument panels. The myth persists that a complex societal situation can still be adequately portrayed to a "cultivated generalist" on a single sheet of paper, and anything omitted by this degree of data reduction is of necessity irrelevant.

A number of techniques have been developed for representing complex situations but these have not been applied to information directly relevant to social innovation. Examples are network maps, and computer interactive display devices capable of handling ordered structures (as opposed to pictures or lines of text).

It is probable that without such techniques, it will be unlikely that we can penetrate the complexity of social situations and communicate whatever insights are obtained. The consequence is poor policy and inability to form a consensus about key issues.

5. Inter-organization information systems

Information systems are generally designed for one organization to serve its predefined purposes. Occasionally, such purposes may include granting access to other organizations whose purpose it approves. This is a very restrictive and inhibiting approach to the facilitation and catalyzation of inter-organizational activity. This point may best be illustrated by contrast with the telephone network which is employed by each user for his own purposes which change constantly over time. Access is not regulated in terms of the use to which the facility is put. As a result the facility makes possible many different and unexpected contacts. No equivalent facility to stimulate contact between bodies relevant to social innovation exists. As a result coalitions form and break up slowly and there is considerable lag in response to any emerging problem situation, or alternatively a very poor follow-up to any spontaneous activity. Information systems should be designed to support inter-organizational activity to facilitate rapid response to new conditions.

6. Images of Man

Social innovation is stimulated and guided by changing concepts of the nature of man. A recent study by the Center for the Study of Social Policy (Stanford Research Institute) makes the point that "Images of humankind which are dominant in a culture are of fundamental importance because they underlie the ways in which the society shapes its institutions, educates its young, and goes about whatever it perceives its business to be. Changes in these images are of particular concern at the present time because our industrial society may be on the threshold of a transformation as profound as that which came to Europe when the Medieval Age gave way to the rise of science and the Industrial Revolution..." The concepts of man are however themselves developed by the innovations which are implemented as René Dubos has pointed out: "The environment men create through their wants becomes a mirror that reflects their civilization; more importantly it also constitutes a book in which is written the formula of life that they communicate to others and transmit to succeeding generations." More succinctly Winston Churchill's point about buildings that "We shape our buildings and then our buildings shape us" could as well be applied to the information systems we choose to create.

The question is what effect does the selection of a particular information strategy have on our changing image of ourselves and how does this relate to the kinds of social innovation we consequently prefer? Conversely, what resistance to social innovation arises from our reluctance to adapt to an alternative image of man?

Organizational Forms in Response to Complexity

As the following quotations make very clear, there is now a widespread recognition our institutions are unable to respond adequately in the face of the increasing complexity of their environment, particularly since they are handicapped by the attitudes and consequences of their own traditional approaches to such stresses:

Evidence is mounting that the environment which managers seek to control - or, at least, to guide or restrain - is increasing in turbulence and complexity at a rate that far exceeds the capacity of management researchers to provide new and improved methodologies to affect management's intentions. Faced with the consequences of force-fed technological change, and the concomitant changes in the social, political, psychological, and theological spheres, there is real danger that the process by which new concepts of management control are invented and developed may itself be out of control relative to the demands that are likely to be imposed upon it. (Introduction to a 1968 management conference session of the College of Management Control Systems, The Institute of Management Sciences)

Social institutions face growing difficulties as a result of an ever increasing complexity which arises directly and indirectly from the development and assimilation of technology. Many of the most serious conflicts facing mankind result from the interaction of social, economic, technological, political and psychological forces and can no longer be solved by fractional approaches from individual disciplines. (Bellagio Declaration on Planning. In: Erich Jantsch (Ed) Perspectives on Planning. Paris, OECD, 1969).

Scientists and business and political leaders in virtually every country are becoming increasingly aware that the human race is facing more crises than its social and political institutions can handle adequately... Many important steps are now being taken to meet these problems. These steps, however, are often shaped to fit existing institutional patterns or to be politically or commercially expedient, while other measures of perhaps equal or greater importance have not yet been started. Moreover, the multitude of crises and their complexity and interactions so overburden the mechanisms that have been designed to handle them that there is a valid fear that these mechanisms will break down at the critical moment and make the disasters worse. (R.A. Cellarius and John Platt. Councils of Urgent Studies. Science, 25 August 1972, pp. 670-676).

Since problems were for so long deemed to be immutable, functions already assumed became more important than aims... In the sequel, within each of these functions, new goals were inferred from extrapolations of goals already achieved, the functions defined the problems to be met, and reassessment of the problems at hand did not lead to the redefinition of the function... The rigidity, fragmentation, and institutional competitiveness of bureaucratic practices are obviously both causes and consequences of this state of affairs. Bureaucratic development is partly a result of the vagueness of aims pursued. The determination of new aims is often not sufficient, however, to overcome these weaknesses, which also stem from the inclination of bureaucracies to resist innovation. For these reasons, contemporary societies are called upon to challenge certain forms of organisation that can no longer render the services they require, because in these societies, change and uncertainty have become the constant companions of prosperity. Thus, it has become a commonplace that many new problems, over the last quarter of a century, have been recognized too late by the government machine, which has often been

moved to action only by the advent of a crisis...For this reason the identification of emerging problems is a function that tends to be overlooked by traditional public administration and therefore cannot be wholly integrated with it... (Organisation for Economic Cooperation and Development. Science, Growth and Society, Paris OECD 1971, pp. 60-61).

...increasing specialization makes all problems more difficult. With more economic and social development, the subdivision of labor is carried to extremes never dreamt of in previous historic periods. The more effective and efficient organizations and planning bodies are those that operate for narrow and segmental purposes, thereby rendering much more difficult any effort to achieve mutual adjustment or coordination. The more able, honored and highly valued expert is the one who works within an increasingly narrow sphere and who has great difficulty in communicating with other experts as well as laymen. (Bertram M. Gross. Strategy for economic and social development. Policy Science, 2, 1971, p. 353).

Institutions, firms and (thanks to television) private citizens today receive critical information very quickly indeed; the aggregate picture at federal level is slow by comparison to materialize. To put the point the other way round, then, the body politic has wildly overactive reflexes. In the body physiologic this is the condition of clonus - it is symptom of spasticity. If we live, as I suspect, in a spastic society it is because of clonic response. And by the expectations of these arguments, the clonus will get worse. (Stafford Beer. Managing modern complexity. In: Committee on Science and Astronautics. US House of Representatives, The Management of Information and Knowledge. Washington, US Government Printing Office, 1970, p. 45).

Many of our institutions seem to have inadvertently reached a critical size beyond which they are virtually uncontrollable in any coherent fashion. This fact of life was aptly described by Richard Bellman, in accepting the first Norbert Wiener prize for applied mathematics (1970): 'I think it's beginning to be realized that our systems are falling apart. We don't know how to administer them. We don't know how to control them. And it isn't at all obvious that we can control a large system in such a way that it remains stable. It may very well be that there is a critical mass -- that when a system gets too large, it just gets automatically unstable.' We see these problems in our educational systems, in our legal systems, in our bureaucratic systems, in our transportation systems, in our garbage collection systems, and so on....Similarly, as the complexity of societal operations increases, autocratically and hierarchically organized bureaucratic structures (whether business, education, government) tend to develop communication overloads near the top and discouragements to entrepreneurship and responsibility lower down...There is a serious mismatch between modern industrial-state culture and institutions, and the emerging new image of man. This mis-match produces such reactions as the growing challenge to the legitimacy of business institutions whose primary allegiance appears to be to their stockholders (typically other corporations) and managers, the growing disenchantment with the technocratic elite, the decreasing trust and confidence in governments, all revealed in recent survey data. The mismatch could result in serious social disruptions, economic decline, runaway inflation, and even institutional collapse. (Centre for the Study of Social Policy. Changing Images of Man. Stanford Research Institute, 1974, p. 230, 232, 240).

These quotations do not however make clear what kind of organizational forms would be most appropriate to this complex environment or, more important, how to facilitate the continuing emergence of more appropriate organizational forms in response to the changing configurations of the problems they seek to encompass. To fulfil its function, any such facilitative open-ended process needs to

avoid pre-defining the nature of the forms to which it will give rise. Whilst at the same time providing a context from which such forms can emerge. One of the sources quoted above recommends that:

In order to sustain our co-plex societal system, we may systematically reconstitute massive bureaucratic structures into organizations with relatively autonomous subsystems (in effect, decentralization). This adaptive form of organization would seem better suited both to cope with complex tasks and to provide more satisfying work for the people involved. (Changing Images of Man, p. 232).

This is only one component of a possible solution however and ignores the unresolved question of the nature and dynamics of the linkages to be maintained between the decentralized units and how to enable the use centralization when it is appropriate. The problem is clarified in the following:

The map of organizations or agencies that make up the society is, as it were, a sort of clear overlay against a page underneath it which represents the reality of the society. And the overlay is always out of phase in relation to what's underneath; at any given time there's always a mis-match between the organizational map and the reality of the problems that people think are worth solving...There's basically no social problem such that one can identify and control within a single system all the elements required in order to attack that problem. The result is that one is thrown back on the knitting together of elements in networks which are not controlled and where network functions and the network roles become critical. (Donald Schon. Beyond the Stable State; public and private learning in a changing society. London. Temple Smith, 1971).

The key questions therefore concern the nature of any alternative organizational forms which might be usefully explored and the problems of facilitating the emergence of organizational networks, their auto-galvanization, their transformation into other configurations, when appropriate, or even their dissolution. (On this latter point it is important to recall that many organizations are often simply memorials to antiquated perceptions of problems.)

Alternative Forms of Organization

1. It is a frequent complaint of those dissatisfied with existing organizations that most of these bodies are based on a western model or concept of organization. As such it is claimed that they do not reflect the style, practice or tradition of organization in non-western societies. This said, however, the formal organizations in such societies tend to differ very little in structure from the western model, except perhaps in the degree of direct or indirect government influence on their activities. Whether organizational forms currently emerging from the Chinese social experiment, for example, could be employed in other contexts is a matter for attention, but there seems to be little evidence of any widespread use of such distinct forms.
2. There has been much discussion of the forms of organization which could result from increased worker (or student, etc.) participation in management. Whether such forms are sufficiently distinct to result in the desired improvement in ability to respond to a complex environment is a matter for discussion.

3. Deliberate efforts have been made in some cases to create minimally structured organizations which blur into formal networks of individuals, groups or institutions. The Club of Rome is one example. The conditions under which such forms are appropriate need to be clarified, as well as the specific possibilities of minimal structuring. Note the commune-type experiments.
4. The pattern of links between organizations across geographic boundaries or fields of concern may be such that the resultant network effectively constitutes a loose organization in its own right but at a different level. Such "organizations" emerge without being deliberately designed and created. It would be useful to know how this process could be facilitated.
5. The relation between members in an organization are conventionally governed by statutory and procedural provisions detailed in appropriate documents. With the advent of computer data networks linking widely dispersed terminals, a new form of computer-based organization is emerging. The rules governing the interaction between the members are precisely embodied in the computer software via which the member users interact through the data network. This technique, known as computer conferencing, has given rise to what are being called "on-line intellectual networks". Some of these already cross national boundaries, linking many institutions (including institutional investors). Clearly the rules governing the participation of member-users can be modified to include most of those which are essential to the functioning of a normal organization.
6. The increased use of the technique noted in the above paragraph could also be accompanied by sophisticated modifications to control procedures in organizations. The current range of organizations is limited because of the need for simple voting and control procedures and easily understandable membership groups. The calculating and display power of the computer permits the use of complex weighted voting techniques to allow for a considerable variety of possible distinctions and means of safeguarding against abuse. For example, one member might be allocated 10 votes on one issue range and 70 on another, with the total votes from particular voting blocs being weighted in terms of a complex index itself governed by a weight changing at an agreed rate over the life of the organization. This would permit a much more subtle make-up of organization membership, reflecting more closely the relative interests, capabilities and qualifications of members. The variety of organizational structures would therefore increase. Such "computer-structured organizations" could be successfully created from combinations of members which would currently be considered improbable or unstable.
7. The above techniques make possible the existence of organizations which only "cohere" and "exist" on particular issues, or which might have a wide voting membership on one issue, but a very limited voting membership on another. This takes us to a point where the concept of an organization as a distinct and well-defined structure (other than in computer terms) is replaced by an emphasis on the potential components of a structural pattern at any one time and the stimulus necessary to call each of them into play. This formalization of inter-organizational dynamics is foreign to conventional thinking about formal organization but is close to the normal intuitive understanding of the operation of networks of small groups, informal organizations and pressure groups. (This concept of a "potential association" is discussed below as a possibility for network design.)

8. Clearly the above trends would encourage the emergence of issue-oriented organizations, presenting all the characteristics of a permanent formal organization except that they would be designed to terminate after a period of days, weeks or months. Such bodies might even be rapidly "created" by computer from a pool of members who have registered interest in participating in any such bodies activated by a sufficient number of requests in response to an urgent issue. The whole procedure of informing members, registering statutes, obtaining funds and initiating action would be handled through data networks. A situation might emerge in which considerably more temporary "computer-formed organizations" of this kind existed than those of a more permanent conventional nature. Clearly this would have many implications which cannot be explored here.

Network design

Just as the distinction between an organizational system and an organizational network has not been resolved (see Appendix), so there is a paradox involved in implying that networks can be "designed" and "operated" rather than that they emerge and evolve in an essentially unpredictable but synergistic fashion. (It may be that designed or operated networks should more appropriately be called systems.) Whatever the case, the following represent some lines of development which merit further discussion.

1. Inter-organizational design

There is little available knowledge on inter-organizational design for the obvious reason that whenever there is any organizational initiative, there is a natural tendency to design a single organization, however large and cumbersome, and little incentive to explore the possibility of inter-organizational networks with a minimum of centralized control, if any. An editorial comment introducing a chapter of readings on "designing an managing interorganization systems" states: "Given the state of the art in research on interorganizational relations, it may seem both premature and hazardous to concern oneself with normative questions of designing and redesigning interorganizational systems." (William Evan. Inter-Organizational Relations. London, Penguin, 1976).

The three articles included as illustrations of potentially useful approaches, make the point that much remains to be done. One deals with strategies for resolving interorganizational conflict, the second focuses on the Antitrust Division of the US Department of Justice, and the third examines the role of computer-based communications systems in effecting inter-organizational linkages (in a product marketing context). None gets to grips with the actual design of interorganization networks and the paradox that implies. There have however been a number of studies of decision-making in an interorganizational environment.

2. Matrix organization

This approach, developed and implemented by NASA for the moon project, is a major step toward network design but fails (in that respect) since it is a single-purpose structure in which the purpose is formulated by one body. Within the matrix structure, each participating body, whether controlled by NASA or not, is considered to be at the intersection of influences from other parts of the structure and itself in turn influences several others. It is a system which tends to diminish the visibility of authority and to emphasize consensus as an operative mode. Operating decisions are part of the give and take of specialized units struggling for a share of the system's total resources.

3. Ad hoc networks

The insights derived from use of a network model as a way of structuring perceptions concerning society can be used to move towards the development of an alternative style of organization.

In testimony in 1975 before the Committee on Foreign Relations of the United States Senate, Alvin Toffler outlined this possibility in the case of international associations (NGOs), in response to a question on how to organize a wide variety of interest groups into a coherent network:

"The question raises extreme difficulties. When you say I mistrust world government, what I mistrust is centralization of power, and I think we should not find ourselves in a position of opposing the notion of world order based on decentralized power or pluralistic power. We have got to find an alternative structure which deals with both these questions. The ready assumption that if we can centralize power we will be able to solve our problems, is a traditional assumption that grows out of our industrial-era experience. I think it applies less and less. One of the reasons I argue the case for much more attention to the NGO's is that the NGO's form the potential for any number of temporary, mission-oriented consortia that could be brought together, whether they are environmental organizations or scientific organizations or organizations concerned with community development of food or whatever the issues are. It is possible to put together temporary concertia to deal with specific problems. Now, in order for that to work you have to have some coordination or management. But what I am describing need not be a pyramid.

Now, here is one way to verbalize the alternative organizational structure. Think of the pyramid. Then think of a thin frame, a very thin frame which is essentially coordinative, which is a thin layer of management and direction, with a whole series of essentially temporary organizational clusters of modules that have relatively short life spans, and among which people float quite freely. They move from one module to another rather than being frozen in a single bureaucratic niche. If we pump some funds into the non-governmental sector, we might help to create precisely this thin coordinative system at the top. We would then have a basis for a very large, very diverse, very flexible, ad-hocratic organization that could operate in the international field."

Nor does Toffler limit this technique to NGOs:

"...we need to think in terms of the creation not of a single center, or a signal world government that will some day govern the nations of the world, but rather in terms of a self-regulatory network of transnational institutions, multiple institutions, a polycentric system. Such a transnational network can provide a higher degree of stability for the planet than the centralized model based on a single international governmental organization...we must first recognize that the U.N. is only a tiny piece of a swiftly emerging transnational mosaic or network of institutions which are part of the new super-industrial system. This network consists of thousands of organizations and millions of individuals around the world in continually shifting relationships with one another." (Alvin Toffler. Hearings before the Senate Committee on Foreign Relations, 94th US Congress, 1st Session, 1975).

4. Potential association

An innovative response to the new operational requirements necessitated by the approach suggested by Toffler is that of the "potential association". Such an association would, as such, not have "members" in the conventional sense of a defined set of individuals or units of organization subscribing in common to a particular set of views. The emphasis would be switched to objectifying the tenuous concept of a group of bodies which could link together in different transient patterns under different appropriate conditions. The need to centre attention on existing organizations (with their tendency to self-perpetuate and constitute obstacles to social change) is diminished in favour of recognition of the range of potential patterns into which the component entities in the potential pool could "gel" in response to new conditions. A meaningful and dynamic social framework for conventional, "permanent" organizations is thus supplied. Thus whilst society may, with the use of an approach of this type, form a highly ordered (low entropy) complex at any given time - satisfying short term, stability requirements - the high probability of switching to completely different high order patterns at later points in time supplies the "randomness" (high entropy) condition essential to the facilitation of social change and development in response to new conditions.

In other words we have a means of ensuring high social stability at each point in time with low predictability over time, or alternatively, and paradoxically, we can think of it as a potentially (i.e. unrealizable) highly ordered situation over time which "contains" a sequence of very disordered situations. An advantage of this is that people and power groups have somewhat greater difficulty in taking up feudalistic roles in potential structures (if in fact it is possible to do so).

5. Organizational tensegrity

There appears to be an unexpected formal analogy between some architectural design constraints and aspects of organization and networks design. Architecture is no longer restricted to simple arches and domes which derive their stability by allowing structural weight to impinge on the compressive continuity of bearing members and protecting the result by occasional tensional reinforcement - an approach which bears considerable resemblance to the conventional hierarchical organization. Instead of thinking in terms of weight and support, the space enclosed may be conceived as a system of equilibrated omnidirectional stresses. Such a structure is not supported by the lowest level. It is pulled outward into sphericity by inherent tensional forces which its geometry also serves to restrain. Gravitation is largely irrelevant (cf. R. Buckminster-Fuller. Synergetics. New York, Macmillan, 1974).

Many parallels can be explored with the organizational development from hierarchies to networks and away from oppressive structures (including the structural implications of worker (or student, etc.) participation in management). The value of this is that considerable thought has already been given to the nature, construction and stabilizing forces within the resultant architectural geodesic and tensegrity structures. It may well be that this will provide the necessary clues on how to design some useful organizational networks for those cases where the hierarchical form is no longer appropriate.

Some Policy Implications

1. Facilitation of network processes

It is clear that intra- and inter-organizational networks are growing, multiplying and evolving in response to perceived social problems and possibilities for action. These changes are in large part unplanned (and unfinanced) from any central point and appear to be self-correcting in the 'excessive' development is compensated by the emergence of counteracting networks. Little attention is given to facilitating this growth so that in some cases it may be considered dangerously spastic. Despite this the network of organizations (international, national, and local) of every kind and with every pre-occupation, represents a major unexplored resource. The (synergistic) potential of this network, if its processes were facilitated, is unknown.

Possibilities for facilitating these processes include:

- facilitative (as opposed to obstructive) legislation
- subsidized postal and telephone communications
- creation of facilitative environments where organizations and people can meet and interact informally to catalyze, wherever possible, the emergence of action programmes or formal collaboration
- creation of information systems and devices to facilitate the development of new contacts in response to new issues (e.g. social action yellow pages, network maps, on-line intellectual communities, community interaction software packages, etc.)
- examination of the significance of the number and reticulation of organizations in a society as a social indicator, both in terms of development and quality of life.

2. Network organizational strategy

The elements of the strategic problem at this time include:

- a vast and largely uncomprehended network of perceived problems and problem systems, on which no single body has (or possibly could have) adequate information.
- a vast and fragmented network of conceptual tools and knowledge resources which is not (and possibly could not be) comprehended by any single body.
- a vast and largely uncomprehended network of agencies, organizations, groups and active individuals spanning every conceivable human interest on which no body has (or possibly could or should have) adequate information.

These networks, and others, are not static structures. They are changing rapidly in response to pressures and opportunities perceived in very different parts of the social system. As such they, and component sub-networks, are not controlled or controllable by any single-body, if only because the complexity cannot be handled by any single body or group of bodies.

The strategic problem therefore is how to ensure that the appropriate organizational resources emerge, and are adequately supported, in response to emerging pressures and opportunities. But it would seem that this must be achieved without organizing and planning such organized response - for to the extent that any part of the network is so organized, other parts will develop (and probably should develop) which will favour and implement alternative (and partially conflicting) approaches.

The challenge is therefore to develop the meaning and constraints of what may be termed a network strategy. This is an approach which facilitates or catalyzes (rather than organizes) the emergence, growth, development, adaptation and galvanization of organizational networks in response to problem networks, in the light of the values perceived at each particular part of the social system.

3. Network vocabulary

Whether amongst academics, policy-makers, administrators, or other practitioners, the frequency with which "network" is now used is not matched by any increasing facility in distinguishing between types of network. Because clear and simple concepts are lacking, together with the appropriate terms, discussion of such social complexity can only be accomplished, if at all, by the use of extremely cumbersome and lengthy phrases which tend to create more confusion than they eliminate. A vocabulary is required which is adapted to complexity. In the absence of such a vocabulary, debate tends to avoid discussion of issues which emerge from such complexity and concentrates on issues which can be adequately expressed via the existing vocabulary. This creates the illusion that the issues which can be discussed are the most important because of the visibility accorded them by the vocabulary at hand.

There is therefore a real challenge to the social sciences to identify concepts associated with complexity and to locate adequate terms with which to label them in their relation to systems (see Appendix). The development of such a network vocabulary would provide a powerful means for objectifying and de-mystifying the complexity of the organizational, problem and conceptual networks by which we are surrounded and within which most of our activity is embedded.

APPENDIX: "System" versus "Network"

The definition of "system" (like that of "structure") is the subject of continuing confusion and often heated debate. It is not surprising therefore that the implication that "network" is in some way distinct from "system" tends to give rise to vigorous debate as recently occurred in Montreal. It is the math-based pure and applied sciences which are most disturbed by the possibility of any distinction. Clearly, in purely formal mathematical terms, both system and network consist of an interconnected set of elements. But once account is taken of the nature of those elements, the manner of their interconnection and the properties of the resultant whole, then the distinctions between definitions of system and of network became confused especially where value-related questions are raised concerning the relative equitability of different social structures.

The question of interest may be less the distinction, if any, and more the connotations of the terms in contexts associated with international and organizational activity. The question may then be why is there a preference for "network" instead of "system" under certain circumstances. Consider the distinctions in the case of a road system/network, a telephone system/network or a concept system/network before reflecting on the case of an inter-organizational system/network. Under what circumstances is there a negative connotation to either term?

The following suggestions have been made as to how the distinction tends to be made in practice.

1. Systems tend to require more information for their description than networks, since flows must be described as well as structural relationships.
2. Systems are described primarily with quantitative information (which is both difficult and costly to obtain and has a short useful life), whereas networks may be described with non-quantitative structural information (which is more readily available at lower cost and has a longer useful life).
3. Systems tend to have a unique (or ultimate) controller regulating the state of the system as a whole, whereas networks tend to have a plurality of controllers (if any), with a relatively high degree of autonomy. (In other words, systems tend to be centralized in some sense, whereas networks tend to be decentralized or polycentric).
4. Systems tend to be associated with imposed structures or patterns (even if limited to the choice of the system boundary), whereas networks tend to be associated with emergent structures or patterns.
5. Systems tend to have well-defined boundaries (even if they are open-systems) whereas the outer-limit (or fine detail) of a network is ill-defined and not of major significance to its description.
6. Systems tend to have well-defined, stable goals or functions, whereas networks, if they have any, may have ill-defined goals, a plurality of goals (possibly fairly incompatible), or may change goals relatively frequently.

7. Systems tend to have a more limited tolerance of changes to their environment, whereas networks tend to maintain a fair degree of invariance and coherence even in the event of highly turbulent transformations to their environment.
8. Societal system descriptions tend to be meaningful only at a macro-level to detached observers, whereas network descriptions retain their utility even when limited to the immediate environment of an involved participant at a particular node of the network.
9. Systems, and particularly their dynamics, tend to be difficult to represent, whereas complex networks can be represented with relative ease.

Rather than attempt to resolve the distinction between system and network, it may be useful to conceive of the two terms as being different but complementary conceptual approaches to a structure-process continuum. When a system perspective is used, in practice the emphasis is on the properties and the characteristics of the whole conceive- as a set of interlinked processes (over which a measure of centralized control is described). The structure supporting the processes if considered at all, is perceived and represented in terms of its gross features. When a network perspective is used, in practice the emphasis is on the properties and characteristics of the continuous pattern of linkages constituting the structure. The processes which may occur in the network, if considered at all, are perceived and represented in terms of the pathways through the network (the mapping of which constitutes the initial challenge). As the concern with processes builds up, the perspective shifts towards the system focus. Whereas concern with detailed representation of the structure shifts the perspective towards the network focus. The system perspective therefore tends to be used when the structure is assumed to be relatively simple and conceptually well-defined but where the complexity of the processes poses a challenge to conceptualization and representation. The network perspective, conversely, is used when the processes are assumed to be relatively simple and well-defined but where the structural complexity poses a challenge to conceptualization and representation.

Expressed in these terms, the complementarity of the two perspectives highlights the problem of description, analysis and policy-formulation in relation to society. A focus on the system process dynamics, as typified by the current approaches to world modelling, is obliged to eliminate structural (and especially fine structural) features to reach a level of aggregation which renders the analysis viable. A focus on the network of fine structure would presumably only be practicable if the complexity of process characteristics was highly simplified. Either filter can be employed, but both cannot yet be removed together and result in any practicable comprehensible investigation.

STYLE	DECISION MAKING PROCESS		LEADERSHIP		FUNCTIONAL CHARACTERISTICS	CENTRAL PROCESSES	ORGANIZED RELATIONSHIPS		PERSONNEL CHARACTERISTICS	RELATIONSHIP TO ENVIRONMENT	
	Type of Decision		Dominant Personality	Functions of Leaders			Intra-organizational	Inter-organizational		Social Environment	Problem Environment
CLASSICAL OR BUREAUCRATIC STYLE	Affirmation of new custom	Transmission of heritage	Elders; wise, sacred	Voice of tradition; source of wisdom nurturer; guardian	Implicit consent Intuitive accord Agreement under obligation or coercion	Strength of tradition Little awareness of alternatives	Coherent, stable traditional hierarchical structure	Traditional contacts; other organ. irrelevant; federations of organizations stable under supreme authority	People trained for highly specialized and limited functions Little job mobility	Component part of static society	Docile, isolated problems in an orderly environment
	Proclamation of intuition	Magnetic, persuasive influencing	Enlightened	Prophetic, inspirational	Vertically oriented hierarchical bureaucracy Organized by expertise	Judgemental character of intuition potential withdrawal of adherents	Emanations of the central intuition	Contacts initiated & maintained if they accept superiority of central message & help disseminate it.	Pyramidal authority structure with fixed procedures for access/appeal to higher levels	Rejection of status quo; articulates change	Identification of new fundamental problem underlying previously isolated problems
	Production of orders	Detailed directions	Aggressive, domineering	Directive; organizing	Written communications with 'fixed' decision rules and chains of command with centralized decision points	Specific standards set by top management	Procedural routinized linkages based on document transfer; jurisdictional disputes	Relations governed by policy of recognition in which superiority of the recognizer is considered implicit		Machine for managing extensive but uncomplex environment	Docile problem groups characterized by their number and variety rather than their complexity and interrelationships
HUMAN RELATIONS OR GROUP STYLE	Formulation of consensus	Shared	Sensitive, cultured	Permissive, non-directive, creation of 'atmosphere'; draws out	Horizontally organized by 'function' areas Mixture of fixed decision rules and autonomous functional rules. Shorter chains of Command with more decision points Participation consent	Individual sense of responsibility; answerability to constituents	Fluid; informal based on mutual empathy	Ad hoc unstructured contacts; organization for project level collaboration; organization groupings raked by fear of 'organization'	Transitional form of organization sharing characteristics of stages 1 and 2 Mixture of line and staff functions with corresponding organizational roles well defined - but flexibly adjusted to allow for more autonomy via both formal and informal access to higher levels of decision-making Job mobility more confined to upper level organizational tasks - other workers tend to remain tied to stated work descriptions and rankings	Reflection of cultured democratic society	Dynamic interactive problems, the consequences of some solutions to problems constitute new problems
SYSTEMIC STYLE	Initiated by experts and evaluated by team	Initiated by experts and evaluation team	Expert, technician	Interprets system environment; clarifies goals, monitors change	Network type organization with mission or objective foci which set flexible decision rules Information flow includes critical man/machine interfaces (e.g. systems analysts, programmers, and controllers) which feedback from bottom to top More autonomous decision making Team consent Modified by team in response to local conditions	Conscientiousness of expert; corrective of goals; threat of non-survival of system	Interacting, constant evolution of new authority structures	Links between complementary or competing organizations committed to survival of same macro-system; dictated by cost effectiveness	Skills less tied to specific sets of tasks within organizations Worker less tied to a single work situation: with developing competence and more flexible skills less attached to specific employing organization Organizations tend to arrange work to develop capacities of people rather than use the capacities to accomplish work Growth of serial careers - with multiple entry paths into different careers, etc.	Attuned to those features of its environment which might constitute a potential threat to its continued growth	Aggressive interactive problems; considerable strategic skills required for central planning
NETWORK STYLE	Participative with representatives of all concerned bodies	Outline directives	Network link catalyzers, generalist	Interprets psychosocial environment, clarifies goals and organizational complexes required; monitors change	More diffuse and geographically separated network type, with a high degree of adaptability and change in organizational configuration Information and decision flows, evolves in response to perceived needs rather than predefined and preset objectives or programs Increased feedback at swifter rates enables previously autonomous decision-making to be integrated into whole system directions	Conscientiousness of those with network roles; counterbalancing objectives of organizational units; threat of non-survival of human society	Interdependent; dynamic emergence of cross-linking authority centers of short duration	Interdependent; dynamic emergence of cross-linking authority centers of short duration, distinction between intra- and interorganizational links considered academic	As above - mix of diverse specialties flexibly adaptive to changes in task and policy directions The managerial executive becomes the prime interface and coordinator of 'temporary' systemic clusters of specialized project groups - with multiple, mobile, and overlapping memberships Ranking according to competence in flexible performance rather than by hierarchic position in organization	Attuned to those features of its environment which might constitute a potential threat to its continued activity and to those which might be threatened by its continued activity	Very aggressive interactive problems; centralized strategy abandoned in favor of decentralized responsibility by a network of interdependent organizations

STYLE	FOCUS	ORGANIZATIONAL FORM	INFORMATION FLOW	CONCEPTION	ORGANIZATION		DURATION	MEDIA	DECISION MAKING PROCESS		
					Purpose of Design	Source of Momentum			Main Concerns	Goals	Degree of Consciousness
TRADITIONAL STYLE	Maintaining a Tradition			Historical institution	Preservation of status quo	Force of tradition	'Permanent' throughout a historical period	Mainly written	Recurrent items	Unquestioned, possibly implicit	Non-reflective
CHARISMATIC OR INTUITIVE STYLE	Pursuing an intuition			Spontaneous creation	Implementing intuition	Dynamism of intuition	'Permanent' for the lifetime of the leader and his immediate disciples		Critical issues	Highly explicit	Spontaneous
CLASSICAL OR BUREAUCRATIC STYLE	Running an administrative machine			Mechanistic structure	Maximizing efficiency	Leadership drive and allocated funds	Undefined duration		Efficient performance of voted programs	Objective and evaluated quantitatively	Conscious; calculated
HUMAN RELATIONS OR GROUP STYLE	Initiating and leading groups			Network of personal relationships	Maximizing personal satisfaction	Group synergism	Undefined short duration	Written Telephone Xerox Etc.	Elaborating group goals	Subjective and emergent	Articulation of feelings
SYSTEMIC STYLE	Survival of a system in a hostile environment			System of flows of information and materials, developed in response to opportunity	Maximizing survival potential and growth of system	Individual self-advancement through organizational unit success in achieving system milestones	For as long as is useful for owners and employees	As above, but significant introduction of computer use at each level speeds up feedback	Adapting system to changing conditions	Outlined centrally; defined and refined by decentralized executive units	Highly conscious or rational perspective
NETWORK STYLE	Adapting to emerging conditions			Dynamic evolving networks of personal and organizational units, living system or organization	Maximizing relevance to perceived problems	Stimulus of individuals and organizational units by new problems and possibilities	For as long as is useful in terms of problem relevance	As above, plus more extended use of interactive communications modes, remote terminals, video conference techniques, etc., enabling widely distributed centers to interact swiftly.	Maintaining balance between adapting to environmental change and creating a fulfilling environment	Defined interdependently	Conscious balance between value and rational perspective

Organization of Meetings for Discussion of Complex Issues

With the increase in the complexity of society and its problems and with the increase in the number of groups and institutions whose views must be interlinked to ensure an innovative response to any new issue, it is obvious that the role of meetings as focal points has become of considerable importance. But whilst the number of local, national and international meetings has increased, as has the variety of issues with which they deal, the form of such meetings has remained essentially the same. Although not applicable to all types of meeting (see below) it is nevertheless valid to note that the basic form of a meeting has not changed over the last half century or even a longer period - despite increasing recognition of the complexity of the issues discussed and despite considerable increase in understanding of the psycho-dynamics of meetings.

It is still standard practice to rely heavily on what can be achieved in a plenary session governed by a rigid time schedule with the consequent emphasis on the contribution of main speakers from an organizer-controlled podium and with effective limitation of the open discussion period. Where the technique of commissions or small group discussions is used, there is still a major problem for participants to allocate their time between parallel groups on related topics, and for the meeting as a whole to receive and integrate the work of such groups once completed.

In a very real sense the content and results of the meeting are predetermined by the choice of:

1. the main invited speakers
2. the potential participants informed, invited, or even subsidized.
3. the physical constraints of the space for plenary, parallel and small group sessions.
4. the geographical location of the meeting in relation to the location of potential participants.
5. the time available.
6. the constraints imposed by a multilingual audience.

As is well known, much is also predetermined by the ("behind-the-scenes") activities and intentions of the organizers and sponsors in structuring the programme and ensuring that the meeting "flows smoothly".

It should not be assumed that these are new observations, for already it is possible to detect the consequences of such abuse of meetings. Questions are increasingly raised concerning the real benefit to be obtained from holding a particular kind of meeting.

Consider, for example, the following extract from a letter recently published in International Associations (1976, 1):

I am writing to you on behalf of a group of international NGO executives who have just returned from a meeting of two hundred persons from all parts of the world — namely, the International Conference of... On the way back home we began talking about the effectiveness of such events. Some of us attend meetings like this regularly and we are questioning their value. This last conference on the... issue was just as sterile as the previous ones in spite of hopes that we could start afresh. One sees the same faces, only at different meeting sites; one hears the same positions defended and one sits in the same kind of hotel or conference room. Somehow we must find another process for such international gatherings.

As we talked on the way home, we agreed that such meetings of 100-200 participants (assembled at costs estimated at \$ 100,000 as a minimum) are like eight cylinder engines running on only two cylinders. We estimated that 85 % of the group listened while 15 % spoke. Not only is this an extremely inefficient use of human resources, it means that many travelled all this way without ever having the opportunity to express their needs and ideas. The more aggressive persons, those speaking the conference language fluently — the conference professionals, still dominate these events. Frankly we feel such meetings are often oppressive...

Many key individuals who used to attend meetings now find that they can allocate their time and resources to more beneficial forms of activity. (They use phrases like "there are too many meetings", "all talk and no action", "the matter has already been adequately discussed elsewhere", "what is the use of another set of resolutions when nothing was done about those from the previous meetings", etc.) Their absence reduces the quality of the meetings actually held and their lack of interaction with "novice-meeting-participants" means that the latter have to waste more time in learning the limitations of the meeting environment.

Clearly many meetings are simply "badly organized". But a significant number of conferences, whether national or international, may be judged a failure or a waste of resources despite the fact that:

1. all conventional physical, technical and administrative facilities and services are used competently with the guidance of experienced personnel;
2. the programme of the conference is well-planned and conforms to the interests and priorities of the different groups of participants;
3. the meeting sessions and the social sessions are "well-organized" and efficiently run.

The question to be raised here is the extent to which the conventional approach to organizing a meeting results in a relatively blunt and crude instrument for:

1. the clarification of complex matters
2. the interaction between groups and organizations whose relationship to the issue and to each other is to be clarified during the meeting.
3. the stimulation of the emergence of innovative and alternative approaches to the issues
4. the initiation of joint projects between the individuals or groups present.

Types of meeting requiring improvement

Four basic types of meeting can be usefully distinguished (see Appendix 1):

1. Hierarchical, podium-oriented meetings used by organizers for informing or exhorting participants or for ceremonial and prestige occasions. This form is extremely well-developed for its purposes and need not be discussed further, except in so far that it is more or less deliberately used to prevent or control communication (including group formation) between participants within the session or between sessions.
2. Small group meetings used for open exchange of views on a specific question. This form has been well explored and need not be discussed further, except in regard to the problem of integrating small group activity into a larger conference framework.
3. Amorphous, unstructured meetings characteristic of fairs, receptions and various kinds of "happening". This form has been quite well explored and need not be discussed further, except to the extent that the relative isolation of participants prevents spontaneous formation of issue-oriented groups.
4. Semi-structured, network meetings intermediate in characteristic between hierarchical and amorphous meetings and providing a framework for many simultaneous small group meetings. This form is only just beginning to be explored by those dissatisfied with conventional methods of organizing larger meetings.

Aspects of meetings requiring improvement

1. Communication between participants

A frequent source of participant frustration within a "well-organized" meeting is the lack of adequate and meaningful contact between participants in terms of their professional interests or organizational responsibilities (namely other than purely social contact). Whilst many conferences are organized primarily for ideal participants in the light of a set of issues and priorities defined by the organizers prior to the meeting, increasingly conferences must respond to a greater degree to the issues and priorities recognized by the real participants or emerging from their interactions during the meeting.

The more experienced participants do not want to be only consumers of what speakers produce. Conferences are for the benefit of participants and the constituencies they represent not just for the benefit of speakers and organizing bodies. Conference participants are increasingly critical and less passive in their response to sterile meeting environments and to seemingly arbitrary imposition and manipulation of particular communication patterns during the course of a conference. Experienced participants and organization representatives have a number of reasons for attending a given conference and justifying the allocation of time and resources. The challenge is to maximize the benefits to participants arising from any such concentration of human resources, given that the organizers will benefit most if the participants are well-satisfied by the exercise (irrespective of the original intent of the organizers).

Innovation is most likely to be facilitated if:

1. contact between participants with complementary interests and commitments is facilitated
2. participants are assisted in their attempts to: initiate new action, inform and involve other participants in projects of mutual interest, and form groups and formalize group action (to the degree necessary).

Such processes could occur either during a meeting session (as a parallel communication activity during periods of formal speeches) or between sessions within the same conference framework. A guide to the possibilities in this area is given in a Checklist of possible participant communication requirements (Appendix 2). This effectively emphasizes the rights of the participant having paid to participate as opposed to the responsibilities of well-behaved participants (namely a code of conduct) as conceived by the organizers.

2. Communication between participant stereotypes

There is a tendency to assume that meeting participants conform, or should conform, to a certain mode or code of behaviour. Much of the value and interest of meetings (particularly international meetings) derives from the unusual diversity of participants and their interests. This diversity, if it is not respected and allowed to influence the organization of the meeting, may however lead to the isolation and frustration of stereotyped groups of participants. In this way the value of the conference as a whole is significantly reduced and little benefit is derived by anybody from the variety of perspectives represented which should in fact nourish and orient any innovative activity and be reflected in its constraints.

The stereotyped groups which tend to emerge or be deliberately ignored may be loosely categorized in terms of the following:

- (a) culture (Moslem, Christian, Japanese, etc.) as a determinant of communication modes; custom (forms of address, eating habits, etc.) as facilitators or obstacles to communication; language (English, European, non-European), as a determinant of communicable concepts and styles of communication.
- (b) development priorities, namely the challenge of Third World representation; ideology (socialist, capitalist, etc.), namely the challenge of integrating conflicting socio-political assumptions.
- (c) age as a determinant of meeting dynamics (the challenge of youth in meetings; integrating perspectives of older generations); sex, as a determinant of meeting dynamics (interrelating male and female viewpoints).
- (d) expertise (expert and non-expert), namely the challenge of communicating complexity; commitment (naive enthusiast and hardened professional), namely the activist challenge; status (official and unofficial participants), namely the challenge of wider public involvement.

- (e) discipline, namely the challenge of inter-disciplinary meetings.
- (f) structural preference (formal versus informal), namely the challenge of relatively unstructured meetings; activity mode (cognitive, affective, physical, etc.), namely the challenge of the experiential mode; activity priorities (debate, information, contacts, demonstrations, etc.) namely the challenge of blending distinct meeting objectives; media preference (speech, discussion, text, audio-visuals, etc.), namely the challenge of non-lecture communication.

The question is therefore what techniques can be used, other than in small group meetings, in order to breakdown the barriers between groups characterized by such differences, whilst at the same time integrating the special perspective which they represent in society at large.

3. Interlinking topics and issue areas

In the case of a conference to deal with a straightforward issue of a kind which has arisen occasionally in the past, clearly there is a fund of experience and allied meeting procedure to ensure that all aspects of the matter are adequately discussed by concerned parties. But in the case of a complex, ill-defined issue where the terminology, categories and action priorities remain to be clarified, special care is required. A conventional meeting approach may oversimplify the discussion process, ignore many relevant side issues and concerned bodies, and generate resolutions which are ineffective, irrelevant, impossible to implement, or positively harmful.

As was implied earlier, the actual choice of the meeting space and duration is a major factor in determining how the issue can be discussed. Time and space factors govern the extent to which the issue can be broken down into sub-issues, possibly to be discussed in parallel. The relationship between meeting rooms on related issues influences the manner in which such issues are linked. The presence or absence of a common, neutral ground between the meeting rooms, and the quality of that space, influences the extent to which participants can and will interact freely and fully. It is in that space that links are born and nourished and that innovative projects take shape.

The actual programme structure is largely determined by these time/space constraints. Many organizers may ignore these constraints by simply multiplying the number of conference and discussion rooms, increasing the number of parallel sessions, or increasing the duration of the meeting. But although each sub-issue may be discussed, there is as yet no satisfactory way of interrelating the discussions and conclusions on related issues where this is justified - or in fact of clarifying the degree of relationship, if any is suspected. A complex network of sub-issues cannot be satisfactorily handled within a meeting governed by a three-dimensional programme matrix.

It has frequently been noted that it is simplistic, even naive, to expect that an interdisciplinary (or multi-viewpoint) synthesis will necessarily emerge simply by collecting into the same space-time framework the specialists from different disciplines or schools of thought. Synthesis is even less likely if their views are expressed in parallel sessions and funnelled through the traditional technique of the "group reports to the plenary session" - which leaves the synthesis to the closing words of the chairman or to the reader of the proceedings. Efforts towards improving this situation are urgently required.

4. Flexible programme restructuring

Clearly there are many restrictions on a conference which is bound to a programme structure determined many months before the meeting itself. In the extreme case, some sessions must be held even though there is no current interest in them; some speakers must be heard, even though most participants would prefer their time to be used otherwise; some new topics cannot be discussed because there is no space on the programme, even though many participants consider the questions to be of greater importance than other topics on the programme.

The dynamic programming flexibility required by the organizers is summarized in the following points:

- (a) Necessity for organizers to be able to re-schedule, during the course of the conference on an hour-by-hour basis in the light of information received at that time:
- the allocation of pre-planned sessions to particular rooms, according to the number of persons who indicate they will attend. (This might include the cancellation of some sessions to give place to others.)
 - the allocation of rooms to new sessions proposed at the last minute on the basis of interests that have emerged during the course of a particular session.
 - the allocation of audio-visual equipment and simultaneous interpretation facilities to meeting rooms according to revised requirements.
- (b) Necessity for organizers to be able to exert the optimum degree of control over the flow of communications in order to maximize inter-participant contact and formulation of new activity without completely disrupting the conference or exceeding the possibilities of the available facilities.
- (c) Necessity for organizers to be able to shift the balance of communication patterns between
- an essentially hierarchical mode
 - a small group session mode
 - an amorphous meeting mode

in order to achieve the advantages of the network mode wherever possible. Clearly whenever the meeting is moving towards sterility, increased participant inter-action should be facilitated, but whenever this increases beyond the ability of the conference to contain it, then the hierarchical mode should be used to a greater extent.

Clearly organizers are faced with the problem of handling flexible evolving conference programmes rather than the traditional pre-determined conference programme. These problems have not yet been explored to any degree.

Expertise required to improve meeting dynamics

There is considerable expertise available to improve small group meetings (10-40 people) in a unilingual environment. Very little attention has been given to improving the dynamics of larger meetings especially in a multilingual, multicultural environment. It is of course in the latter kind of meeting that many projects are formulated, acquire necessary support, and approved.

Some of the new skills that could usefully become as common as that of conference secretary or interpreter are: meeting dynamics mediator, inter-cultural mediator, inter-disciplinary mediator, meeting analyst, meeting evaluator, contact specialist, presentation advisor, etc. Some of these are reviewed in Appendix 3.

Technical facilitation of meeting dynamics

Considerable attention has been given to technical equipment for conferences. Almost all such equipment is concerned with facilitating the task of one person in informing many others of his views under the control of the chairman of the session. Little of it, if any, is concerned with facilitating the two-way communication between participants. As an example, it is still very common for 500-1000 participants to attempt to communicate via a crude "message board" (if the organizers permit it) on which notes are pinned in the hope that the addressees will find them. Many other technical and procedural devices are possible to improve meeting dynamics. Some are reviewed in Appendix 3.

Alternative forms of meeting

The use of the methods noted in the two previous sections offer a means of modifying meeting dynamics modestly or very significantly depending on the risk which the organizers and participants are prepared to take. Some of those arising from the previous section, particularly:

- participant-controlled communication devices
- computer-assisted contact formation
- on-site computer-conferencing

would effectively result in a different and much more dynamic style of meeting. Some effects are reviewed in Appendix 3.

Meeting types

It is useful to distinguish between four basic types of meeting which are best suited to different purposes. The four types are of course extreme cases which in reality blend into one another. The relationships between the extremes can however be usefully illustrated by the accompanying diagram (see Diagram A).

1. Hierarchical meetings (see Diagram 1)

a. **Protocol and policy**: These tend to involve a speech by an eminent person which participants must listen to either as a gesture of respect, or for reasons of protocol, or as a matter of good public relations, or because it may outline new policies for the first time.

b. **Exhortative**: These tend to involve a speech by a respected person exhorting participants to some new effort, namely a speech by a skilled orator conceived as a means of arousing enthusiasm or of changing beliefs in support of some new action.

c. **Information**: These tend to involve a speech by some technically competent person in which new facts are presented, or the results of programmes, or a detailed outline of new programmes.

d. **Administration**: These tend to involve the presentation of annual or financial reports, election of officers, etc.

Advantages: These include the absence of restriction on the number of participants; the ability for those organizing the meeting to inform large numbers of some current situation; and the ability of participants to hear the views of individuals who would otherwise be inaccessible to them.

Disadvantages: These include the restriction on participant expression; the suppression of viewpoints not in accord with those of the organizers of the meeting, or at least not envisaged within the programme framework; and the channelling of participant expression via the podium rather than directly between participants.

2. Small group meetings (see Diagram 2)

a. **Workshop**: These tend to concentrate on the exchange of experiences, discussion of proposals, and clarification of issues.

b. **Committee**: These tend to concentrate on the elaboration of specific proposals, drafting of reports, etc.

Advantages: These include the ability to focus in detail and at great length on complex matters; the facilitation of expression of minority viewpoints; and the ability of all present to participate fully in discussion.

Disadvantages: These include the difficulty of informing any plenary session of the substance of the discussions, of taking into account the viewpoints of parallel group meetings on related topics, and of integrating the conclusions into the larger perspective of the plenary body.

3. Amorphous meetings (Diagram 3)

a. **Exhibitions**: These involve the free movement of participants and their exposure to a wide variety of information on exhibit stands, according to their special interests.

b. **Social occasion**: These include unstructured receptions and parties involving much self-selected interaction between participants.

c. **Open-meetings**: These are un-directed, or minimally directed, large meetings, with much movement and interaction between participants. There is frequently relatively free access to the public-address system.

Advantages: These include considerable opportunity for participants to make contact with one another on the basis of their special interests and to choose the manner in which those interests should be developed (whether by holding a small meeting immediately, or planning some collaborative enterprise for some later date).

Disadvantages: These include a considerable restriction on general coordination and consensus formation verging in some cases on a general state of disorder.

4. Network meetings (Diagram 4)

This is an emergent form of meeting organization characterized by the following:

a. **Flexibility**: Rapid conversion, in the light of emerging consensus during the course of the meeting, to and from the other forms of meeting organization.

b. **Emergent issues**: Identification of emergent issues and formation of subgroups to clarify them rapidly so as to maintain the momentum of the meeting.

c. **Alternative sessions**: Organization of alternative sessions not originally envisaged in the programme or room allocation, where significant numbers of participants find that they have more in common on subjects not scheduled in the pre-established meeting programme.

Advantages: These include a much greater response to the needs of participants present rather than the imposition upon them of a programme which may not reflect their pre-occupations or the areas in which they consider interaction to be both possible and useful.

Disadvantages: These include a considerable strain on the ability of the conference organizers to maintain the coherence of the meeting without having it endangered by emerging issues and desires for programme restructuring.

The first three types of meeting have been well-explored. The dynamics of such meetings and the technical problems of organizing them are well-known. Considerable expertise and technical equipment is available to ensure that such meetings function efficiently and to the satisfaction of participants content with the set-pieces of the pre-established programme.

Such meetings require that participants function in a predictable, well-behaved manner within the framework provided and that their satisfaction with the meeting should primarily be derived from the speakers, panelists and moderators of the sessions established in the printed programme by the organizers.

The focus of such meetings is therefore on the pre-determined meeting session framework. Considerable problems arise if there is any question of modifying the programme and the room allocation in the light of emerging requirements

during the course of the conference. Yet it is precisely the emergence of these requirements which shows that the conference is an occasion on which something new is occurring. Because all significant interaction is supposed to take place within the planned sessions, mediated by the speaker and chairman, no attention is normally given to the problems of the interaction between participants independently of such sessions, other than during the formal social events. Contact between participants is facilitated solely by receptions, parties and banquets. No serious attempt is therefore made to establish contact between participants on the basis of their professional interests or commitments.

Such contacts may of course occur as a result of chance introductions during social occasions.

— from conference organization for well-behaved participants to conference organization for the satisfaction of participants

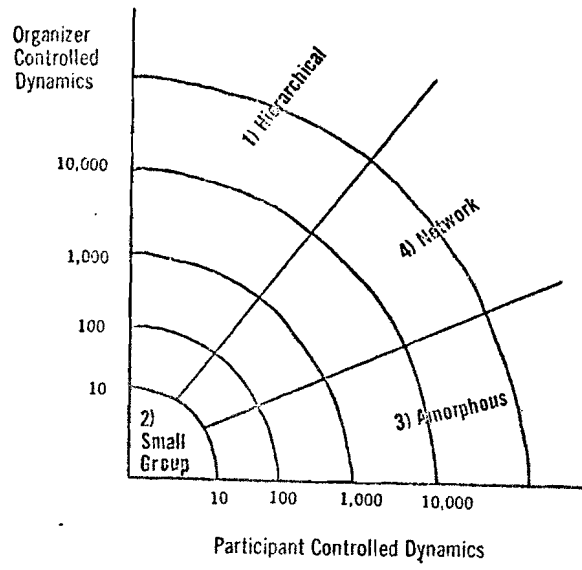


DIAGRAM A

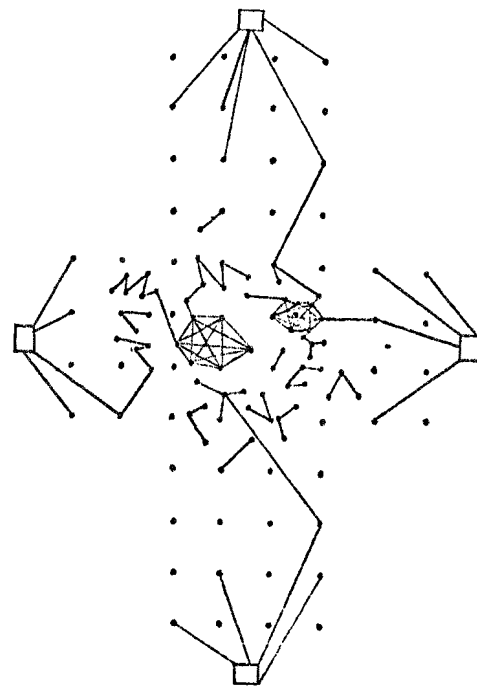
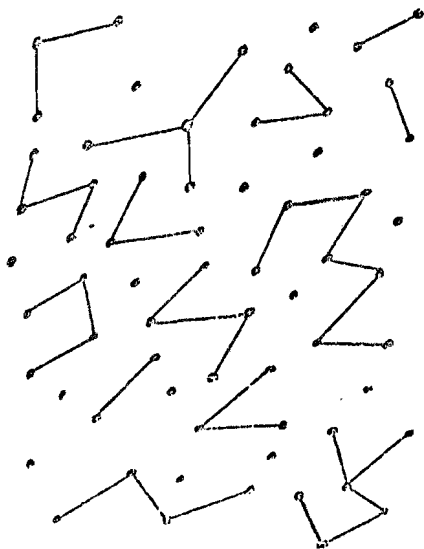
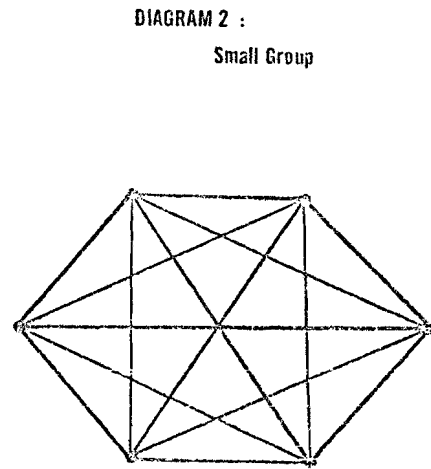
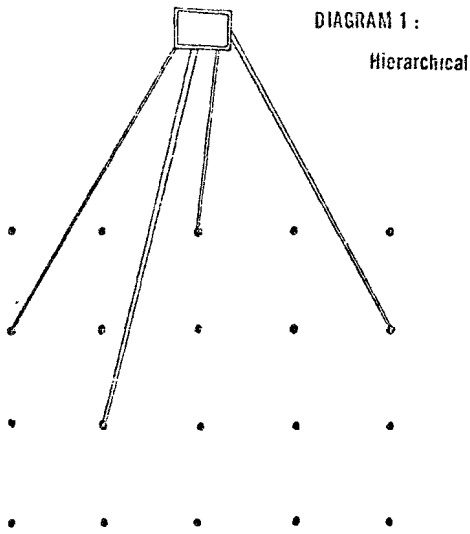


DIAGRAM 3 :
Amorphous

DIAGRAM 4 :
Network

Checklist of possible participant communication requirements (tentative)

A participant may well be prepared to pay whatever reasonable cost is necessary in order to have good communication guaranteed by technical support and thus ensure significant benefit from his investment in the (usually considerable) cost of participation in meetings. The participant may be assumed to want the following communication problems to be resolved for him during an ideal conference. The following list does not take into account the conventional problems of sound amplification, interpretation, audio-visual assistance and other facilities increasingly considered as normal.

1. Communication by a participant within a particular session

- a. Ability of a participant to inform (a) the speaker, and/or (b) the chairman, and/or (c) all participants, and/or (d) a selected group of participants of points such as :
 - (1) his agreement or disagreement with the speaker
 - (2) his agreement or disagreement with a proposal under discussion
 - (3) his desire to move onto the next agenda item
 - (4) his desire for clarification of the point being made
 - (5) his desire for the speaker to make his point more rapidly
 - (6) his desire to adjourn the session
 - (7) his desire to break into small group discussion sessions.
- b. Ability of a participant to participate in electronically-assisted weighted voting on issues in order to arrive at consensus without polarization and oversimplification of the issues under discussion.
- c. Ability to receive an extensive summary of a session into which he has come late, or a brief summary of the past 5-10 minutes of the session if he has been otherwise temporarily occupied.
- d. Ability to convey a message to any other participant he can identify during the course of a meeting session (e.g. to the last speaker from the floor to several speakers from the floor with whom he is in agreement).
- e. Ability to exchange messages with one or more known people during a session to determine a common course of action (e.g. on leaving for a discussion over coffee, or discussion on how to vote).

2. Communication by a participant within the conference framework

2.1 With the organizers

- a. Ability to convey messages to (and receive messages from) the administrative officer responsible for revising travel, hotel and other such arrangements.
- b. Ability to receive up-to-the-minute information on
 - (1) the conference programme amendments
 - (2) the reallocation of rooms for meeting sessions
 - (3) any rescheduling of his own time in the light of the previous points, particularly when he has commitments in particular sessions.

2.2 With other participants in general

- a. Provision of a (regular updated) list of names of people present at the conference with some indication of how they may best be contacted.
- b. Provision of a (regular updated) list of names of people present at the conference with interests and commitments similar to those he has indicated as his own.

- c. Ability to inform all (interested) participants of :
 - (1) a proposal for a new issue for discussion or action.
 - (2) a proposal for the organization of a new working group
 - (3) the announcement of a briefing session or audio-visual event
 - (4) a proposal for a new resolution
 - (5) names proposed for election and to receive the names of the persons interested.
- d. Ability to leave messages for (and receive messages from) people he is not able to contact directly with the minimum of delay before the messages are received.
- e. Ability to have a series of contact meetings (two or more persons) scheduled and re-scheduled according to the changing availability of his prospective contacts, the respective priorities he attaches to them, and his and their respective fixed commitments.
- f. Ability to specify which portions of his time are
 - (1) definitely committed to particular sessions
 - (2) definitely committed to his own private schedule
 - (3) definitely committed to particular contact meetings, however the other person may want them re-scheduled
 - (4) currently available for automatic scheduling and re-scheduling of proposed contact meetings.
- g. Ability to re-specify his interests and communication preferences as new issues emerge during the conference or as more desirable communication possibilities become evident.
- h. Ability to acquire a mailing list of participants having certain types of interest in order that he may send to them (1) during the conference, or (2) after the conference, a copy of some text/report/brochure/meeting invitation, etc.
- i. Ability to indicate the specific areas of activity in which he has engaged in the past, possibly with an indication of the resulting reports (or articles), so that other participants can leave messages indicating that they would like to be sent copies (or receive further details) after the conference.

2.3 With much-solicited key persons (in the case of a non-key person)

Ability to indicate to a selected eminent person his particular interest and reason for a private discussion, given that such persons are usually faced with the need to reduce the number of people with whom they interact on such occasions.

2.4 With non-key persons (in the case of another key person)

The following measures are required, particularly by popular or eminent persons, to prevent exposure to a flood of communication which they may not be able, or wish, to handle. (They are specially required to reduce communication from persistent, or even eccentric, participants.)

- a. Ability to specify
 - (1) from what categories of participant he does (or does not) want to receive communications
 - (2) from which specific participants he definitely does (or does not) want to receive communications
- b. Ability to specify
 - (1) to which categories of participant he may be available for contact, if there is similarity or complementarity of interest.

(2) in what sort of context he is prepared to make contact (private meeting, coffee sessions, interaction with a group, talk to a small meeting, or prepared conference, etc.)

(3) what maximum period he is prepared to allocate to such a contact

(4) what he is prepared to do in any session specifically arranged for his participation.

- c. Ability to exchange messages with (possibly unknown) participants to ensure, if necessary, that they define precisely the purpose of any proposed contact meeting.
- d. Ability to specify
 - (1) which people should be able to leave priority messages for his attention
 - (2) which people should only be able to leave non-priority messages for his attention.
- e. Ability to specify which people should be informed, but not consulted, about his re-scheduling of his contacts with them.
- f. Ability, in the case of a speaker, to receive messages containing the names and addresses of participants who request a copy of the text of the speech, when available.
- g. Ability not to have his name listed in the general lists of participants and their interests as distributed to certain categories of participants, but only a contact num-

ber, in order that he can assess the quality of the proposed contact before responding.

2.5 With key persons (*in the case of another key person*)

The following measures are required in order to facilitate communications between key persons present at a conference.

- a. Ability to specify which people should be able to contact him immediately and directly, without the necessity of leaving messages, or by leaving priority messages.
 - b. Ability to specify
 - (1) which (even more eminent) people have the right to re-schedule their planned contacts with him, without consultation
 - (2) which people he must consult before re-scheduling his contacts with them.
3. **Communication by a participant with the outside world**
- a. Ability to receive messages from his home office and send messages to his home office.
 - b. Ability to communicate (i.e. leave and receive messages) with other individuals unable to attend the conference physically because of commitments elsewhere, such that for many purposes they may be considered to be present at the conference.

Possibilities for technical support of improved meeting dynamics

Participant consensus expression

A simple device can be developed and distributed to participants, in the same way as earphone devices are currently made available, which would permit each participant to indicate any or all of the following :

- (1) agreement or disagreement with the speaker
- (2) agreement or disagreement with the proposal under discussion
- (3) desire to move onto the next point on the agenda
- (4) desire for clarification of the point being made
- (5) desire to adjourn the session
- (5) desire to break into small group discussion sessions or similar points.

The device given to each participant would consist of a set of 6 (or more) switches corresponding to each of the above points. The switches would be linked to a counting device such that when 27 participants pressed the first switch a counter visible to all participants (including the speaker and the chairman) would indicate « 27 ». The total for each other point would also be indicated at the same time. In this way, at a glance, all participants in the meeting session could determine with greater accuracy the sense of the meeting and how it should be continued. This would help to avoid meandering sessions which tend to make conferences a disappointment and a waste of time.

The device as described could be put together from simple items already marketed. A similar device technically is already used in some special classrooms to enable the teacher to obtain feedback from pupils. A simplified device would in fact be particularly useful in lecture-type situations whether in classrooms or in conferences.

The great advantage of the device is that it help to change the pattern of communication. Instead of all communications being mediated by the chairman or speaker, participants are able to indicate to one another their assessment of the meeting in a way which prevents the chairman from manipulating the meeting on the basis of his own interpretation of the desires of participants. The use of such a device would introduce much more immediacy into debates since at every moment, in effect, a continuing vote is being made on a number of features of the meeting. (if recorded, as is technically feasible, this would be extremely valuable data for the evaluation of meeting effectiveness, particu-

larly if a normal voice recording was also available in parallel).

A future development, less easy to implement, is the possibility of arranging for participant-to-participant information flows so that sub-group formation could be facilitated as opposition or support for a particular issue crystallized during the course of a meeting session.

Travelling microphone

It frequently happens that a meeting room has no facility for equipping individual participants with a microphone, or that this is considered economically unjustified. Either the session is then conducted (a) without participation from the floor, or (b) participants come to a microphone at the front, or (c) a microphone on a long lead is taken to them by a hostess. These techniques are extremely crude in practice and seriously inhibit involvement of participants -- they destroy the dynamics of a meeting, particularly when the microphone is necessary for the interpretation.

It is not difficult to envisage a simple piece of equipment that could be permanent, or installed if required prior to a meeting, or possibly in a few minutes prior to a discussion period. This could consist of parallel wires or rails, running the length of the room some three metres above the ground, and supported in tension by vertical posts. The microphone would move over the width of the room, between the parallel rails, on a wire. The connection to the parallel rails could be so arranged that the microphone could be moved the length of the room, or across the room, and then lowered to the person desiring to speak. This movement could be done electrically or simply by a hostess at the side of the hall. Several microphones could be available on the same set of parallel rails.

An even simpler approach to this problem would be to make use of directional microphones operated from one or more strategic positions in the meeting hall. (Whether these devices are as suitable to meetings as they are reported to be for various forms of espionage remains to be seen).

Meeting consultants

The concept of a consultant to advise on the organization of a conference is well-accepted, as is the concept of a public relations expert to assist in the smooth running of the conference in order to create the right impression. It would seem that other types of consultant could also be usefully considered in order to facilitate the meeting dynamics.

The following, for example, could assist :

- (a) in an advisory capacity, for the conference dynamics as a whole, or
- (b) in an advisory capacity during a particular meeting session or
- (c) by intervening in pre-determined ways in order to improve the dynamics

(1) **Meeting dynamics consultant** : concerned primarily with : the general pattern and intensity of communication flow; the diminution of bottlenecks and sterile patches and abusive manipulation of communication opportunities; and attempting to promote the emergence of synergism from the totality of isolated contacts and group interaction.

(2) **Inter-cultural consultant** : concerned primarily with bridging cultural gaps and creating an awareness of cultural sensibilities which might otherwise be ignored creating offence or otherwise hindering the establishment of good communications between participants.

(3) **Inter-disciplinary consultant** : concerned primarily, in the case of interdisciplinary meetings, with bridging the gaps in the communication between people with different disciplinary backgrounds.

With the progressive increase in specialization, the future may see the emergence of a new type of conference professional, namely the interterminology interpreter as contrasted with the present inter-language interpreter. Inter-disciplinary interpretation could now be said to be achieved in the same way as interlanguage conference interpretation fifty years ago.

Graphic mapping of discussion points and issues

(1) It is possible to produce one or more maps showing the relationships between the issues which are the concern of the conference as a whole or of a particular meeting session. These serve to sharpen the focus of debate and are a basis for contact between similarly concerned participants. Clearly such maps may be modified during the course of meeting sessions.

(2) The future may well see the emergence of a new type of conference professional in contrast to the present stenographer or minute writer. This would be a person able to isolate, display and interrelate, on a large-screen graphic display device, the points and relationships as they are made and recognized by a speaker, as well as those attacked by him or by his opponents.

or reinforced by his supporters. Such a display, and its reproduction as a map or series of maps at the adjournment of each session would considerably sharpen the focus of debate and give precision to the pattern of contacts sought and made between participants and opposing groups.

Multi-meetings

There is increasing use of parallel or concurrent group and commission meetings during a conference. At present each such meeting session is part of one programme established by a single organizing committee. However, participants often have interests in a number of related organizations which each hold conferences. Occasionally several such bodies agree to hold their meetings concurrently, or with a partial overlap, to permit participants to attend sessions within both programme frameworks. This « multi-meeting » technique could be developed, particularly with adequate technical support, to permit a variety of organizations to hold their conference simultaneously, with overlap and joint sessions wherever feasible.

Costing formal meeting sessions

A special type of clock has been developed in Denmark to time meetings of corporate executives. Before the meeting the salaries per minute of each executive present is fed into the clock. As each minute of the meeting passes the clock then also shows the total cost of the meeting up to that time. An alternative for international meetings would be to show the cost per minute in relation to the travel expenses of participants, or in terms of an appropriate portion of the conference budget.

Participant communications unit

Individuals can already obtain briefcase size portable communication terminals which can be used to interlace with a telephone system or a computer system. Just as conference participants are issued (possibly on payment of a deposit) with multi-channel earphone systems for use during a conference, so it would be possible to issue them with communications units for use anywhere in the conference complex or in their hotel rooms. This would be an ideal means for storing and transferring messages and other information (1) from the organizers to all (or selected) participants or (2) between participants as desired.

Computer-assisted voting

1. Mechanical voting : The concept of a voting board whereby each participant can indicate, using a button on his desk, his vote on a particular issue is now well-understood. This technique is however only used for formal voting and not for the expression of participant opinion during the course of a debate (as suggested in point A above). Future developments of this technique will require that participants first identify themselves in some way (by inserting a card or a special number) before their votes are accepted.

2. Weighted voting systems :

(1) Card assisted : By extending the use of the electronic voting system noted in the previous paragraph, it will become possible to allocate a definite number of votes to each participant according to some agreed criteria. Once he identifies himself, he is then able to allocate however many votes he has either for (or against) a particular issue, or else to some other participant whom he allows to vote for him.

(2) Consensor : A device, known as the « Consensor », already marketed in the United States (by Applied Futures Inc., Connecticut), is a quantifying voting device which can be used by participants to explore and clarify attitudes and judgments concerning the questions and problems that a meeting has set out to discuss. As currently marketed, it is suitable for meetings of 5 to 16 participants.

The hand-held unit enables each participant to express his views by means of two switches : one to select between the alternatives being voted upon; a second to indicate the intensity with which the participant is in agreement or disagreement. The results are indicated on a visual display unit visible to all participants.

(3) Complex voting : By using a computer to calculate and interrelate votes, there is virtually no limit to the complexity and subtlety permissible in a meeting voting system. Beyond the one-participant-one-vote system, and the simple weighted voting systems lie many possibilities for interrelating and weighting votes. These have not been explored. They are particularly significant because it may well be that only in a meeting environment equipped to facilitate such complex decision-making will it be possible to establish the very delicate coalitions (conditional and temporary) of partially opposing groups which may be the only degree of consensus

which can emerge. The technology and software capability is available. The cost of the necessary electronic calculators now brings them within the reach of every conference-goer's pocket. Such calculators could be specially programmed or designed for conference-goers (as they are for other specialized tasks).

Computer-assisted contact formation

The use of computers to assist in the organization of conferences, particularly the administrative problems of mailing and registration, is now becoming accepted. Software packages are being developed. This use of the computer does indeed assist the conference organizer but it does not help the conference participant - it may even give him a heightened impression of being a numbered body in a participant processing machine.

Computer software packages can also be developed to move the dynamics of a conference onto a new level in order to facilitate the kinds of communication noted in the checklist.

The technique could work as follows, for example :

1. Individual registration cards : These would be an extension of the existing registration document. Different cards would be required for : (a) non-specialist visitor; (b) specialist visitor; (c) ordinary participant; (d) eminent participant (specialist); (e) eminent participant (non-specialist), etc. On these cards the participants would indicate (if they wished to benefit from contact assistance) :

1.1 Profile

- a. Topics of special interest
- b. Preferred method of treating such subjects.

The participants would be able to modify any such profile during the course of the conference as new issues emerged or alternative contact opportunities become evident.

1.2 Availability

- a. Which categories of participant should be informed in the case of complementarity of interest and commitment.
- b. Context preferred for exploring the topic (e.g. individual contact, small group, large group, guided tours, etc.).
- c. For what maximum period.
- d. What he is prepared to contribute to a group session on the topic.
- e. etc.

The participants would be able to modify any such profile during the course of the conference as the characteristics of the partici-

part categories became clearer and as his available time was reduced.

2. Event registration card : These would be prepared for each :

(a) exhibition stand; (b) planned meeting session; (c) planned informal session; (d) audio-visual display; (e) guided tour; (f) etc.

On these cards would be indicated :

2.1 Profile

- a. Topics emphasized.
- b. Method of treating the topic.
- c. Preferred range of participant types.
- d. etc.

The responsible officials would be able to modify any such profile during the course of the conference if the range of topics included, or the nature of the meeting, was changed in the light of preceding events.

2.2 Restriction on participation

- a. Which categories of participant should be informed in the case of complementarity of interest.
- b. Maximum number of participants.
- c. Ability of the responsible body to supply further information, if requested.
- d. Etc.

As before, these restrictions could be changed during the course of the conference in the light of participant reaction to the planned event within the conference framework.

3. Computer-matching : The information on all the cards would be sorted by computer in order to supply periodically (e.g. 2 to 5 times per day) :

- a. To each participant : a personalized list of people with complementary professional interests or commitments.
- b. To each organizer of a planned event : a list of people who have indicated an interest in that event as described.
- c. To each organizer of a proposed event : a list of people who have indicated an interest in that event as described.
- d. To all concerned : a revised allocation of meeting rooms and meeting times, in the light of the interest manifested for particular events and the physical and technical constraints.

4. Dynamics : By responding to the information received, all concerned can modify their actions within the conference environment according to their best advantage and in the light of the possibilities which emerge from each new contact made. Such a system lends itself to many other possibilities, including integration with conventional administration of the conference, or

with the computer conferencing technique described in the next section.

Computer conferencing

The computer conference is a new communication technique which is already in use in a number of situations in the United States. Further developments are envisaged but basically it is a means of enabling many people to « attend » invisible meetings that run continuously 24 hours a day for as long as the participants want. At its simplest level, it is a written form of a conference telephone call. A participant can communicate with a group of people by typing messages and reading, on a display screen or a printout, what the other people are saying. The computer automatically informs the group when someone leaves the discussion, permitting him to continue once again when he rejoins the group.

Major advantages over verbal communication are :

- participants can be both geographically and chronologically dispersed; many people can talk and listen simultaneously;
- participants can contribute at their own convenience, rather than having to wait until other speakers have finished, or being obliged to speak quickly with inadequate time for reflection;
- all messages for him are stored until he wants to reply to them in the order he chooses;
- participant contributions can be anonymous or identified by a number, leading to more uninhibited discussions;
- results of votes are presented only as distributions and are therefore adequately secret;
- during the conference, participants may communicate privately with one or more other selected participants, leading to more rapid resolution of important issues;
- a permanent record may be kept, and possibly indexed for selective retrieval.

Long-distance computer conferencing

This « glamorous » form of computer-conferencing is unpopular with the organizers of conventional meetings because it may lead to fewer international meetings being held. In particular it offers a means of linking by satellite contiguous regions between which travel is difficult (e.g. the West African countries). These possibilities are currently being explored for some developing regions.

Computer conferencing during large conferences at one location

The techniques being developed for long-distance computer-conferencing can be used at much lower cost during the course of a large conference. Because of the scepticism of conventional conference organizers, this possibility has not been considered. There is however no reason why participants should not have access to terminals, whether in the meeting rooms, in special rooms, or in their hotel rooms (or with the use of the Participant Communications Device described under point G above). This technique could provide the basis for fulfilling all the requirements noted in the participant communication checklist, including :

- ability of a key person to respond selectively to questions addressed to him.
- facilitation of interest group formation in the light of emergent issues.
- ability of all participants to exchange and channel messages in parallel with any formal meeting sessions.
- ability of organizers to contact any groups of participants.
- ability to reschedule meeting sessions and individual contact.
- ability to build up select lists of participants with particular interests.
- ability to use computer analysis of the strengths and weaknesses of the communication patterns during a particular period.
- ability to arrange for the accurate invoicing of the communications sent and received, with the ability to subsidize (completely or partially) some kinds of communication.
- etc.

Conclusion

This paper has attempted to show that there is a whole range of meeting techniques requiring new kinds of technical equipment and support. These may not be necessary for many conventional conferences but unless they are available for some kinds of conference, the cost of such occasions will be recognized as increasingly unjustified. Experience with such techniques and their technical support could prove a determining factor in attracting conferences to particular conference centres.

Clearly once a particular international organization, conference organization, or conference centre becomes known for the manner in which it guarantees a quantum jump in participant interaction and sense of satisfaction, the meetings it organizes will become worth the extra expenditure to get to wherever the meeting is held and benefit from the use of such facilities. □

Institutional "Games" and Strategies as a Response to Complexity

The complex intra- and inter-organizational environment constitutes, for many people in industrialized societies, a reality which is as substantial as that of the natural environment with which previous generations felt themselves to be in closer contact. Within such a context in which those involved must simplify their perception of their surroundings in order to be able to act and survive, additional dynamics occur. Individuals, groups and institutions use that part of the environment upon which they have some conceptual or operational hold as a "territorial" base from which to interact with others. There therefore emerges a form of territorial behaviour in which each attempts to build up the significance and size of his own territory at the expense of others. This occurs between organizations, between disciplines or schools of thought, between languages, between cultures, between ideologies, between religions, between values, etc.

Having acquired a hold on a part of any domain, the individual or group in effect transforms it into a fortress which has to be defended against enemies from without and against rivals from within. Survival demands an expertise in strategy and tactics which may well involve obstructing the development of the portion of the domain over which control has been achieved.

Nullification of innovation

Clearly there is a discrepancy between the declared reason for the existence of an organization and its behaviour in practice. It is widely assumed that people or organizations acting on societal problems are attempting to improve the system as a whole or in part. But in the case of politicians, academics, and organizations in general, it is not always the substantive problem which is important. This is in many cases merely a symbol for the territory constituted by the issue.

- a. In the case of diplomacy or politics, for example, issues may be viewed as an opportunity for advancement of the nation or party, or for the benefit of its public image, and only incidentally as a question which requires solution in its own right, independent of national interests or party politics.
- b. In the academic environment, again it is territory which is often the prime concern. A new hypothesis or paradigm may be viewed, if at all, as a territorial intrusion. Even if it is satisfactory, in terms of explanatory power, it may be analyzed in terms of opportunities for publishable criticism or counter proposals which will improve the academic status of the scholar. A scholar must dissent to distinguish himself from his fellows.
- c. Organizations in general, including international agencies, are locked into complex "games". Again it is not program effectiveness which tends to be the final criterion but rather the territory constituted by the problem for which the programme was created and its implications for the survival of the organization. Organizations become "learning environments" and role habitats and have a system maintenance, rather than a system change, function. "The organization is the message" to borrow from McLuhan.

Activity in politics, organizations or academe may thus be more directed to stabilizing a condition of fulfilling behaviour. As a result "more effective" or "more truthful" may become interpreted as doing more activity of the same kind and avoiding or opposing innovation. The tension involved in the process of problem identification and solution, and the associated behaviour; may be considered a desirable feature of the environment and therefore oppose convergence to any "solution" which would terminate the problem solving activity. Much activity is therefore a question of "tourner autour du pot" in order to ensure maintenance of the status quo. Such activity may effectively, but indirectly and invisibly nullify any innovative activity as Stafford Beer has made clear in his adaptation of Le Chatelier's Principle to social systems:

"Reformers, critics of institutions, consultants in innovation, people in short who 'want to get something done', often fail to see this point. They cannot understand why their strictures, advice or demands do not result in effective change. They expect either to achieve a measure of success in their own terms or to be flung off the premises. But an ultrastable system (like a social institution)...has no need to react in either of these ways. It specializes in equilibrial readjustment, which is to the observer a secret form of change requiring no actual alteration in the macro-systemic characteristics that he is trying to do something about." (Stafford Beer. The cybernetic cytotblast -- management itself. Chairman's Address to the International Cybernetics Congress, September 1969)

Problem displacement

Close analysis of "successful" social innovation may therefore reveal that the particular problem has been eliminated to the satisfaction of all concerned (from the electorate to the policy-maker) by eliminating the particular set of symptoms by which it was recognized and which gave rise to the call for remedial action. But action of this kind may merely have ensured that a new set of symptoms emerges in some other social domain. The new set may well be considered more acceptable, or may be less easy to focus on as the basis for an effective campaign for remedial action. Some time will also be required before the new set of symptoms can be effectively recognized. It may in fact be very difficult for an organization to see that its programmes merely displace a problem into the jurisdiction of some other body - whose own actions will eventually result in the problem being displaced back again or into the jurisdiction of a third body. (Institutions may deliberately engage in problem displacement throughout a network of jurisdictions as a way of legitimating their own continued existence.) Such displacement may be difficult to detect because one set of symptoms may be apparent in legislation (e.g. legal discrimination), but when eliminated may then take on an economic character (e.g. economic discrimination) which if eliminated may then take on a social character (e.g. social discrimination), and then a cultural character, etc. Such displacement chains may loop back on themselves and develop side chains which are difficult to detect since each organization is only sensitive to the problem symptoms in its own domain and considers symptoms of the same problem in other domains to be acceptable or of secondary importance. This situation makes it difficult to compare the presence or absence of problems in different geographical areas because of the different forms its symptoms take, the acceptability of some forms in some areas, or the lack of sensitivity to them.

Insubstantiality of complex problems

The fluidity and complexity of this situation is reinforced by the nebulous character of societal problems. Such problems are the artefacts of concerned minds; their shadowy nature derives from the fact that they represent in part an objective state of affairs and in part a subjective state of mind. What is a critical problem to one person may appear unimportant, not a problem at all, or even an aspect of a solution, to another person. There is no paradox then in finding that some complex industrial societies, having a comparatively high plane of material life and rapid advancement of cultural values, may nevertheless be regarded by their members as more problem-ridden than other societies with substantially less material wealth and cultural achievement. Problems thus bear a resemblance to "negative theories", namely they "exist" in the same way that theories exist (bearing the same relationship to data and values), but instead of providing explanatory and predictive power to link related phenomena within a coherent framework, they mark the presence of confusion and unpredictable relationships between seemingly unrelated phenomena.

Structuring the societal environment

In this strange perceptual environment based almost entirely on the movement of symbols and data through information systems and the media, individuals and organizations may well, in the absence of grounded realities, engender experiences for themselves analogous to those under sensory deprivation. A generalized sense of eventlessness may thus provoke the emergence of compensatory collective tensions (having an illusory quality), which can be called societal problems, and to which the collectivity can enthusiastically respond with positive innovative activity - thus structuring its experience

"...the temptation in our position at the present time, vis-a-vis this enormously complex set of problems, is to grab quick, quick, but quick, at anything that will obscure the darkness of the subject and, above all, give us something to do, preferably with our larger muscles." (Gregory Bateson, conference summary. In: M C Bateson. Our Own Metaphor. 1972)

In the case of an individual there exists a phenomenon known as stimulus-hunger, which may be partially transformed into recognition-hunger. These both express the need to avoid sensory and emotional starvation which lead to biological deterioration. Structure-hunger is a further phenomenon through which the individual, in order to avoid boredom and eventual emotional starvation, experiences the need to structure his time - most commonly through some project or activity designed to deal with the material of external reality.

There are several options for structuring time in an intra- or inter-organizational environment. In order of complexity, these are: rituals, pastimes, games, intimacy, and activity (which may form a matrix for any of the others). The goal of the individual then becomes that of obtaining as many satisfactions as possible from his transactions with others. The satisfactions of such social contact revolve around somatic and psychic equilibrium and are related to:

1. the relief of tension
2. the avoidance of unwelcome situations
3. the procurement of recognition
4. the maintenance of an established equilibrium.

Games

Whilst much could be said about rituals and pastimes as a substitute for activity on problems, the concern at this point is specifically with "games" as one form of activity which may govern the dynamics of an intra- or inter-organizational environment and structure individual behaviour in it.

Eric Berne (author of *Games People Play; the psychology of human relationships*, 1966) provides a definition:

"A game is an ongoing series of complementary ulterior transactions progressing to a well-defined, predictable outcome. Descriptively it is a recurring set of transactions, often repetitious, superficially plausible, with a concealed motivation; or, more colloquially, a series of moves with a snare, or "gimmick". Games are clearly differentiated from procedures, rituals, and pastimes by two chief characteristics: (1) their ulterior quality and (2) the payoff. Procedures may be successful, rituals effective, and pastimes profitable, but all of them are by definition candid; they may involve contest, but not conflict, and the ending may be sensational, but it is not dramatic. Every game, on the other hand, is basically dishonest, and the outcome has a dramatic, as distinct from merely exciting, quality." In contrast to a mathematically definable game postulating completely rational players, this type of game is "un-rational, or even irrational, and hence more real."

In addition to the satisfaction they provide, which do not necessarily imply fun or enjoyment, people play such games for a variety of reasons:

1. to avoid confronting reality
2. to conceal ulterior motives
3. to rationalize their activities
4. to avoid any real participative activity.

Clearly all these reasons and the games to which they give rise, may constitute significant obstacles to effective innovative activity. For whenever the individuals involved are in key positions in their respective organizational units, the games they play will effectively determine the positions, policies and activities of their units.

It is for this reason that it is important to understand the nature and range of such games. It is characteristic of the current approach to such matters that the games are only referred to in a humorous context, as coffee-table gossip, which thus prevents any formal recognition of their implications for innovative activity.

As all who are directly involved in organizational activity are aware, such games may be the occasion for humor, but their existence and acquisition of expertise in them can only be ignored at the risk of becoming ineffective in the initiation and implementation of any project.

It is significant to note that a recent in-depth study of institutional executives concluded that a new type of person is taking over the leadership of most technically advanced corporations in the U.S.A. The study names this type a gamesman, described as follows:

The modern gamesman...loves change and wants to influence its course. He likes to take calculated risks and is fascinated by technique and new methods. He sees a developing project, human relations, and his own career in terms of options and possibilities, as if they were a game. His character is a collection of near paradoxes understood in terms of its adaptation to the organization requirements. He is cooperative but competitive; detached and playful but compulsively driven to succeed; a team player but a would-be superstar; a team leader but often a rebel against bureaucratic hierarchy; fair and unprejudiced but contemptuous of weakness; tough and dominating but not destructive. Unlike other business types, he is energized to compete not because he wants to build an empire, not for riches, but rather for fame, glory, the exhilaration of running his team and of gaining victories. His main goal is to be known as a winner, and his deepest fear is to be labeled a loser. (Michael Maccoby. The Gamesman. Simon & Schuster, Inc., 1976)

Of special interest is the gamesman's attitude toward change and innovation, for this is in contrast to the status quo orientation noted above as characteristic of participation in most games in institutional settings. Perhaps these new gamesmen should be considered as super-skilled at the games at which the vast majority are merely novices. The study concludes that "given our socioeconomic system, with its stimulation of greed, its orientation to control and predictability, its valuation of power and prestige above justice and creative human development, these fair-minded gamesmen may be as good as we can expect from corporate leaders."

The key question is whether, through the various existing semi-humorous perceptions of the kinds of game which are played, it is possible to develop greater recognition of their importance both for advancing social innovation or for retarding it. In doing so, it is important not to lose sight of the positive function of games for the individuals who play them, and for the organization units they represent. If, as Eric Berne notes,

"games are both necessary and desirable, and the only problem at issue is whether the games played by an individual offer the best yield for him."

Then in order to stabilize a highly innovative environment, it may be necessary to ensure the emergence of more sophisticated creative games and more skilled players. Such games might then be both directly supportive of social innovation and of the fulfillment of the individual players. The highest form of game skill, with the most benefits for society, may presumably bear some resemblance to the attitudes finally developed in the Eastern martial arts.

